

Aerospace Education Results

Aerospace Education Results (AER) is new Supplemental Education Services (SES) offered for students enrolled in fourth to eighth grades in Pulaski County school districts. The Arkansas Aviation Historical Society doing business as the Aerospace Education Center (AEC), where AER will offer SES in three-hour sessions on ten consecutive Saturdays in the fall, spring, and summer, submits this application.

AER engages students in interdisciplinary lessons with high interest for this age. AER's math and science lessons use aerospace themes and multiple modes of learning which follow Arkansas math and science standards. As part of stimulating students' interest in math and science—which should improve achievement in school—AER hopes to encourage aspirations and preparation for higher education.

The architecture, exhibits, and activities at the AEC add another dimension to the SES here, engaging students' wonder and motivation.

AER features small-group (maximum of ten students per teacher) along with one-on-one instruction and other group sizes. Students are able to appreciate their own progress by assembling personal portfolios of their projects.

Participating in hands-on, technology-based demonstrations, students learn real-world applications of basic knowledge essential to their advancement in school and life. Activities include such assignments as robot design and construction, rocket launches, model aircraft flights, and flight simulation.

National Board Certified teachers creatively design and effectively teach lessons aligned with Arkansas standards. Guest instructors include aviators, engineers, scientists, instructors, and students in the local aerospace industry and colleges. Support teachers as well as those with National Board Certification are state-certified. Others involved are student teachers, parents, and friends of the AEC.

An experienced external evaluator uses mixed methods for showing effects on student attitudes and aspirations as well as on benchmark results. Attendance, teacher observations, student products and gains in knowledge and skills, and both student and parent attitudes are measures in this evaluation. AER shares results with parents, teachers, schools, the Department of Education, and others. It uses evaluation results to improve future SES.

Section IB: Basic Program Information

Section IB: Basic Information		20 Points
Applicant Name Arkansas Aviation Historical Society d/b/a Aerospace Education Center (AEC)	Program Name (if different from Applicant Name) Aerospace Education Results (AER)	
<p>Has this applicant ever been removed from any state's approved provider list? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No</p> <p><i>If the response is "Yes", applicant must provide a description of the circumstances under which the removal occurred, and the state(s) from whose approved provider list the applicant was removed.</i></p>		
<p>Type of organization (indicate with a check in the appropriate box)</p> <input type="checkbox"/> For-profit <input checked="" type="checkbox"/> Not for Profit <input type="checkbox"/> School Entity <input type="checkbox"/> Higher Education Institution Other (describe)	<p>First Year applicant approved to offer SES services in Arkansas (New Applicant)</p> <p>First year applicant approved to offer SES services anywhere (New Applicant)</p>	
<p>Subject areas to be covered (09-10 indicate with a check in the box)</p> <input checked="" type="checkbox"/> Math <input type="checkbox"/> English/Lang Arts <input checked="" type="checkbox"/> Science	<p>Grades to be served (09-10) in each subject area to be covered</p> <p>Math 4th - 8th grades English/Language Arts Science 4th -8th grades</p>	
<p><i>Staff availability and qualifications (do not exceed 100 word description)</i></p> <p>Teachers with National Board Certification design and lead curriculum. AER will recruit from more than 100 in Pulaski County through personal contacts, Internet listservs, newsletters and news media. The National Board Certification website publishes names of Arkansas National Board Certified teachers. Highly effective teachers with Arkansas certificates assist them. AER will recruit teachers in the same ways who have demonstrated their abilities. Non-certified, volunteer instructors include professionals in the aerospace industry, university faculty, parents, and other friends of the AEC. Lead teachers will orient volunteers. Principals will recommend teachers, and teachers will be interviewed. A highly qualified evaluator will measure SES performance and outcomes. AEC provides a part-time bookkeeper and custodial services.</p>		
<p>Service delivery setting (check all that apply)</p> <input checked="" type="checkbox"/> Other: Aerospace Education Center	<p>Specific student populations proposed to be served (check all that are proposed to be served)</p> <input checked="" type="checkbox"/> Low income <input checked="" type="checkbox"/> Minority <input checked="" type="checkbox"/> Other (describe) Non-minority, non-proficient	
<p><i>Time when services are proposed to</i></p>	<p><i>Student/instructor ratio</i></p>	

