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Young Math Masterminds

Support for Parent and Family Engagement in Student Learning

Mathematics is Everywhere

Kindergarten to Third Grade

Mathematics is more than just numbers. Math is Everywhere!

Early math skills develop anywhere that young children and adults have opportunities to play and learn together. If you fold laundry, read children's books, or follow recipes, math is part of your daily family life, probably in more ways than you think.

For example, children can develop early math skills at home while doing chores, cooking, playing outside, during a trip to the grocery store, at the bus stop, and elsewhere.

This document includes some ways that parents and families can bring math into their child's daily life outside of school and contains examples and terms that parents and families can use to communicate with teachers and better understand how their child learns math.

Parents can provide opportunities to show children that mathematics is all around them and a big part of their lives. The ideas in this document can help and inspire math thinking and doing beyond the classroom!

Sometimes talking about math can be challenging. Some words have one meaning in math and they have other meanings too.

Teacher: "Do you know what volume means?"

Student: "Yes."

Teacher: "Can you explain volume to me?"

Student: "Yes, it is a button on the remote control."

This document contains some important math words that help students, families, and teachers speak, listen, and more clearly understand how children learn and use math.

Parents and families can support their child and become effectively engaged in the learning process especially when teachers help them understand **1) what** their child is learning, **2) why** they are learning it, and **3) how** they can help their child apply the new knowledge and skills to life outside of the classroom.

When children learn a new concept, they **4) show** ways that they use their new knowledge and skills. If a teacher provides parents with something called "look-fors," the parents can observe and monitor the learning behaviors their child shows. As a result, when parents and teachers communicate about the child's learning, they will both **5) know** how well he or she is learning. *(For more on this idea see the document titled: "The Family-5 in this packet!)*

Here are some ways to encourage children as they think and experience math.

Learning Mathematics in Kindergarten

Did you know that learning mathematics is vital for children's early school years and for later success in mathematics? Well did you also know that early learning mathematics success supports better overall academic outcomes in areas such as literacy, science, and technology? It's true! Also, research tells us that young children show a remarkable ability to solve mathematical problems and to reason and explain their mathematical activities. ALL children can learn math! Here are some ways to support this early math learning at home.

Major Areas of Focus in Kindergarten Math

- Count to 100 by ones and by tens.
- Know number names and the count sequence.
- Count to tell the number of objects and comparing the quantities of two groups of objects.
- Compare numbers between 1-10 to identify which is greater or less than the other.
- Understand addition as putting together and adding to, and subtraction as taking apart and taking from.
- Compose and decompose numbers from 11 to 19 into tens and ones (such as 18 = 10 + 8).
- Understand that 2-digit numbers are made up of tens and ones.
- Adding and subtracting within 5.
- Breaking up numbers less than or equal to 10 in more than one way for example, 9=6+3, 9=5+4).
- Solving addition and subtraction word problems within 10 using objects or drawings.

Problem Solving in Kindergarten

Rich, interesting problems are powerful tools for student learning. Try some open-ended everyday math problems with your kindergartener. There can be multiple answers or different strategies for solving. Make time for your child to share his math thinking with you. Here are some examples of problems that will spark your child's curiosity and lead them to investigate new questions.

- Find 2 toys or other objects. What is the same or different about them? Add 5 more toys or objects. How many ways can you sort them into groups? Can someone in your family figure out how you sorted them?
- Marta said a number. Her brother said a number that is 2 more. What might the numbers be?

Measurement in Kindergarten

Young children need many experiences measuring with nonstandard measurement units (handspans, their own foot, a paperclip) to describe the length of objects. Ask children questions about comparing and estimating lengths of things in their environment:

- What is longer than two of your foot lengths but shorter than three of your foot lengths?
- Encourage your child to look at the length of two-foot lengths and then make predictions about what might be a little bit longer. Then, try it out. Encourage them to make a list of what they discover.

