New Jersey Department of Education

FIRST through THIRD GRADE

Implementation Guidelines

2015

The New Jersey Department of Education, in partnership with Rutgers University, Graduate School of Education (GSE) and the National Institute for Early Education Research (NIEER) have developed First through Third Grade Implementation Guidelines with funding provided by the Race to the Top Early Learning Challenge (RTT-ELC) Grant. The purpose of these guidelines is to outline best practices in the primary years of schooling and to assist educators with fusing practices that are both academically rigorous and developmentally appropriate. These guidelines are the work product of a collaboration that spans local school districts, State & Federal agencies, and higher education.

Dr. Shannon Riley-Ayers, Associate Research Professor at NIEER , and Dr. Sharon Ryan, Professor of Early Childhood Education at GSE, led the development of the guidelines. The final document is also the product of the contributions of content experts Dr. Dan Battey, Dr. Nora Hyland, Dr. Lesley Morrow, and Dr. Jorie Quinn. We would especially like to thank the teachers and administrators in New Jersey schools who participated in focus groups and whose contributions provided invaluable input to the content and form of the final guidelines document. The contributions of these practitioners as well as that of our two expert reviewers, Dr. Sharon Lynn Kagan and Dr. Sharon Ritchie, have helped to ensure that the First through Third Grade Implementation Guidelines reflect up to date research on best practices in relevant and useful ways.

Table of Contents

INTRODUCTION

Those who teach in first, second, and third grade know how foundational the early years of teaching and learning are to the ongoing academic success of their students. It is in the primary grades that children learn how to become fluent readers and writers, to engage with different kinds of symbol systems, and to master a range of concepts and processes in mathematics, science, and social sciences. It is also in the early elementary grades that children develop an awareness of themselves as individuals and how to be a participant in a community of learners. The challenge for teachers in first, second and third grade is to teach every subject matter to groups of children who differ academically, linguistically, and culturally. Not an easy task!

Making the task of teaching in the early grades even more complicated is the increasing pressure that teachers experience to demonstrate improved student achievement. Teachers often feel that, to meet these external accountability demands, they cannot teach in child-centered or developmentally appropriate ways but, rather, must impart as much knowledge as possible. Yet, young children learn more effectively by being engaged in solving problems that require them to apply increasingly sophisticated knowledge and skills. Young children are active learners, and effective teachers of young children are curriculum makers who use time, resources, and space creatively to meet the needs of their students.

The First through Third Grade Implementation Guidelines are a resource for primary teachers to empower them to teach in developmentally appropriate ways. The Division of Early Childhood Education has partnered with the National Institute for Early Education Research and the Graduate School of Education at Rutgers University to produce these guidelines for first, second, and third grade as part of a continuous, comprehensive approach to early childhood education in New Jersey. They join the Preschool and

Kindergarten Guidelines already available.

Throughout the guidelines, every effort is made to connect theory, practice, and standards by:

- Drawing on vignettes of classroom teachers that integrate curriculum and projects to help their students engage with the required content in greater depth;
- Providing examples of how teachers can adjust required curricula and programs to enrich and integrate content children are learning;
- Sharing examples of individualized instruction to meet the needs of all learners;
- Giving concrete strategies for how teachers can shape curricula to include inquiry, problem solving, and communication skills; and
- Highlighting opportunities and practices for teachers to create environments and learning experiences that encourage children to grow socially and emotionally, build self-regulation, and exercise effective approaches to learning, such as persistence and flexibility.

To help you access what you need in these guidelines, the document is divided into six key sections.

Introduction—sets the stage and provides the educator with the reasons and need for the First through Third Grade Implementation Guidelines.

Young Children as Learners—provides a definition and exploration of young children as learners, developmentally appropriate practice, development, and diverse learners as well as how teachers can be academically, culturally, and linguistically responsive by working with families and communities.

Setting Up to Support Children's Learning—presents teachers with a look into classroom space and time, including environments and schedules, teacher-child interactions, and the promotion of classroom management through developmentally appropriate practice, Response to Intervention (RTI), and positive behavioral intervention and supports.

Exploring Classroom Content—provides teachers with background about content areas and best practices for Mathematics, Science, Social Studies, Technology, and English Language Arts.

Teaching/Instructional Strategies—gives teachers a look at data-driven instruction, including collecting and using data, scaffolding and differentiation of instruction and units, and teaching and learning through the project approach.

Moving Beyond the Classroom—offers teachers guidance about their work as professionals, with a focus on teacher evaluation and classroom observation measures.

Young Children As Learners

First through third grade is a time of immense change for children as learners. They are gaining mastery over their bodies and are shifting in the way that they think and process information (Hyson & Biggar-Tomlinson, 2014). At six or seven years of age, children no longer rely on their informal understandings of concepts but, rather, are learning to cognitively organize differing disciplinary ideas in response to novel situations. At the same time, they are more cognizant of others in their world and have a greater command of spoken and, increasingly, written language. Therefore, the tools used to help children with their learning are also changing.

For Piaget, children at these ages are moving from the preoperational to the concrete operational stage. They are able to be more fluid in their thinking because they are developing the ability to view a problem from more than one perspective. This means that they are beginning to see how differing ideas are related. Children make these cognitive shifts through interaction with their environments. Consequently, they need to interact with others and engage in rich, meaningful conversations about subject matter. According to Vygotsky (1978), all learning occurs first socially before being internalized by children. The development of new knowledge and skills is socially constructed. It is also important to recognize, however, that children's learning is shaped by the socio-cultural context in which it takes place. What children learn is influenced by what a culture values. Although schools value particular kinds of knowledge, families or communities may not emphasize the same types of knowledge.

This section presents the kinds of learning and development in which children experience in first, second, and third grade while also focusing on children's cultural and educational diversities. Utilizing a strengths-based approach, guidance is provided on how to enact developmentally appropriate practices that capitalize on the strengths that children and their families and communities bring to the school.

Developmentally Appropriate Practice

A firm understanding of how young children learn and develop is essential for all primary teachers when planning instruction. Developmentally appropriate practice (DAP) means "teaching children in ways that meet children where they are, as individuals and as a group, and help each child reach challenging and achievable goals that contribute to his or her ongoing development and learning" (Phillips & Scrinzi, 2014). The National Association for the Education of Young Children (NAEYC, 2009) proposes three core principles of DAP. The first principle is to understand children's learning and development. This means knowing the age-related characteristics of learning and the developmental continuum of children. The second principle is to know and recognize what is individually appropriate. This means considering each child's individual abilities, interests, and developmental progress to make instructional decisions responsive to these individual variations. It also means understanding that children may be the same in some ways but different in others. The third principle is to embrace what is culturally important. This means getting to know children's families and their values, expectations, and factors that influence their lives, including their learning and development. Being culturally appropriate means recognizing how each child processes information that may differ due to variations in culture.

Developmentally appropriate practice includes teaching and learning that is:

1. Age appropriate;
2. Individually appropriate; and
3. Culturally appropriate.

Intentional teachers in primary classrooms use DAP to help young children reach challenging but achievable goals. Teachers observe children to learn about each child's developmental progress, noting social and emotional, cognitive, language, and physical characteristics and development. They take careful note of each child's culture, previous experiences, home language, and interests and use this information to plan meaningful experiences that target key learning standards. The effective teacher then makes plans and draws on a range of teaching strategies to move the child along the learning trajectory through challenging experiences within the child's reach (Epstein, 2014).

Developmental Domains

The domains of teaching and learning are interdependent. Development and learning in one area influences and is influenced by learning and development in other areas. Effective teachers take into account all domains simultaneously. They consider what children need to learn and how they learn and develop socially, emotionally, cognitively, linguistically, and physically. Intentional teachers develop goals and plan instruction and interactions for all children in all areas based on what they know about the child, learning standards, and effective teaching practices. They know what to do to help the children to reach these goals and can describe the rationale behind their approach.

Physical Development

At a very basic level, physical health and well-being are the foundation for all learning. It is difficult for a child to solve a complicated math problem if he or she is hungry, tired, or troubled in another way. Meeting basic needs is critical, as it allows children to be ready and active participants in their learning.

On average, children grow two to three inches and gain three to five pounds per year from ages six to eight. However, there is considerable variation in both gross and fine motor physical development during this time (Tomlinson, 2014). Children in first through third grade can handle greater physical demands than can younger children, due to their bone and muscle growth. Typically third grade children, who develop control over their muscles, demonstrate more precision of movement and coordination than do first graders. This precision enables school-age children to participate in games and sports that involve gross motor control. However, hand-eye and foot-eye coordination are not fully developed until about age nine or ten. At this point in their growth, children's fine motor abilities typically enable them to engage in tasks such as sewing, building with Legos, and playing a musical instrument. Development of children's fine motor skills is especially evident in writing and drawing. By age six, most children can print the alphabet and their first and last names as well as write the numbers 1 through 10 with reasonable clarity (Berk, 2002). As children grow in the primary years, their written letters achieve consistent heights and their writing has more uniform spacing. Children's drawings become more organized and detailed. Dimensionality, or the ability to copy a three-dimensional form, such as a cylinder, still develops up to age eight.

At this age, children need regular physical movement and may become fatigued by long periods of sitting, even more so than by long periods of active motion (Tomlinson, 2014). Motor action, cognitive development, and behavior are all part of a single, dynamic system in the brain, and all of these components influence each other. Physical play and exercise are critical to development, in part, because they promote learning and academic success (Trawick-Smith, 2000).

Cognitive Development and Executive Functioning

By age eight or nine, the brain is nearly adult-size, and head growth slows. Brain development during early middle childhood is characterized by the growth of specific structures, especially the frontal lobes. These lobes, located in the front of the brain just under the skull, are responsible for planning, reasoning, social judgment, and ethical decision making, among other functions. As the size of the frontal lobes increases, children are able to engage in increasingly difficult cognitive tasks. During this period, lateralization (dominance of one hemisphere or the other with respect to specific functions) increases, and the corpus callosum (the neural fibers that connect the two hemispheres) thickens, which, in turn, speeds the processing of information.

Children's thinking becomes more logical, flexible, and multidimensional due to this brain development, enabling them to deal with concrete information that they can perceive directly. They are not yet, however, able to understand complex, abstract concepts or learn through text or direct instruction alone (Tomlinson, 2014). Children still depend on physical actions or direct experiences to learn a new concept (Pica, 2004). Learning at this age requires many opportunities for hands-on application of new skills and active participation in learning activities that build on children's prior learning and everyday life experiences.

During the first through third grade years, executive function skills continue to develop. Executive function is a set of mental processes that help to manage tasks such as planning, organizing, and paying attention. Growth in executive functioning skills, such as self-regulation of thought and attention, does not occur simply as a result of maturation. These skills rely on teaching and learning to improve. With support, children in the primary grades gradually increase their ability to focus attention, while filtering out irrelevant information, and begin to engage in longer periods of sustained work.

Social and Emotional Development

As children develop cognitive and physical abilities during the primary school years, they also develop socially and emotionally and, as a result, become more responsible and independent. At this age, children also have a stronger ability to follow rules and are capable of playing cooperative, rule-regulated games. Thus, teachers can provide children with meaningful work to be completed both independently and collaboratively.

During the primary years, children become more attuned to others' emotions and how their own behavior affects others. They develop a more realistic understanding of their abilities, understand that people have different perspectives, and begin to make social comparisons; that is, they judge themselves in relation to others. This highlights the need for teachers to provide each student with individualized opportunities to be successful. Developing individual instructional opportunities allows children to take the next challenging, but achievable, step in their learning and development. This approach ensures that all children experience success while building their skills and self-esteem.

Friendship Skills Development

Friendships develop and change over time. Friendships require children to learn how to give and take. In positive friendships, children develop skills that help them learn how to meet their own social needs and the needs of others. To promote the development of friendship skills, teachers need to provide experiences such as playing games or sharing materials in the classroom.

Part of developing friendships is learning how to take another's feelings into account. Children in the primary years begin to both talk and listen to one another. They also begin to work and play in groups with children of similar interests. In the classroom, teachers can help children build friendship skills by having them work together in collaborative groups. While working in groups, children learn to cooperate and communicate effectively with one another. By setting clear rules and expectations prior to group work, teachers provide children with appropriate skills for interacting in social relationships.

Language and Literacy Development

Language and literacy development is a major focus for children in the primary grades. Most children who are not up to grade level in literacy skills by fourth grade generally do not catch up (Annie E. Casey Foundation, 2010). Increases in language development require repeated exposure to new words and numerous opportunities to use them. Children need access to texts and spoken language to learn new concepts and words. As such, strong language skills are the building blocks for learning to read and write. By age eight, children expand their vocabularies to about 20,000 words (Berk, 2008) and are learning new words rapidly, at a rate of approximately 20 words per day. They begin to understand that words may have multiple meanings and begin to see nuances in word meanings. At this age, children engage in rich conversations with peers and adults and discuss new words, including their meanings and connections to other words.

This increased vocabulary provides support for developing reading and comprehension skills. Reading skills develop quickly and become more advanced as children move from first through third grade. Children are likely to have a reading vocabulary of 300 to 500 words in first grade, and, by third grade, children are likely to be efficiently reading chapter books, decoding advanced words, and reading fiction and informational texts aloud with fluency.

Strategies for language development must also support English language learners (ELLs). The number of children who speak another language at home is steadily increasing. Children at this age are capable of becoming dual language learners, and notable benefits to bilingual learners have been documented (e.g., Farver, Lonigan, & Eppe, 2010; Valentino & Reardon, 2015). To promote language development, teachers support literacy learning in both English and the child's home language.

Summary

This section offered a snapshot of children's development and the role of teachers in shaping this development. Although each domain is described separately, it is critical to note that the child develops as a whole. Each domain influences and is influenced by the experiences and development in the others. Notably, children's development before the age of eight or nine is uneven and episodic, as children may not develop equally in all domains. One child may be gifted cognitively but struggle with physical tasks. Another child may be physically ahead of his or her peers but struggle with social interactions in the classroom. No two children develop in exactly the same way. Children enter these grades with a range of skills, prior experiences, and abilities across domains, and they continue to develop at varied paces. Effective teachers consider each child individually and tailor instruction to meet all students where they are, while working diligently to move each to the next level in the developmental spectrum.

Diverse Learners

Although teachers' knowledge of general patterns of development for children ages 5 through 8 is important, the reality is that every class of children is diverse. This diversity will be evident in the range of experiences and competencies that children demonstrate. Although some children in first grade might be reading texts for third graders, others will have trouble with basic sight words. Some children will complete tasks within minutes, while others will need to have extra time allotted to be successful.

There also will be children who vary significantly along the developmental spectrum. They may not necessarily be identified as such, but teachers often work with children who may have special needs who require substantial differentiation of instruction to be able to learn. The Individuals with Disabilities Education Act (IDEA) of 2004 mandates that children with identified disabilities be fully included in regular education classrooms. Therefore, it is highly probable that teachers will be teaching one or several children with individual education plans that specify required adjustments to their instruction. Teachers also may have children in the classroom that show exceptional talent or giftedness in one or more areas.

Children in primary classrooms also vary in cultural and linguistic backgrounds. New Jersey has one of the highest immigrant populations in the nation, and there are some districts in which over 30 languages are spoken in the community. At the same time, U.S.-born families differ in terms of race, ethnicity, socioeconomic background, and culture. Often, teachers assume that, because all of their students are White, there is no diversity. However, even within seemingly homogeneous groups, there exist many differences that should be accounted for in the curriculum if children are to feel recognized and supported in their learning (Derman-Sparks & Ramsey, 2011).

The challenges and joys of being a primary teacher include being able to help each group of diverse young children become competent learners who have mastery over a variety of subject areas and who are able to work as a community to apply and inquire about their learning. Key to this work is teachers who not only are knowledgeable about children's learning and development and of subject matter and pedagogy but who also have an understanding of how to use children's differences as a resource.

To work with differences and diversities in the classroom, teachers need to be committed to ensuring that every child receives an equitable education and is treated fairly. Achievement data collected over several decades show how children from low-income, minority, or English language learning backgrounds are less likely to succeed academically and socially. Teachers in the primary grades provide the foundations of learning that can either support or hinder children's academic success. Therefore, if every child is to succeed, teachers also need to be advocates for their students and work with children's families and communities. So how can teachers be academically, culturally, and linguistically responsive in just and fair ways? How can teachers work effectively with families to use children's differences as strengths in the classroom and beyond? The following sections address these concerns.

Being Academically Responsive

Too often, the curriculum used to teach subject matter assumes a one-size-fits-all approach. If all students, with their differing academic learning needs, are to master necessary content and skills, teachers need to modify the curriculum. Differentiating instruction to meet the needs of academically diverse students involves adapting either the task, the content, teaching techniques, the learning environment, and/or assessments for a particular student or group of students. For example, consider Henry in the following vignette:

> Henry is an active first grader who is excelling academically. He scored above grade average on the Developmental Reading Assessment (DRA) at the midpoint check and has achieved 100% on all math unit tests. He is adept at solving problems in content areas such as science and demonstrates a strong vocabulary obtained from his extensive reading of informational texts. He is flexible in his thinking and points out connections to previous lessons. He is one of the few children in his classroom to have developed an understanding of language that enables him to "get" various jokes and riddles that the teacher shares. He is an athletic child of average height but consistently makes baskets in a full-size basketball hoop. Henry likes to participate in full-group discussions, but is not yet self-regulated enough to wait to be called upon. He also has a difficult time keeping his hands off of other children nearby while working in large- or small-group settings. After a period of sitting or whole-group instruction, Henry often needs sensory input. He demonstrates this in a number of ways (e.g., touching his neighbor, gripping his pencil tightly and pressing hard, standing at his desk instead of sitting, chewing on the sleeve of his shirt).

In her first grade classroom, Mrs. Thompson differentiates the environment for Henry. She recognizes that he needs sensory input, so she has shortened whole-group instruction and has flexible expectations so that Henry knows that he can stand instead of sit at his desk. Henry is also has bouncy bands on his desk to keep his feet moving while sitting. In her lesson planning, Mrs. Thompson thinks about how she can break up the whole-group instruction portions of a lesson so that Henry does not lose focus. She also has initiated whole-class yoga to help Henry to become more aware of his body and to stretch out his need to move and touch things.

Teachers often think about differentiating the curriculum for children who are struggling, but a strengths-based approach also requires that teachers recognize and challenge students who excel academically. For example, gifted and talented students who are working in a subject area or areas at least one or two grade levels above their age group benefit from having the curriculum enriched in some way. Enrichment does not mean more of the same but, rather, adjusting a lesson so that students can go deeper into knowledge. So what are some strategies that teachers can use to build on children's strengths, regardless of where they are on a developmental continuum and in their mastery of academic knowledge and skills?

Observing and documenting children's learning. The first step in getting to know the children in the classroom is to observe them in a variety of learning situations. Anecdotal records of what children are engaged in, their interests, and their responses to various activities can be used to build a baseline of information about who students are as learners. Children also help with this documenting if asked to represent their learning and thinking in some way. This might be through drawing for younger students, graphing, writing a short summary, or presenting information orally. Once a teacher has a sense of the children, then specific interventions that capitalize on their strengths while also targeting specific areas of need can be planned.

Using flexible grouping. Children learn from one another, and those who are more advanced can help support the learning of others. Sometimes it is more helpful to target instruction by working with a group of students at the same level, and it is useful to consider what form of grouping works best for what is being taught. One of the most important things that children learn in the primary grades is how to respect and be responsive to differences; therefore, it is important that teachers find ways for children of differing abilities to interact with one another. One of the easiest ways to do this is to place children's desks in heterogeneous groupings.

Implementing learning activities that allow for different strengths. Every learning activity can be either simplified or enriched in some way. One of the best ways to teach to children's strengths is to implement projects. While some children might investigate different travel options to get to Arizona in a second grade communities project, others could be working on creating a brochure with simple text to describe their town. The key is to know the learning progressions of differing content and then work to help children deepen their learning, no matter their learning needs

Using student interests to supplement the curriculum. Children need to know that they have a place in the classroom and are accepted for who they are. Teachers who include children's interests and experiences in the curriculum have better success at motivating children to persist with challenging concepts and skills. For example, Mr. Walsh knows that Carlos, in his third grade class, is reluctant to write. He also knows that Carlos is interested in graphic novels, so he introduces some graphic novels into his library and reads them to the class during the whole-class portion of the literacy block. He then suggests that Carlos write and illustrate his own graphic novel.

Teachers who plan and enact curriculum that has been adapted or modified using children's strengths and interests enable all learners to find a place in the classroom.

Being Culturally Responsive

Culture involves more than being from a certain place or the food, dress, or customs of a particular community. Cultures are defined by a set of values and worldviews that, in turn, shape norms or rules for behavior as well as the different outward products or artifacts produced by communities, such as food and dress (Ramsey & Williams, 2000). Simple behaviors, such as whether one makes eye contact when talking or how a parent disciplines a child who is misbehaving, are culturally influenced (Weinstein, Curran, & Tomlinson-Clarke, 2003).

In the United States, what is taught in schools and how it is taught has been dominated by the values, rules, and worldviews of the White middle class (Derman-Sparks, LeeKeenan & Nimmo, 2015). However, many children in New Jersey's classrooms are not from White middle class homes and, therefore, often experience a dissonance between how they have been taught to behave and what is expected of them in school. Primary teachers inadvertently discriminate in the classroom if they do not consider how culture shapes children's learning and their classroom behavior. For example, Ms. Adams keeps getting frustrated with Houng, a second grade Vietnamese American girl, who repeatedly answers "Yes" when Ms. Adams asks her whether she understands. However, Houng's written work is often incorrect. Ms. Adams concludes that Houng lacks motivation to learn and chastises her for not

seeking help. Ms. Adams has no idea, however, that the literal equivalent of "yes" in Vietnamese is "da," which also can mean, "I am politely listening to you" (Grossman, as cited in Weinstein et al., 2003).

The first step toward enacting a culturally responsive pedagogy (Gay & Howard, 2000) involves teachers' recognition of themselves as cultural beings whose histories and identities shape how they interact with students (Souto-Manning, 2013; Weinstein et al., 2003). Unless teachers are able to understand how their culture shapes who they are and how they work in the classroom, they will continue to assume that their own ways of being and doing things are the norm (Derman-Sparks et al., 2015; Derman-Sparks, & Ramsey, 2011; Souto-Manning, 2013). In so doing, teachers reinforce their cultural values over those of their students and may be inclined to see children's differences as problematic.

Once teachers are aware of their own cultural identities and how schools have traditionally emphasized mainstream culture as the norm, it then becomes possible for them to enact curriculum and pedagogy that uses children's differences as resources, rather than as deficits, for instruction. Some of the ways that teachers can incorporate children's cultures into the curriculum include:

Creating an inclusive classroom environment. An easy strategy is to ensure that the classroom is structured to show acknowledgment of and respect for diversity. This involves including books and images that portray children from different races, ethnicities, family types, genders, and abilities. Photographs and other displays of the children themselves allow children in a classroom who are not part of the dominant culture to feel recognized. Signs in the languages of the children as well as in English also help to communicate inclusion.

Allowing children's discourse patterns into the classroom. Different cultures have different linguistic codes, and culturally responsive teachers allow these different ways of speaking and communicating into the classroom (Weinstein et al., 2003). Of course, children need to learn how to speak and use academic English; however, by validating their cultural discourse patterns, children are able to build a bridge between their culture out of school and their in-school experiences. In allowing children's linguistic codes into the curriculum, teachers also learn how to communicate with their students more effectively. For example, Ms. Adams, in the above example, could learn some words in Vietnamese related to the concepts that she is trying to teach as one way to enable Houng to engage with the curriculum.

Allowing children's ways of being into the classroom. Often, teachers are so focused on getting through the academic curriculum that they may not pick up on the cultural references that children share. For example, a first grade teacher may be talking with the children about things that roll or turn. When showing a picture of a rolling pin, one child may call out, "That's what we use to make roti." The teacher might ignore this comment and then ask the children whether they ever make pizza with a rolling pin. In this example, the teacher missed an opportunity to learn more about a child's cultural experiences. If the teacher had known or asked what roti is, she not only would have affirmed this child's culture but also would have opened up the conversation so that other children could contribute to their experiences with rolling pins and dough.

Enacting culturally responsive classroom management strategies. Teachers need to use a cultural filter when interpreting children's behavior (Weinstein et al., 2003) and to be aware of and use cultural discourse patterns to communicate their expectations. Children may respond better to a direct discourse pattern ("Sit down, please!") than an indirect one ("Javon, would you sit down, please") or to particular consequences related to cultural values. If teachers are to be culturally responsive, it is also important that the expectations for classroom behavior are communicated explicitly and modeled consistently to all children.

Learning from and including families. Including children's cultural knowledge and experiences in the curriculum requires teachers to develop their cultural content knowledge (Weinstein et al., 2003). One way to do this is to get to know the children's families. This is not always easy to do, as some families

may not believe that they should be involved in their child's schooling. For example, newly arrived immigrant families who do not have English as a first language may defer to the teacher when it comes to their child's education. Other families, based on their own schooling experiences, may be untrusting of teachers. One way to get to know families, then, is to invite them to the school for some kind of informal event, whether it be a picnic or a reading of a book that children have made that could include the sharing of cultural stories or artifacts. It is important to get to know families on an individual basis as well, which can be done through an interviewing project whereby children interview family members and construct a story. Another way is to make home visits and to get to know where children live, who they live with, and common family practices, including those that involve literacy and language.

Central to all of these actions as well as others espoused in multicultural education books, e.g., anti-bias curriculum (Derman-Sparks & Edwards, 2012), is the importance of infusing children's out-of-school experiences into the everyday curriculum of the school (Souto-Manning, 2013). Taking a strengths-based approach, culturally responsive teachers use children's cultural ways of knowing and being to help them to navigate academic content and to learn to negotiate differences between themselves and their peers.

Being Linguistically Responsive

All language learning occurs within a social and cultural context. It is through talking with others and participating in the cultural practices of a community that children learn how to use language. New Jersey's classrooms are home to a large number of ELLs. Many teachers assume that, because a child does not speak English and they do not speak the child's language, the only way to work with ELLs is through some kind of specialized intervention, usually outside of the regular classroom. However, it is through participation in the English-speaking classroom community that young ELLs learn to become proficient users of English.