<i>be offered</i> <input type="checkbox"/> Before school <input type="checkbox"/> After school <input checked="" type="checkbox"/> Weekends <input checked="" type="checkbox"/> Summer <input checked="" type="checkbox"/> Other: Weekends during school year	List the ratio of instructors to children in the proposed program 2 : 10 Maximum number of students for each instructor (not to exceed 10 students per instructor) 10
<i>Cost per hour (not to exceed current maximum allowable from RFA) \$50</i>	<i>Approximate number of hours required for proposed tutoring 30</i>
<i>Minimum number of students that will be served in a single district 10</i> <i>Minimum number of students that will be served in a single school or setting 10</i>	<i>Will students be transported by this provider?</i> <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
<i>Provider Contact Information:</i> Contact Person Name: Jim Wohlleb Street Address: 3301 East Roosevelt City, State, Zip: Little Rock, AR 72306 Contact telephone number: (501) 376-4232 ext. 101 or (501) 680-9244 Contact fax number: (501) 372-4826 Email: wohllebamesc@aristotle.net or ajones2701@aol.com Website: http://www.aerospaced.org Hours of operation: 2 – 9 PM Tuesday - Saturday	

**Aerospace Education Results (AER) will offer SES to students of
Little Rock School District,
North Little Rock School District, and
Pulaski County Special School District**

Section II: Narrative and Supporting Documentation

Section IIA. Program Overview

Model of instruction

Several features describe AER services:

- **Small class size and high teacher-to-pupil ratios**
- **Intensive learning throughout three-hour sessions on ten consecutive Saturdays**
- **Scientifically and mathematically robust projects which engage students**
- **Orderly, disciplined environment maintained by sufficient, seasoned instructors**
- **Differential instruction based on initial diagnostics and continuous assessment**
- **Both verbal and non-verbal student expression and assessment**
- **Instruction, counsel, and participation of parents who agree to strict conditions**
- **Interchanges with students' school teachers before, during, and after SES**

- **Design and instruction by teachers who hold National Board Certification**

Diagnostic and Assessment Processes:

AER administers diagnostic assessments in math and science to determine skill and knowledge levels on the first Saturday. A certified teacher designs and administers pre- and post assessments and records outcomes for measurement of gain. The assessments include students' attitudes and aspirations (in addition to parents' opinions).

Besides math and science assessments conducted by AER specialists, AER reviews students' data collected by their school districts including most recent SAT10, criterion-referenced test scores, and Academic Improvement Plans. These allow coordination of tutoring with instructional plans provided by students' teachers at their schools.

AER develops and implements hands-on, standards-based, math and science lessons and addresses students' individual instructional needs. This type of teaching and learning promotes development in verbal, social, and logical thinking skills as well as academic knowledge and skills. Participating in AER activities across ten consecutive Saturdays (three-hour sessions) for a total of 30 hours of math and science, students receive literacy and math tutoring in one-on-one sessions, pairs, or other small-number combinations,

and whole-group (1:10 teacher to student ratio) projects as teachers judge necessary.

AER enjoys various types of space for learning activities—such as two large classrooms (former East Lab and McDermott’s Workshop), open floor space (main floor and mezzanine), domed theater (Episphere), large-screen auditorium, flight simulator—in the AEC’s 70,000 square feet and an additional 15 acres or more for outdoor demonstrations. All necessary teaching and learning materials including paper, pencils, manipulatives, supplies, books, student portfolios, rocket and balloon apparatus, LEGO Mindstorm kits, computers, calculators, and others are supplied by AER. Parents or guardians are responsible for transporting students to and from tutoring sessions.

Process Used to Reassess Students’ Content Knowledge and Skills

Tutors observe students as they work and daily review completed assignments and projects to determine levels of student understanding and non-comprehension. All this informs the next lessons. Offering student-centered curriculum, AER seeks to raise not only math and science achievement levels of students, but students’ knowledge of the aerospace industry and aspirations towards such career choices as well.

Title I students

AER recognizes that students from Title I schools exhibit diversity of home environment, scope of knowledge, intellectual skills, and learning styles. Many enjoy less-than-average parental support and academic emphasis at home. Such traits may add immense burdens to the two-or-more grades' gap of some students. AER teachers undertake extraordinary challenges in coaching their students to perform satisfactorily AER's ambitious projects. AER requires written commitments of parents and invites them to classes as volunteer helpers. At both outset and completion of the 10-week sessions, AER teachers meet with parents to describe parental roles as well as to learn more about their children's needs and review their progress. Teachers also seek out parents as students' performance indicates, and teachers invite parents' contacts.