Another way to encourage students to estimate size is to send them on a **Scavenger Hunt**. First, give your child a spoon and send them on a scavenger hunt around the house (or a room) to find two items that are longer and four that are shorter than the spoon. Then hand your child a small ball and have them find two round things that are bigger. Is everything bigger/smaller? Listen to your child's math thinking and logic skills as they share their findings!

Learning Mathematics in First Grade

In First Grade, the teaching and learning focus is on four critical skill areas:

- Developing an understanding of addition, subtraction, and strategies for addition and subtraction within 20.
- Developing an understanding of place value, including grouping in tens and ones.
- Developing understanding of measuring lengths.
- Reasoning about attributes of geometric shapes.

Math Facts

Math facts are basic calculations that children can learn to help them do math more quickly. Children should *learn* their math facts rather than *memorize* them. Math facts are important because they form building blocks for higher-level math concepts. Skills such as adding and subtracting larger numbers, telling time, counting money, measurement, multiplication, and division are just a few of the concepts built with math facts.

- Parents can support their child's learning of math facts by encouraging them to say the whole calculation and answer aloud.
- Ask your child's teacher for examples of how to ask questions that encourage your child to think about different ways to get the answer.
- Practice regularly, but for short periods at a time, and focus on the positives!

Procedural Fluency

Procedural fluency is more than memorizing math facts or procedures like addition, subtraction, multiplication, or division. Procedural fluency is more than using one isolated skill for a given situation. It is about understanding *how* to do mathematical procedures and *when* they should be used.

In first grade, students strengthen their skills in performing procedures flexibly, accurately, efficiently, and appropriately. In addition to thinking through procedures, they can use appropriate tools for computing, recognizing patterns, and predictability. It is important that students learn with understanding, not just by completing a step-by-step procedure.

Learning math facts and procedures can be fun!

Learning math facts and various ways to use them does not have to be boring! However, it can be if the only technique is memorizing basic addition and subtraction facts. There are many strategies that can be used to learn, and eventually quickly recall, basic facts. The key is variety! Here are a few activities to do at home to help your child practice math facts.

- Use a pair of dice, a domino, or a deck of playing cards. Have your child choose a domino, a card, or roll the dice to identify two numbers. Add the two numbers to find the addition fact.
- Together with your child, choose some numbers. Ask your child to use small items like Legos, blocks, or stones and put them in groups of 10. (In math, the small items are often called "manipulatives.") Have your child move the items to match the numbers you chose together. Practice moving the items to add and subtract items from the group.
- Play this simple game: "I'm thinking of a number…" Think of a number from 1 to 100. Ask your child to guess the number. Give hints, like, "more or less, even or odd, etc." to help them guess your number. The idea is to learn the value of numbers and their order. As they work with larger numbers, increase the numbers they can guess.

Learning Mathematics in Second Grade

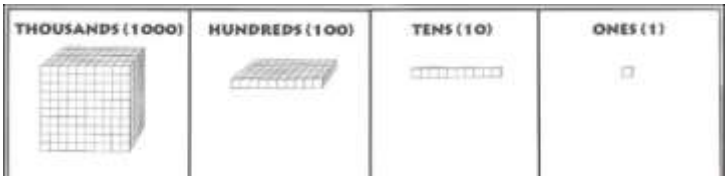
In second grade, children need a firm understanding of place value and then use that understanding to add and subtract numbers within 1000. The idea of regrouping and memorizing steps is not the focus. Children should understand that the digits of a three-digit number represent amounts of hundreds, tens, and ones. For example, 706 equals 7 hundreds, 0 tens, and 6 ones. Through place value understanding children take numbers apart and put them back together (i.e. 23 is made up of 20 and 3). Children are also expected to be able to read and write numbers to 1000 and compare three-digit numbers. To build place value understanding and number sense for your second grader, have him/her practice skills such as counting by 2s, 5s, and 10s, comparing large numbers up to 1000, and adding or subtracting 10 and 100 to and from numbers mentally.

What is place value?