Using children's proficiency in their home language, teachers can help ELL children become successful speakers and communicators in English (Castro, Paez, Dickinson, & Frede, 2011). This work is very important, as helping ELLs become speakers of English has direct implications for early literacy learning.

Consider how Mrs. Thompson, in the following example, uses her knowledge of Hindi and of Saanvi's linguistic ability in English to help her participate in the classroom.

> Mrs. Thompson works closely with Saanvi as she acclimates to her new classroom. She is learning English in school and speaks Hindi at home with her family. Mrs. Thompson must rely on a variety of resources, as she does not speak Saanvi's home language. She has formed a warm relationship with Saanvi and helps her feel welcome in the classroom. Mrs. Thompson is able to understand Saanvi through observation and communicates with her through gestures and pictures. Observing Saanvi's work with pattern blocks, Mrs. Thompson knows that Saanvi has a strong understanding of problem solving. She challenges Saanvi with various puzzles to continue development of her problem-solving skills. She notices that Saanvi enjoys reading small books that she brings from home. Mrs. Thompson encourages her to work with a partner during reading time. She asks her to read books in Hindi to her partner while her partner reads books with heavy picture cues to Saanvi in English. Mrs. Thompson also observes Saanvi's skill in her drawings. In her science journal, Saanvi's drawings demonstrate an understanding of the science content studied in class. Mrs. Thompson acknowledges Saanvi's concept development, evident in her journal, and works one-on-one with Saanvi to add labels to her drawings. Mrs. Thompson also notices that Saanvi is anxious each time the class leaves the room. To help ease her stress and strengthen her feeling of belonging, Mrs. Thompson uses some words in Hindi, such as hello, goodbye, lunch, art, and music.

Castro et al. (2011) recommend several research-supported strategies that can help ELLs with their language and literacy development that include:

Creating a language- and literacy-rich environment. Children learn a language by hearing, seeing, and speaking the language. Presenting images alongside environmental print in English and the home languages of children provides visual cues to help children move from one language to another. For example, during calendar time, a first grade teacher has relevant vocabulary words written in Spanish, Russian, and English. As she reads and points to the word in English, she asks the children who speak the other languages to teach her how to say the word. Similarly, having books both in English and translated into the languages of children in the classroom provides resources for children to engage with print and oral language.

Providing many opportunities for talk. It is through talk that children develop their awareness of sounds and learn the meanings of words while also practicing how to speak English. While engaged in talk, children also develop an awareness of how English is used in different social contexts and learn to participate in the academic discourse of the classroom. Therefore, teachers need to provide opportunities for children to talk using both their own language and English. Because most ELLs usually have a silent period during which they do not speak English but, rather, are developing their receptive vocabulary, it is important that teachers provide many opportunities for informal interactions between children as well as small-group activities in which children who are learning English may feel more comfortable talking with their peers than with the adults in the room.

Having consistent routines. Learning to speak, read, and write in English requires learning how to participate in daily classroom practices. Having a consistent schedule and using the same kinds of activities for transitions and classroom management allows children with little or no English to feel confident, as they are able to follow along and be a participant even if they cannot perform all of the activities in English.

Using gestures, visual cues, and other supports. Although children may not be able to use English when they first enter the classroom, they can understand and participate in the curriculum if provided with simple supports. Using gestures and movement and modeling what is expected as well as using pictures and other visuals can help children to understand what is being asked of them. Similarly, when talking, teachers can use repetition and emphasize key words that they want children to understand. Importantly, teachers need to keep directions simple until ELL students are able to comprehend more complex instruction in English.

Using the children's home language as a tool for instruction. Teachers who are monolingual may believe that they are not qualified to use the children's home language in the classroom. Research, however, suggests that, in making this assumption, teachers are doing a disservice to their ELL students. Children's proficiency in their home language supports their learning and the use of English. In small-group interventions, teachers can work with their ELL students to read and speak basic vocabulary and sentences in their home language and in English. As was seen in the case of the teacher above, this can be done in combination with visual cues and gestures. When planning instruction, teachers can prepare themselves to use more than one language. To learn more about the home language of their ELL students, teachers need to collaborate with families. By showing their ELL students that they are interested in learning about their language and culture, teachers send a clear message that both languages are important and valued in the classroom.

The challenge in using these strategies with ELL students is how to differentiate instruction in these ways when teachers have multiple students who are learning English whose command of English varies and who do not speak the same language. The What Works Clearinghouse (2014), in its educators' practice guide, Teaching Academic Content and Literacy to English Learners in Elementary and Middle School, provides four recommendations for teachers to implement, based on the latest research evidence. These recommendations are:

Focusing on academic vocabulary instruction. Vocabulary is key to reading comprehension. Young ELLs are, at the same time, learning both a new language and how to read. Teachers can explicitly teach academic vocabulary to their ELLs by using a brief informational text for each lesson that is aligned with their instructional goals. The text should include a small set of academic vocabulary. Teachers can then work in small groups with ELLs, directly teaching the words through different modalities (e.g., talking, reading, writing, acting out, using the text). As they do so, they also can demonstrate different word-learning strategies, such as looking at the contextual clues and sounding out the words.

Integrating English language instruction into content-area teaching. Visual tools, such as videos and graphic organizers, can be used to help ELLs make sense of the content. Content-specific vocabulary and general academic vocabulary should be taught as part of the lesson. Providing ELLS with opportunities to talk about academic content with peers also provides them with practice in using the vocabulary.

Using small-group work. Providing opportunities for ELL students to work in groups with peers who are fluent in English (research recommends 1 ELL to 3–5 native English speakers) helps them to learn English and to practice academic content. Small-group work can be targeted specifically to the academic learning needs of ELL students, which can include specific literacy skills, such as vocabulary and comprehension.

Providing regular writing opportunities. Helping ELLs to learn how to use academic English should not solely involve talking and reading. Teachers need to provide language-based supports to help ELLs as they write, including visual aids, graphic organizers, and the like. Working with English-speaking peers, including talking about writing, also can help ELLs to become more literate in English.

Linguistically responsive teachers welcome ELLs into their classroom and use a variety of supports to enable their students to participate as fully as possible in the classroom community. If, however, after several months, teachers notice that their ELL students are not improving in their use and understanding of English, then it is important that they advocate for extra supports for their students. Proficiency in English is central to academic learning, and, too often, despite having the capacity to learn and be successful, ELL students lag behind their monolingual counterparts.

Summary

Children's academic success depends on teachers who can use children's diversities as strengths in the curriculum. The diversities of children in the primary years can help to enrich and enliven the academic curriculum. Key to the work of academic success is teacher's developing culturally responsive teaching strategies and a toolkit of cultural knowledge. Working with families and communities is one way that teachers can develop their cultural toolkit.

Working With Families and the Community

During the last 50 years, the traditional family structure has changed significantly. The American Academy of Pediatrics (n.d.) notes that family types include nuclear, single-parent, cross-generational, adoptive/foster, never-married partners, blended, multiracial, and same-sex parent. When educators partner with parents, positive outcomes for children, teachers, families, and schools occur (Gillanders, Iruka, Bagwell, Morgan, & Garcia, 2014). These benefits increase when families are embraced as resources, as, essentially, teachers' partners in education. Unfortunately, too often, teachers "other" families by viewing them as inadequate or unhelpful and as the reason that particular students are having trouble learning (Hughes & MacNaughton, 2000).

Effective teachers capitalize on the diversity of experiences and knowledge of families. The aim is not to inculcate parents into the teacher's way of thinking but to build bridges between the families' culture and experiences and those of the teachers and schools. When teachers reach out to parents and share what children are learning in class, rather than ask parents to look in on their child's education from the outside, families get a sense of the purposes behind the curriculum. Moreover, by stepping outside of the boundaries of the school, teachers have the opportunity to consider families as resources rich with knowledge. Families provide insight into their cultures, how they spend time, and what they value and serve as a rich source of information about their children. When educators and families work together and share their knowledge and expertise, it is possible to individualize instruction and help children to use their knowledge from both home and school to learn more effectively (Gillanders et al., 2014).

Communicating with Families

All parents and guardians are keen to learn about what and how well their children are doing in school. There are many ways to communicate with families beyond parent-teacher conferences and back-to-school nights, including:

- **Weekly newsletters** developed by both the teacher and children. These can include descriptive information about classroom activities and what children are learning and doing.
- **A communication book** that goes between home and school for each child. The communication book keeps families informed about their child and the curriculum. A good rule is to update the book every couple of weeks with changes in project phases or classroom events.
- **A class website and/or e-mail list** to share news about upcoming events and homework assignments with families.
- **Phone calls or texts** to let families know something great that their child accomplished. Some teachers make it a habit to call or text four to five families each week and tell them something personal and positive about their child. In this way, over the course of a month, teachers will reach every family, even if it is just to leave a message. Repeating this process every month or every other month lets families know that the teacher cares about their child's well-being.

No matter what the communication strategy, it is important that teachers communicate equally with all families. Not every child's family will have access to new technologies, be able to read and converse fluently in English, or have a consistent phone number. Teachers will have to find the best means of communicating with each child's family. For some families, this may be e-mail, but, for others, it will be a telephone call or text. Teachers need to remember to keep track of what, when, and how each family is contacted. Where possible, teachers should try to get key communications translated into the languages of the children in their class.

Using Family Knowledge in the Curriculum

Teachers build their knowledge of each family's culture so that they can build rapport with children's families. When the groundwork is laid, events such as back-to-school night, class trips, or project presentations will be better attended, and opportunities for ongoing communication and relationships will emerge. Informal strategies might include:

- Getting to know parents in the local community by holding social events, such as a family picnic or a pot luck, or attending community events, such as street fairs, sporting competitions, or other outings. These kinds of events allow teachers to build relationships with families away from the school setting. They also may help families form connections with one another. This

allows families from differing sociocultural backgrounds to share and to be resources for one another (Warren, Hong, Rubin, & Uy, 2009).

- Visiting children at home is a great way to meet families and learn about children's lives outside of school. If some parents are not comfortable having a teacher visit in the home, the teacher could consider meeting at a community site, such as a local restaurant, library, or other public space.
- If teachers do not have time to visit families outside of school, they can get to know them by chatting at pick-up and drop-off times.

Once families are familiar with and comfortable engaging in their child's academic setting, teachers can ask families to:

- Help out by working with individual children or small groups of students. Family members may have an interest in a particular subject matter or speak a language other than English, which might be helpful with ELL students.
- Be the subject of an interview during project work. Family members with particular jobs or cultural experiences can share insights from their work to help students to seek answers to their questions.
- Share their particular skills in the classroom.

Teachers can use family knowledge and skills to structure learning activities that engage individual children. When Miss Rivera learned that one of her students was from Australia, she organized a literacy and math activity using Australian animals. Tomas, one of the children in her class, asked whether the dingo would be seen in an Australian dog park. Miss Rivera provided time for the children to research the dingo and asked the family to join the class for a conversation about Australia.

In summary, working with families is key to enabling teachers to draw on children's experiences and diversities in their curriculum making. Clearly, this kind of work is time and labor intensive in what is already a more than full day of teaching. Thus, teachers determine just how much they can do. In addition, some families may resist the outreach and relationship-building efforts of teachers. Sometimes, families may be reluctant to be involved if they have had unpleasant educational experiences, or there may be a language or cultural barrier. By developing reciprocal relationships with as many of the children's families as possible, however, teachers are more effectively able to meet the needs of all learners in their classrooms.

Reaching Out to the Community

Schools, whether located in large, densely populated cities, suburbs, small towns, or rural areas, are part of a community. Communities are comprised of a number of different organizations, residences, and businesses that can be a resource for teachers, especially in their work with families. Families in low-income neighborhoods and those communities with a large immigrant population tend to interface more with community groups rather than schools. Community-based organizations become the means by which families meet and network and learn how to navigate various institutions, like schools (Warren et al., 2009). Engaging with these community organizations can help teachers to build positive and productive relationships with harder-to-reach families.

Community-based organizations also have many resources that teachers can use in their curriculum. These organizations may have additional resources for field trips or extra materials and texts that teachers may want to tap into for a specific project. Looking outside of the school to who and what are in the community allows teachers to supplement and enrich the school curriculum. During the project on the community dog park, Mrs. Thompson asked her children to interview a representative from the local pet store so that they could learn about dog care. Similarly, Miss Rivera asked her second grade students to compare their community with their pen pals' community in

Arizona. Mr. Walsh found resources by visiting the local historical society. In each case, the teachers found organizations and individuals who were willing to share resources and personal knowledge with the children in the school district.

Working with the community is also about giving back. By doing work in the community, teachers model how they can contribute to the development of others within the spaces and in regard to issues that they share. Children can be involved in service-learning projects and through their project work and learning can give back to the community. For example, Mrs. Thompson's first graders spoke with their local mayor and representatives to learn about what it would take to build a dog park and then worked with the local council to share their plan.

It is important to learn who and what are in one's community and to start networking. Teachers could consider identifying key resources and people through a community mapping exercise. Community mapping involves students generating and answering questions to create a descriptive portrait of the community. Questions may focus on who lives in the community and what their demographic backgrounds are; which cultural groups are in the community; where the community begins and ends; what community services are available; what business, residence, recreation, and community-oriented sites are in the community; and who has governance and authority in the community. The answers enable teachers to learn about opportunities for networking, for resources, and for partnership to support the education of students in their primary years.

Summary

By engaging with families and communities, teachers are able to enrich the curriculum while building relationships with those who also are a major influence on what children learn and how they view schooling. Successful relationships with families and communities will enrich children's learning and generate a community within and beyond the classroom.

Setting Up to Support Children's Learning

Teachers work to create an environment that is safe and conducive to learning for all children. They do this through the physical setup of the classrooms, the way the time is scheduled, and the social-emotional environment. This section focuses on the classroom setup, classroom management, and classroom content.

Classroom Space and Time: Environments and Schedules

The layout of a classroom sets the tone. In classrooms aligned with DAP, the room layout reflects the children's age and culture. The room is welcoming, bright, open, well organized, and well designed. Desks and tables are configured in groups that allow space for children to work together, to move freely, and to spread out. Materials are interesting, varied, and readily available for hands-on exploration. Children's work is displayed on the walls, engendering a sense of belonging. In this classroom, the teacher and the children comfortable as the teacher focuses on building effective approaches to learning.

Fostering Positive Approaches to Learning

Hyson (2008) suggests two key dimensions of approaches to learning. The first is enthusiasm for learning, which is internally motivated, including interest and pleasure in learning. The second is engagement in learning, which is a behavior dimension that consists of attention, persistence, flexibility, and self-regulation. Children who have developed these traits are more attentive, focused, and interested in learning (Jacobs & Crowley, 2014). Cooperative, accepting, and harmonious environments help to promote development of these skills. Effective teachers use strategies to strengthen children's engagement and joy in the process of learning. Teachers work with children to develop problem-solving strategies when working on cognitively demanding tasks and in solving socially based conflict. Instead of relying on external recognition or adult praise (Hyson, 2008), children develop their own internal motivation to learn.

Hyson (2008) suggests that teachers consider practices that build children's motivation to learn. Instead of external rewards, such as stickers, Hyson recommends that teachers:

- Emphasize children's effort
- Emphasize children's working together, collaboratively
- Provide challenging tasks
- Provide lessons or activities that promote connections between concepts and experiences
- Provide help and support (scaffolding) for children who struggle when mastering a new skill

In the classroom, teachers can create an engaging environment that invites children to learn. Instead of external rewards, children need opportunities that allow them to believe in themselves and to be excited by the world around them. Further, keeping children interested and engaged is one means to lessen behavioral issues in the classroom.

Whole-Group Circle/Morning Meeting

In a DAP classroom, teachers create an area large enough for children to sit comfortably in a whole-group circle. This place can be used for Morning Meetings (Kriete & Davis, 2014), lessons, and activities.

Starting each day with a whole-group Morning Meeting provides an opportunity for children to practice social skills and values, including respect and responsibility. From being part of the group, children gain a sense of belonging, develop social and listening skills, engage in cooperative interactions, and have an opportunity to express themselves in a supportive, safe environment. Along with building a sense of community, the Morning Meeting merges social, emotional, and intellectual learning, as it provides a place for children to observe, reflect, speak, and listen. Children also gain an understanding of the day's plans and events.

Typical Morning Meetings include a greeting, morning message, group activity, and sharing

activity. At the beginning of the Morning Meeting, children greet each other by name. This greeting can include handshakes, clapping, singing, or other activities to welcome each member of the class. The teacher presents the morning message as a warm-up to the day. As the children discuss the message, they practice their academic skills. As a whole group, the class completes a short activity together. This collaborative activity helps build a cohesive framework for interaction. A short activity might provide an introduction to project work or a problem that children can solve together quickly. A sharing activity gives students an opportunity to present different interests and ideas to the class. During the sharing activity, children learn to respond to one another in positive ways.

Along with the Morning Meeting, the Whole-Group Circle area is a place for lessons or activities. This area can be used to engage children in interactive writing, experiential math, hands-on science activities, social studies, small-group work, project work, or whole-class read-alouds. Children sit comfortably and face the teacher, important visuals, or one another. Using the Whole-Group Circle for teaching and learning allows children to see, be seen, and be part of the group. In second and third grade classrooms, this may mean that children take on larger roles during meeting time, such as leading the group time, reporting out, reading, and sharing with the group.

Classroom Areas

Creating other areas in the classroom where the children can meet and work is important, too. Desks provide areas for children to engage in small-group work as well as work independently. When determining seating arrangements, teachers consider individual needs and preferences such as seating children together who need a little extra quiet, creating groups with mixed abilities and mixing up the groups regularly. In early primary classrooms, children begin learning how to work cooperatively, first and second graders often like to work in pairs, and older students can be grouped in twos, threes, or fours.

In the classroom library, teachers provide a wide collection of books to support project work, student interests, different reading levels, and the cultures and languages of children. In classrooms with younger children, books can be arranged in baskets. Having books in baskets allows younger children to see the covers as they flip through the collection or level to make an independent selection.

Some schools have computer carts, some have computer labs, and others have computers in the classroom. Computers in the classroom are positioned to have their own area in the classroom. Although room size can limit the ability to create a computer area, teachers use creative ways to keep this area separate to prevent distractions.

One area essential for learning is the world outside of the classroom and school walls. Teachers can take children outside for walks, allowing them to explore natural and man-made happenings in the world around them. Nature walks provide children with opportunities to observe and document, inspire topics for project studies (e.g., seasons, shadows, plants, air, water, soil, light, insects, construction), and rejuvenate their minds and bodies. Natural materials collected during nature walks can be used as manipulatives in the classroom for math or as objects to explore in the scie

In the classroom, teachers can store manipulatives and materials in an intentional, organized, and inviting way in baskets or bins. High-quality and open-ended materials that are labeled in English and the children's home languages are provided and accessible. Prior to a project, teachers collect and arrange materials to avoid wait time. While project work may require additional materials, it is essential that these materials remain organized and out of the way, as children need to work in spaces unencumbered by disorganization. Once the project is completed, materials can be stored or reused in other areas or centers in the classroom.

Classroom Displays

Ideally, classroom displays consist of children's work and information. Displays are current, meaningful, and at children's eye level. The children's work on display allows each member of the class to feel valued and important. Teachers can consider displaying draft and final work so that children can see their growth, change process, and the importance of all of their efforts. Teachers can ask children what they would like to see displayed in the classroom, e.g., their work, their pictures. If there is room in the classroom, teachers could display children's three-dimensional, hands-on projects. If space is limited, the "classroom photographer" can take pictures of the products for display.

Children also need informational displays in the classroom. These displays can include reference charts, word walls, content boards, process or format reminders, and current teaching tools. Although informational displays change throughout the year, based on content and time of the year, some displays, such as a birthday chart or a classroom rules and routines chart, may not.

Classroom Schedules

Children and teachers enjoy the comfort of a predictable but flexible routine. Knowing what is coming next in one's day can assuage one's fears. A typical classroom schedule includes arrival time, Morning Meeting, language arts, science, social studies, lunch/recess, writing, special activities (e.g., art, music), mathematics, and a closing meeting. In a traditional schedule, content blocks are scheduled throughout the school day. However, as described in the vignettes in these guidelines traditional schedules can be modified to support project-based learning and the integration of content areas. In the project-based learning paradigm, content is related, and the schedule is flexible to accommodate the integrated approach. Throughout the day the students are afforded the opportunity to engage in independent work, small group and whole group instruction, centers (that provide choice), and one-on-one work with the teacher as needed.

Summary

In DAP classrooms, teachers assure each child that he or she is a welcome member of the community. This rich, warm learning environment is established at the start of the school year and maintained throughout the year. The design of the classroom, organization of materials, and daily schedule provide children with a sense of belonging and security and allows for rich and diverse learning opportunities. Through project-based learning, the rigid lines between content areas are blurred. Children learn how to apply knowledge and understanding as they explore and make connections across content areas and to the real world. In DAP classrooms with predictable yet flexible schedules, teachers and children are engaged in and excited about learning.

Promoting Classroom Management through Developmentally Appropriate Strategies

At any given time, the primary grade classroom consists of children of differing abilities and social and emotional skills. These differences require that teachers know how to use effective, developmentally appropriate strategies for classroom management. Through effective classroom management techniques and proactive strategies, teachers support each child's individual learning and behavioral needs.

Developing Emotional Literacy

Children recognize, understand, and express emotions by "having and developing" emotional literacy. Through emotions, such as anger, happiness, fear, love, and loneliness, children respond to the world around them. Teachers use various strategies to help children develop emotional literacy.

Teachers model ways to respond to different situations that might arise during the day. Instead of getting upset when a child knocked over a container of beads, Mrs. Thompson said,

> "Oh boy! Those beads certainly made a loud sound. It's okay, spills happen! Let's work together to clean them up." Mrs. Thompson smiled, sang a made-up bead clean-up song, and then helped Dante put the beads back into the container.

Another strategy to help children to develop emotional literacy is to expand their vocabulary of "feeling" words. To a child who is angry when she loses a race, Miss Rivera says, "Janelle, I see you are upset. Let's take a walk and talk about how you feel." Instead of identifying the emotion as anger, the teacher provides the word "upset," which is less harsh and easier to manage. Miss Rivera also offers Janelle opportunities to recognize how she feels by playing games, singing songs, and reading stories that identify new feeling words.

Sometimes children experience conflicts with one another. To avoid accusatory or escalatory language, teachers teach children the value of "I Messages." They teach children to say, "I am mad that I wasn't able to swing," rather than, "You gave that swing to Sheila, and you promised I could use it next." Instead of placing blame, children learn to state the problem and to identify their emotion.

Response to Intervention (RTI)

RTI is one strategy for teachers to use to help identify and support children with learning and academic needs. By following a problem-solving model, RTI provides services and interventions as soon as the child demonstrates a need. RTI provides strategies for disability identification and early intervention assistance with the "most vulnerable, academically unresponsive children" in schools (Fuchs & Deshler, 2007, p. 131).

With its a multi-tiered approach, RTI promotes "the practice of providing high-quality instruction and interventions matched to student need, monitoring progress frequently to make decisions about changes in instruction or goals, and applying child response data to important educational decisions" (Batsche et al., 2005). For RTI to work well:

- Children need high-quality classroom instruction
- Teachers must continually monitor and assess students
- Teachers need to use tiered or differentiated instruction
- Parents must be involved

RTI uses three levels of intervention: primary (Tier 1—High-Quality Classroom Instruction, Screening, and Group Interventions), secondary (Tier 2—Targeted Intervention), and tertiary (Tier 3—Intensive Interventions and Comprehensive Evaluation). This three-tiered model supports differentiated instruction for all students by matching the specific intervention to the student's needs. The three-tiered model is described below.

Tier 1—High-Quality Classroom Instruction, Screening, and Group Interventions. Some students may have difficulty with grasping concepts or understanding content. By collecting data through, for example, anecdotal notes, teachers determine where and how a child is struggling . With adequate information, data to inform teaching content and practices, teachers modify

instruction to meet each child's needs or implement strategies to support learning. Should a child continue to have difficulty learning, teachers can consult with the school's Intervention and Referral Services Team (I&RS). Mr. Walsh recalls this process for a student in his classroom:

> During the first week of the Community Project, I noticed Nayan was struggling to maintain conversations with his peers. He didn't answer any questions, nor did he add anything to the conversation. He looked down, averting eye contact, when others spoke with him. I also noticed Nayan would not raise his hand to read during class. While working in small groups, I asked Nayan to read a passage from Roald Dahl's The Twits. Nayan struggled to read and was not able to make connections between several letters and their sounds.
>
> During my prep, I reviewed some of the work in Nayan's portfolio and noticed errors in Nayan's writing and spelling. After collecting evidence of my concerns, I completed our school's Request for Assistance Form and sent it to the Child Study Team. With the form, I included reasons for the request, observed behaviors, and evidence from Nayan's portfolio.

Once struggling learners are identified as "at risk" through universal screening and/or state- or district-wide tests, they receive additional supports during the school day in the classroom. Typically, these supports last for eight weeks, although the length can vary. Children who demonstrate significant progress at the end of this period are released of the supports while those who do not show adequate progress are moved to Tier 2.

Tier 2—Targeted Interventions. Children who do not make adequate progress in Tier 1 classrooms receive increasingly intensive instruction to meet their needs. The intensity, frequency, and duration of this targeted instruction is based on their needs, performance, and progress. The intervention and services are provided in small-group settings. Two students, Kaylie and Marcus, in Miss Rivera's second grade class have been receiving Tier 2 interventions for reading. Miss Rivera recalls the close of the marking period:

> Both students have been through Tier 1 interventions and did not demonstrate adequate progress, so they were recommended for Tier 2 interventions. While Marcus has well-developed skills in phonics and alphabetic principles needed for the reading process, he struggles with developing fluency in reading connected text. I am pleased with Marcus' progress. In the last two months, he has demonstrated significant progress and will no longer receive Tier 2 interventions. Kaylie, however, continues to struggle with decoding and needs more intensive work on phonics. She is considered at high risk and is being recommended for Tier 3 interventions.

Typically, in the primary grades, the interventions are in reading and mathematics. Tier 2 interventions may be implemented longer than Tier 1 interventions, but should not exceed a marking period. Students who demonstrate too little progress are considered for more intensive Tier 3 interventions.