Professional Development

AER teachers with National Board certification provide professional development (PD) to parents/guardians, other teachers working in AER, student teachers, and interested school personnel. They strive for common understanding of AER curriculum and pedagogy among the staff. Staff work under the leadership of National Board certified teachers, and all have experience engaging children with diverse backgrounds and learning styles. Occasionally, guest speakers from the aerospace industry carry out projects and discuss lessons with students.

Family Strategies

Initial contacts with families occur through informal school encounters (PTA, principals, counselors, and teachers), SES fairs conducted by districts, and referrals to the AEC and lead teachers. In a brochure and on the AEC's Internet home page AER publishes its qualifications and information of interest to parents.

On the final Saturdays parents participate in appreciating their children's work during the preceding Saturdays. Parents and students receive certificates of completion along with their portfolios. AER teachers invite them to share the portfolios and certificates with their school district principals and teachers.



Section III: Indicators of Quality

1. Key instructional practices and major design elements of the program

(1) High quality: **The NASA curriculum reflects the *National Science Education Standards* view: “The *Standards* call for more than “science as process,” in which students learn such skills as observing, inferring, and experimenting. Inquiry is central to science learning. When engaging in inquiry, students describe objects and events, ask questions, construct explanations, test those explanations against current science knowledge, and communicate their ideas to others. They identify their assumptions, use critical and logical thinking, and consider alternative explanations. In this way, students actively develop their under-standing of science by combining scientific knowledge with reasoning and thinking skills.”**

(2) Based on research: ***Principles and Standards for School Mathematics* (2000) has AER’s vision: “...Teachers help students make, refine, and explore conjectures on the basis of evidence and use a variety of reasoning and proof techniques to confirm or disprove these conjectures.... Students are flexible and resourceful problem solvers. Alone or in groups with access to technology, they work productively and reflectively, with the skilled guidance of their teachers....They value mathematics and engage actively in**

learning it...” One reason that many students are not learning the mathematics they need to know is that the curriculum offered to students does not engage them. (Kenney and Silber 1997)

..According to Hirst *et al.*, “Robotics has been shown by a number of researchers to be motivating and beneficial in teaching science and technology (Beer et al., 1999). We believe that robots are a powerful way to motivate learning. The construction and programming of robots uses a wide range of scientific and engineering principles – key skills in the modern technological economy (Wasserman, 2002). This range of skills necessitates teamwork, planning, and record keeping.” “There is currently a widespread appeal of robotics to adults and children of both sexes. . . . Robotics is also a vehicle for developing key skills (*e.g.*, teamwork, critical thinking, planning, scientific observation and record keeping); for reinforcing skills in elementary physics, mathematics, and numeracy.”

(3) Specifically designed to increase student academic achievement: Lessons in the guides developed by NASA Aerospace Education Services Program specialists have been successfully taught in countless workshops and student programs throughout the United States. Their activities encourage students to explore and experience real-life science, technology, engineering, and math (STEM) applications. As stated in *Aeronautics: An Educator’s Guide with Activities in Science, Mathematics, and Technology Education* (1998), “The

subject of flight has a wonderful power to inspire learning.”

2. Methods used to deliver instruction to students:

Working in teams (pairs and others), students create projects; e.g., they invent robots (technology) to perform certain tasks. Learning cause and effect is enhanced by the models they assemble. Similar to scientists in laboratories, students test and adjust their programming in real time. After reflecting on what does or does not work, students consult with peers, adapt their programming, adjust models, or begin again. Students quickly learn they can solve real-world challenges. In addition to groups, students have one-on-one instruction, as teachers determine their needs, and learn in smaller groups.

Robotics teaching is in pairs. With balloon and rockets, group size will vary according to student behavior and learning style. Learning in teams prompts students to solve problems through discussion and defend their solutions.

In cases when students need basic math functions, teachers customize exercises to teach the necessary but absent skills for participating in the class projects. These may be with single students, pairs, or larger groups. The opportunities to participate in the lively projects are incentives to learn faster what they have not accomplished before.