A place value is the amount or value of each digit in a number. (The word digit means an individual number.) For example, the 5 in 53 represents 5 tens, or 50. However, the 5 in 506 represents 5 hundreds, or 500. It is important students understand that even though a digit can be the same - like our example with the number 5 - its value depends on where it is "placed" in the number.

What is a place value chart?

Students are often taught place value with a chart. A place value chart is a simple picture guide to help students understand a digit value in a number. The size and complexity of the place value chart will vary as a student progresses up grade levels.

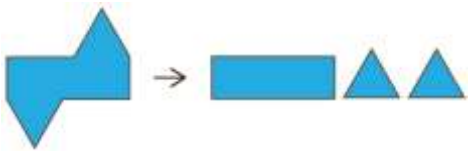


Other important Second Grade Skills:

In Second Grade, children measure and estimate lengths using tools such as rulers, meter sticks, and measuring tapes. Children should be able to estimate the length of an object using inches, feet, centimeters, and meters. Have your child estimate how much longer one object is than another and measure lengths using an appropriate tool. Ask your children to solve everyday word problems involving length.

Children in Second Grade will also work with time and money. Ask your child to tell the time using both an analog or circular "face" clocks and digital clocks. Have your child create a schedule of events for a weekend day using various times throughout the day.

When you empty the change from your pocket, have your child count it. How many quarters? How many dimes? How much is it worth altogether? Ask questions such as, "I have 3 dimes, one nickel and 4 pennies, how many cents do I have? Is there more than a dollar in coins? Can I buy that package of gum for $0.75? If not, how much more money do I need?"



Second graders probably already know the basic shapes, but children in second grade should be able to describe and analyze shapes by examining their sides and angles. Also, children investigate, describe, and reason about breaking apart and putting together shapes to make other shapes. Have your child describe shapes in their environment, explaining how they know the correct shape. For example, "This table top is a rectangle. Its opposite sides are equal in length, it has four right angles, and it has four straight sides."

Learning Mathematics in Third Grade

Play games with your child that have some mathematical calculation and strategy involved. Keep the focus on *how* the game is played and ask your child questions about his thinking behind the choices he makes. At this stage, social and emotional skills begin to blend with learning math. Help your child recognize his emotions as he sees the outcome of his choice and how he interacts with others who may progress quicker or make better choices.

Encourage your child to ask for help if he is confused about the rules or gets stuck thinking through the process. At this developmental stage, children begin to form attitudes about their math ability. Help your child keep math anxiety low and confidence high as his ability to "figure things out" improves.

A lot of mathematics in third grade is about the thinking and planning process using items that represent numbers. Creating questions that encourage your child to think and problem-solve is the best way to support and help your child enjoy learning mathematics.

Ask your child...

What is the best strategy for your next move?

How do the other players' decisions affect your plan?

Should you change your strategy? How?

Learning mathematics isn't always about one correct answer. In class, your child will first learn how to guess their answers, then they will learn to "estimate" and make an "hypothesis." Ask your child's teacher for ways to talk about estimating and creating a hypothesis when thinking about math outside of school.

Third grade math focuses on multiplication and division concepts. Children will multiply and divide within 100. Children will also solve word problems using addition, subtraction, multiplication, division, and problems involving measurement and time.

- Ask your child to weigh produce in the grocery store and calculate the price of the food.
- Ask your child to use a scale at home and estimate the weight of items. Ask him to calculate the difference in the weights. Help your child compare the weights and ask him or her to hypothesize why one is heavier than the other.
- Ask your child to gather items in groups (groups are called "sets") such as 10 or a dozen (12) to gain familiarity with the basics of multiplication. If your child has only part of a set, ask him to determine how many items he needs to make an entire set.
- Ask your child to mentally compute basic multiplication facts when you are walking, playing, or doing chores outside. Have him practice the ones he is having trouble remembering.
- Ask your child to compare two containers of different sizes. Then ask him to estimate which container holds more liquid. Show him how to check the estimate with a measuring cup.