Tier 3—Intensive Interventions and Comprehensive Evaluation. Tier 3 interventions are individualized, intensive, and aimed directly at the child's specific skill deficits. Children who do not demonstrate a significant level of progress in response to Tier 3 interventions are referred for a comprehensive evaluation. Depending on the results of the evaluation, the child may be considered eligible for special education services under IDEA 2004. Evidence collected by the teachers and child study team from Tiers 1, 2, and 3 are included in the eligibility decision.

RTI services. RTI provides a framework to allocate resources to help improve student outcomes.

RTI services may vary from one school to another, and the various strategies implemented include problem-solving, functional assessment, standard protocol, or hybrid approaches. Per IDEA 2004, at any point during the RTI process, parents may request a formal evaluation for their child to determine eligibility for special education services. It should be noted that no RTI process can be used to deny or delay a parent's request for a formal evaluation.

Positive Behavioral Interventions and Supports

Positive Behavioral Interventions and Supports (PBIS) follow a problem-solving model that provides children with strategies to learn and practice appropriate positive behaviors in a supportive environment. The PBIS system is intended to prevent inappropriate behavior by teaching and reinforcing positive behaviors. The behavior interventions and supports used by teachers include consistency, collaboration, input, feedback, and data-based decisions. For example, if a child is seen running in the hallway, a teacher says, "Walk in the hall," instead of, "Don't run in the hall." In this example, by proactively teaching the children how to manage their "need to run," teachers set clear expectations and rules for the children to follow on a daily basis.

Targeted social and emotional skills for individual children. The PBIS system provides three tiers of support. Tier 1—Universal Interventions promote a positive school climate for all students. Teachers reinforce a set of behaviors and expectations for all students. Tier 2—Secondary Interventions provide strategies for small groups or individuals with repeated behavior issues. Tier 3—Tertiary Interventions provide a function-based, problem-solving process for students with disabilities who have intensive needs.

Teachers promote a Tier 1—Universal Interventions system in their classrooms on a daily basis through routines, language, and organization. A classroom that uses this approach follows a daily schedule, beginning with a Morning Meeting. Along with greeting the children as they enter the classroom, teachers can use the Morning Meeting to set the tone for the day. During the meeting, teachers model and role-play positive behaviors. Throughout the day, teachers reinforce positive behaviors using language and facial expressions (smiling), as seen in the vignette below:

> Miss Rivera is working with a group of students at the science worksite. While engaging with the students, she continually monitors those in other worksites. She overhears a conversation at the math center. Anahi says, "I don't think that's how we're supposed to compare the populations, John. You're doing it wrong." John responds, "No, Anahi, I'm right. Look." John looks at Miss Rivera who smiles and nods, providing him with the support he needs. Using the behavior strategies that he has learned when challenged, John stops, takes a breath, and then explains his thinking to Anahi without raising his voice or becoming frustrated. Once John has finished explaining, Miss Rivera walks over to the math center, pats John on the arm as reinforcement, and continues to the writing center.

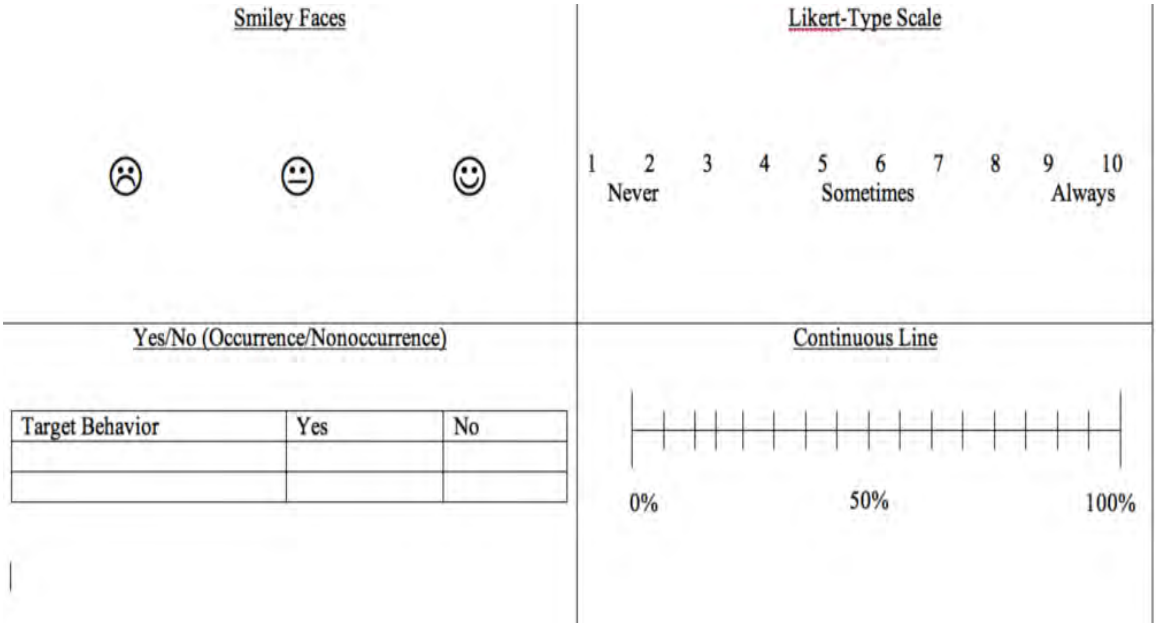
Teachers set clear expectations and rules for the children to follow on a daily basis. Throughout the day, teachers remain consistent in their approach to classroom and behavior management, providing logical consequences, those that match the offense or behavior, as needed, rather than giving warnings. Teachers state a logical consequence on the first negative behavior. For example, "Cheating on a test means you will receive a failing grade"; "When you spill something on purpose, you will clean it up yourself"; or "You will apologize when you take something that isn't yours." By being proactive through monitoring students, teachers can help children to avoid troublesome behaviors and provide strategies for problem solving.

Classrooms with Tier 2—Secondary Interventions provide additional positive behavior strategies tailored for students with repeat problematic behaviors. Interventions that teachers can use in their classrooms include check-ins/check-outs, small-group or individual review of the rules, clubs for social skills, or behavior contracts. The check-in/check-out intervention creates a strategy for behavior management that works between home and school. Upon arrival at school, the child checks in with his or her teacher. The previous day's signed card is turned in, and a new card is provided. The teacher also provides reminders for appropriate behaviors and reviews expectations. Working with a small group, teachers can use various strategies, including modeling, role playing, and collaborative problem solving to reinforce positive behaviors. As with Tier 1 interventions, teachers remain consistent in their approach to classroom and behavior management.

Tier 3—Tertiary Tier Interventions are for children with serious emotional and behavioral disorders. Children with no diagnostic label but who demonstrate serious behavior problems may receive Tier 3 Interventions as well. In the classroom, children may use a behavior card to track their own behaviors. A behavior card provides students with an opportunity to learn to be accountable for their behavior on a daily basis. Teachers may consider using a behavior card when children:

- Exhibit persistent behavior problems
- Are very unorganized
- Consistently fail to complete daily class/school requirements
- Exhibit persistent emotional difficulties such as frustration, and anxiety
- Are defiant and oppositional.

Behavior cards use different response formats, such as a score of 1 to 9, and can include smiley faces, as appropriate. Examples of behavior cards are seen below.



Children (and teachers) can track and discuss changes in specific problem behaviors, using the cards as evidence of change. Teachers also may provide external rewards after a determined number of positive behaviors are exhibited.

Positive Behavior Support (PBS) Plan

Positive Behavior Support (PBS) is a problem-based model used to prevent inappropriate behaviors through the teaching and reinforcing of appropriate behaviors. PBS uses functional assessments, antecedent manipulations or triggers, teaching strategies, and reinforcements to achieve lifestyle changes. PBS can be used to address a range of behavior problems, including aggression, tantrums, property damage, and social withdrawal. Using PBS as a foundation, teachers create plans for children who need individualized support. A team of individuals most involved in the child's life, i.e., the teacher, family, and any other essential adults, develop these plans and are crucial to its success.

Successful implementation of a PBS requires that teachers follow six steps: (1) build a behavior support team, (2) engage in person-centered planning, (3) conduct a functional behavioral assessment, (4) develop hypotheses, (5) develop a behavior support plan, and (6) monitor outcomes. For more information on the six steps of PBS, teachers can visit the Technical Assistance Center on Social Intervention for Young Children website at

http://challengingbehavior.fmhi.usf.edu/explore/pbs/process.htm.

Summary

Effective behavior management strategies are necessary for classrooms to function well so learning can take place. Strategies such as RTI, PBIS, and PBS consider the whole child and are developmentally appropriate for the primary years. By working with the children to proactively manage behaviors and develop emotional literacy, teachers create a healthy environment in the classroom that responds to individual children's needs.

Exploring Classroom Content

As noted, these guidelines are designed to facilitate the use of developmentally appropriate practices and inquiry approaches, such as projects, when teaching academic content. In this section, we present each content area separately so that each can be explored in detail. Nevertheless, as demonstrated throughout this document, children's learning is not compartmentalized. Rather, the content and practices, as presented in the next several sections, are woven together to provide an integrated approach to learning. This is most clearly demonstrated through the three classroom vignettes presented in these guidelines.

Teaching Mathematics

Shifts in mathematics classrooms based on the state standards often focus on the mathematical content. Nevertheless, the focus on the Mathematical Standards for Practice, reflected in the new PARCC (The Partnership for Assessment of Readiness for College and Careers) assessments is just as important. This focus places new forms of classroom participation and discourse as central to quality instruction in mathematics. In the past, mathematics classroom talk often adhered to IRE (Initiation, Response, Evaluation), whereby teachers show a solution method, students repeat that method, and the teacher evaluates the student's use of the method as correct or incorrect (Hicks, 1995). This form of classroom talk leaves little space for student generation of strategies, explanations, or representation or for struggling with mathematical ideas, practices that are named in current state standards.

Both the mathematics content and practice standards necessitate a considerable modification in how we think about mathematics instruction. In centering classrooms on new forms of doing mathematics, more responsibility is placed on students to generate their own strategies, explain their thinking to fellow students, challenge each other's reasoning, and struggle with mathematical ideas and processes. In turn, this places more responsibility on teachers to support students in thinking and communicating mathematically. These responsibilities change teachers' work to posing problems rather than asking students to repeat procedures to produce answers. Notably, teachers need to allow students time to struggle with mathematics rather than stepping in to provide solutions. When students do run into difficulties, practices such as questioning to scaffold students' thinking toward thinking critically in math are needed. Once students have solved problems, the teacher must press the students for complete explanations, which provides a model for other students as well. In orchestrating discussions about student solution methods, teachers can connect students' ideas to important mathematics concepts and strategies and highlight specific mathematical ideas for students to attend to through re-voicing and reflecting.

Re-voicing is simply re-uttering someone's talk. This re-uttering can involve repeating, highlighting, rephrasing, or expanding on what a student says (O'Connor & Michaels, 1993, 1996).

Posing Problems to Maintain High Cognitive Demand

For students to generate solution strategies and persevere in solving problems, problems must be posed before teachers show the students solution methods. This shift in how mathematics lessons are carried out requires open posing of problems and a focus on the structure of problems to be solved. Problems are posed in a way that is open enough for multiple strategies to support student practicing. In this sense, practicing is different students' repeating procedures. Practicing entails the need for students to produce strategies and explanations and to discuss various methods and advantages and disadvantages of each strategy, the bulk of the mathematical work of the classroom.

One way to think of this approach is to look at the problem types in addition, subtraction, multiplication, and division in the Common Core State Standards Mathematics (pp. 88–89). These problem types include the variety of situations that students need to be exposed to when solving problems. Too often, curriculum focuses on lower cognitively demanding problem types, such as Add To and Take Away Result Unknown. Teachers need to provide access to all problem types.

In a second grade classroom, children, in their study of communities, were given the question, "How many more pizza restaurants does that town have [than our town]?" This is an example of a Compare Difference Unknown problem type that many teachers think is difficult due to the wording "How many more?" Compare problems often use the wording "How many more" as do Add To Change

Unknown problems. However, Compare problems have no action and, when the problem does not tell students what to do with the number of pizza restaurants in each town; the problem makes it difficult for students to understand how to model "How many more." If the pizza restaurants closed or opened, this would add explicit action and, therefore, change the problem type to Add To or Take From, resulting in an easier problem to solve. It is important for teachers to understand how the problem types pose different types of challenges and all types are important.

More open problem posing places emphasis on modeling and questioning to support students to engage in more difficult content. For instance, when solving the Compare Difference Unknown problem above, teachers can model their thinking process or scaffold student understanding through questioning:

- Modeling: "When I see a problem like this, I first think, well, 'Which town has more pizza restaurants?' Then once I know which one town has more, I know that I need to figure out if that town has one more, two more . . . "
- Questioning: "Who has more pizza restaurants, Lito or your town? Lito? How do you know? Okay, so how many more pizza restaurants does Lito have?"

Using modeling and questioning, along with posing problems openly, allows the teacher to manage students' experiences with new content but also relate learning to prior ideas. In this context, it is important that modeling and questioning do not narrow the ideas and strategies that students generate. Modeling, in particular, is one way to guide students toward thinking about and explaining problems and their solutions.

Supporting Mathematical Explanations

Students often think of mathematics in terms of correct and incorrect answers, which means that explanations are not central to doing mathematics. Shifting the focus of the classroom away from taught strategies to student generation of strategies places an emphasis on students' generating explanations for their strategies. An explanation needs to include why something happens or works mathematically. For instance, when explaining the standard algorithm for multi-digit addition, a student might say:

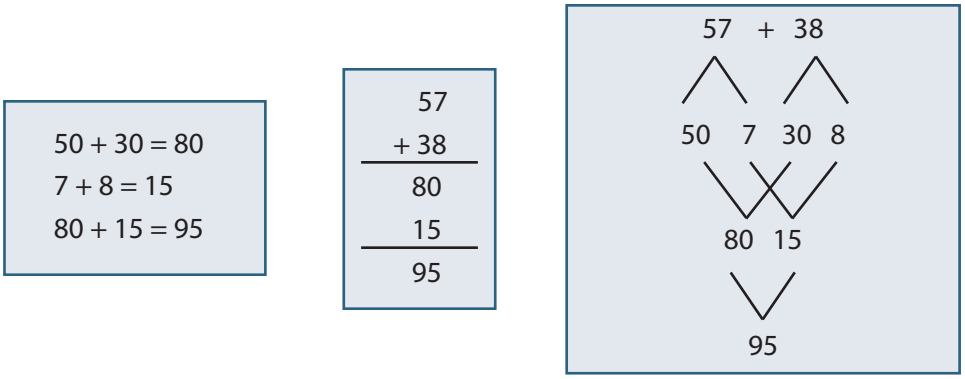
$$\begin{array}{r} {\scriptstyle 1} \\ 57 \\ +38 \\ \hline 95 \end{array}$$

"I added 7 and 8 and got 15. I put a 1 up top and then added it to 5 and 3 and got 9."

Although this explains steps, it does not show an understanding of why the strategy works or that the strategy is based on place value. Rather than providing a procedural explanation of the steps to a solution, without reference to the quantities or the mathematical ideas, students should be expected to reference mathematical concepts (Franke, Kazemi, & Battey, 2007). For teachers, this means modeling as a way to explain a strategy or mathematical idea. For the example above, the teacher could model what explaining the strategy might look like:

> When I see a problem with tens and ones in it, I know that I need to remember when I'm adding tens and when I'm adding ones. When I use this strategy, I sometimes have to remind myself of a few things. First I add 7 ones and 8 ones and get 15 ones. I know that I can put the 5 ones down here from the 15, but where am I going to put the one ten from the 15? I have to put it in the tens. Then I add up 1 ten, 5 tens, and 3 tens to get 9 tens and put a 9 in the tens place.

Supporting students through modeling of thought processes makes teachers' expectations clear in regard to what it means to explain in mathematics. In addition, teachers can support students by representing strategies. For the same problem above, there are multiple ways to represent a single solution strategy. For instance, let's say that a student solves the problem by combining the tens and ones separately, without regrouping. The student might add 50 and 30 to get 80 and then add 7 and 8 to get 15. Then putting them together would get 95. This strategy can be represented in many ways.



Each of the representations shows the same strategy; however, there are three different ways to record it, each of which exhibits place value-based understandings sought in state standards. How teachers choose to represent and notate students' thinking provides a record of strategies and ideas that students can use to make judgments about efficient solutions (Franke et al., 2007). The teacher supports students in finding ways to represent their thinking, from which other students can learn as well. In this way, the teacher is co-constructing explanations and representations with students. Co-constructing supports students in communicating the meaning of their mathematical thinking and allows other students to make sense of and build from that thinking. It also provides a way to record and assess student thinking when the teacher cannot be present. Finally, it also gives students, especially ELLs, a way to show their thinking and to eventually be able to draw out their verbal understanding of the mathematics.

Mistakes, whether in answers or explanations, are opportunities for learning. Although teachers usually ask questions of students with incorrect answers, they often do not focus on the students' understanding of the problem. Rather, this questioning focuses more on the step that they missed, which frames the mistake as one of repetition, rather than the teacher addressing the mathematical idea or understanding that the student needs to grasp. The next section on questioning addresses this idea in greater detail.

Using Questioning to Press for Complete Explanations

Students know that, when they are asked a question in math, it often means that their answer is wrong (Carey, 1995). When using this practice, the teacher overlooks asking everyone to explain their answers. As mentioned earlier, this requires a shift in instruction from focusing on answers to focusing on explanations and justifications. It also requires a shift in questioning away from answers, steps, and procedures to mathematical ideas, strategies, and justification.

Often, teachers ask for students to repeat steps with questions, such as "What was your next step?" Instead, questioning should focus on justification and why various strategies make sense.

Productive initial teacher questions might concern whether students understand, agree with, or have used an approach similar to that of another student. Follow-up questions are important to both student understanding and achievement (Franke et al. 2009; Webb et al., 2013).

One example can be found in the third grade study of community. This study asks children to compare and contrast the same location over time. Let's say that students are comparing a street at four time points, when the street had 10, 22, 46 and 105 houses on it, respectively. Using a scaled bar graph for which each square represents a certain number of houses provides students with an opportunity to represent the data as required in state standards. As students explain their bar graphs and how they represent houses at different time points, teachers can pose various follow-up questions to press for understanding:

- Clarification (So, I'm not sure if I understand what you did. Can you tell me how you showed 46 houses on your graph? Exactly how is your strategy different than that of the group that used each square to represent 5 houses?)
- Detail (You decided to use each square to represent 10 houses. How did you represent 105, then?)
- Agreement/Disagreement (What do you think about how they represented 105 houses? Why do you think that?)

In addition, teachers support students in working together on mathematics through questioning (Baines et al. 2009; Mercer, 1999). This type of questioning focuses on:

- Sharing more information (Can you explain your reasoning for having each square represent 5 houses?)
- Challenging group members (It sounds like you disagree, David. Can you tell her what makes you think that 46 is represented incorrectly?)
- Discussing alternatives (I'm wondering if you can find another way to graph the houses.)
- Coming to agreement (I hear you saying different things. How will you resolve your different ways of representing the houses?)

In posing these kinds of questions within pairs or groups of students, a teacher engages students in deeper mathematical thinking, raises important mathematical patterns, and models ways in which students can justify their reasoning. These questions are also useful at the whole-class level when orchestrating class discussions after the lesson.

Questioning also can support students who may be struggling to understand particular mathematical concepts. When students have an incorrect answer, teachers can probe for why it occurred. It is possible that the student simply miscounted, has a misconception, or needs additional practice to solidify his or her understanding. Rather than focusing on the steps, it is best to ask students how they solved the problem, what they did first, and whether they can explain what they were thinking as they solved the problem. Following up can further illuminate the misunderstanding, e.g., "I'm not sure I understood that last part"; "Okay, I understand that. What did you do next?"; "Can you tell me how you counted?" These questions serve as an assessment of learning, a form of co-constructing explanations of student thinking, and a model for the types of questions that students should ask themselves and one another.

Orchestrating Mathematical Discussions: Modeling, Representing, Reflecting

After posing the problem, supporting student explanations, and probing thinking through questioning, the teacher makes space for students to share their ideas. Again, this is a shift from the more typical classroom focus on teacher or curriculum-taught strategies. This requires time for students to share ideas, question those ideas, model or co-construct mathematical meaning through re-voicing, and reflect on the relationship of their ideas to important mathematics concepts.

Providing space and time for students to solve problems and share their solutions is critical to fostering classrooms engaged in substantive mathematical work, as many students learn from the various ways that other students explain their ideas. Sharing engages students in doing mathematics beyond simple repetition of taught strategies and, instead, includes solving problems, creating models, explaining themselves, and justifying their reasoning when challenged by peers. This is closely connected to posing problems in an open-ended way. If the teacher poses problems in a way in which only one solution strategy is required, then the sharing of ideas does not engage learners in actual problem solving or explaining their own thinking.

Re-voicing is simply re-uttering someone's talk. This re-uttering can involve repeating, highlighting, rephrasing, or expanding on what a student says (O'Connor & Michaels, 1993; 1996). In doing this, teachers highlight key mathematical concepts and focus student attention on what they need to understand. When teachers re-voice, they focus students on mathematical language and discussion, guiding students to mathematical argumentation. In this way, it serves as a form of modeling the thinking or co-constructing the meaning of the mathematics that teachers want to encourage. This can be a particularly important strategy for ELLs in providing a language model for mathematical explanations. State standards ask students to explain why addition and subtraction strategies work using place-value understanding. If a problem asks students to solve 44-23, re-voicing can clarify or amplify particular ideas during conversation:

- Repetition: "Rachel said that she . . . "
- Highlighting: "As he subtracted, he said I'm subtracting 2 tens or decenas from 4 tens. That's important because some of you said that you subtracted 2 from 4, but they're not ones or unidades, are they?"
- Rephrasing: "Another way to say what Jeremy said is . . . "
- Expanding: "When he said that he subtracted 2 tens from 4 tens, he was using place-value language. We always want to be careful to note whether we're adding or subtracting hundreds, tens, or ones."

This example shows the use of re-voicing as a way of talking about key mathematical ideas across languages, English and Spanish. In this case, re-voicing is used to place emphasis on connecting mathematical language (tens and decenas, Spanish for tens) and as well as focusing on critical mathematics ideas. Drawing on a child's home language is a powerful way to assist with understanding mathematics terms and concepts. Notice that repetition is a form of modeling, but highlighting, rephrasing, and expanding serve as a way of co-constructing the meaning of the mathematics with students.

As students share their ideas, the teacher connects student explanations to prior concepts and important mathematical ideas to be learned. Re-voicing is one way to do this, but supporting students in reflecting on learning is also critical. Leading students in reflecting focuses them on important mathematical concepts and connects to related ideas:

- "I wonder if anyone else notices a connection to what we were doing yesterday."
- "This is what I was saying about being careful when using mathematical language. So when I say a polygon, what does that mean?"

Summary

Focusing mathematics instruction on multiple strategies and explanations places more responsibility on the teacher to find ways to guide students to central mathematics concepts. The benefits to students are that they improve at generating mathematics strategies (as opposed to book- or teacher-taught strategies), problem solving, explaining themselves, and engaging in mathematical communication. As teachers shift in their mathematics teaching, it is critical to provide supports for diverse learners, such as ELLs, in the classroom. Teachers can support different learners through the use of co-constructing representations with students as a way to explain thinking when some students do not yet have the language. In addition, modeling and re-voicing are ways to focus students on key mathematical ideas and ways of thinking. These practices shift teaching mathematics from telling procedures that do not help students to become mathematical problem solvers to a form of scaffolding toward mathematical sophistication.

Teaching Science

Children are naturally curious. Think of the first question that a young child asks an adult: "Why?" Asking that "why" is the beginning of lifelong opportunities for wondering, questioning, and exploring. Some children explore nature, while others like to take things apart to see how they work. Building on these diverse interests while children are young is essential, both inside and outside of the classroom environment.

Engaging in hands-on science in the primary classroom provides children with opportunities to ask questions, gather evidence, share their ideas, and defend their conclusions. When approached in a thoughtful way, science discussions help promote critical-thinking skills. If students investigate questions in small groups, they learn how to collaborate with and respect the thoughts and ideas of their peers. A second grade teacher stated:

> In my classroom, we have Science Talks on Friday afternoons as part of our literacy block. During the talks, the groups present their research and findings. Members of the class pose questions. In the beginning of the year, the children were nervous. They didn't like to ask questions. With time, the "audience" began to ask some great questions like, "Why did you select those materials to build the bridge?" I used science to support the students' vocabulary development and language skills, an important part of my literacy curriculum and English Language Arts state standards.

In supportive learning environments, children are afforded multiple opportunities to work together in collaborative groups. Students are more willing to take risks when providing predictions and explanations for their ideas. Children learn how to persist in the face of adversity. They begin to recognize a failed experiment as an opportunity to learn something new. Science helps strengthen children's interests, motivation, curiosity, cooperativeness, communication, and self-control, while building confidence in their abilities. Science hones these executive-function skills and approaches to learning while developing science knowledge and skills.

Aligning Children's Learning with the Next Generation Science Standards

In 2012, the National Research Council (NRC) developed the Next Generation Science Standards (NGSS). The NGSS include three dimensions: (1) Science and Engineering Practices, (2) Crosscutting

Concepts, and (3) Disciplinary Core Ideas. Three dimensions define the framework, which includes eight items in regard to scientific and engineering practices, seven items that are the crosscutting concepts, and four content areas that comprise the disciplinary core ideas.

The NGSS included here remain current, and, in 2017, the state will require that teachers align their classroom science teaching with these standards. In this regard, the National Academies Press has published A Framework for K-12 Science Education: Practices, Crosscutting Concepts, and Core Ideas that can be found at http://www.nap.edu/catalog/13165/a-framework-for-k-12-science-education-practices-crosscutting-concepts12-science-education-practices-crosscutting-concepts.