B. Evidence of Links Between Research and Program Design

Mathematics

Mathematical Process Standards	Components of the Supplemental Educational Services Provider's Instructional Program
Problem Solving	Many interesting problems can be suggested by everyday experiences, like experimenting with kites and paper airplanes. For example, teachers ask students to determine if changing the surface area of the fins on a rocket affects the distance traveled.
Reasoning and Proof	Students use the guess and test method to experiment with ways of increasing the distance an object will travel. Students will present and prove their findings.
Communication	Students work and communicate in teams to design robots to complete tasks. Not only do they collaborate with each other, they also present their findings in a "Math Congress" (teams take turns presenting to other students) where they discuss questions, comments, and concerns.
Connections	Students collect data connected to science (aerospace) projects such as how far a rocket travels. Through displaying and analyzing the data, the students develop connections to mathematical ideas such as variation and change, probability, ratio and proportion.
Representation	Students conduct experiments involving aerospace, communicating their findings to others by using physical objects, drawings, charts, graphs, and symbols through "Math Congresses".
Other	

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Evidence of Links Between Research and Program Design

Science

Unifying Science Concepts and Processes	Components of the Supplemental Educational Services Provider's Instructional Program
Systems, order, and organization	<i>Students explore measurement. Students experiment with capacity, volume, length, area and other units of measure. Using inquiry, students collect and organize data for display in graphic organizers; e.g., collecting distances traveled by air engine vehicles created by student teams.</i>
Evidence, models, and explanation	<i>Students create models to formulate, test, and prove or reject hypotheses. Students create models of flight vehicles, robotics, and other mechanical representations that explain key scientific concepts; e.g., exploring Newton's Three Laws to show evidence and to explain force, motion, inertia, and acceleration.</i>
Change, constancy and measurement	<i>Students test a single variable to predict outcomes. Students identify cause-and-effect relationships by conducting investigations. Students identify the independent, dependent, and controlled variables, so they can accurately measure values for each; e.g., exploring friction by changing the type of string (independent variable) used as the track for a balloon rocket, then comparing the distances traveled (dependent variable), keeping all the other components of the rocket (controlled variables) the same.</i>
Evolution and equilibrium	<i>Students identify how things change over time and how they maintain a balanced state of being. Students</i>

	<p>explore characteristics of objects and systems. Through this exploration, they identify what characteristics remain (relatively) constant and which ones change over time, e.g., <i>identifying celestial bodies in our galaxy through the use of the Episphere digital planetarium.</i></p>
<p>Form and Function</p>	<p><i>Students identify complimentary aspects of objects and systems, analyzing characteristics of basic mechanical designs, e.g., perfecting the design of robots to perform various tasks.</i></p>

C. Connection to State Academic Standards and School or School District's Instructional Program(s)

1. How the program connects to specific state academic standards:

Pulaski Technical College is funding curriculum development which integrates inquiry-based lessons (with resources like LEGO MINDSTORMS, NASA education (see attached sample lessons), and a high-altitude balloon exercise devised by Dr. Keith Hudson, Director of UALR's GIT—activities discussed on the Science and Mathematical Process Standard Charts in Section B) address the following Arkansas state standards:

MATH CONTENT STANDARDS

Number and Operations

- 1. Number Sense: Students shall understand numbers, ways of representing numbers, relationships among numbers and number systems.**
- 2. Properties of Number Operations: Students shall understand meanings of operations and how they relate to one another.**
- 3. Numerical Operations and Estimation: Students shall compute fluently and make reasonable estimates.**

Algebra

4. Patterns, Relations and Functions: Students recognize, describe and develop patterns, relations and functions.

7. Analysis of Change: Students shall analyze change in various contexts.

Geometry

11. Visualization and Geometric Models: Students use visualization, spatial reasoning and geometric modeling.

Measurement

12. Physical Attributes: Students shall use attributes of measurement to describe and compare mathematical and real-world objects.

13. Systems of Measurement: Students shall identify and use units, systems and processes of measurement.

Data Analysis and Probability

14. Data Representation: Students formulate questions that can be addressed with data and collect, organize, and display relevant data to answer them.

15. Data Analysis: Students select and use appropriate statistical methods to analyze data.

16. Inferences and Predictions: Students develop and evaluate inferences and predictions that are based on data.

17. Probability: Students understand and apply basic concepts of

probability.

