1. Describe the practice proposed for recognition, and list its objectives. Detail how the practice is innovative and how it promotes high student achievement.

Kids Teaching Kids Aviation is a cross grade level, cross-curricular project involving second and seventh grade students. In this program, now in its seventh year, second grade "learners" spend an afternoon with seventh grade "teachers" who help them "soar" through a multi-modal unit on aviation. The objectives of this project are:

1. To establish a vehicle of communication and collaboration between older and younger students.
2. To underscore the value of learning from and with someone who is of a different age.
3. To develop a sense of audience and an understanding that one may need to alter his/her word choice to be fully understood.
4. To provide an introduction to the principles and history of flight.
5. To understand basic aviation science concepts.
6. To become familiar with manufacturing and mass production concepts.
7. To understand the basic elements of teaching and learning with elementary age students.

Project Plan:

This six-week unit is part of an exploratory rotation class for seventh graders. Approximately 300 seventh graders and 300 second graders participate in this program throughout the school year. During one cycle, a class of seventh graders learn basic aviation concepts and prepare five aviation activity centers for a class of second graders. The five centers include: assembling a wooden WWI Biplane, making a parachute while learning the science of parachuting, discovering which wing shapes work best while using a working wind tunnel, "flying" an airplane using a large screen Microsoft Flight Simulator, and, finally, using a computer animated software program, "*The Way Things Work*, to understand how and why machines are able to fly. Second grade teachers prepare their students through reading fiction and nonfiction books about flight and aviation. They also integrate the anticipated event into the appropriate and relevant curriculum.

During the last week of the cycle, the second graders visit the seventh grade class. These students are divided into five small groups and they rotate through the "hands-on" learning stations while seventh grade guides teach the concepts of aviation theory through interactive activities. The second graders collaborate with the seventh graders to learn about aviation, while the seventh graders explore manufacturing concepts from their technology education curriculum. The second graders leave with aviation information, a paper airfoil, a parachute, and a wooden biplane. Seventh graders leave with organizational skills, a public speaking/mentoring experience, and a new found personal pride.

This practice is innovative in that it promotes multi-age, multi-level collaboration and learning. Very often in our lock step curriculum, students are not exposed to nor do they have the opportunity to work with other groups of students who are of different ages. Lev Vygotsky, a noted educational theorist, describes the "zone of proximal development." He believed that what children are capable of doing with the assistance of

others might be a greater indication of the direction their learning might take than what they can do alone. The old and young have much to learn from each other. This project is a great place to start what should be a life long process.

This project promotes high student achievement because it fosters independent learning and collaboration between and among students of different ages. It encourages students to think, reflect, and engage in problem solving that involves the practical application of abstract scientific concepts. According to the Learning Pyramid developed by National Training Laboratories, the average retention rate of information learned through hands on activities is 75%. The average retention rate of information learned through teaching others is 90%. The activities in this project push all of the students to higher levels of achievement. Ultimately, this project also prepares the students for the demands and the realities of the modern world of work where the ability to collaborate and to solve problems is paramount to success.

2. List the specific *Core Curriculum Content Standards, including the Cross-Content Workplace Readiness Standards,* addressed by this practice and describe how the practice addresses those standard(s). Provide an example to substantiate your response.

Language Arts Literacy Standards Addressed By This Practice	3.1 All students will speak for a variety of real purposes and audiences.	Seventh graders teach aviation concepts to second graders. Second graders ask questions and clarify information.
	3.2 All students will listen actively in a variety of situations to information from a variety of sources.	Seventh graders listen to instructions and advice from teachers in preparing their lessons. Second graders listen at the various instructional stations to learn about aviation.
	3.5 All students will view, understand and use non-textual visual information.	Students view a short film about aviation and participate in a flight simulation. Students understand aviation concepts through hands-on manipulation of a parachute and plane parts.
Science Standards Addressed By This Practice	5.1 All students will learn to identify systems of interacting components and understand how their interactions combine to produce the overall behavior of the system.	Students examine and understand the working parts of a plane and a wind tunnel and learn how the parts work together to create the total machine.

	5. 2 All students will develop problem-solving, decision-making and inquiry skills, reflected by formulating usable questions and hypotheses, planning experiments, conducting systematic observations, interpreting and analyzing data, drawing conclusions, and communicating results.	Seventh grade students collaborate to plan and execute a lesson. They test out the scientific concepts that they are about to teach. Second graders work will their "teacher" to test out hypotheses about aviation and draw conclusions about newly learned concepts.
Cross-Content Workplace Readiness Standards Addressed By This Practice	1. All students will develop career planning and workplace readiness skills.	Through the study of aviation concepts and their application, students learn about careers in aviation.
	2. All students will use technology, information and other tools.	All students use the flight simulator to understand the concept of controlling and steering an airplane.
	3. All students will use critical thinking, decision-making and problem solving skills.	Teams of seventh and second graders solve the problem of learning aviation skills through collaboration and sharing of information.
	4. All students will demonstrate self-management skills.	Teams of seventh and second graders work together independently to complete all learning stations.

3. Describe the educational needs of students that this practice addresses. Document the assessment measures used to determine the extent to which the objectives of the practice have been met. Provide assessments and data to show how the practice met these needs.

All students learn best in an environment that is interactive and where they can take control of their learning. Learning increases when students collaborate with their peers or with someone other than the teacher. When younger students work closely with older students, the older students serve as role models and provide a link to the younger students' success and achievement. The younger students see a model to emulate and goals to work toward in the not-too-distant future. In fact, the majority of the current seventh graders were the second graders who participated in the early years of the project. Another important factor is that the middle school years can be a difficult time period for many students. These years are often characterized by insecurities and feelings of self-doubt. Linking middle school age students with younger partners enables the older students to feel responsible for the younger ones' successes. In the process of "teaching" the second graders, the older students gain insight into their own learning processes,

which, in turn, helps them become more confident and more successful. This project also addresses the higher order/critical thinking skills called for on all sections of the ESPA, GEPA, and HSPA.

Assessment Measures:

1. Seventh graders kept an on-going journal/notebook where they record their response to the lessons so that the teacher could monitor their understanding and development of concepts over time.
2. Seventh graders developed prototypes and products as models of the ones they shared with the second graders.
3. Seventh graders participated in class discussions that indicated their level of understanding of the concepts taught.
4. An on-going record of the number of student participant/partners was kept. The effectiveness of the project was assessed by how many pairs of student partners completed the activities.
5. Informal assessment of second graders was achieved through a language experience approach. As a follow up, the classes discussed and wrote about their experiences using aviation-related vocabulary words that were learned during the project.
6. Second graders completed the aviation worksheets and puzzles provided by the seventh graders as an additional measure of their understanding of the concepts and the total experience.

All student participants had the opportunity to experience success, to collaborate, to build confidence, to think critically, and to learn about aviation. These needs were met as indicated by the various assessments used. Seventh graders revealed through their journals and through their instruction with the second graders that they understood their tasks and the aviation concepts. Second graders revealed through their follow up discussions and their completion of the follow up activities that they understood their tasks and the aviation concepts.

4. Describe how you would replicate this practice in another school and/or district.

This project could be easily replicated in another school or district. The school or district would need to develop an aviation unit as part of a regular science or technology course. The teacher from the middle or high school would need to make contact and establish a relationship with the elementary teacher(s). Schedules and transportation between schools would also need to be coordinated. Materials would need to be purchased in advance. Special items such as the flight simulator and the wind tunnel would need to be budgeted for. But other related activities could be substituted.