Next Generation Science Standards	
Dimension	**Categories / Classifications**
Science and Engineering Practices	1. Asking Questions and Defining Problems 2. Developing and Using Models 3. Planning and Carrying Out Investigations 4. Analyzing and Interpreting Data 5. Using Mathematics and Computational Thinking 6. Constructing Explanations and Designing Solutions 7. Engaging in Argument From Evidence 8. Obtaining, Evaluating, and Communicating Information
Crosscutting Concepts	1. Patterns, Similarity, and Diversity 2. Cause and Effect 3. Scale, Proportion, and Quantity 4. Systems and System Models 5. Energy and Matter 6. Structure and Function 7. Stability and Change
Disciplinary Core Ideas	PS: Physical Sciences Domain PS1: Matter and Its Interactions PS2: Motion and Stability: Forces and Interactions PS3: Energy PS4: Waves and their Applications in Technologies for Information Transfer LS: Life Sciences Domain LS1: From Molecules to Organisms: Structures and Processes LS2: Ecosystems: Interactions, Energy, and Dynamics LS3: Heredity: Inheritance and Variation of Traits LS4: Biological Evolution: Unity and Diversity ESS: Earth and Space Sciences Domain ESS1: Earth's Place in the Universe ESS2: Earth's Systems ESS3: Earth and Human Activity ETS: Engineering, Technology, and Applications of Science Domain ETS1: Engineering Design ETS2: Links Among Engineering, Technology, Science, and Society

Exploring Science through the Project Approach

Science and engineering provide teachers with significant, rich content for project-based learning (see the section in these guidelines on Teaching and Learning through the Project Approach for a more detailed description of the project approach). In addition, studying science and engineering requires the integration of other content areas. For example, math allows children to communicate and represent outcomes from science experiments. Children need to use language to ask questions, have discussions, make predictions, and present their findings. Whether as the backbone or in a supporting role, the hands-on nature and inquiry approach used by good science teaching and learning make it an essential component of project work.

Both science and the project approach consider real-world problems. Driving questions envelop what children know and what they need to find out to solve the problem. To "do" good science and engage in successful project work, children need to develop inquiry and research skills. As a project moves from one phase to the next, children reflect upon and revise their thinking. Children use the same skills as scientists to change misconceptions or unknowns into understandings. Whether developed from a teacher provocation or from children's interests, science and engineering content provide teachers with relevant and developmentally appropriate project ideas.

The Science and Engineering Practices Dimension of the NGSS framework naturally aligns to the three phases of project-based learning. These practices provide students with a means to engage in "doing" science and engineering. At the beginning of a project, students ask questions to help determine what they know and what they want to find out. These questions help them to make sense of and discover more about the world around them. The table below shows the alignment between the three project phases and the NGSS science and engineering practices.

Project Phase	Science and Engineering Practice
Phase I: Beginning the Project	**Ask Questions and Defining Problems**
Phase II: Project Research	Ask Questions and Defining Problems Developing and Using Models Planning and Carrying Out Investigations Analyzing and Interpreting Data Using Mathematics and Computational Thinking Constructing Explanations and Designing Solutions Engaging in Argument From Evidence
Phase III: Concluding the Project	Obtaining, Evaluating, and Communicating Information

Selecting Good Science Topics for Project Work

High-quality science programs build on children's previous experiences and pique their curiosity by providing them with opportunities to pursue their own questions and develop their own ideas by (a) engaging them in in-depth explorations of a topic over time in an intentional environment, and (b) encouraging them to reflect on, represent, and document their experiences, and (c) share and discuss their ideas with others. Such learning should be embedded in children's daily work, be

integrated with other domains, and be accessible to all learners (Worth & Grollman, 2003). Worth and Grollman remind us that achieving a high-quality science program requires teachers, or teachers along with children, to select a science topic, conduct research to increase their understanding, develop an environment to support science learning, arrange the daily/weekly schedule to support science inquiry, foster and develop questioning, encourage children's work, and observe and assess understanding and concept development. To build understanding, children need to engage in hands-on experiences in the life, physical and earth, and space sciences. Topics should provide direct interactions to help promote children's experiences, development, understanding, and connections to the real world.

The NGSS (NGSS Lead States, 2013) define four disciplinary core ideas or content that can be explored at every grade level. These ideas include physical sciences (PS), life sciences (LS), earth and space sciences (ESS), and engineering, technology, and applications of science (ETS). Grade-level suggestions from the NGSS include:

For a more detailed look at the Grade Level Bands, visit:

First Grade NGSS at
http://www.nextgenscience.org/sites/ngss/files/1%20combined%20topics%206.11.13_1.pdf

Second Grade NGSS at
http://www.nextgenscience.org/sites/ngss/files/2%20combined%20topics%206.11.13.pdf

Third Grade NGSS at
http://www.nextgenscience.org/sites/ngss/files/3%20combined%20DCI%20standards%206.13.13.pdf

First Grade Science Content

PS4	Waves and their Applications in Technologies for Information Transfer
LS1	From Molecules to Organisms: Structures and Processes
LS3	Heredity: Inheritance and Variation of Traits
ESS1	Earth's Place in the Universe
ETS1	Engineering Design

Second Grade Science Content

PS1	Matter and Its Interactions
LS2	Ecosystems: Interactions, Energy, and Dynamics
LS4	Biological Evolution: Unity and Diversity
ESS1	Earth's Place in the Universe
ESS2	Earth's Systems
ETS1	Engineering Design

Third Grade Science Content

PS2	Motion and Stability: Forces and Interactions
LS1	From Molecules to Organisms: Structures 0.....and Processes
LS2	Ecosystems: Interactions, Energy, and Dynamics
LS3	Heredity: Inheritance and Variation of Traits
LS4	Biological Evolution: Unity and Diversity
ESS2	Earth's Systems
ESS3	Earth and Human Activity
ETS1	Engineering Design

Brett Moulding is a contributing member of the NRC Committee that developed the NGSS. His blog and videos about the NGSS are on the Teaching Channel website at https://www.teachingchannel.org/blog/2015/03/12/ngss-standards-with-a-purpose/

Within the core ideas, teachers blend science and engineering practices and crosscutting concepts. In first grade, students study various content (living things and space systems) that requires a focus on patterns. One of the seven crosscutting concepts, patterns, becomes a tool that students use to observe and describe phenomena. For example, students observe and record evidence of the patterns of how the sun, moon, and stars appear in the day and night skies.

Using the same crosscutting concept of patterns, students across grade levels can make similar connections. In grades 1 and 3, for example, students study life science core idea LS3-1, which focuses on heredity. In first grade, students make observations and construct evidence based on patterns to support the idea that young plants and animals are like, but not exactly like, their parents. In third grade, the same core idea and crosscutting theme are re-explored and expanded. Noting similarities and differences in patterns, students analyze and interpret data that provide evidence that both plants and animals have traits inherited from parents and that variation of these traits exists in a group of similar organisms.

Based on the first grade content discussed above, various projects can be implemented in the classroom. In first grade, one project might focus on the patterns and cycles of the sun, moon, and sky; another might focus on how the use of various behavior patterns help in animal survival. These projects promote opportunities for hands-on exploration over time and across content areas.

Approaches or Strategies for Teaching and Learning Science in the Classroom

In the classroom, teachers use effective strategies to engage children with specific science content. These strategies help children to develop their thinking. Specifically in science, best practice strategies support children's learning, motivation, engagement, curiosity, and persistence. Consider the following best practices linked with the science and engineering practices when exploring science in the classroom.

Questioning to direct inquiry/talk about explaining phenomena and findings. When studying science, the types of questions asked are essential. Consider the difference between, "What color is the sky?" and, "Describe the color of the sky." While both generate an answer, the second statement asks the student to look at the sky closely to describe the color. Responses to the first question may include "blue," "gray," or "white." Responses to the second inquiry can range from "Dark blue like my shirt," or "It looks blue, but then I see big, puffy white clouds, and some of the clouds are gray." By changing the question or statement, teachers provide opportunities for rich back-and-forth dialogue. The teacher might continue with, "Why do you think the clouds look gray?" Notice, too, the richness and variety of vocabulary used. Asking focused questions when studying science allows teachers to determine children's knowledge and concept understanding while allowing all children to develop a deeper and more diverse vocabulary. As children become more adept with language, they, too, begin to ask questions to help them to define problems. In classrooms with dual language learners or learners with language delays, using new vocabulary multiple times in different contexts and with concrete objects wherever possible can help children develop understanding and confidence when using new words.

Krashen and Terrell (1983) and Tabors (2008) recommend using a variety of questioning strategies with ELLs and with children with language delays. With non-verbal children, teachers may use known-answer and closed-ended questions, such as "Show me," "Point to," "Where is?," or "Who has?" As children acquire language, the teacher can move to known-answer or closed-ended questions,

including, "Yes/no," "Either/or," "Who?," "Which?," "What?," or "Where?" For children able to produce more in-depth responses, the teacher may ask thought-provoking, open-ended questions like "Why?," "How?," or "Explain." Children with advanced language can be asked thought-provoking, open-ended, predictive questions, such as, "What would happen if?," "Why do you think?," or "How do you know?" Through various questioning strategies, teachers can help children to develop both language and content understandings.

Co-constructing and collaborating to find (inquire) an answer. Science provides countless opportunities to co-construct knowledge, and emphasis is placed on the meaning developed from the exploration, rather than on the acquisition of facts. For example, in the third grade vignette in these guidelines, Mr. Walsh issues an engineering challenge to his students. Working in groups, students use various materials to develop and use models to construct a transportation system. Before beginning their construction, the children conducted research and then worked together to determine how their transportation system will move, how it will look, and how much and what type of material(s) they will need.

To complete the project, the students help one another to construct knowledge. Alone, each student has a piece of the puzzle. The transportation designer knows what the system will look like. The historian knows how the community has changed and how those changes can have an impact on the future. The reporter knows the types of questions to ask to guide the design. The structural engineer knows what materials the students need to build their transportation system. Working together as a collaborative team, the groups co-construct or construct explanations and designs solutions about the transportation system, guiding and helping one another with their knowledge and understanding.

Modeling ideas to explain phenomena. In the classroom, teachers model how to conduct science experiments, how to share results, and how to act as a member of the classroom audience. Teachers consider how to introduce science talks at the beginning of the school year. In the primary grades, children may not have experience in presenting or responding to information. To help children learn these skills, teachers model the appropriate behavior. Pretending to be the presenter, the teacher may say:

> I'm going to stand in front of the class to share the results from our group's science experiment. Although I may be a little nervous, I know I'll be okay. I'm going to use my science journal to help me share our results. As I present, I need to remember to speak clearly and engage the audience by looking at them directly.

This example of modeling also uses presentation and speaking skills, while requiring the audience to listen carefully.

Practicing science skills. Science provides opportunities for children to practice their skills, including data gathering, displaying, observing, experimenting, hypothesizing, and predicting. Whether drawing in a journal, conducting an experiment, or rebuilding a structure, children practice what they have learned. As children repeat experiments throughout the year, they practice the cycle of inquiry and then reflect on what they have learned. Teachers provide opportunities for children to practice skills relevant to science understanding by asking them to evaluate and communicate information. Reading, analyzing, and interpreting data, graphs and charts, or measurements in different contexts provide children with opportunities to practice their visual literacy and mathematics skills. Over time, when conducting science experiments and engaging in argument from evidence while presenting findings, children's use of detail and accuracy improve.

Reflecting as part of the cycle of inquiry. During science reflection, children have opportunities to review their thinking and ideas. If children have misconceptions about a science concept,

reflection, i.e., using questioning and more experimentation, provides children with a path for re-exploration. Reflection is also a powerful tool when children experience adversity or failure. As an example, as part of the third grade project, groups work together to construct bridges. Four of the five groups are successful. The fifth group continues to experience failure. Mr. Walsh notices the potential to turn this around. Unwilling to let the children quit, he places them into "reflecting mode" by asking questions. He asks the children to think about the process of their building by beginning the conversation with a couple of closed-ended questions:

T: Did you create a drawing before you began building?
C: Yes, we all drew pictures. <Group members share their drawings>
T: Okay. When you built, did you follow your drawings?
C: Yes, and they fell down three times!
T: That's okay. Tell me about the materials you used.
C: We used straws the first time, but they bent and fell down. The next two times, we used these blocks (Keva Planks). They fell down, too, both times.
T: Tell me what you notice about the blocks.
C: They are stronger than the straws, but they fell down.
T: We need to think about why the blocks fell down.
C: We do. Other groups used the same blocks, and they built their bridges. What did we do wrong?
T: Let's go visit with some of the other groups and find out.

As students visit with the other groups, they begin to realize why their structure kept falling down. It was not something that they were doing wrong but could be attributed to the surface on which they were building. During their group presentation, the group shared their experience with the class. They said, "Our bridge fell down because we were building on carpet! Everyone else was building on the hard floor." By thinking about and reflecting on their experience, the group learned how failure provides opportunities for students to *construct explanations and design solutions*.

Representing thoughts, ideas, and understandings. Sharing ideas through representation is essential to science understanding and concept development. Representing science ideas requires help from other content areas, including math (charts, graphs) and language (writing, speaking, vocabulary). In the classroom, teachers can help children to develop skills in mathematics and language arts to support science by asking them to record their science observations and data in science journals. Used effectively and appropriately, journals become powerful reference tools that support science exploration, concept development, and scientific understanding. During conversations with peers and whole-class science talks, children refer to data and documentation represented in their science journals as evidence to construct explanations and support their thoughts and conclusions. Mr. Walsh recounts:

> In the past, my students used their journals to document their work, and that was it. Once finished, the journals were placed back in the bin. Now, we use journals as tools for reflective conversation. My students bring their journals to our Friday Science Talks and use them to support their conclusions with evidence. Journals now have a deeper meaning and purpose in our classroom, while also providing an opportunity to integrate science understanding and concept development, art, mathematics, writing, and language.

Summary

The only way for children to understand science is for them to "do" science, and they need to engage with science content that is age-appropriate and relevant. Hands-on experiences are critical and allow children to experience the full cycle of inquiry as they define the problem or question, make a prediction, plan an investigation, describe their test, draw conclusions, and share their ideas (Worth & Grollman, 2003). If something goes wrong during an experiment or exploration, children need time to revisit the inquiry cycle to re-think their ideas and understandings. While exploring science, children develop language skills as they explain the process and their thinking, math becomes a communication tool to support conclusions, and journals are no longer add-ons but become valuable reference tools children use to record, reflect on, and share their discoveries and evidence. True science cannot be learned in isolation or by turning to a certain page in a textbook. Science is experienced by collaborative learners who are ready to explore the natural and designed world around them.

Teaching Social Studies

State standards define the goals of social studies as for children to "understand their world and to have an appreciation for the heritage of America with a high degree of literacy in civics, history, economics and geography." The standards also assert that social studies provide students with the knowledge, skills, and perspectives to become active and informed citizens in a digital and increasingly global society. Social studies provides the conceptual framework for students to make informed decisions about local, national, and international issues and challenges.

National Council for the Social Studies

In grades 1, 2, and 3, students gain fundamental knowledge about social studies (i.e., government, citizenship, geography, economics, and history) by exploring, inquiring into, and representing their own worlds in ways that enable them to understand these abstract concepts. They relate this to what is most familiar to them—their own lives and experiences. According to the National Council for the Social Studies (2010), social studies instruction should attend to 10 key themes: (a) culture; (b) time, continuity, and change; (c) people, places, and environments; (d) individual development and identity; (e) individuals, groups, and institutions; (f) power, authority, and governance; (g) production, distribution, and consumption; (h) science, technology, and society; (i) global connections; and (j) civic ideals and practices. Further, instruction builds conceptual development around these themes while also modeling the tools and skills that real historians and social scientists use to explore significant questions in their disciplines. Thus, teachers guide students to explore topics deeply, develop layered questions, question assumptions, and communicate their findings to broader audiences, while using and reinforcing their learning in literacy and mathematics to support their inquiry into topics and the communication of their findings.

Despite these laudable goals for social studies, recent National Assessment of Educational Progress results in history, civics, and geography show the lowest scores of all subject areas among elementary-aged students in United States (National Center for Educational Statistics, 2011a, 2011b, 2011c). These results may be linked to the well-documented marginalization of social studies instruction in elementary classrooms (Bolick, Adams et al., 2010) and recent trends in accountability in terms of basic skills in literacy and mathematics.

Good social studies instruction begins with the interests and questions of students, and the area

of social studies is explored using the tools of social scientists and historians, which include reading authentic documents and secondary texts; taking notes, writing about and interpreting information and preparing written reports and presentations; and using and representing numerical data to inform their understandings of questions related to history, economics, geography, government, and civics.

Using the Arc of Inquiry for Social Studies

In an effort to frame the way that project-based instruction can both focus on deepening students' knowledge of the ten key themes laid out by the National Council for the Social Studies (NCSS) and support key literacy skills, the College, Career, and Civic Life (C3) Framework for Social Studies State Standards (NCSS, 2013) was developed. It presents the arc of social studies instruction that encompasses four dimensions, each of which is discussed below and followed by a description of how it might look in grades 1 through 3:

1. **Developing questions and planning inquiries.** In this dimension, teachers structure shared experiences and model how to ask questions about that experience. Teachers encourage students to propose solutions to questions and to make connections among questions to generate deeper questions about the topic related to the social studies disciplines (civics, history, economics, and geography). Students then determine the kinds of sources that will be helpful to answering their questions. For example, in the first grade vignette, Mrs. Thompson launched a study of community with the shared experience of reading a book about community to her students and taking a community walk. She then engaged in a unit that focused on student-generated questions. To plan a social studies project, the teacher skillfully assists students to develop questions that lead to deep inquiry and that allow them to explore the core concepts of social studies and the related themes outlined by the NCSS (2010). Specifically, Mrs. Thompson asked students to use the community map (geography) that they constructed to identify who works at each location and how it relates to community life, thereby addressing a theme of People, Places, and Environments.
2. **Applying disciplinary concepts and tools.** Students, led by teachers, practice using the knowledge and tools of political scientists, historians, economists, and geographers to begin to build conceptual knowledge and answer their questions. This was evident throughout Mrs. Thompson's unit as she asked students to read, observe, take notes, create models, use numerical data to support their hypotheses and conclusions, and share their findings formally.
3. **Evaluating sources and using evidence.** Students gather evidence from several sources using active learning and data-gathering techniques. These data-gathering techniques include interviewing, observing phenomena, taking photographs, reading information, looking at maps or representations, and taking field trips. Students evaluate sources by distinguishing between fact and opinion, and by grade 3 they begin to use the evidence to make claims or build arguments. Take the second grade vignette as an example where the students gathered evidence for their social studies learning by interviewing a number of people and then using the interview data to create and support an opinion or statement about how communities are similar and different.
4. **Communicating conclusions and taking informed action.** During the final stage of the inquiry arc, students present a summary of their findings using representational media (e.g., writing, images, video, drawings, multimedia) and are able to both ask and answer questions about their findings. They identify and explain local, regional, or global problems that their

inquiry might inform and ways that the class or individuals might take action on that problem. For example, in the third grade vignette, Mr. Walsh had his students share their findings about their community with a second grade class. In this way, they both shared their learning and took action on the identified problem that people in their town do not know enough about their town's history.

Planning Inquiry-Based Social Studies in Diverse Classrooms

All three teachers described in the vignettes used community resources and knowledge to inform their teaching. Miss Rivera invited family members of children to become participants in the class research project by their being interviewed about their communities. Positioning family members as knowledgeable experts can function in several ways to assist students who may be culturally or linguistically marginalized from schools. By inviting family members who come from non-dominant cultural groups or who are part of communities that are not typically involved to share their experiences, teachers create opportunities for students to more strongly identify with the school and to recognize that valuable knowledge exists in every family and community. Further, by including the families of ELL students, these students have the opportunity to use their dual language skills in the service of an academic project through translating for their peers.

When planning inquiry-based projects based in social studies, teachers may consider the following:

- What are the students' interests?
- What languages are spoken at home?
- What are the students' ethnic and cultural backgrounds?
- What are the careers, hobbies, and interests of the students' families?
- What celebrations do the students' families engage in as part of their family lives?
- Where do the students play, grocery shop, walk, or drive frequently?
- In what extracurricular activities do the students engage?
- To where have the students traveled, and what did they see/do there?
- What means of transportation have the students used, and which do they use regularly?
- What books, movies, and music do the students like most?
- Who are the local school board members, politicians, and community leaders?
- What are the key issues in the community that affect the students and their families?
- How can family knowledge be incorporated into this inquiry unit?

Having accumulated this information, teachers can then develop inquiries that both build upon what students already know and address the state standards for social studies.

In the early grades, teaching strategies mirror and build internal cognitive routines for learning. That is, the things that teachers do and ask students to do regularly as part of instruction reflects what skilled learners do all the time. This means that teachers must intentionally use carefully selected learning and teaching strategies as their key tools to develop the social studies arc of inquiry described above. In so doing, teachers can individualize learning and make it possible for seamless differentiation, allowing students to learn and develop at a pace that meets them where they are developmentally. The key strategies for learning and teaching critical to the teaching of the social studies in first through third grade include questioning, co-constructing, modeling, reflecting, and representing. Each of these strategies is presented in the table below and described in relationship to project-based social studies instruction and the arc of inquiry.

Dimension 1: Developing Questions and Planning Inquiries	**Dimension 2:** Applying Disciplinary Tools and Concepts	**Dimension 3:** Evaluating Sources and Using Evidence	**Dimension 4:** Communicating Conclusions and Taking Informed Action
Questioning	Co-constructing Modeling	Reflecting	Representing

- **Questioning** is at the heart of social studies learning and teaching. In each of the vignettes presented in these guidelines, the teachers begin with questions. Students are asked to form questions about their world and their experiences in ways that illuminate the social studies themes. This is an example of developing and planning inquiries, as outlined in the arc of inquiry instruction. Teachers help students to shape their questions in ways that lead to social inquiry and social problem solving. For example, Mrs. Thompson carefully analyzed her students' observations of the park. She noted that the students seemed to focus on three areas of the park: the trees, the fountain, and dogs. She then helped students to develop questions about these aspects of the park, helping them to focus on issues such as people, places, and environments ("Who plants the trees in the park?") and power, authority, and governance ("Why can't the dogs run around without leashes?"). As students become more skilled at identifying these themes, they are able to generate increasingly sophisticated questions and inquiries (NCSS, 2013).
- **Co-constructing** involves creating knowledge and processing information with others to deepen understanding. Teachers create multiple opportunities for co-constructing in social studies instruction in first through third grade by creating concrete models to help children to understand abstract concepts. Providing opportunities for students to co-construct three-dimensional models (as Mrs. Thompson did in the first grade vignette through the community map) or other concrete social representations of experiences (e.g., a mock election, a role play of a farmer's market) to collaboratively work through the nuances of an experience or a concept through play, representational building, collaborative discussions, and collective projects is essential to meeting the standards of the social studies. Mr. Walsh, in the third grade vignette, had his students co-construct a timeline to deepen students' historical thinking and refine their ability to identify important events. Co-constructing allows students to apply disciplinary concepts and tools and mimic the activities of real economists, political strategists, geographers, and other social scientists.
- **Modeling** can be thought of as a teaching arc, in which teachers model particular behaviors or processes or as something that students do to represent some concept that they have learned or to approximate a skill. Throughout the social studies inquiry process, modeling is used in both ways. Teachers model or show students how to ask questions by asking good questions. They model how to use the tools of social scientists in the service of inquiry. Teachers explicitly model how to collect data sources. They model how to find information in a text, how to take notes during an observation, how to record data (through photographs, drawing, words, or numbers) and how to conduct interviews. Likewise, they explicitly model strategies for evaluating data. They may model how to read a map or how to create a Venn diagram before students do it independently. Finally, students may need models for how to communicate their findings. At the same time, students are creating models throughout the

social studies inquiry process. These are maps, diagrams, notes, reports, digital images, or role plays that model what they have learned, and they are further exploring and applying the disciplinary concepts and tools of social scientists.

- **Representing** is a learning strategy that is similar to modeling, but it more specifically focuses on how students represent their thinking in a concrete form. In the early grades, students represent their learning and knowledge in a variety of ways throughout the inquiry process. Pre-writers may use drawings almost exclusively, but, as students progress, they may capture what they have learned in writing and using other forms of technology. Representing happens throughout the inquiry process and is integral to communicating conclusions and taking informed action, a key component of the social studies arc of inquiry. Students in Miss Rivera's class wrote letters to pen pals and took notes on interviews to represent the knowledge that they were acquiring and sharing on communities, a common social studies topic. They maintained portfolios that represented all they had learned and were then able to reflect on those representations to organize their learning.
- **Reflecting** is an important practice of accomplished learners. Students who reflect on what they have learned are able to process it and draw conclusions. As such, teachers model and structure opportunities for reflection in social studies instruction. For students to inquire into their social world and draw conclusions that will deepen their understanding of the ten social studies themes, they need opportunities to reflect on what they have experienced and to practice making conclusions. Reflection is a critical skill for students to develop to evaluate sources and use evidence in the arc of social studies inquiry. Teachers at this stage help students to reflect on their inquiry and make decisions about what information is important. In Mr. Walsh's third grade class, he helped his students to reflect on what they had learned and inspired them to continue to add to their timelines throughout the rest of the year. Likewise, Mrs. Thompson led her first grade students through a reflection of what they learned about dog parks and then developed opportunities for her students to consider how they might engage in civic action around what they learned.

Summary

Social studies instruction in first through third grades should be developed with careful attention to:

- Inquiry—helping students to ask and answer questions related to their own lives and that touch upon the ten social studies themes outlined by NCSS (2010)
- Grade level social studies content standards
- Students' background knowledge and family knowledge
- Active learning strategies to gather and analyze sources of available evidence
- Analysis, recording, and communicating of evidence in ways that both reinforce and use the skills and content of the standards in literacy and math and attend to using technology as a means of communication.
- Development and habituation of learning strategies among students that allow them to acquire skills and knowledge at a pace and in ways that are suited to them.

Teaching with Technology

Technology has changed the way we work, the way we think, and how we go about our daily lives. Today, children have much greater access to complex technology, interactive media, and information than in the past. They may believe that everything that they read or hear on the Internet is true. Without guidance, they will have access to technologies they may not know how to use appropriately or understand due to their age or limited experiences.

During the primary grades, technology supports children's cognitive and social growth and abilities. Mindful of children's development, teachers provide hands-on learning experiences that build children's digital and information literacy skills, knowledge, and understanding. Technology can be used to create bridges between children through collaborative work. Technology is a powerful tool that extends learning and social experiences. As technology continues to develop and change at an incredible pace, children need a solid foundation on which to learn and thrive in a digital society.