SCIENCE CONTENT STANDARDS

- 1. Characteristics and Processes of Science: Students demonstrate and apply knowledge of the characteristics and processes of science using appropriate safety procedures, equipment, and technology.**
 - 5. Matter: Properties and Changes: Students demonstrate and apply knowledge of matter, including properties and changes, using appropriate safety procedures, equipment, and technology.**
 - 6. Earth's History: Changes in Earth and Sky: Students demonstrate and apply knowledge of Earth's history using appropriate safety procedures, equipment, and technology.**
 - 7. Motion and Forces: Students demonstrate and apply knowledge of motion and forces using appropriate safety procedures, equipment, and technology.**
 - 8. Energy and Transfer of Energy: Students demonstrate and apply knowledge of energy and transfer of energy using appropriate safety procedures, equipment, and technology.**
 - 9. Earth Systems: Students demonstrate and apply knowledge of Earth's structure and properties using appropriate safety procedures, equipment, and technology.**
2. Connection with the instructional program(s) of the district(s)/school(s) in which services are provided:

The Little Rock School District aligned its curriculum maps with the state standards (above). AER teachers—familiar with those maps—coordinate tutoring sessions’ activities to enhance the same contents delivered during the school day. Teachers in the students’ schools offer more traditional activities. In the tutoring sessions, on the other hand, hands-on lessons mirror “real world” activities which illustrate and reinforce what their teachers present to them. In other districts, AER teachers will assure that similar alignment applies.

3. How required materials are integral to the program and student success:

AER-designed math and science activities encourage students to engage sequences of learning activities which stimulate higher-order learning.

That, coupled with highly qualified teachers (who understand the standards), involve students in ways which customary classroom teachers do or can not. This is an added value of this approach.

4. Costs to parents/families of students related to the student’s participation in this program:

Parents furnish transportation to and from the classes at AEC (at Little Rock Airport).

D. Monitoring Student Progress

Specific programs and practices that will be used to **diagnose** a student's needs, **prescribe** an instructional program to meet that student's needs, and to **evaluate and monitor** the student's progress toward clearly identified goals.

1. Assessment process:

(a) The process by which student needs are assessed/diagnosed and skill gaps identified: **When students enroll, AER teachers diagnostically test math and science to learn students' skill and knowledge levels. AER has several possibilities—CompassLearning , The Learning Institute, or teacher-fashioned. Then, each student's level is recorded and used as both the pre-test and a supplement to standard scores (below). After completing 30 hours of tutoring, each student is assessed again, and specific progress is documented for measurement of gain.**

In addition to math and science assessments conducted by AER teachers, AER reviews each student's data collected by their school district including

- **most recent SAT10 percentile rankings, normal curve equivalent scores, and standards scores for each subtest related to math and science;**
- **criterion-referenced test scores including scale scores and proficiency levels; and**
- **Academic Improvement Plans (AIPs) designed by the students'**

schools.

Review of these items allows AER to coordinate tutoring with the instructional plans provided by students' teachers at their schools.

Interim assessments include observations of students, student work (portfolio contents), and students' oral presentations. After every 3-hour session, teachers meet to analyze this student-based information to drive further instruction.

2. The specific process used to evaluate, monitor, and track student progress on a continuous and regular basis.

Teachers keep running-records about each student. Teachers layer in observations of students, student work (portfolio contents), and students' oral presentations. After every 3-hour session, teachers analyze this information and adjust following lessons accordingly. Post-tests created by teachers based on benchmark-released items measure students' progress at the end of the 10-week sessions. When they are available, results of achievement tests (which parents give permission for AER to receive) are also reviewed. Teachers communicate students' progress in written reports to teachers and parents and are available for conversations with them.

E. Evidence of Effectiveness

Note: This is a newly developed program, so this cites performance history of staff, instructional materials/ methodology utilized, and other evidence for the program's success.

1. Evidence that this program contributes to a positive impact on student achievement on valid and reliable performance tests:

AER teachers have earned the highest certification, so they have proven proficiency. (The national certification process requires this.) They use their expertise when designing and implementing AER's highly engaging curriculum. Teachers work in synergistic teams which stimulate creativity among the staff. AER schedules regular periods for reflection, evaluation of individual students, and planning next steps to boost student achievement.

AER teachers incorporate effective materials into their curriculum. The NASA curriculum and LEGO Mindstorms, for example, reflect the *National Science Education Standards*.

2. Evidence that this program has a positive impact on student performance using a measure of school grades, homework completion, or school/teacher administered subject area test:

All AER teachers are proven highly effective and impact their students where they teach regularly. AER employs National Board-certified teachers as leaders for professional development of tutors, curriculum design, and instruction. National Board teachers have gained their certification based

on evidence-based teaching and learning that produces increases in student achievement. Multimedia portfolios of instructional goals, standards-based lessons, student work, and teacher reflection are submitted by each teacher and rigorously studied by the National Board of Professional Teaching Standards (NBPTS) before National Board certification is awarded. AER relies on standards of NBPTS to ensure teachers are highly qualified and competent. Some of the letters of support submitted with this application speak to the impact of the head teacher.