Addressing Technology and Interactive Media

In January 2012, NAEYC and the Fred Rogers Center for Early Learning and Children's Media at Saint Vincent College developed and distributed their position statement, Technology and Interactive Media as Tools in Early Childhood Programs Serving Children from Birth through Age 8, which concerns the use of technology and interactive media in programs that serve young children. A summary of the key points of the position statement indicates that (a) technology use should be developmentally appropriate, (b) teachers should provide equitable access to technology, (c) time limits should be placed on screen usage, and (d) teachers need continuous professional learning opportunities that develop their understanding of appropriate and effective technology integration (Wartella, Blackwell, Lauricella, & Robb, 2013).

In this regard, teachers need to consider the following questions when using technology in the classroom:

- How does the technology support integration of other content areas?
- Do all children have equitable access?
- How does using the technology tool build digital literacy and digital citizenship?
- Is the experience developmentally appropriate?
  - How does the experience enhance the use of materials, activities, and interactions?
  - What resources do I need to support my understanding?
  - How does integrating technology in the classroom build foundational learning experiences that promote children's developmental and academic growth?

Teachers need to evaluate technology and interactive media to ensure that learning experiences are safe and cause no harm. When creating lessons for the classroom, they make certain that lessons are developmentally appropriate. During the review, the teacher considers how the lesson, activity, or project uses technology to promote hands-on, engaging experiences, meet lesson objectives, and develop and support children's understanding.

Aligning Practice with the New Jersey Core Curriculum Content Standards for Technology

Technology provides opportunities for children to become members of the global community and to participate as digital citizens. In the classroom, teachers promote digital citizenship by aligning practice with standards for technology education. Although the technology standards do not

recommend how to teach, they do offer clear ideas about how to use technology appropriately in the classroom.

The New Jersey Core Curriculum Content Standards (NJCCCS) for Technology approach technology from two different perspectives. The first standard, 8.1, provides a framework for students as they use digital tools to solve problems and create and communicate knowledge. Successful students master grade-level requirements using various technologies (including laptops, tablets, and digital cameras). The second standard, 8.2, focuses on the designed world along with the nature and impact of technology. When mastering this standard, students consider technological design, computational thinking, and engineering as related to the individual, society, and the environment. Technology Standard 8.2 relates to Dimension 3: Disciplinary Core Ideas—Engineering, Technology, and Applications of Science found in the Next Generation Science Standards. The 2014 NJCCCS for Technology can be found a http://www.state.nj.us/education/news/2014/standards/techcareer/tech.pdf.

Whereas the position statement from NAEYC guides what teachers need to do to provide appropriate and effective technology access in the classroom, the International Society for Technology in Education and NJCCCS for Technology describe what children should know in regard to digital tools and the nature of technology. Both sets of standards require students to think critically. Teachers use the indicators on the NJCCCS for Technology to create specific objectives when working with technology. For example, Standard 8.1.A states, "Students demonstrate a sound understanding of technology concepts, systems and operations." To understand and use technology systems, students will "[i]dentify the basic features of a digital device and explain its purpose" (Standard 8.1.2.A.1). Not only do the standards require that students know the features of a device, they also ask the student to explain their purpose.

Best Practices for Technology Teaching to Support and Frame Project-Based Learning

Used effectively, technology can provide an avenue for research or a place to store documentation. Consider the project from the first grade vignette. After a shared experience, the children wondered about a dog park. They asked questions and conducted research to develop a solution. Along with primary source documents or interviews, the Internet is used by the children to conduct research. As they collect information, they store their notes in a word processor, develop a presentation, or create a story to share their solution.

The Internet provides a healthy environment filled with answers for Phase II of project work. Using online tools, teachers can create Internet projects in the form of WebQuests. WebQuests develop from either the children's interests or from a topic in the classroom. A WebQuest is an inquiry-oriented activity that draws information from the Web (Strickland, 2005). WebQuests are designed to use learners' time well, to focus on using information rather than looking for it, and to support learners' thinking at the levels of analysis, synthesis, and evaluation.

Social studies and science provide interesting content for WebQuests. The content will vary based upon the grade level and individual students. If the project focuses on the designed world, children may be asked to design a solution to a problem. If the project has a more research-driven conclusion, the final project may result in a presentation. In either case, as children work, they use digital tools to record and share their findings.

When working with digital tools and the designed world, teachers can promote children's growth and development as digital citizens by asking thoughtful, provoking, open-ended questions. Effective questions help children to build understanding and skills, while helping teachers to determine gaps in knowledge.

The teacher and child(ren) work collaboratively to build knowledge, skills, and understanding that they could not gain alone. As the teacher and child(ren) co-construct knowledge, emphasis is placed on meaning rather than on the acquisition of facts. Technology can contribute to co-constructing and collaborating to gain knowledge and understanding.

For example, in the second grade vignette, students wanted to learn about their town and about their pen pal's town. As part of the technology lesson, students were asked to write notes to their pen pals. Some of the students asked to create podcasts rather than writing letters using word processing software. The students were familiar with word processing but neither they nor the teacher had ever produced a podcast. Working together with the teacher, the podcast group researched how to create podcasts, what to say in them, and how to post them in a safe way for their pen pal friends. The teacher did not tell the students how to create a podcast; they learned how to create one together. With the teacher, the children built an understanding of how technology supports their learning and demonstrates their ideas. In this example, they learned the process of creating and sharing knowledge through the use of a podcast.

Modeling to Teach Students to Use Technology

Teachers demonstrate the skills needed to use technology by having children copy or model their actions. For example, as part of an upcoming project, a class may need to store and graph data using a spreadsheet. The teacher models how to use the spreadsheet for the students by saying, "As I look at the spreadsheet, I notice rows and columns. I like to enter the column headers at the top, centered and in bold text. I don't put a header in the first column, as it can refer to both the column and the row." Later in the modeling process, the teacher creates and describes a graph using the data entered into the spreadsheet. Once the graph has been completed, the teacher models how make assumptions based upon the graph. As a next step, the teacher works with a small group to help them enter data, create a graph, and then analyze the graph.

Practicing to Allow Students to Learn Technology

Practicing provides children with an opportunity to "redo" what they have learned. As children practice skills in the classroom, they demonstrate proficiency and understanding. Children may need multiple attempts to practice their technology skills before they master them. Consider the spreadsheet example above. Children may immediately understand the look of the spreadsheet. They recognize the toolbar and understand the associated vocabulary, including "cells," "headers," "rows," and "columns." Children will enter the numbers in the correct cells. They may remember how to bold and center the headers. They may not remember how to format the cells for addition and subtraction or how to create and read a graph based upon the data. Providing multiple opportunities for practicing helps build children's confidence and increases their success rate.

Reflecting on Using Different Technologies

Reflecting is a very powerful learning strategy when working with technology. At the end of a project, teachers can use reflection to have children consider their choices. For example, the teacher may ask, "Why did you use PowerPoint instead of Word?" and, "How did PowerPoint help you share your thoughts and ideas?" The teacher may continue, "If you were going to do the project again, what would you change? Why?" Reflecting focuses children's attention on what they know and the outcome of something that they have accomplished. Reflecting requires that teachers ask probing

questions and directs children's understanding as they consider their thought processes. Essentially, reflecting requires children to think about their thinking.

Representing to share ideas using technology. Children like to share their thoughts and ideas, and technology provides a multitude of options for sharing. Using digital tools, such as word processing software, children can write letters, take research notes, or develop their writing skills. Children can safely use blogs to respond to their teacher or to one another as part of a class or homework assignment. To represent their ideas effectively and safely, children need access to age-appropriate software and Internet technologies.

In the third grade, students create a Google Community Calendar of Events. They add to the calendar as new events occur in the town. The students then create flyers to share details about the events with family and friends.

Ideas to remember when using technology in the classroom. A number of phrases are used to describe today's children when it comes to using technology, including "technologically savvy" and "digital natives." Even though these young digital natives may be proficient at using technology, they still require guidance and support from their teachers. In the computer lab or at the computer center, teachers may consider the following ideas to ensure student success.

Providing equitable access to technology. Children in the classroom may be required to share technology. Some classrooms have two computers, some have access to a computer lab, and some may have to share a computer cart with four other teachers. If the number of machines limits access to technology, teachers could consider creating a sign-up sheet and keeping track of when children visit the computer center, making certain that all students have equal access to technology. The same routine can be used with digital cameras, tablets, or other technologies to which the children have access.

Considering accessibility issues. Using technology in the classroom requires preparation. In primary grades, websites should be bookmarked ahead of time to avoid typing errors or unanticipated Google searches. Websites should be reviewed to make certain both content and links provide valid and safe information. Occasionally, school filters may deny access to websites. Teachers may need to contact school administration or the technology department for access. When using technology, teachers need to be proactive and make sure that certain resources are in place before beginning any lesson or activity.

Mentoring technology use. Even though teachers model appropriate Internet and technology use, sometimes children click on the wrong buttons, become too confident in their abilities and forget to follow direction(s), or simply suffer from a technology breakdown. If children will be using technology or the Internet, the teacher could consider inviting a family member to the classroom to act as a second set of hands. Technologically savvy family members help children if they have difficulty using various software packages, connecting to the Internet, or printing.

Using technology with a purpose. Technology should be used with intention and purpose. It should enhance the lesson or activity but not replace the use of another writing implement. Asking children to type a spelling list is not a good use of technology, as the same list could be written using pen or pencil and paper. Redesigned, the same lesson could provide students with an understanding of Technology Operations and Concepts. Instead of writing an objective whereby the children type their spelling list, teachers may want to think about Standard 8.1.2.A.2: "Create a document using a word processing application" and 8.1.5.A.2: "Format a document using a word processing application to enhance text and include graphics, symbols, and/or pictures." While children still create a spelling list, they also learn how to create a document, format text, and add graphics. These skills provide the foundation for creating newsletters, reports, and flyers that may be required during the middle and high school years.

Summary

Technology is a useful, supportive tool for learning and sharing ideas. In project work, children use digital tools for collecting or creating information. They use presentation tools to share their thoughts, ideas, and solutions to problems. In addition, project work provides opportunities for children to think about and respond to the nature and impact of technology, engineering, technological design, computational thinking, and the designed world.

Providing access to developmentally appropriate technology lessons and activities helps children to expand the reach and scope of their learning, understanding, and skill development. While children in primary grades focus on themselves and their community, middle and high school students engage in topics from the global stage. Giving children access to technology, along with foundational skills, helps them to become responsible digital citizens. Used effectively, technology supports the development of critical-thinking, problem-solving, and decision-making skills.

Teaching English Language Arts

The goal of English Language Arts (ELA) for grades 1 through 3 is to have all children reach or exceed grade-level expectations and to be considered fluent in literacy when they enter Grade 4. Research has demonstrated that children behind at the end of third grade tend to stay behind. Thus, by the end of third grade, children need to have mastered decoding skills and to be able to comprehend what they read with fluency. This responsibility does not rest solely on third grade teachers, but, rather, it is a shared responsibility of all educators from the time the child enters school.

To achieve these expectations requires tremendous growth in literacy skills from first to third grade. Whereas, at the end of third grade, children are expected to decode complex words and read chapter books with fluency and comprehension, first grade children are mastering print concepts and learning to understand the connection between sounds, syllables, and words. In addition, children's vocabularies will need to double from first to third grade and they must know many comprehension strategies to help them understand the literal, inferential, and critical meaning of texts they read. The language and literacy skills that grow from first to third grade are developmental but also are contingent upon good teaching, student practice, and application. Teachers use what they know about children through both formal and informal assessments to meet them where they are and to move them along individual trajectories toward the ELA state standards.

Teachers also continue to foster young children's motivation to read and write, which provides children with the internal drive to practice important literacy skills. We find in literacy that the rich get richer and the poor get poorer (Stanovich, 2000). This means that those students with higher reading skills read with ease and will read more, thus continuing to increase their skills. However, those students who struggle with reading concepts, such as decoding or comprehension, may find reading to be laborious and may engage less in reading, thus continuing through a cycle of little improvement.

Language and Literacy Elements

Fortunately, literacy has been an area of much theoretical reflection, research, policy, and professional development over the past 50 years. During this time, a strong understanding of the science of literacy teaching and learning has been built as has the understanding that this science is nuanced through the art of teaching young children. In terms of guidelines for practice in literacy, one must consider that language, reading, and writing are not content areas, per se. To make literacy

skills relevant, teachers integrate their use into areas such as math, science, social studies, art, music, and physical education. Learning language and literacy is done in context with applications to meaningful content and experiences.

The National Reading Panel Report, the National Early Literacy Report, and the RAND Report provide us with a list of research-based skills needed to become successful readers and writers. Based on this, ELA standards provide specific objectives that are appropriate for the primary grades. To become a competent reader, there are critical literacy elements for children to master such as phonological awareness and phonics, vocabulary, comprehension, fluency, and writing.

Reading: Foundational Skills

Foundational skills for emergent and early readers include print concepts and phonological awareness (generally Kindergarten and Grade 1 only), phonics and word recognition, and fluency. In addition, vocabulary development is a critical foundational skill that influences other skills, such as reading comprehension and decoding.

Print Concepts demonstrate how print works. Print concepts include (a) the relationship between spoken and written language; (b) concepts of words, letters, and sounds; and (c) the directionality of print (in English, left to right and top to bottom). Children learn print concepts via storybook readings and exploratory activities at home and school as well as through explicit instruction that addresses these topics (Gehsmann & Templeton, 2013).

Phonological Awareness refers to the ability to hear individual sounds within words as well as in parts of words. Phonemic awareness is a sub-category of phonological awareness and refers to the ability to hear and manipulate the smallest units of sounds in the English language, which are called phonemes. Both phonological and phonemic awareness are solely auditory processes, and mastery of both is critical to reading success (Cardoso-Martins & Pennington, 2004). In the teaching of phonological awareness, children learn to identify rhyming words and segment sounds and to blend them together. Children are also taught to substitute one sound for another, such as the "c" in can for an "r" sound to make ran, and to identify the number of sounds heard in a word.

Phonics is the ability to accurately associate letters with their corresponding sounds, which is an essential word recognition skill for young children (Shaywitz ,et al., 2004). Phonics is dependent on the sub-skills of (a) letter recognition and (b) knowing the sounds that letters make. Some common phonics activities include having children sort pictures or small items based on their initial, medial, or final letter. The teaching of word families and other word chunks helps children to look at more than one letter at a time (e.g., the "at" family, the "in" family, the "et" family). In teaching phonics, teachers focus on long and short vowel sounds; digraphs, such as th, sh, ch, and ph, which are irregular consonant sounds; and irregular vowel sounds.

Fluency is also a key element of reading in the primary grades. Fluent reading occurs when a child has mastered phonics and can decode independently. Fluent readers have prosody, which is reading at the right pace and with expression. To be fluent, children need a large vocabulary so that the words in the text are quickly understood. Fluency improves as children master many comprehension strategies to help them to understand the text.

Vocabulary

Vocabulary development is an area of great importance and tied closely to comprehension. If a child is able to decode, but doesn't know the meaning of the words, then he or she will not comprehend. Jalongo and Sobolak (2011) determined that, to become proficient readers, children should know about 10,000 words by the age of six. Children develop vocabulary when they are

speaking and listening. Children's oral language, both expressive (speaking) and receptive (listening), provides the foundation upon which their reading and writing skills are built (Gillam & Reutzel, 2013). To reach these goals and go beyond, students need instruction that includes questioning, clarifying, repeating, providing examples, and defining words and word nuances in terms that they can understand.

Good readers:

- Read with a purpose
- Actively make sense of what is read
- Recognize when they are struggling with meaning and employ a variety of strategies
- Know the types of narratives and informational texts and how they are organized
- Integrate knowledge gained form the text to predict, compare and contrast, problem solve, analyze and hypothesize

Reading: Comprhension of Narrative and Informational Literature

Children in primary grades need multiple opportunities to read and be read to throughout the day to develop their reading and comprehension skills. Teachers read aloud to children on a regular basis and discuss the text's key ideas and details as well as the craft and structure of the text in terms of how the different texts are organized (Duke, Bennett-Armistead, & Roberts, 2003).

The ultimate goal for reading instruction is the comprehension of text. Directly teaching children comprehension strategies helps them to understand what they read, remember what they read, and communicate what they read to others. Teachers model and children practice integrating the knowledge gained from text for use in varied circumstances such as predicting, comparing and contrasting, problem solving, analyzing, demonstrating text to text connections, and hypothesizing.

Writing

Since the 1970s, educators have included writing as an integral part of best practices in early literacy (Morrow, 2009). Teachers model effective writing strategies. They give children ample time throughout the day to "share the pen" through interactive writing, engage in independent writing and journaling time. Teachers provide writing choices (both content and form) and the opportunity for students to work on their writing over time. Students also are given on-demand writing tasks in which they respond to a specific prompt or question in a specified amount of time.

Students learn to write different types of texts and for different purposes. These include narrative, informative/explanatory, and opinion pieces. The teacher presents each type of writing with age-appropriate, well-defined claims and information and form. Teachers provide students with opportunities to produce and distribute their writing in meaningful ways, which may include digital tools. Technology enables children and teachers to enhance the learning and teaching process with programs that allow them to write reports with added video, music, and illustrations.

Digital Literacies

To be successful in the 21st century, young learners must become proficient in both traditional (print) and digital literacies (McKenna, Conradi, Young, & Jang, 2013). McKenna et al. note that there are similarities between traditional and digital literacies. For example, both types of texts may have page numbers, a table of contents, headings, and an index. Nevertheless, the differences between the two types of text may be greater than their similarities. While traditional text is almost always read from the left to the right and from the top of the page to the bottom, digital texts are often

navigated in a non-linear manner as the reader clicks on links to move through a variety of pages and websites. Additionally, digital texts often contain hyperlinked resources, such as on-demand pronunciations, dictionaries, audio texts, and video clips (McKenna et al., 2013). These additional resources, which can be considered scaffolds for learning, may be the reason that digital texts have been found to be at least as effective as traditional texts in supporting literacy achievement, and sometimes more so (Korat & Shamir, 2012; Moody, Justice, & Cabell, 2010; Tracey & Young, 2007).

Putting it Together: Strategies and Organizational Structures for Implementation

Teachers assist children in putting the skills of literacy together to be able to read and understand increasingly complex text and communicate with others effectively through reading, writing, speaking, listening, and viewing. This is accomplished by using effective teaching and learning strategies within the literacy block and beyond. Successful teachers use the mandated literacy block in a flexible manner to explicitly teach skills and reach the standards. This means that teachers incorporate various learning structures throughout the day, including teacher-directed whole-group and small-group instruction, one-on-one instruction, independent work, project-based learning, and student choice. Teachers use what they know about children from information collected through formal (e.g., basal reading assessments, DRA (Beaver & Carter, 2006) and informal assessments (e.g., writing rubrics, running records, anecdotal notes) to plan this instruction and appropriate activities.

The classroom library is a small area of the classroom that has comfortable places to read (e.g., rugs, small couch, bean bags, rocking chairs) and is well stocked with books of all types and levels. Morrow (2014) recommends five to eight books per child, spanning three to four grade levels.

Reading Comprehension. To become a fluent reader who comprehends what is read, children must have experiences in whole group, small group, one on one, independent, and guided reading. A focus of this is to develop comprehension strategies. In doing so there, reading easily integrates other content areas, such as science and social studies. Children need extended time to read books and have books read to them at their level and beyond. They need time to self-select and explore a variety of texts that include books in their home language—narrative, informational, brochures, comic books and graphic novels, historical fiction, poetry, and folktales. These should be organized in a meaningful way in a literacy center that is accessible to the students. It is important that these selections offer high-quality content, rich story structure, and high-level vocabulary and represent positive, non-stereotype gender roles and racial and linguistic diversity (Machado, 2013). In addition to building an extensive and diverse classroom library, so teachers also rely on the school and local libraries to supplement as needed.

Comprehension reading workshop. The reading workshop format can be used effectively as a component of literacy instruction. The purpose of reading workshop is to teach comprehension strategies and give children the opportunity to practice them during independent reading time. Reading workshop begins with teaching a short mini-less that deals with a comprehension skill such as showing evidence from the text to substantiate an answer to a teacher-generated questions or making text to text connections. The teacher may do a shared read aloud of a quality piece of children's literature to teach the lesson. The mini-lesson is followed by independent reading, buddy reading, or research to practice the skill or skills just learned. Children can select their own texts to read from a limited number of books. When beginning reading workshop for the first time, a lesson on selecting a "just right" book is useful. During independent reading, the teacher has mini conferences with one child or in small groups. This is when explicit teaching should be evident. Teachers use this time to not only monitor students' reading skills and strategies through informal

assessment but also to teach and reteach new skills and strategies and scaffold children to their successful application.

Reading aloud. Reading aloud is important for children of all ages. This provides the teacher the opportunity to model fluency and reading with expression. Reading aloud is generally kept to a short period of time and can be an interactive reading experience if students join in or share the reading.

Mr. Walsh uses a read aloud during his reading workshop that is related to a project his class is conducting. He reads a historical fiction text set around the time period related to the project. Mr. Walsh knows that all children, regardless of age, need to have the opportunity to have text read aloud to them. He chose a book that is beyond the independent reading level of most of the children in the class. As children grow older and their vocabularies increase, reading higher-level books that contain uncommon words becomes critical to vocabulary development (Cunningham & Stanovich, 1998). Therefore, teachers read aloud to all children to expose them to higher-level vocabulary than they would find in their everyday conversations and in the books that they are reading independently. Further, through this enjoyable process, Mr. Walsh models fluency and demonstrates various strategies (by "thinking aloud"), such as pausing to pose a question, which shows how he is monitoring his comprehension. Mr. Walsh follows every reading with a meaningful discussion about the text. Here, the class may focus on vocabulary, key ideas or details, or text features or engage in describing the characters or comparing and contrasting texts.

Mrs. Thompson uses a read alouds in first grade. In the example that follows, she uses a community helper poem that is written on chart paper and has clip art included for picture supports. She uses this as the medium to continue work on rhyming and end punctuation and connects it to the Social Studies unit on community. The poem begins, "Teacher, teacher, what do you do? I teach reading and writing, too. Doctor, doctor what do you do? I help when you're sick with the cold or the flu." After reading these few lines, she asks the students what they notice about this poem.

A word wall is a classroom display at children's eye level that features challenging or high-frequency words that are organized alphabetically. Children use this as a resource when writing or reading. Often, words are written and then cut out into the shape of the word, which provides visual configuration clues for those students who may need this. Teachers discuss each word with the class before it is added.

Michael: I hear rhymes!

Mrs. Thompson has the class assist Michael in highlighting some rhyming words with a yellow marker on the poem. The group hears that the words have the same ending and connect that back to the word work they are doing on word families.

Keisha: They keep asking a question and then answering it.

Mrs. Thompson asks Keisha to come and circle the end punctuation that shows her that there are questions in the sentences.

Albert: I see words from our word wall.

Mrs. Thompson asks Albert to circle all the words "what," and he chose his friend Deandre to circle all the words "you," and he chose Sean to circle all the words "do." While these children are doing the circling on the chart, the remainder of the class is actively engaged in writing these high-frequency words on their personal clipboards, using the word wall as a guide. Note that sight word acquisition is an essential word recognition skill (Gehsmann & Templeton, 2013). Sight words are those that teachers want students to be able to automatically identify without having to "sound out." Tier 1 words that occur with great frequency in the English language (e.g.,

"the,""is,""was") are often taught as sight words. There are high-frequency sight words for each of the primary grades. Tier 2 words are academic words, are taught by sight, and include those found in math, science, and thematic units. Teachers often have Tier 3 words, which are a special category for wonderful words that come up and are worth remembering.

Alison: This reminds me of "Brown Bear Brown Bear, What do you see?"!!

Mrs. Thompson remarks that Alison has made a text-to-text connection and that, during snack time, they will do a choral reading of this book to remind everyone of the similarities. Mrs. Thompson will reread this poem several times for familiarity during the community unit, each time with a different focus. She encourages children such as Saanvi, who are ELLs, to take bigger roles in reading and activities after several exposures to the text.

Guided reading. Another important component of the literacy instruction is guided reading, an instructional approach that involves the teacher's working with a small group of students who demonstrate similar reading behaviors and read similar levels of texts. The groups are determined by the teacher through formal and informal assessments conducted on an ongoing basis. The groups are not stagnant; rather, they are temporary, fluid groupings in which children move at different paces through the levels and are moved to groups when their achievement levels are more like the others'skills in different groups. The teacher works with the small group on highly targeted, scaffolded reading instruction.

Mrs. Thompson's first group is reading a new book. She does a short book walk to introduce the children to new vocabulary, in this example it is animal names. Mrs. Thompson discusses the names of the animals in the book on several pages to assist children in both the decoding of the words on the pages and with comprehension of the text. Mrs. Thompson then reads the story to the children and following her read aloud, she asks the children to whisper-read the book at their own pace. As the group reads, Mrs. Thompson notices that one student reads the book quickly without making any errors. Mrs. Thompson makes a note to think about moving him to a more challenging reading group. Mrs. Thompson selects one child to keep running record of his reading. She notes that this student reads tooth instead of teeth and says winds instead of wings. Mrs. Thompson makes a note in her plan book to work with this child individually.

To introduce new vocabulary to ELLs, provide visual supports and concrete objects where possible.

Mrs. Thompson's next group is reading a different and more difficult book. This group is more advanced than the first. The group has worked with this book before; therefore, Mrs. Thompson will use this time to help the children become more independent readers. She teaches them how to figure out unknown words by using the meaning of a sentence and by looking at the letters in the words. They begin with a game called "guess the covered word." This time, the covered word in the sentence "I can [blank] fast" is run. The children are encouraged to select a word that makes sense in the sentence and then look at the letters in the word to see which one the correct word is. Words generated for the missing word are walk, eat, hop, sleep, and run. The activity is repeated in other sentences throughout the book.

The next group is reading another book. In this lesson, Mrs. Thompson focuses on teaching the children to look at ending sounds to figure out words. Mrs. Thompson writes, "I am go to the store" on the chart. She reads the sentence and the children quickly point out that it does not sound right. She writes a second sentence, "I am going to the store." They identify the difference in the two sentences by pointing to the words go and going. Mrs. Thompson reminds the children to look at the ends and beginnings of words when reading. They read the book with special attention to the word endings. After the first reading, she starts a discussion to demonstrate their ability to infer and

asks them whether they could think of another way to end the story.

Centers. There is great value in small-group literacy instruction for young children. This means, however, that the remaining members of the class have to work independently from the teacher so the students in the small-group literacy instruction may receive the support and attention that they need. During this time, children must participate in meaningful learning so that the time is not wasted. This time can provide teachers with an excellent opportunity to integrate project work during their literacy block. Importantly, the centers available to children during the literacy block incorporate literacy skills and other domains, such as science, social studies, and math.

In her second grade class, Miss Rivera uses the students' project to generate quality centers during her literacy block. While Miss Rivera works with small guided reading groups on targeted reading skills and strategies, the other students are actively engaged in the various worksites for their project work. The focus of the worksites is written communication. The science worksite provides children with the opportunity to research the climate of the community and the animals that live in the community. They record this information on a graphic organizer created by the teacher. The geography/technology/literacy worksite affords children the opportunity to use their technology research skills to calculate the mileage to their study community and then to write a plan or step-by-step instructions on how best to get to the community of interest. The design site allows these young learners to communicate using symbols or models, which are both the basis of effective learning strategies. Here, the students create a picture of the community using symbols, models, or other methods of their choice.

This connection of social studies and science to the literacy block centers provides rich opportunities for the children to continue their work in an area of interest that is meaningful to them. It provides application of key literacy skills, independent work, and cooperative work with others. The teacher gives careful consideration to what each worksite will target, with an overall theme of using written communication. To meet standards, students in the early grades write for a variety of purposes for different audiences. They are asked to write informative texts and to participate in shared research and writing projects.

Throughout the year, teachers continue to provide experiences in the centers during the literacy block that (a) are tied to other content areas where possible, (b) closely reflect the expectations in standards, (c) provide opportunities to practice skills and strategies already taught through mini-lessons and guided reading sessions, (d) contain some type of accountability, such as a product, and (e) provide opportunities for children to put into practice cognitive functioning skills (approaches to learning), such as persistence, problem solving, creativity, and focusing attention. Teachers continue to adjust their management of the centers as needed. Miss Rivera begins the year by having the children move through a rotation of centers. By supporting students' independence, teachers often transition to using a self-directed system whereby children have a center guide sheet. The guide sheet allows them to independently move through the worksites of their choice (some are required) throughout the week as the teacher monitors their progress.

Offered here is a cautionary note about center time: Center time is generally, and rightfully, used to meaningfully occupy children's learning time while the teacher works with a small group. Enriching the students' experiences within the centers is also of importance. Therefore, teachers reserve a block of time from this part of the day to join the children in the centers to scaffold and enhance the students' independent learning. This is an ideal opportunity for the teachers to engage in meaningful conversations, document children's learning and development through anecdotal notes, and enhance the children's understanding of key concepts and skill application.

Writing. Writing is an integral part of the language arts. Children must be exposed to many different types of writing and engage in writing of all types. In addition to the writing described in the centers above, children in primary grades have opportunities to write for long periods of time

throughout the year. Students are provided a choice of writing pieces at times to increase interest and motivation in writing and also to respond to on-demand prompts.

- **Writing workshop.** Extensive writing can be accomplished through writing workshop methods. Here, the teacher provides a short mini-lesson around procedure (i.e., how to identify a writing topic), craft (i.e., how to use similes in writing), or strategy (i.e., how to determine the correct spelling of a word). Then, children work independently on writing a variety of pieces, including poems, narratives, mysteries, "how-tos," and so on. During this time, the teacher conferences with individuals or small groups to both assess where students are in their writing and use teachable moments based on their writing to teach new skills and to hone previously taught skills. Children revise, edit, and add details to their writing during this workshop, which will lead to publication and distribution of several key pieces throughout the year. At the end of each workshop, there is time for students to share a piece of writing and for the teacher to reinforce writing strategies that student authors have demonstrated.
- **Interactive writing.** Co-constructing a piece of writing through an interactive writing event during the literacy block is an important way to create a deeper understanding of a writing strategy or process. In her first grade classroom, Mrs. Thompson uses a shared writing approach when she summarizes the children's journal responses to the interview with the veterinarian during her project work. She "shared the pen" by asking children to come up to the white board and to complete parts of the summary list. This lesson provides a scaffolded experience of creating a summary and focuses on chunking larger words into syllables for spelling. Interactive writing is a great springboard for word study, as discussed below.

Word study. Word study is a strong alternative to the traditional phonics, spelling, and vocabulary programs, for which there are prescribed lists for all children to drill, memorize, and be tested on. Word study also provides a good opportunity for a meaningful center during the literacy block, as it offers children the opportunity to discover spelling patterns, manipulate word concepts, and apply critical-thinking skills.

Word work for spelling often begins with a developmental spelling assessment of the level of children's stages of spelling development and their knowledge of important orthographic (spelling or word pattern) features. Formal programs, such as Word Journeys and Words their Way, provide word lists based on the child's level and offer supporting activities for practice and experiences with the words. During center time, children can engage in doing word sorts according to word patterns, experiment with prefixes and suffixes, or draw a picture to demonstrate the meaning of the word.

Summary

The classrooms described above allow children the opportunity to explore and learn across content domains while also receiving explicit literacy instruction. Children are expected to complete work assigned to them during small-group instruction or during whole-group lessons. However, they also have choices in the selection of assignments during the day. Information is introduced during whole- and small-group lessons, and information is repeated and reviewed. Children's individual needs are met during small-group reading instruction, writing workshops, and center time. Reading and writing are integrated into content-area learning. Children in the classrooms read and write all day long in all of the content areas, and the classrooms are arranged so that the children have access to varied materials and texts. Most importantly, the children come into the classroom each day ready and motivated to read and write in response to the opportunities the teacher provides.

Teaching/Instructional Strategies

To bring content to life and to reach all students, teachers employ a repertoire of teaching techniques or instructional strategies, including questioning, modeling, co-constructing, and reflecting that were demonstrated throughout the content sections above. This current (and extensive) section shifts to first presenting strategies central to addressing the needs of all learners: data-driven instruction and scaffolding. Then this section of Teaching/Instructional Strategies provides an in-depth look at units of study and implementing the project approach to teaching and learning. Further, this section provides in-depth vignettes of three classrooms where the teachers presented content and skills through a unit and then developed a key idea or interest from the unit into a meaningful project for the students.

Data-Driven Instruction: Collecting and Using Student Assessment Data

A comprehensive approach to assessing children is:

> a coordinated and comprehensive system of multiple assessments—each of which is valid and reliable for its specified purpose and for the population with which it will be used—that organizes information about the process and context of young children's learning and development in order to help early childhood educators make informed instructional and programmatic decisions. (U.S. Department of Education, http://www.ed.gov/early-learning/elc-draft-summary/definitions)

This entails that teachers collect and use data from multiple sources to make meaningful and valuable judgments and instructional decisions about children. Note that comprehensive assessment does not mean exhaustive amounts of assessment or overburdening the student or teacher. Comprehensive means a balance of domains (math, reading, social-emotional, etc.) examined, of sources of information (formal/informal, summative/ formative), and of methods (observation, student work, tests). Teachers can take the opportunity to map the assessments given to children in their classrooms to identify holes, needless overlap, and ineffective data use. The chart is useful to map out assessments in the classroom (add as many rows as needed), reflect on what is over-assessed or under-assessed, and determine which data are not used in a meaningful manner.

Assessment Name	Domain Assessed	When administered?	Who administers?	Who uses the data?	How are the data used?

Assessing Children in Primary Grades

The process of assessing what young children know and can do poses particular challenges. Young children experience different rates of growth in their physical, motor, linguistic, and emotional development. Further, their developmental and learning patterns can be episodic, uneven, and rapid (Ackerman & Coley, 2012; Bowman, Donovan, & Burns, 2001). For these reasons, summative tests alone may not necessarily provide the most accurate picture of children's concept knowledge, skills, or understanding. Rather, these tests need to be coupled with performance-based assessments administered in the classroom on an ongoing basis to have the full picture of the student.

Summative assessment provides teachers with a snapshot of student understanding. Also called assessment of learning (Earl, 2005; Stiggins, 2002), summative assessments can be a grade on a test, a benchmark assessment, or a grade on a report card at the end of a marking period. Formative

> Formative assessment involves: (a) observing and investigating young children's individual behaviors as a seamless part of instruction, (b) documenting and reflecting on the evidence, (c) analyzing and evaluating the data in relation to set goals or a standards of learning, (d) hypothesizing and planning which considers what the children are demonstrating and the implications for instruction, and (e) guiding and instructing where the data helps the teacher target the needs of the children and scaffold their learning to the next level (Riley-Ayers, Stevenson-Garcia, Frede, & Brenneman, 2012).

assessment, in contrast, provides teachers with a tool to address student achievement while informing instruction (Frobieter, Greenwald, Stecher, & Schwartz, 2011) and occurs when teachers become participant-observers and engage in an iterative assessment process over time (Riley-Ayers, Stevenson-Garcia, Frede, & Brenneman, 2012). It is a process used by teachers and students during instruction that provides feedback and is used to adjust ongoing teaching and learning. Its intention is to improve students' achievement of instructional outcomes.

Using Data

We know from research that collecting assessment data is something that teachers are able to do generally quite effectively. The simple collection of data, though, is not sufficient to have an impact on learning outcomes. Rather, teachers must effectively use the data to inform instruction. This requires time to carefully examine the data and to design instruction around the needs of the group as a whole and to plan differentiated instruction for individual learners. There is not one protocol for teachers to employ to use data effectively. However, one key aspect of completing the assessment cycle is to reflect on the data, consider what the evidence is saying about the child, and make a plan (formal or informal) to support that child's learning to move him or her along the learning continuum.

It is often important for this reflective teaching practice to occur with colleagues. Convening teachers to examine data and discuss their use on a regular basis is good practice. The Tuning Protocol (http://www.nsrfharmony.org/system/files/protocols/tuning_0.pdf) offers a guide for meeting as a group to examine student work. The protocol includes these steps: (1) one teacher's presentation of student work or assessment data, (2) clarifying questions by the rest of the group, (3) examination of the student work or data, (4) warm and cool feedback, reflection, and debriefing. Through this process, the teacher is offered insight from colleagues about a particular student, how to collect more information about the student, and/or the next instructional steps for the student.

Another way to look at data is in aggregate form by classroom. Examining child assessment data across the class is useful in many ways. First, these data can offer insight into specific areas in which a teacher may be in need of professional learning or support. Second, these data offer insight into small-group instruction opportunities. Third, these data may provide evidence for curriculum changes or adjustments.

Data in the Classroom

First grade teacher Mrs. Thompson uses a comprehensive approach to assessment in her classroom for language arts. Three times a year, she administers the DRA to all students. This provides her with a formal benchmark of her students' reading levels for documenting progress and for reporting to district administrators and parents, and these data become one piece of her understanding of the students. Throughout the year, Mrs. Thompson uses running records during her guided reading groups to informally assess students' reading levels and adjusts groupings and instruction based on this information. She also monitors comprehension through questioning and

students' oral and written responses to texts. To examine her students' writing progress throughout the year, Mrs. Thompson uses the Developmental Writing Continuum from the New Jersey Model Curriculum Assessments (http://www.state.nj.us/education/modelcurriculum/). She continually evaluates her students' work during writing workshops, using the continuum, by highlighting the skills and strategies that she sees the children exhibiting. Using this continuum, she plans next steps for mini-lessons, individual conferences, and whole-group experiences for shared writing. Mrs. Thompson collects written work samples to include in her evidence portfolio for each child and adds anecdotal records that highlight each child's individual development. These include notes on oral language and vocabulary use that the children demonstrated through experiences and meaningful conversations (rather than vocabulary tests). These notes also include records of children's approaches to learning through language arts. For instance, notes may document one child's persistence in reading a new text or a look at another child's creativity in providing an ending to a story.

In some classrooms, teachers involve students in the assessment process through focused feedback. The teacher and child work together to determine the next steps. The child takes ownership and responsibility for his or her learning.

Third grade teacher, Mr. Walsh uses a comprehensive assessment approach in his teaching of mathematics. He begins with pre-tests and summative tests for each unit in the math book, which was purchased by his district. He looks at these assessments individually and across the class. Based on these assessment, he selects students for small-group support and generates a small group of students who are ready for more complex application of the math skills. Mr. Walsh also assesses, on an ongoing basis, by watching his students solve problems, examining their work, and recording anecdotes that capture how the students describe their thinking and their processes when determining the answer. This occurs through the typical math lessons, through the problem of the day that Mr. Walsh posts at the beginning of math, and through his project studies whereby children use mathematical understandings as they study maps to compare what their town looked like previously and how it looks today. Within the ongoing math assessment, Mr. Walsh also assesses his students' approaches to learning and executive functioning. This may be evidenced in an anecdotal note of a child's problem-solving approach to a difficult problem as he or she flexibly (or not) applies math learning or about a child's ability to focus attention on the key components of the math word problem while filtering out irrelevant information.

Scaffolding and Differentiation of Instruction

All classrooms consist of students with different skillsets and abilities. Some students may be excellent at mathematics but not at writing. Others may excel at sports and technology but dislike working in groups. No matter the differences, teachers must have strategies to meet the needs of each student. This requires teachers to know individual students' abilities, skills, interests, and needs. Positive teacher-child interactions and careful observation and evaluation of data help develop this understanding.

One method to help children learn is by scaffolding instruction. Vygotsky (1978) put forth the concept of the zone of proximal development (ZPD). This is, "the distance between the actual developmental level as determined by independent problem solving and the level of potential development as determined through problem solving under adult guidance, or in collaboration with more capable peers" (Vygotsky, 1978, p. 86). Using information from a variety of assessments, including observation, teachers learn what children can do independently and what they can do with support. To scaffold the children's learning, teachers begin with what children can do independently and move forward slowly from there, essentially breaking the learning into achievable chunks. For ELLs, this might entail the use of various resources to ascertain the child's current skills.

The think-aloud is a specific modeling technique. A think aloud is when the teacher makes her internal thought process public. The teacher "talks aloud" as she solves a problem, monitors comprehension, and so forth.

For example, the teacher may ask someone who speaks the child's home language to assess the child's understanding of the concepts. Further, teachers may use visual supports, gestures, and technology to communicate with ELLs and to support their learning.

Teachers can scaffold instruction by modeling the process of a particular task. Mr. Walsh's third grade students had never conducted an interview. Mr. Walsh taught the students the interview process through a think-aloud. Having learned and practiced the interview process before starting a major group project, the students had prior knowledge and knew what was expected of them. Another strategy to scaffold learning is to allow students to discuss the content as a group, activating their background knowledge and learning from one another. For another group project on life cycles, Mr. Walsh asked the students to conduct a brainstorming session. During this time, students in their groups shared their prior knowledge with one another. This activity provided the students with a place to begin as a collaborative team. Throughout the learning process, teachers ask open-ended questions to gauge student understanding and concept development. From the responses, teachers determine which supportive materials students need to help them to achieve more advanced learning goals and objectives.

Units

Delivering content in a coherent and logically sensible way is a challenging task. One way that teachers can do this is by organizing lessons within a unit of study, usually by some kind of theme or topic that brings different concepts and skills together. Many commercially available curricula organize the teaching of a specific subject matter within curriculum units, but units also can be interdisciplinary. Whatever the topic being studied, units provide a developmentally appropriate way to deepen children's understandings of subject matter and to help them make connections across subject matter.

The vignettes below provide descriptions of first, second, and third grade classrooms as they integrate high-quality curricula across learning domains to reach children of all abilities. Highlighted in the vignettes is an elementary school district. In this district, Community is a mandatory social studies unit. The three teachers in the vignettes, Mrs. Thompson (first grade), Miss Rivera (second grade), and Mr. Walsh (third grade), find the topic valuable.

First Grade Unit Vignette

Unit Introduction/Description

Mrs. Thompson finds it difficult to teach social studies during her busy day. She knows that the elementary curriculum for literacy is rich with literature that supports ideas about community with expository texts about community workers as well as fictional texts or stories. By integrating social studies with language arts, Mrs. Thompson covers the necessary content while also helping her students learn and apply key literacy skills.

The Social Studies Unit on Community

To begin the unit, Mrs. Thompson consults the state standards for ELA and social studies as well as the curriculum guides provided by her district. She then composes "I can" statements (goals for children) that describe the overarching (throughout-unit) objectives.

I can describe a community.
I can describe the people in my community.
I can describe the places in my community.

To ensure that she is responsive to the needs of her students, Mrs. Thompson begins the unit by eliciting her students' understanding of community. On the carpet in the literacy center, Mrs. Thompson begins:

> Over the next few weeks, we are going to be reading stories about the people and places in the community. Each of you also will choose a place in the community that you would like to learn more about. You will meet with other students who are interested in that place in our community and work together as a team to find facts that you can share with the rest of the class. Your team will create a model of that part of the community. That means that you will use cardboard, construction paper, and other materials to make a smaller copy of what your location looks like. Once everyone is done researching and creating, we will put all of your pieces of the community into a community map.

The KWL chart tracks what a student knows (K), wants to know (W), and has learned (L) about a topic. It can be used before, during, and after research projects.

Mrs. Thompson introduces the book On the Town: A Community Adventure by Judith Caseley. After reading the story, Mrs. Thompson shows the children the KWL chart and asks them to help her to first complete the "K", the "know column": "What we know about a community." She then asks them to share their "wonderings" about communities and records these comments in the "W", the "wants to know" column:

Can we go on a community adventure?
Who works in the community?
What is the community?
Is the park part of the community? Who owns the park?
Who belongs to my community?
How do we make our community better?

As Mrs. Thompson plans her next lessons in the community unit, she works toward balancing her learning objectives from the social studies curriculum with these student-generated questions. Understanding the importance of using a variety of texts, she selects both narrative and informational texts. She uses these during her reading mini-lessons to help build the children's understanding of communities while also helping students to develop reading strategies, such as questioning and identifying the main ideas in a text. Students use their new understanding of community to work in groups to research places such as the grocery store, community park, fire station, and post office. The students, across 3 weeks, work on the research and on creating the model of their location in the community.

To close the unit, the students create an aerial map using the models of the key places in their town. Mrs. Thompson moves a miniature figure along the street and stops at each place in the

community. At each stop, she prompts the group who researched that location to talk about the location they constructed. Students read the sentences that they composed that include what happens at that place, who works or lives there, and how it contributes to community life. When Mrs. Thompson's figure reaches the post office:

Cari reads, "The post office is where the mail carriers work."
Michael adds, "All of the mail comes here. Then the carrier delivers it to houses."
Josey then reads, "At the post office, we can buy stamps and send letters."

Both she and the students pose a few questions about the post office, and the group answers. Mrs. Thompson moves the figure to the next location, and the groups continue sharing information about the places and people in their community.

The section, Teaching and Learning Through the Project Approach, in this document, shows how Mrs. Thompson continues this unit into a project guided by the students' interest.

Second Grade Unit Vignette

Unit Introduction/Description

In second grade, the students request pen pals. Their teacher uses a classroom pen pal website to link students together. This year, Miss Rivera's class is linked with children in second grade in Phoenix, Arizona.

The Social Studies Unit on Community

Throughout the third week of October, during the Morning Meeting share circle, students in Miss Rivera's class share the letters that they received from their pen pals. The letters that they share are the second letters in a series that they exchanged with their pen pals. This is part of a literacy unit on written communication. In the first two letters, the pen pals told each other about their town. Miss Rivera concludes the Morning Meeting by generating a list of all the things the class has learned about Phoenix.

After their Morning Meeting, yoga stretches, and a review of the schedule for the day, Miss Rivera transitions into her literacy block. The class has been focusing on comparing and contrasting different versions of the same story in language arts, and Miss Rivera saw this as an opportunity to have her students think about the similarities and differences between their town and their pen pals' town. Using the information from the letters, they create a Venn diagram to map out the similarities and differences between the two communities. This year, Miss Rivera decides to structure this unit so that she connects her social studies objectives with the ELA standards. This will allow her the time to go into more depth with social studies content while also meeting additional standards.

During their 45-minute social studies period, Miss Rivera reviews the Venn diagram that the students created in their language arts block, and asks her students to develop questions that they would like to have answered about the differences between their town and the town in which their pen pals live. The students share questions about their pen pals' town and about the differences between the towns. She records their questions on a chart:

Do all towns have grocery stores?
How many towns are there?

Do all towns have schools?
How many houses does our town have?
Is there a firehouse in all towns?
Do all towns have lakes?

This is the beginning of a month-long social studies unit from Miss Rivera's curriculum that is used to study different communities in depth. Throughout the unit, Miss Rivera's students will gather information about different communities, reflect on the information, and maintain a portfolio folder of various resources.

During the unit, Miss Rivera includes elements of dance from the year that the school was founded, in the early 1900s. With the help of the music and physical education teachers, Mr. Lewis and Mr. Felson, the students learn about the Charleston, ragtime, and jazz. Mr. Felson focuses on elements of music, such as rhythm, timbre, dynamics, form, and melody. Understanding these elements will be essential when the class begins to learn about the different instruments and conventions used in jazz and ragtime.

The students research Phoenix, Arizona, using the Internet, library books about Arizona, and local Phoenix newspapers obtained by their school librarian. This unit includes students' looking at the different climates of the United States and learning about the similarities and differences between several cities and towns across the United States. At the conclusion of the unit, the class summarizes their understanding of the similarities and differences between their town and their pen pal's town. They share what they learned with their pen pals through Skype. The principal attends the presentation, and at the conclusion, she shares experiences from her hometown in rural Minnesota. The children begin asking where other key personnel in the school grew up. They ask the principal about the nurse, the custodian, and so on. The principal answers what she can and thanks the class for inviting her to the event.

The section, Teaching and Learning Through the Project Approach, in this document, shows how Miss Rivera continues this unit into a project guided by the students' interest.

Third Grade Unit Vignette

Unit Description/Introduction

Mr. Walsh has planned a Social Studies unit on Community Change for the next few weeks. His class has a 45-minute Social Studies instructional period several times a week, which alternates with science instruction by month. Before beginning the Community unit, Mr. Walsh visits the local historical society. He requests photographs of the town in which the school resides. He visits sites in the photographs, taking pictures of how they look today. He organizes a PowerPoint slideshow to share with his students. Mr. Walsh reads select books that present the history of the town to develop his content knowledge and to use as a resource during the lessons.

The Social Studies Unit on Community

In class, Mr. Walsh begins his third grade social studies unit on Community Change by asking the students to look at a picture of an old school house. The conversation begins:

Mr. Walsh: Take a look at this picture. What do you see?
Adam: That's our school, but it's black and white and gray.

Randi: I think it's an old picture of our school, but the name is different.
Jonas: My mom told me our school used to have a different name.
Janelle: The picture is really old. Some parts of it are hard to see, but it still looks like our school.

Once the students share their observations, Mr. Walsh clicks on the next slide, which shows the school as it looks today. He asks the students to observe and share what they see. He clicks on the next slide with images of the two schools next to one another. The conversation continues:

Mr. Walsh: Okay, here are both schools together. What do you notice?
Marguerite: The old school kind of looks like our school.
Marcus: Yeah. Look, it has the same number of windows on the front.
Jessica: It does, but it's smaller than our school.
Kadejah: It's not as tall as our school!

Mr. Walsh uses this discussion as a way to transition from a discussion of changes in the school to a discussion of changes in the larger community. He asks the students to think about their town and to share questions related to how their town has changed over time. Mr. Walsh writes their questions on the Smart Board.

How old is our town?
When was our town made?
Who lived here when our town was made?
How many people lived here when the school was first built?
How many people live in our town now versus a long time ago?
Did our town always have lots of pizza places?
Were there always so many houses?

During the next few weeks, Mr. Walsh uses informational texts to teach students how to gather information from primary sources and use what they have collected in writing summaries. He introduces them to research strategies while reading books and newspaper articles, navigating websites, viewing historical pictures, and viewing different types of maps of the area. He asks his students to create a document on Google Drive to record what they have learned. Mr. Walsh tells the students to use the websites on his Google site when using the Internet to find answers to their questions. He reminds them to use the Five W's (Who, What, When, Where, and Why) of website evaluation (http://www.schrockguide.net/uploads/3/9/2/2/392267/5ws.pdf) to complete a critical evaluation for each website using Kathy Schrock's Critical Evaluation Survey for Elementary School (http://www.schrockguide.net/uploads/3/9/2/2/392267/evalelem.pdf). He reviews the importance of recording specific information and including dates in their notes.

For more information on Dadaism, visit MoMALearning at http://www.moma.org/learn/moma_learning/themes/dada

Mr. Walsh asks the art teacher to include a study of art from the time period. Mrs. Johnson, the art teacher, will begin with a study of the basic elements of art and principles of design for Dadaism (Visual and Performing Arts Standards 1.1.2.D.1 and 1.1.2.D.2). Once the students understand the technique, she will have them create a piece in the style of Dadaism, which began in the early 20th century, around the time that the school was founded.

After two weeks of research, Mr. Walsh covers a classroom wall, lengthwise, with chart paper with a line down the center. He dates it on one side with the founding year of the town and the other side with the current year as a timeline for their town's development and growth. Mr. Walsh asks the students to add

the historical information that they collected on the timeline using sticky notes. They complete this assignment while working in groups.

Once the timeline is complete, Mr. Walsh sounds the chime and asks his students to join him at the meeting rug. He asks each group to sit together and to share the information that they added to their section of the timeline. Once they finish, he describes their new writing assignment, to create a text to share about how the town has changed. As they begin to plan their work, Mr. Walsh listens to the students' conversations. He takes notes on his tablet.

For the next few days, Mr. Walsh uses a variety of mentor texts, such as brochures and short informational texts, to show students different ways that they can continue to inform readers about the history of their town. Together, the class selects from three different writing projects, including a report or short informational book, a Google slideshow presentation, or a history brochure. The students can choose to work with a partner or on their own. Over the next few weeks during the writing workshop, students use the computers to write about the history of their town in a variety of different formats. To conclude the assignment, Mr. Walsh has a Town History Day. He adds the students' work to the public library's section on the town history.

The section Teaching and Learning Through the Project Approach, in this document, shows how Mr. Walsh continues this unit into a project guided by the students' interest.

Summary

These three unit vignettes provide insight into typical high-quality primary classrooms. The teachers use mandated content through an integrated approach and use the standards in all areas to create objectives and learning experiences that cover the breadth of learning that is expected for children in first through third grade. These vignettes provide concrete examples of teachers using technology effectively and engaging students in meaningful learning tasks. The three teachers also vary the delivery of the instruction so that children have the opportunity to learn in whole groups, small groups, and on their own. The varied instructional groups provide teachers with opportunities to differentiate instruction to meet the needs of the diverse learners in each classroom. Through this approach, the teachers provide a positive learning environment in which all children are valued members of the classroom community.