3. Evidence of improved student outcomes:

Letters of support submitted with this application speak to the outcomes of AER teachers through the example of the director.

F. Communication with parents and families

1. How the SES provider reports student progress to the student's parents/families, including how often:

AER lead teachers meet with parents of AER students (1) at registration; (2) after initial diagnostic assessment, to discuss students' academic needs; (3) when students complete 15 hours of tutoring, to discuss growth; and (4) when students exit. Parents receive written reports each time. Parents may contact teachers at nearly any time.

AER teachers both explain parental roles and learn more about their

students' needs from parents. Teachers also review children's progress with their parents. During these encounters, teachers gain insight into the kinds and extent of household resources their students enjoy. This information helps teachers better support learning at home through clues of what resources to suggest or provide.

At enrollment parents sign releases for scores, grades, and AIPs from schools for assessing students' needs and evaluating curriculum.

At orientation, via contracts between AER and parents negotiated before the program begins, and through communications throughout the course of ten weeks, AER teachers stress parent involvement. AER teachers customarily establish and develop such parent relations where they teach. So this is not a new practice to adopt. Discipline is strict with maximum time-on-task expected. A graduation celebration at completion of the program also involves parents. On that occasion they and students receive reports of students' progress along with certificates of completion.

2. Process for resolving any disputes or conflicts that may arise with parents. How parents support the service provided. How the program works to accommodate the needs and schedules of working parents.

AER tries to avoid conflicts with parents by transparent procedures and by frequent messages and prompt, complete responses to inquiries. AER teachers do their utmost to uphold contracts with parents. Disagreements with these practices should occur rarely. AER and AEC administrators

assure they are available to school district and school principals and teachers to prevent and resolve any which occur.

During mandatory conversations with parents prior to the start of AER sessions, teachers explain AER philosophy, expectations for and commitments to students, and procedures. Teachers emphasize responsibilities of students' families, and parents agree to these. They have ample opportunities to discuss their children's needs. At this time and later, parents set schedules and favored means (written or verbal) for communications.

At the final sessions parents participate in honoring their children's work during the ten sessions and their subsequent progress. Parents and students receive certificates of completion along with their portfolios. AER teachers invite them to share these with their district principals and teachers.

Conflicts between students and tutors, parents and tutors, or others are resolved with the assistance of National Board certified teachers according to published policies. AER obviates conflicts to a large extent by establishing communications between teachers and parents before students enter and by sustaining them beyond the end of the ten weeks. Likewise, teachers set clear, firm behavioral and procedural rules for the students, their parents, and themselves; and teachers enforce them consistently.

Parents have access to AER teachers and AEC administrators by land and

mobile telephones and by e-mail. In addition, they may arrange direct discussions with AER teachers during the ten weeks and immediately following.

Further, AER's Saturday sessions accommodate parents' weekday schedules. AER offers an alternative to SES providers who tutor only during the work week.

Teachers record communications with parents. These records are available to parents along with the students' tutoring records. Conflicts not resolved between parents and teachers readily are considered with appropriate confidentiality by the faculty and AEC administrators. Teachers and administrators are available for consultations with school administrators.

In cases of unresolved conflicts, AER assists students and parents find other SES providers.

The AEC involves attorneys on its board and outside counsel as warranted in contracting with school districts and administering payments for AER activities.

AER offers various meeting times and dates to allow optimum opportunities for parents to meet with AER lead teachers.

G. Communication with Districts/Schools

1. How AER ensures a connection between the described instructional program and the program in place at the students' school.

AER tries to avoid conflicts with school districts and their personnel by transparent procedures and by frequent communications and prompt, complete responses to inquiries. AER complies with district policies and discloses its professional qualifications and other resources, strategies, schedules, rules, and other appropriate information. Disagreements under these circumstances should occur rarely. AER and AEC administrators ensure they are available to school district and school principals and teachers to prevent and resolve any which occur.