Teaching and Learning through the Project Approach

The previous sections provided an understanding of young children that applies directly to teaching. First, the primary years are a critical period in children's learning that sets the stage for later learning. Second, teachers must consider the whole child and know that development in various domains is interconnected but that skills in each domain may develop at a different pace. Third, each child is unique, which means that every classroom is a room full of diverse learners, no matter how similar they appear in terms of cultural or socio-economic background. Fourth, effective teacher-child interactions are critical to providing emotional and instructional support in the classroom. Fifth, it is the responsibility of the teacher to respond to children's strengths and weaknesses through differentiation of instruction and scaffolded learning. Finally, providing children with concrete learning experiences with connections to previous learning, coherence, and relevance across domains is necessary to having motivated and engaged learners.

Primary teachers have to combine these understandings of young children's learning and development with the teaching of subject matter. Much of the elementary school day schedule is divided into specific time slots devoted to math, literacy, science, social studies, and the like; yet, an

understanding of the everyday world involves the integration of knowledge from multiple disciplines. When young children are working in groups on a math project, for example, they also read and write as well as use their social and problem-solving skills to come up with a solution. Life in and outside of classrooms is full of learning experiences that require this kind of integration and the application of knowledge across subject areas. This integration of knowledge is also important because it allows children to build on previous learning experiences and to make connections between a variety of subject matter while also practicing various skills that strengthen their learning and development in various domains.

Unfortunately, when the school day is divided by subject matter, children may not realize how they are using a range of disciplines in their classwork. Moreover, teachers are inclined to concentrate as much as they can on a specific kind of content assigned at a particular time of day, often due to the requirements of standardized curricula. However, while curriculum is separated into discrete subject matter in most schools, this approach is not in keeping with best practice and what we know about young children's learning and development.

So how can teachers address the challenge of school days' being divided into time blocks dedicated to particular subject matter, and the use of required curricula in key subject areas with what is known about children's learning, which suggests that interdisciplinary and integrated learning is key? One way is to teach using integrated units on a topic such as communities shown through the examples above. Often, however, units of study are linked solely to a subject matter, especially if they are part of commercial curricula. Another way is for teachers to devote some time in the week to project-based learning, a pedagogical approach to integrating curricula.

Projects, by definition, are in-depth investigations of real phenomena that are a part of children's lives (Katz & Chard, 2000). The emphasis is on real phenomena, real ideas that children can explore and, by doing so, learn and apply a range of subject matter while also developing their problem-solving strategies, social skills, and research/inquiry skills.

When working with projects in the classroom, teachers use their current classroom schedule and continue facilitating the same project over time. Although projects involve children in in-depth investigations of a question or topic, teachers such as Mrs. Thompson do not have to use every minute of every day to work on the project. Instead, project activities can be included at different points in the school day or week. Some teachers use their social studies or science lessons one or two times a week for project work, while others, such as Mrs. Thompson, use centers and incorporate project work in the literacy block to reinforce and extend students' subject matter learning. A sample weekly schedule, including project work, is presented below (scheduled project work is italicized).

Allotted Time	Monday	Tuesday	Wednesday	Thursday	Friday
15 minutes	Arrival Time	Arrival Time	Arrival Time	Arrival Time	Arrival Time
30 minutes	Morning Meeting: Project Work	Morning Meeting	Morning Meeting: Project Work	Morning Meeting	Morning Meeting: Project Work
90 minutes	Language Arts: Project Work	Language Arts	Language Arts	Language Arts: Project Work	Language Arts
45 minutes	Science / Social Studies	Science / Social Studies: Project Work	Science / Social Studies	Science / Social Studies: Project Work	Science / Social Studies
60 minutes	Lunch / Recess	Lunch / Recess	Lunch / Recess	Lunch / Recess	Lunch / Recess
60 minutes	Writing: Project Work	Writing	Writing	Writing: Project Work	Writing
45 minutes	Special	Special	Special	Special	Special
55 minutes	Mathematics	Mathematics: Project Work	Mathematics	Mathematics: Project Work	Mathematics
15 minutes	Closing Meeting	Closing Meeting	Closing Meeting	Closing Meeting	Closing Meeting: Weekly Project Update

In addition to ensuring that time has been scheduled in the weekly schedule for project work, teachers also need to consider the three phases (Chard & Katz, 2010) for implementing a project:

Phase I: Beginning the Project

Projects usually begin with a question or line of inquiry sparked by children or teachers. The emphasis is on real phenomena, real ideas that children can explore themselves and, by doing so, learn a range of subject matter while also developing their problem solving strategies and social and other related skills. The topic for a project should be: (1) linked to children's questions and interests, (2) suitable for investigating in school and can incorporate varied content and skills, (3) have the potential to be studied for a period of time (at least two weeks), and (4) allow for problem solving. In the First Grade Community Project (see below), Mrs. Thompson builds on the students' interest in dogs and the problem of not having a dog park in their community. The topic of the dog park meets the four criteria for a project: (a) it is related to students' interests and questions, as they have already been investigating their community and have asked why dogs cannot run around without leashes; (b) it can be studied in school through various content areas; (c) it can be studied for multiple weeks; and (d) it requires the children to work together to solve a problem.

Phase II: Project Research

From the questions the children raise, it is then possible for the teacher to act as a consultant or facilitator, helping children to gain new information about the topic through firsthand, real-world experience. This involves fieldwork, such as visiting local sites and interviewing people, drawing and

writing observations, and using primary sources or teacher-provided websites. In Mrs. Thompson's project, groups of children work at various worksites on different tasks, such as designing the dog park, drawing and painting signage for the dog park, making models of dogs out of art materials, interviewing someone from Petco about the needs of dogs, and writing letters to the mayor and public works committee to advocate for a dog park. During this time, Mrs. Thompson posts documentation (pictures, stories, and evidence of children's learning) on a bulletin board in the classroom so that children can revisit what they were learning the previous time and have a starting point for deepening their investigations.

Documentation of the project—the activities and investigations that children engage in, the products they produce, the people they interview—is central to the success of any project. Documentation occurs when a teacher "collects, analyzes, interprets and displays evidence of children's learning throughout the project" (Helm & Katz, 2001, p. 55). These displays, which might take the form of student work, with a teacher's written analysis underneath or photographs about an activity in which children were involved that includes descriptions about what they were doing and what they learned, motivate children to revisit their learning and to reflect on next steps to answer their questions. Documentation also communicates to others such as the principal or parents how an integrated inquiry approach contributes to children's learning. Most importantly, documentation helps the teacher to assess children's learning throughout the project and guides the teacher's planning of the form, content, and delivery of other project activities that build on what children have already accomplished.

Phase III: Concluding the Project

Once the students have completed their investigations, it is important for them to summarize, reflect on, and demonstrate their learning. This phase of the project is just as important as any other phase and should involve the children as co-decision makers, as in the other phases. During this phase, the children have the opportunity to "consolidate and integrate information from different experiences in the project" (Helm & Katz, 2001, p. 51). Moreover, this phase gives the teacher an opportunity to determine whether his or her goals for individual children and the class as a group have been achieved.

This process begins by asking the children what they have learned. This discussion might be initiated by returning to the KWL chart or the planning web created with the children. The teacher and children also might look at all of the documentation they have created around the project, such as drawings, graphs, photographs, interview notes, and models, to help them reflect on what has been learned.

To conclude the project, the children also can be encouraged to think about with whom they might communicate their project learning. Sharing their project learning with others is a meaningful way to involve families and community members, including other teachers and students or the leadership of a school or district, such as the principal or superintendent. This sharing can take many forms, including a talk, book, mural, construction that the children create, or a culminating event (Helm & Katz, 2001). Culminating events, such as asking families to come in and learn about the project by viewing the artifacts and documentation related to the project, motivate children and teachers to bring together their work on a project (Helm & Katz, 2001). In Mrs. Thompson's first grade classroom, the project concludes by the whole class's reflecting on their original questions from Phase I using the KWL and by sharing what they learned individually and in their groups about creating a dog park.

Summary

Projects are a curriculum approach that enables teachers to include multiple modalities and ways of learning, to help students integrate and connect their ideas to broader disciplines of knowledge, and to simultaneously ensure that the students are developing in all developmental domains.

First Grade Community Project: How Do We Improve Our Community?

At the end of the three-week social studies unit on community (see the section on Units in this document for a description), Mrs. Thompson notices that the children are still interested in the community topic. In revisiting the KWL chart and by reflecting on their culminating activity of the aerial map, she can see that the children were especially interested in the community park. Mrs. Thompson sees this as a great opportunity to use the students' interest in the community park to implement a project that will help them investigate one of the children's original questions, "How do we improve our community?"

While the unit allowed Mrs. Thompson to deepen the children's literacy learning by focusing on the topic of community, a project allows her students to research a particular question in depth about their community. The project also provides the opportunity to continue standards-based learning in content areas while pursuing a real-world, student-led application of the children's knowledge from the unit.

To begin the project, Mrs. Thompson organizes a walking trip to the community park. She prepares her students for the trip by asking them to make observations that they find interesting or that they would like to know more about. Equipped with paper, pencils, and clipboards, the students record words and pictures to represent their observations.

Phase I: Beginning the Project

Upon their return to school, Mrs. Thompson prompts students to share their observations while she records them on a chart paper labeled, "What did we observe?" The students share their observations and questions:

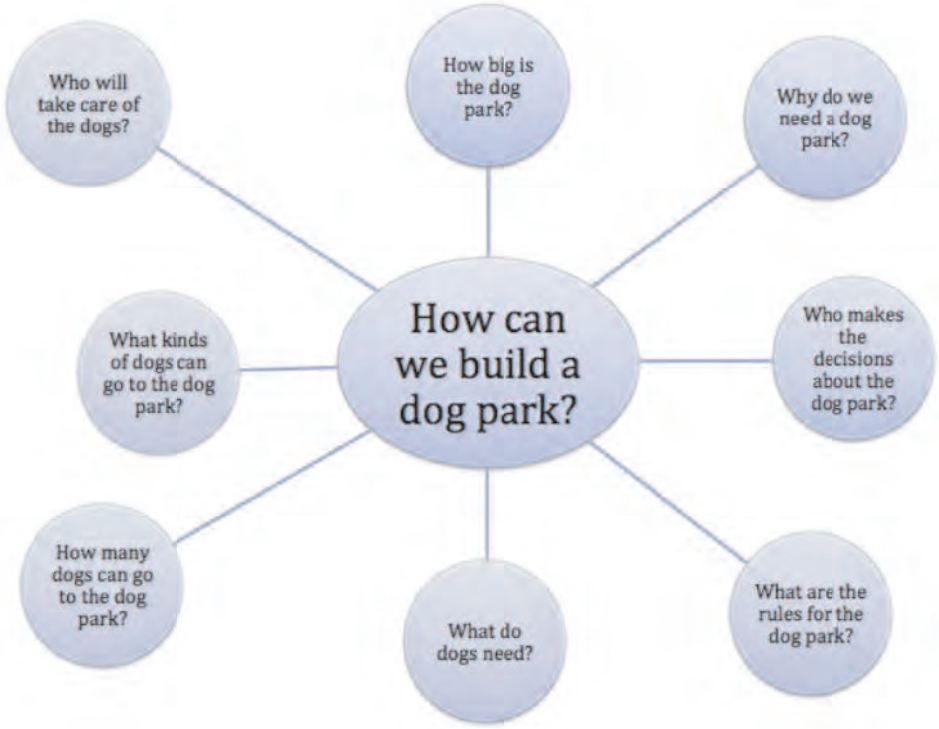
Nikhil: "I saw lots of tall trees."
Ryan: "The water wasn't working at the fountain."
Jenna: "I saw people walking their dogs."
Mary: "Yeah! The dogs had to be on a leash!"
Nnenka: "It's sad, they had nowhere to run."
Jared: "Who plants the trees in the park?"
Darla: "Why can't the dogs run around without leashes?"
Carrie: "Did you know that my dog likes to play at the park?"

Mrs. Thompson says, "Okay, these are great comments and questions! Turn to a partner and talk about how we can work together as a class to do something for our community." Mrs. Thompson reminds the children to use their journals as a reference tool as they talk about the park.

During sharing, Darla's group proposes that the dogs should be allowed in the park to run around and play. Mrs. Thompson leads a discussion about why dogs cannot run around the park unleashed.

She then says, "What do you think we can do about this?" Jilliana and Genesis say, "Let's make the park for dogs, too! How do we build a dog park?"

Developing the project. During common planning time, Mrs. Thompson brainstorms with her colleagues about the project. They make a project map (below) to help with the planning process.



Phase II: Project Research

To help the children answer their essential question, "How can we build a dog park?" Mrs. Thompson asks her veterinarian, Dr. Gutman, to visit the class. Prior to his visit, Mrs. Thompson asks the children to work in small groups to write questions to ask Dr. Gutman about dogs.

Expert interview. The children direct their questions to Dr. Gutman:

What kinds of dogs can visit a dog park?
What do the dogs need?
Will the dogs be friends?
What kinds of toys do dogs use?
How can we keep the dog park clean?
What can the dogs do at the dog park?

At the conclusion of the interview, Mrs. Thompson asks the children to write or draw what they learned in their journals. She then asks children to share. She uses these interactions as teachable moments for language art skills, as seen below:

Joseph: I drew a picture of a Doberman and his dog friends. And here is the water bowl and a ball because dogs need exercise.

Mrs. Thompson: How do you spell Doberman, Joseph? Let's sound it out together. Let's start with the syllables. /do/ What sounds do you hear there?

She writes the word on the chart paper and, together with the children, they sound out the word.

At the conclusion of the sharing (and teaching), Mrs. Thompson explains the four worksites that the students will work in during project time the next few weeks.

Math Survey Worksite. Over the next few days in this worksite, students will conduct and analyze surveys to answer questions such as: Who will use the dog park? What should be in the dog park?
Research Worksite. In the research worksite, students will use Internet research to determine who makes the decisions about the dog park in the town and county. They will also write opinion letters to the appropriate person that contains reasons to support their thoughts about a dog park.
Design and Engineering Worksite. There are a lot of art materials in the design worksite. When students work here, they will create a model or prototype of the dog park to show others how it will look based on what the needs are as determined by their research.
Literacy Worksite. There are books and resources to help students investigate different species of dogs and their needs. Students will be reading, listening, writing, and drawing to prepare to teach others about different dogs.

During the next three weeks, the children visit the different worksites to explore and to work together guided by the teacher to find answers to their questions. While at the worksites, Mrs. Thompson works with the children on their investigation, scaffolding each child's individual learning. She includes books at different levels, including books on tape in children's home language. She strategically forms heterogeneous groups so that children of differing abilities can work together toward a common goal. During her interactions, she collects anecdotal evidence by monitoring the children's learning and understanding, which is used to inform instruction. Project worksites are refreshed to meet the children's learning needs.

Phase III: Concluding the Project

To conclude the project, Mrs. Thompson sends the students' letters to the mayor, inviting him to visit the class. Families are also invited to the class for the students' culminating presentations. Each group of students is responsible for presenting a different aspect of the dog park. One group shows their design for the dog park, another presents a poster and book of what they have learned about different dogs, a third group shares their persuasive piece on why the town should build a dog park, and the final group presents the model for a dog park.

Second Grade Community Project: Where Did Our School Personnel Grow Up?

After concluding the unit on community similarities and differences (see the section on Units in this document for a description), Miss Rivera continues to hear the children ask various teachers where they grew up and what their town was like. Miss Rivera talks with her colleagues about the students' interest and realizes that, although the community unit is complete, the children are still very interested in learning more about different communities.

Phase I: Beginning the Project

Miss Rivera's class is currently focusing on writing informational text, and she sees the children's interest as an opportunity to start a community project within the Writer's Workshop.

Miss Rivera begins, "This year we have been discovering how communities are similar to ours and also very different. I understand that you are very interested to hear where the adults in our school grew up. We have also been learning that informational writing helps our readers to learn something new. Sometimes we write about topics we already know a lot about, and, other times, we have to do more research. So far, we have used the Internet and books to do our research, but there is also another way to research: Ask people! We call that "interviewing." Jorge's hand immediately went up, and, when Miss Rivera called on him, he said, "I know what an interview is. The newspaper interviewed my dad!" He continues by telling the class that an interview is when you ask someone questions and write down the answers. Miss Rivera forms the students into small groups and asks them to brainstorm questions that they would ask someone about his or her community.

After brainstorming for 10 minutes in small groups, the students come back together to share their questions. Miss Rivera records their questions on the chart paper:

What is the name of your town?
Was your town big or small?
What state is your town in?
What animals live in your town?
What did you do for fun in your town?
Did your town have a park?
What makes your town special?
How far away is your town?

Miss Rivera asks the students to get back into their small groups and choose five questions to ask. She concludes the lesson with the news that the person whom they will be interviewing is someone in the school.

Developing the project. Miss Rivera works with her second grade colleagues to design a project map that will help guide her teaching and the children's learning throughout the project.

Phase II: Project Research

Miss Rivera sets up a time for key personnel from the school to come in to be interviewed by the children. During the next project time, students practice asking their questions in small groups first and then interview the staff members. Students record the interview in ways that they are best able to capture the information. Some use complete sentences, and others use single words or pictures. For some students, Miss Rivera provides a tape recorder so that they can record the interview and (for some) re-listen and then write their notes with the support of an adult.

At the next project time, Mrs. Thompson explains the four worksites that the students will work in during project time the next few weeks.

Science Worksite. In this worksite, the students will explore the climate of the community. During their time here, students will research the climate and the animals that thrive in the staff members' home towns.

Math Worksite. Here, the students will compare populations, size (square miles), and other details, such as the number of movie theaters and grocery stores in the communities. Each group will graph their results for comparison.

Geography Worksite. In this worksite, students will locate the community on the map and calculate the mileage from their community using Google maps. Students will then write a plan to go see the community (i.e., take a plane; drive, for which they will provide directions; or another method of transportation).

Design Worksite. Here, students will create a visual representation of the community based on what they know from the information gathered. Students will have a choice of representation, such as a map, a detailed picture of one aspect of the community, a model of the community, or a teacher-and-student agreed-upon design.

The students collect all of their interview information in their community portfolios. Miss Rivera reviews the portfolios periodically to evaluate the children's learning and to plan responsive activities, lessons, or support throughout the project.

Phase III: Concluding the Project

At the end of the month-long project, Miss Rivera asks the students to look at their communities' portfolio to review all of the information that they collected about their interviewee's community. She posts the chart with their "big questions" from the beginning of the project on the board. She reminds the class that they started this project one month ago and have learned so much about the differences and similarities between their community and others. Miss Rivera prompts the students to think about how they could show what they learned. The students create pictures and charts, write informational texts, and prepare a computer presentation.

In small groups, the students use their portfolios to organize what they learned throughout the project. One group creates a Venn diagram to compare and contrast their town with that of their "school person." Another group draws a picture of their "school person's" town, including the animals that live in it, using their science notebooks and the information that they collected about the local habitat. A third group asks whether Miss Rivera can pull out the math center information cards so that they could tell about their town "in numbers," and they do so through graphs. A fourth group prepares a power point presentation online (Prezi: (http://prezi.com/). After all of the groups complete their projects, their "school person" and their family members are invited to attend the project sharing day.

Third Grade Community Project: Designing a Transportation System

A WebQuest is an inquiry-oriented lesson format in which most or all the information that learners work with comes from the web. A WebQuest is constructivist project that requires students to work together in specific roles as they solve a problem. Students work in groups of three to five, using the Internet to conduct their research.

After the third grade unit on community concludes (see the section on Units in this document for a description), Mr. Walsh reflects on his anecdotal notes of the students' learning that he acquired throughout the unit. He notices that many of the children's conversations and interests focused on transportation changes. He decides to bring this up with his colleagues at their next professional learning community (PLC) meeting.

Every month, one or two teachers work together to present at the school's PLC. This month, Mr. Walsh has asked to present his third grade social studies unit on community. He presents the unit to the group along with his concerns that the unit ended before he could go deeper into some areas in which the students expressed an interest. Mrs. Carmichael suggests that Mr. Walsh consider developing an Internet project called a WebQuest. Using both the essential question for the unit, "How Has Our Community Changed?" and the children's interest, the teachers develop a WebQuest titled, "Using Community Change to Design a Transportation System for Our Future" The WebQuest is created using QuestGarden (questgarden.com), an online development tool.

Developing the Project WebQuest

The objective for the WebQuest is for the students to apply their knowledge of how their community has changed to designing a transportation system for the future. Mr. Walsh decides on the four roles—historian, structural engineer, transportation designer, and reporter— for the students in each of the five groups and drafted their job descriptions. The PLC group developed a list of questions for each team member to research, using the Internet and primary source documents. The group found and evaluated websites to help the students conduct their research. The librarian selected appropriate primary source documents. The PLC group decided that the final project for the WebQuest could be a presentation to the Historical Society.

WebQuest Processes

A WebQuest is a project-based approach to learning that comprises three phases. In Phase I, the students work together to brainstorm about their community and transportation. In Phase II, students work individually to conduct their research. While researching, students answer questions based on their roles. For example, during this WebQuest, the student in the role of historian answers his or her questions from that perspective. In Phase III, the students in the group come back together to solve the problem. In this WebQuest, the students will design a transportation system for their town.

WebQuest Project Phase I: Beginning the Project. Mr. Walsh introduces the WebQuest to his class. He reads through the entire WebQuest, and then the students break into groups of four, with each selecting a job. During Phase I, students:

1. Discuss transportation changes in their community.
2. Brainstorm about changes to transportation in the future based upon changes in the past. Mr. Walsh suggests that students design a new transportation system, or possibly a new type of transportation, for the town.

WebQuest Project Phase II: Project Research. Using the Internet and primary source documents, the students conduct their research individually based on the questions for their role. During library time, the students use the primary source documents and informational texts collected by the librarian to continue their research. Mr. Walsh creates worksites in the classroom to help support the group designs.

To complete the Designing a Transportation System WebQuest found in this vignette, visit http://questgarden.com/q/walsh_transport

Research Worksite. Students conduct their Internet research.

The Map Worksite. Mr. Walsh asks the groups to consider how life was different at the various time points during their community's development. Mr. Walsh provides the students with maps that allow them to review the number of homes on four streets in the town. The students compare the current number of homes on these streets with architectural maps of the town from the past. The students draw conclusions about how their community has changed and, using this knowledge, consider how their town in the future may change. Students create an initial map of their future community.

Literacy Worksite. The students review stories about the town's history. Mr. Walsh discovered that the town had a drive-in movie theater and that a forest was demolished to build the local mall and movie theater. Each group reviews more primary source documents that detail changes in the community. Mr. Walsh invites a friend from the town's historical society to share stories about the town and to answer questions. After their research and the interview, each group discusses how the community may change in the future. They add their changes to their future community map.

The Census Bureau Project Worksite. The students explore changes in the population of the town over time. Using a variety of tools and resources, the students graph changes and use historical data to consider how transportation will change to support changes in the size and needs of the community.

The Design Worksite. The students design transportation to support the changes and needs in their community. Using 3D representations, the students create a model of the transportation system for their future community.

A podcast is a digital medium that consists of an episodic series of audio, digital radio, pdf, or ePub files subscribed to and downloaded through web syndication or streamed online to a computer or mobile device.

Phase III: Concluding the WebQuest Project. The groups create podcasts to share their transportation designs. Once completed, Mr. Walsh invites members from the local Historical Society, families, and the other third grade classes to view the podcasts. After the presentations, each group works together to reflect on their initial question, "How has our community changed?" The groups then reflect on their transportation designs for the future and their roles in the process, individually and as a team.

Moving Beyond the Classroom

Being an effective educator means attending not only to children's learning within the classroom but also to one's own learning. Teachers who are professionals are involved in a constant cycle of improvement as they reflect on their practices and identify areas for further learning.

Professionalism

The first years of school are foundational to young children's academic and social success. Children enter pre-kindergarten as novice learners and complete third grade as readers and writers, individuals capable of engaging in complex problem solving, and who have a command of a range of skills to help them function effectively in a classroom and beyond. As these guidelines illustrate, teaching children in the primary grades is a complex undertaking, requiring educational professionals who can apply their knowledge of subject matter, children's learning and development, teaching strategies, and assessment to ensure that all children in their care learn. At the same time, teachers have to balance the demands of multiple audiences that include administrators, policymakers, families, and communities while also adjusting curriculum and pedagogy to meet the needs of an increasingly diverse student population.

Professional educators use their experience and expertise to meet these demands, and they approach their work ethically, acting in the best interests of the children and families whom they serve. Teachers know that their actions have the potential to either improve or detract from outcomes for particular children (Fennimore, 2014). As a consequence, teachers must be consistently self-reflective, thinking about all of the possibilities that may have an impact on the learning of a child or group of children. Additionally, they often have to choose between more than one possible courses of action. Consider, for example, a newly arrived immigrant child who speaks little English and is placed in a first grade classroom with no support. A caring teacher learns as much as he or she can about the child and his family and considers how to adjust learning tasks and use the resources of other children in the classroom to help the child navigate the curriculum, while also taking into consideration how best to advocate for appropriate resources to help support the child. Teachers have to be advocates for their students and ensure that every child is treated fairly and has the same opportunities to learn, regardless of background or circumstances.

Professional Learning

Given the complexities of teaching children in the primary grades, ongoing teacher learning is essential. All too often, however, teachers are not asked about their professional needs and are expected to attend trainings that have little connection to the contexts in which they work. If teachers in the primary grades are to be effective, then they need to be advocates for their own professional needs. Depending on the leadership of the school, being able to follow through on individualized professional learning may not always be possible for all teachers. There are, however, many ways that teachers can work together to learn and improve in meaningful ways. Some of these include:

- Initiating a book club in which instructional texts are read by a group of teachers and then a discussion is held about how to apply the ideas in daily lessons.
- Using common planning time to focus on a key area or issue. A group of first grade teachers might work on how to use iPad apps for literacy instruction. They might first identify suitable apps and then have each try them out and report back. If there is no common planning time, teachers might meet during a lunch time once every few weeks.
- Doing a lesson study as a group. This involves identifying a concept to be taught, developing a lesson, and then having one group member teach that lesson and videotape his or her teaching. As a group, teachers then meet to discuss the lesson and how it could be improved.
- Observing other teachers known to be experts in subject matter or pedagogy.

- Working with other teachers outside of the local community by joining a professional organization, such as the New Jersey Association for the Education of Young Children, New Jersey Reading Association, or the Association for Supervision and Curriculum Development. These organizations provide resources and offer conferences, professional meetings, and networking opportunities.

Summary

Being a professional means being an advocate for children and families to ensure that every child receives the resources and supports that he or she needs to learn. Being a professional also means challenging the norms of professional learning in one's school by engaging with colleagues to learn and improve. By focusing on meaningful problems relevant to their everyday work together, primary teachers can stand up for developmentally appropriate practices in a time of increasing standardization and accountability.

Improving Teaching Quality

Continuous Improvement Cycle

1. Maintain a forum or culture of commitment to improvement
2. Evaluate and assess for areas in need of improvement (use objective data)
3. Develop and implement improvements or interventions
4. Evaluate and report on improvements
5. Revise as indicated and continue through the process again

A commitment to a continuous improvement cycle will yield high-quality teaching and learning environments. First, as outlined above, a forum and culture of a commitment to improvement is necessary. The continuous improvement cycle begins with this commitment, and success is deeply rooted in the acceptance of its process. Without this commitment, the process can become less about improvement and more about regulation and punitive feedback. When the process is used well, however, teachers and administrators work collectively to determine areas in need of improvement and develop the necessary interventions to achieve that improvement.

There are several clear structures by which to examine teaching quality in the New Jersey classroom. The first includes the teacher evaluation system and student growth objectives. The second includes classroom observations that use standardized tools to provide insight into quality, which is examined in a variety of ways, depending on the instrument.

Teacher Evaluation

Teacher evaluation has been a component of the field for some time now in various forms. With the introduction of state-approved instruments, there is now a shared definition of quality. Teacher evaluation also provides the opportunity to engage evaluators in consistent training that increases the reliability of teacher evaluation. The goal of teacher evaluation is twofold: to examine and report on the teaching quality afforded to the students of New Jersey and to provide support to teachers to improve their practice and improve student outcomes. The New Jersey Department of Education has put into place several supports for teachers to understand and implement the teacher evaluation system. AchieveNJ is the educator evaluation and support system in New Jersey. The website provides a wealth of updated information about teacher evaluation and student growth objectives (http://www.nj.gov/education/AchieveNJ/).

Classroom observations are appropriate for identifying key areas of development for teachers of all grade levels. Although raters are trained, observers cannot be experts in all of the grade levels and content areas that they observe. Therefore, teachers are encouraged to take an active role in the evaluation of their practice. To this end, teachers need to have a deep understanding of the evaluation system, prepare instruction that meets the high-quality benchmarks, and highlight the evidence, specific to the grade level, that supports the attainment of certain criteria on the evaluation system.

A model for developing grade-level-specific evidence related to the teacher evaluation system can be found in the Teacher Evaluation Support Document: PreK & K (http://www.state.nj.us/education/ece/eval/Evidence.pdf), developed by the Workgroup on Teacher Evaluation Evidence. The document provides a description of what each item of the Danielson Framework may look like in the early years. In this regard, the question for primary teachers to consider is: "What does evidence for a particular item look like, given best practices at my grade level and my district's curriculum?" This question is best addressed through PLCs in which teachers and administrators address this important question jointly over time, thereby developing their own "evidence document."

It is important to note that the evidence document does not alter the teacher evaluation system selected by the district. Rather, it is a companion (not a replacement) for observers to use to score items at each particular grade level. For example, for Component 2c in the Danielson Framework, "Managing classroom procedures," the document would provide a description, or "evidence," of what managing classroom procedures would look like in a first, second, or third grade classroom.

Student Growth Objectives

Focusing SGOs on the learning of multiplication facts or being able to skip count would indicate only one small aspect of the math program that primary teachers present throughout the year. An SGO that focuses on children's mathematical practices, such as "make sense of problems and persevere in solving them" or "model with mathematics," covers a more broad definition of what the students will accomplish in the year.

Teachers set Student Growth Objectives (SGOs) for their students at the start of the year, and are assessed on whether those objectives are met at the end of the year. This measure of student growth accounts for a percentage of teacher evaluation performance ratings. AchieveNJ defines SGOs as academic goals for groups of students that each teacher sets with his or her principal or supervisor at the start of the year. These academic goals should be aligned to standards and measured using high-quality assessments of various types, including locally developed tests, performance assessments, and portfolios.

SGOs are embedded in what teachers typically do. They are a reflection of their typical teaching, rather than a burden, and are intended to exemplify the true scope of what teachers do in the classroom. AchieveNJ has provided a quality evaluation rubric for the development of SGOs. This rubric is included below and is valuable for evaluating SGOs for effectiveness before implementation. Teachers can develop the SGOs collectively with their administrator, with the rubric present, to evaluate the quality of the SGO.

AchieveNJ: Student Growth Objectives: Quality Rating Rubric

Excellent	Good	Fair	Inadequate
NUMBER OF STUDENTS/INTERVAL OF INSTRUCTION			
Number of students in *combined* SGOs **represents all or a large majority** of the teacher's students.[a]	Number of students in *combined* SGOs represents **at least half** of the teacher's students.	Number of students in *combined* SGOs represents **at least a quarter** of the teacher's students.	Number of students in combined SGOs represents **less than a quarter** of the teacher's students.
Includes start and stop dates that include a **significant proportion**[b] of the school year/course length.	Includes start and stop dates that include **at least half of** the school year/course length.	Includes start and stop dates that include **some of** the school year/course length.	Includes start and stop dates that include **little of** the school year/course length.
RATIONALE FOR STUDENT GROWTH OBJECTIVE/STANDARDS CHOSEN			
Names the standards group addressed by the SGO and references content **at the most specific level** of applicable standards.	Names the standards group addressed by the SGO and **references content at a general level of applicable standards.**	Names the standards group **addressed by the SGO.**	**Does not** name standards addressed by the SGO.
Includes a **significant proportion** of standards for which the teacher is responsible during the instructional period[a]	Includes **at least half of** the standards for which the teacher is responsible during the instructional period.	Includes **some of the standards** for which the teacher is responsible during the instructional period.	Includes **few of** the standards for which the teacher is responsible during the instructional period.
Articulates how the **majority of selected standards** are critical to enduring understanding of the subject area, success in future classes, and readiness in college, career, and life.	Articulates how **some selected standards** are critical to enduring understanding of the subject area, success in future classes, and readiness in college, career, and life.	Articulates how **some selected standards** lead to future success.	**Does not justify how the standards chosen** lead to future success or does so poorly.
STARTING POINTS			
Multiple, **high-quality** measures are used to thoughtfully determine students' starting points.	**Multiple measures of varying quality** are used to thoughtfully determine students' starting points.	**Multiple measures of varying quality** are used to determine students' starting points.	**A single measure** is used to determine students' starting points.
Pre-assessment, if used, provides a **high-quality measure of skills**, is **administered reliably**, is **vertically aligned** with the post-assessment, and is **used in conjunction** with other measures to determine starting points.	Pre-assessment, if used, provides a **quality measure of skills**, is **administered reliably**, is **mostly vertically aligned** with the post-assessment, and is **used in conjunction** with other measures to determine starting points.	Pre-assessment, if used, is based on **skill** and content, is **administered reliably**, is **somewhat vertically aligned** with the post-assessment, and is **used in conjunction** with other measures to determine starting points.	Pre-assessment, if used, is heavily **content-based**, is **not administered reliably**, is **not vertically aligned** with the post-assessment, and **is used as the sole measure** of student starting points.

This two-page rubric is a teaching tool that may be used by teachers and administrators to work toward producing high-quality SGOs. This rubric describes activities and components of SGOs that align with guidance documents and presentations previously published by the Department. The State requirements for SGOs can be found in regulations at NJAC 6A:10-4.2(e). **Any score generated by the use of this rubric cannot be used as part of a teacher's required evaluation rating.**

Note: a. The mSGP rating of teachers in tested subjects and grades includes a significant number of standards and students. Therefore, SGOs for these teachers may address a more targeted student group, content area, or set of skills. SGOs may be designed to reinforce standards required for success on New Jersey state tests or address areas on which the teacher would like to increase instructional focus. In addition, in some cases, including those of teachers with multiple discrete courses, or several hundred students, educators should strive to set SGOs for the courses and students that best reflect their work even if they cannot incorporate a majority of the classes and students for which they are responsible. b. Significant: Somewhere between 51% and 100%, which deliberately leaves room for districts to make choices appropriate for their local contexts. c. Items: Performance-based or portfolio tasks or questions on an assessment that measure learning. d. Critical standards: Those that lead to enduring understanding and/or future success in school/college/career/life. e. Key decisions: Those that surround, e.g., assessment development, baseline measures, scoring plan parameters. f. In cases of teachers who teach the only course of a particular type that is offered, this component can be used to assess general collaboration within a department or team.

AchieveNJ: Student Growth Objectives: Quality Rating Rubric

Excellent	Good	Fair	Inadequate
ASSESSMENTS			
Aligns **all items**[c] to the selected standards that were taught during the SGO period.	Aligns **most items** to the selected standards that were taught during the SGO period.	Aligns **some items** to the selected standards that were taught during the SGO period.	Aligns **few or no items** to the selected standards.
All selected standards have at least one assessment item. **All** critical standardsd have multiple items.	**Most** selected standards have at least one assessment item. **Most** critical standards have multiple items.	**Some** selected standards have at least one assessment item. **Some** critical standards have multiple items.	**Few or no** selected standards have an assessment item. Critical standards **are not identified or do not** have multiple items.
Range of rigor in assessment **accurately** reflects rigor of instruction, content, and skills of course.	Range of rigor in assessment **mostly** reflects rigor of instruction, content, and skills of course.	Range of rigor in assessment **somewhat** reflects rigor of instruction, content, and skills of course.	Range of rigor in assessment does not reflect rigor of instruction, content, and skills of course.
Highly accessible to all students regardless of background knowledge, cultural differences, personal characteristics, and special needs.	**Mostly accessible** to all students regardless of background knowledge, cultural differences, personal characteristics, and special needs.	**Somewhat accessible** to all students regardless of background knowledge, cultural differences, personal characteristics, and special needs.	**Clearly disadvantages** certain students because of their background knowledge, cultural differences, personal characteristics, and special needs.
Assessment format, construction and item design is **consistently** high quality. Includes rubrics, scoring guides, and/or answer keys for **all** items, **all of which** are accurate, clear, and thorough.	Assessment format, construction and item design is **mostly** high quality. Includes rubrics, scoring guides, and/or answer keys for **all** items, **most of which** are accurate, clear, and thorough.	Assessment format, construction and item design is of **moderate** quality. Includes rubrics, scoring guides, and/or answer keys for **some** items, **most of which** are accurate, clear, and thorough.	Assessment format, construction and item design is of **low** quality. Includes rubrics, scoring guides, and/or answer keys for **some** items, **few or none of which** are accurate, clear, and thorough.
STUDENT GROWTH OBJECTIVES/SCORING PLAN			
Student starting points are used **thoughtfully to justify** student learning goals.	Student starting points are used **to set** student learning goals.	Student starting points **are present**, but their relationship to student learning goals is not clear.	Student starting points **are not considered** when setting student learning goals.
Student learning goals are differentiated to be ambitious and achievable for **all or nearly all students**.	Student learning goals are differentiated to be ambitious and achievable for a **majority of students**.	Student learning goals are differentiated to be ambitious and achievable for **some students**.	Student learning goals **are not differentiated or are set too low**.
Scoring range for "full attainment" **accurately reflects** a teacher's considerable impact on student learning. Scoring range is **justified by analysis** of student starting points and the rigor of the assessment.	Scoring range for "full attainment" **accurately reflects** a teacher's considerable impact on student learning. Scoring range is **implied by** presented student starting points and the rigor of the assessment.	Scoring range for "full attainment" **reflects less than** a teacher's considerable impact on student learning. Scoring **range may not be reflected** by student starting points and the rigor of the assessment.	Scoring range for "full attainment" **is too low or too high to accurately represent** a teacher's considerable impact on student learning.
COLLABORATION/COMPARABILITY			
Most, or all, key decisionse were made collaboratively between teachers. A common assessment is in use.[f]	**Many** key decisions were made collaboratively between teachers. A common assessment is in use.	**Some** key decisions were made collaboratively between teachers. A common assessment **is not** in use.	**Few or no** key decisions are made collaboratively by teachers. A common assessment **is not** in use.

Classroom Observation Measures

Another source of data for improving instruction in the primary classroom is published classroom observation tools. These tools work best when used with the intention of improvement rather than evaluation. Specifically, these observation tools can be useful to improve instruction by looking at individual classroom data and also can be aggregated to provide valuable information about school or district classroom quality. These data can easily be used to inform professional learning topics, curriculum decisions, and other systemic or policy decisions.

Listed below are four instruments to consider. These instruments vary in costs and training requirements for use. Each defines quality in a slightly different way. They all require trained and reliable administrators, but several can be used more informally for self-evaluation and reflection.

The Early Language and Literacy Classroom Observation (ELLCO; Smith, Brady, & Clark-Chiarelli, 2008) has 18 indicators, addressed on a 5-point scale, that assess the quality of the classroom environment and teachers' practices. Using ELLCO, educators gather the classroom data needed for informing professional development and program improvement that lead to better literacy outcomes for young children. The instrument provides information about the classroom in the following categories: classroom structure, curriculum, language environment, books and reading, and print and writing. Teachers will find this classroom observation tool useful for a close focus on language and literacy in five critical areas: comprehension, vocabulary, fluency, phonics, and phonemic awareness.

Assessment of Practices in Early Elementary Classrooms (APEEC; Maxwell, McWilliam, Hemmeter, Ault, & Schuster, 2001). This tool assesses the quality of an elementary school environment, with a focus on developmentally appropriate practices in kindergarten to third grade classrooms. APEEC contains 16 items with two or more descriptors, which are rated on a 7-point scale. The subscales include the physical environment, instructional context, and social context. This instrument can provide teachers with an overall picture of the quality of their classrooms, including how well a teacher is integrating domains (supported by project work) and will highlight such areas as children's role in decision making.

Classroom Assessment Scoring System (CLASS; Pianta, LaParo, & Hamre, 2005) provides information on ten dimensions of quality of teacher interactions and other features of instruction. CLASS contains multiple dimensions of teaching that are linked to student achievement and development. Interactions are measured through ten dimensions, which are divided into three larger domains. The Emotional Support domain comprises Positive Climate, Negative Climate, Teacher Sensitivity, and Regard for Student Perspectives; the Classroom Organization domain includes Productivity, Behavior Management, and Instructional Learning Formats; and Instructional Support comprises Concept Development, Quality of Feedback, and Language Modeling.

EduSnap Classroom Observation (Ritchie, Weiser, Mason, & Holland, 2015). Every aspect of the classroom environment influences how children learn and how teachers teach. Only when various aspects of the classroom environment are observed simultaneously can one see the true complexities of classrooms and how they affect teaching and learning. The EduSnap Classroom Observation quantifies students' experiences of their school day. Using 27 items, EduSnap provides information about the time that students spend in activity settings (e.g., whole group, free choice, transitions), content areas (e.g., reading, science, math), student learning approaches (e.g., collaboration, metacognition), and teaching approaches (e.g., didactic, scaffolds). The data provide an understanding of curriculum balance, curriculum integration, and efforts aimed at meeting state standards. EduSnap provides a means for educators to move away from using data as purely evaluative toward using data to inquire into classroom, grade-level, school, and district practice.

Appendix A: Developmental Milestones

During the primary grades, children typically progress from one developmental milestone to the next. Each child is unique, however, and develops and gains skills at his or her own pace. While some children may have advanced language skills, they may lag in other areas, such as physical growth and development or sensory and motor development.

Understanding student development and common characteristics at a specific age is crucial to teaching and student success in the classroom. Knowing how children develop provides a foundational understanding when teachers develop lessons and activities to meet students where they are and to challenge them. Having such a foundation also helps with the selection of appropriate literature for the classroom library and of engaging materials for and instruction in academic content areas, such as mathematics and science. Most importantly, understanding child development allows us to recognize and document a potential problem.

Developmental milestones are typically grouped into five major areas: physical growth, cognitive development, social and emotional development, language development, and sensory and motor development. The developmental milestones listed in each section below are intended to be a guide to children at that specific age. It is essential to remember that human development is extremely complex and that every child develops differently and has different needs. It is the teacher's role to meet the child where he or she is developmentally and to move him or her along a trajectory of development. When questions arise about a child's development, however, teachers are advised to contact the appropriate experts for advice and guidance.

Childhood Milestones for First Graders (Age 6)

The six-year-old is known for tremendous growth and change. Six-year-olds lose teeth, have emotional highs and lows, and experience an increase in language development, which leads to their curious nature. This curiosity helps them move from a fantasy world to embracing a whole new world of scientific discovery. They are excited with who they are as individuals and with what the world has to offer to them.

Social and Emotional Development

- Wants parental attention, while beginning to shift to peers
- May be insecure with increased independence
- Plays in more elaborate manner
- Usually likes to play with friends of the same gender
- Understands feelings of others, although most are still focused on themselves
- Finds failure can be very hard
- Develops a sense of humor
- Begins to think about how they look in the eyes of others and are self-conscious
- Can be moody, friendly, and enthusiastic at times and then rebellious and irritable at other times
- Wants to make friends but can be bossy and not understand why friendship is rebuffed
- Can be very competitive
- Is fascinated by rules
- Is sometimes a "poor sport" or dishonest; may invent rules
- Is sensitive to criticism; thrives on encouragement
- Has a strong desire to perform well, do things right
- Generally enjoys caring for and playing with younger children
- Tends to prefer playmates of the same sex
- Can be helpful with small chores
- Has a strong need for love and attention from parents and teachers
- Determines what is "good" and "bad" based on parents' and teachers' opinions; begins to develop a moral sense (such as understanding "honesty")

Physical Growth and Development

- Is still having growth spurts
- May be clumsy
- Often is full of energy; likes to be active
- Enjoys running, jumping, skipping, tumbling, throwing, catching, dancing to music, and other forms of physical play
- Can dress him or herself but may still need help with buttons or laces
- Tires easily
- Is in perpetual motion, e.g., squirming while sitting, gesturing while talking, running, tumbling, throwing
- Gains control of fine motor activities
- Develops a good sense of balance; may stand on one foot and walk on a balance beam
- Can catch balls, tie shoelaces, and manage buttons and zippers
- Is sloppy and in a hurry

- May be noisy or loud in the classroom
- Develops the ability to copy designs and shapes
- Learns to distinguish left from right
- Engages in oral activities (teething), chews pencils, fingernails, or hair

Cognitive Development

- Can express him or herself well
- Begins to understand cause-and-effect relationships
- Starts to grasp the concept of time—past, present, and future
- Becomes more engaged in the process rather than the product
- Likes to do "work" but may take on projects that are too big
- Expression and artistic enjoyment increases
- Can follow a series of three commands in a row
- Views things as right or wrong, wonderful or terrible, with very little middle ground
- Increases problem-solving ability
- Has a short attention span but is long enough to enjoy more involved stories
- Learns best through discovery and active involvement with people and materials
- Interested in real-life tasks and activities; wants to make "real" jewelry, take "real" photographs, and create "real" collections
- Begins to understand time and days of the week
- Begins to understand that past is tied closely to the present
- Uses language and words to represent things not visible

Language Development

- Experiences language gains in depth, description, and expression
- Rapidly develops vocabulary, with approximately 3,000 new words
- Uses correct grammar most of the time
- Can spell his or her first name and write some letters and numbers
- Reads some simple words
- Enjoys language play—songs, riddles, rhymes, and word games
- Asks a lot of questions
- Likes to write
- Enjoys sharing thoughts and ideas
- May reverse printed letters (b/d)
- ometimes carries on "collective monologues"—two children playing together and talking but carrying on separate monologues

Childhood Milestones for Second Graders (Age 7)

Seven-year-old children tend to look inward. They are discovering who they are as people and learning about their place in the world. They can appear moody, sulky, or even depressed while at home or at school. The seven-year-old perfectionist loves the eraser and worries about how others, particularly his or her peers, perceive him or her. These children are fascinated by the world around them and are industrious. As budding engineers, seven-year-olds like to take things apart to discover how they work.

Social-Emotional Development

- Becomes more aware of and sensitive to the feelings of others
- Increases focusing skills
- Avoids taking risks and making mistakes
- Craves security and structure
- Is afraid of being in trouble with his or her parents or other adults
- Is generally worried about the opinions of others
- Develops friendships, typically with other children of the same gender
- Sometimes plays in larger groups
- May like working or playing alone or with one friend
- Needs reinforcement
- Is touchy; may say or think, "Nobody likes me"
- Loves to talk, even exaggerate
- Works hard to please teachers, parents, and other adults
- Is sensitive to adult evaluation
- Is more independent but still relies heavily on the teacher
- Places more of an emphasis on fairness
- Likes structure; dislikes changes in school routines
- Compares self to others; can be self-critical
- Recognizes that establishing friendships is very important, although often lacks the skills necessary to do so
- Views things as right or wrong, wonderful or terrible, with very little middle ground
- Seeks a sense of security in groups, organized play, and clubs

Physical Development

- Experiences increasing coordination
- Prefers drawing small letters and figures
- Has growing pains
- Uses scissors with ease
- May undergo changes in self-concept due to great differences in size and abilities of peers
- Is developing large muscles in arms and legs, more so than small muscles
- Learns to use small/fine muscles
- May appear gawky and awkward due to long arms and legs
- May not want to rest when tired
- Is sometimes tense
- Experiences many physical hurts, real and imagined

Cognitive Development

- Has a solid sense of time
- Develops a preference for learning style
- Strives for perfection in his or her work
- Enjoys hands-on activities and inquiry
- Considers issues and problems using only one factor at a time
- Becomes a reflective thinker
- Is more serious and less impulsive
- Realizes that there are many things that need to be learned, sometimes leading to lower confidence
- Begins to reason logically and organize thoughts coherently
- Does most of his or her thinking about actual physical objects; has difficulty handling abstract reasoning
- Often makes decisions based on the influence of others instead of by reasoning
- Wants to assume more responsibility
- Likes to collect, organize, and sort things
- Has a longer attention span
- Learns to evaluate what he or she does
- Needs closure; wants to complete assignments
- Likes to work slowly
- Wants work to be perfect; erases constantly
- Needs manipulatives to learn effectively
- Is curious about how things work
- Is egocentric but begins to understand others' perspectives

Language Development

- Has a growing interest in words and vocabulary development
- Shows improved listening skills
- Becomes a better reader
- Enjoy conversations with adults
- May struggle with spelling
- Is interested in word meanings
- Develops more skill in reading
- May reverse printed letters (b/d)
- Expands speaking and listening vocabulary at a very rapid pace

Childhood Milestones for Second Graders (Age 8)

Third graders are, on the whole, a very excited, energized group of young people. They enjoy talking about their ideas and interests. They can hold extensive conversations as they climb the monkey bars or take flight on the swings. As they work or play, third graders tend to be found in the same gender groups. As budding young thinkers, this group likes to wonder and experiment with, "What will happen if . . . ," or, "How does the . . ." With growth in verbal and written language development, eight-year-olds can predict why something may happen and then support their ideas with evidence.

Social-Emotional Development

- Has a sense of his or her place in the world
- Is fairly independent and outgoing
- Develops a strong sense of right and wrong
- Is increasingly capable of cooperation, organization, and following the rules
- Enjoys friendships with a group of children of the same gender
- Demonstrates compassion and empathy for others
- Adjusts well to change
- Is willing to take risks
- May have difficulty adhering to boundaries
- Begins to define self, based on certain attributes or achievements, such as "I wear glasses"
- May become self-conscious based on how he or she believes that he or she looks in the eyes of others
- Senses that establishing friendships is very important, although he or she may lack skills
- Begins to develop a sense of humor and tell jokes
- Is less dependent on adults and more dependent on peers
- Begins to question authority and test limits
- Often overestimates abilities; "bites off more than he or she can chew"
- Interested in rules and rituals
- May have a best friend
- Has a strong desire to perform well, do things right
- Finds criticism and failure difficult to handle
- Views things as right or wrong, wonderful or terrible, with little middle ground
- Generally enjoys caring for and playing with younger children

Physical Development

- Moves with more grace and control
- Experiences increases in strength, stamina, and reaction time
- Is enthusiastic about playing on teams
- Is full of energy
- Hurries
- Experiences improvement in eye-hand coordination and fine motor skills
- Enjoys rough-and-tumble games as well as team sports
- May be physically daring
- Exhibits increased speed and smoothness in fine motor skills

- May write with tiny letters; creates artwork with more detail
- Is developing large muscles in arms and legs, more so than small muscles.
- Enjoys testing muscle strength and skills
- Has a good sense of balance
- May notice large differences in the sizes and abilities of other children

Cognitive Development

- Is continuing to develop attention span
- Cares about both the process and the product
- Seeks approval of peers and adults
- Has a growing interest in how things work
- Prefers groups or group activities
- Masters basic skills
- Exhibits increases in his or her confidence and competence
- Is able to reason logically about actual objects and organize thoughts coherently but cannot handle abstract reasoning very well unless it relates to real experiences
- Learns best through active, concrete experiences
- Enjoys collecting, organizing, and classifying objects and information
- Engages in imaginative play in the form of skits, plays, and puppet shows
- Likes groups and group activities
- Enjoys planning and building
- Increases problem-solving ability
- Is interested in magic and tricks
- Learns to plan ahead and evaluate what he or she does
- May say, "That's dumb," or, "I don't want to do that," when something is suggested
- Begins to see and understand the perspectives of others
- Listens well but is so full of ideas that he or she cannot always recall what has been said
- Like to explain ideas—may exaggerate
- Gets engrossed in activity at hand; loves to socialize at the same time
- Is industrious, often works quickly

Language Development

- Is rapidly increasing speaking and listening vocabularies; is talkative
- Has a tendency to exaggerate
- Enjoys sharing ideas, interests, and opinions
- Is fluent in his or her speaking
- Uses complex sentences with few grammatical errors
- Uses sophisticated language to describe ideas and experiences
- Learns to see books as sources of information, and reading may become a major interest
- May reverse printed letters (b/d) (until mid-third grade)

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