AER receives data from each student's school to understand instructional needs. AER also receives curriculum maps and pacing guides from schools to learn the calendar of instruction provided during the regular school day. AER prepares lessons to correlate with students' regular school agendas so that students receive coordinated services. The unique aspect of AER tutoring is the use of interdisciplinary math and science content and hands-on lessons. AER believes students are able to understand basic math and science content and processes more deeply when fully engaging hands-on processes.

2. Specific procedures to ensure communication of student's progress between the Supplemental Educational Services Provider and the teacher/designee, including frequency, content and methods.

AER provides each student's written progress reports to their home school and makes available the external evaluation of AER annually. AER encourages students to share their experiences and portfolios with their school teachers. AER teachers first contact students' school teachers when the school district discloses them to AER and invites teachers to share observations and suggestions.

H. Qualifications of Instructional Staff

1. Amount and quality of training provided to program staff in general and in specific content areas related to the SES provided:

AER teachers receive training specific to the SES they offer. Examples follow.

- **An expert in robotic teaching from LEGO Education, widely used throughout the US, trains AER teachers for a full day**
- **Two lead teachers attend Space Camp for Educators at Huntsville, Alabama, conducted by NASA (five days). Well established, NASA leads training of teachers to integrate math and science into aerospace curriculum. In turn, these teachers instruct other staff.**

For every three hours with students, teachers devote an hour or more to developing and rehearsing lessons, reviewing students' progress, and professional development.

2. Years and level of work experience, particularly in working with Title I students:

AER employs highly qualified teachers of diverse age, years of teaching, gender, and ethnicity. Each has taught students eligible for Title I at least a year.

3. Highest degree attained and minimum educational requirements

Highest degree of teachers is masters, and minimum education is bachelor's degree. In addition, college students and student teachers participate as volunteers or training.

4. Certification of staff

Approximately 10 lead teachers are National Board Certified or National Board Certification candidates. About 10 support teachers (as well as the lead teachers) are certified by the State of Arkansas. The director, Charlotte Cook, is the Young Astronaut Specialist at Carver Magnet Elementary School in the Little Rock School District. She attended NASA's week-long Space Educator Conference in Houston and led 80 students to the NASA Space Camp in Huntsville. She also earned a masters degree in elementary education, is certified in Arkansas to teach pre-K through eighth grade, and holds a National Board Certification—Middle Childhood Generalist. She also has experience as a math coach . For Math Journeys, she served as a math coach for two years, wrote curriculum, and trained other teachers. (This is a summer program for fifth grade students who scored basic or below basic (ACTAAP). (Please see attached resume.)

5. Volunteers:

AER invites student teachers to learn best teaching practices with AER's highly effective staff. They assist teachers and interact with students. AER

students also benefit from guest experts who encourage students to consider technical careers and prepare for higher education. These employees of local aerospace firms and universities bring their experience, love of aviation, and confidence in its future to these students. Each of the NASA-sponsored Arkansas Space Grant Consortium awardees at 16 Arkansas campuses of higher education is required to make presentations to school groups or the general public for their NASA-sponsored projects. This includes both faculty and students in science and engineering. Topics might include demonstrations of rocket propulsion or discussion of black holes and other astronomic phenomena. Similarly, the Civil Air Patrol visits AER and helps instruct students. Guests as well as all others who have contact with students receive orientation to AER.

I. Provider Goals and Objectives

AER Goals and Performance Objectives:

AER expects students to learn through multiple intelligences which allow deeper and more meaningful access to content. As students become more successful learners, they increase their motivation and improve their attitudes towards gaining knowledge and skills. AER services address one

primary goal and four performance objectives:

Primary Goal: Students will raise achievement in mathematics and science, awareness of career opportunities in aerospace, and self-confidence in learning math and science.

Objectives:

1. 80 per cent of students will increase the number of hours engaged as demonstrated in student and parent surveys by 10 per cent.

2. 80 per cent of students who regularly attend AER sessions will improve their scores by 50 per cent between pre- and post-tests of AER.

3. Combined with instruction in their schools, these students should raise their scale scores on the following spring's benchmark tests in math and science (which parents request for AER review) by 5 per cent.

4. 80 per cent of students will improve attitudes toward learning, increase their interest in technical careers, and feel more confident about their ability to master math and science lessons as demonstrated in student and parent surveys.

J. Cost of Service

Specific description of your pricing structure.

AER invoices school districts up to \$150 per student for its three-hour sessions.

Pricing structure per student is \$50 per hour for 3 hours each Saturday for 10 weeks.

AER keeps records of attendance and complies with state accounting procedures.