

NASA Explorer Schools Rubric : Measuring School Success in Achieving the Six Anticipated Outcomes

| | A | B | C | D | E | F |
|---|---|---|--|---|--------------------------------|----------------------|
| 1 | | Exceeds Expectations | Meets Expectations | Meets Minimum or Does Not Meet Expectations | Maximum Possible Points | Rating Scores |
| 2 | Outcome 1: Participation and professional growth of educators in science | 6-8 points | 3-5 points | 0-2 points | 48 | |
| 3 | <p><i>Guideline 1 - Instructional Strategies</i></p> <p><i>[data sources*: interview transcripts; surveys: TI, Adm, TLC; e-folio]</i></p> | <p>Teachers <u>meet expectations</u> and:</p> <ul style="list-style-type: none"> • Immerse students in scientific inquiry, questioning, and experimentation. • involve students in the process of generating and evaluating scientific evidence. • Model scientific reasoning. | <p>In regard to their classroom teaching of STEM-G topics teachers apply what they've learned about inquiry methods to create learning environments that immerse students in:</p> <ul style="list-style-type: none"> • Hands on investigations. • Cooperative learning activities. | <p>In regard to their classroom teaching of STEM-G topics teachers describe:</p> <ul style="list-style-type: none"> • Problems with not being able to implement inquiry methods in their classroom teaching. • Difficulties with or restrictions in implementing cooperative learning strategies. | 8 | |
| 4 | <p><i>Guideline 2 - Time Intensive</i></p> <p><i>[data sources: interview transcripts; surveys: TL, TI, FC; e-folio]</i></p> | <p>Teachers <u>meet expectations</u> and:</p> <ul style="list-style-type: none"> • Present information to other NES and non-NES schools. • View individual learning opportunities as part of an intensive and sustained professional development plan. • Express higher satisfaction with NES professional development (rating score mean is at least 4 out of 5). | <p>Teachers:</p> <ul style="list-style-type: none"> • Attend workshops and conferences. • Network with the learning community. • Share information with other NES and non-NES teachers. • Express satisfaction with NES professional development (rating score mean is at least 3 out of 5). | <p>Teachers attend workshops and conferences, but:</p> <ul style="list-style-type: none"> • Do not network with the learning community. • Do not share information with other NES and non-NES teachers. • Express dissatisfaction with NES professional development (rating score mean is less than 3 out of 5). | 8 | |
| 5 | <p><i>Guideline 3 - Classroom Practices</i></p> <p><i>[data sources: interview transcripts; surveys: SI, TL, TI, FC; e-folio]</i></p> | <p>Teachers:</p> <ul style="list-style-type: none"> • Integrate NASA resources and expertise (including AES) into their curriculum to increase student engagement and make learning relevant and meaningful. • Aim their teaching strategies and materials to improve student performance in STEM-G areas. | <p>Teachers:</p> <ul style="list-style-type: none"> • Integrate NASA resources and expertise (including AES) to encourage student engagement. • Aim teaching strategies and materials toward improving English, reading, language arts, and STEM-G instruction. | <p>Teachers:</p> <ul style="list-style-type: none"> • Do not use NASA resources or call upon NASA experts to encourage student engagement. • Do not attempt to adapt and implement NASA content materials into their curriculum. • Do not consider how they can aim their teaching to improve student performance. | 8 | |

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| 6 | <p><i>Guideline 4 - Content Knowledge</i></p> <p>[data sources: interview transcripts; workshop reports; surveys: TL, TI, FC; Admin; e-portfolio]</p> | <p>Teachers <u>meet expectations</u> and:</p> <ul style="list-style-type: none"> • Recognize and know how to change common student misconceptions in STEM-G areas. • Improve pedagogical content knowledge—specific teaching practices for specific content, such as teaching forces and motion through dance moves (e.g., NASA FMA show). | <p>Teachers:</p> <ul style="list-style-type: none"> • Report or demonstrate increased knowledge of (and/or skills in) STEM-G content, careers, family involvement. • Describe or show use of (pedagogical content) inquiry, classroom management, lesson planning, or grouping methods gained by NES professional development. | <p>Teachers:</p> <ul style="list-style-type: none"> • Show no growth in their subject matter knowledge or skills. • Report no increased knowledge of STEM-G content, careers, or family involvement. • Describe or show no use of (pedagogical content) inquiry, classroom management, lesson planning, or grouping methods gained by NES professional development. | 8 | |
| 7 | <p><i>Guideline 5 - Active Learning</i></p> <p>[data sources: interview transcripts; workshop reports; surveys: TI, FC; Admin; e-portfolio]</p> | <p>Teachers <u>meet expectations</u> and present, lead, or write about how to:</p> <ul style="list-style-type: none"> • Become actively engaged in meaningful discussion, planning and practices to meet annual SOL and professional development goals. • Observe expert teachers and are observed teaching and receive feedback. • Plan how new curriculum materials and new teaching methods will be used in their classrooms. • Review student work in context to the topics being covered. | <p>Teachers:</p> <ul style="list-style-type: none"> • Demonstrate understanding of standards. • Show how to connect their work to specific standards for student performance. • Meet at least monthly to discuss STEM-G curriculum materials and teaching methods and to plan and reflect on NES implementation. | <p>Teachers:</p> <ul style="list-style-type: none"> • Demonstrate little to no understanding of standards. • Cannot show how to connect their work to specific standards for student performance. • Do not meet regularly to discuss STEM-G curriculum materials, teaching methods, or to plan/reflect on NES implementation. | 8 | |
| 8 | <p><i>Guideline 6 - Coherence</i></p> <p>[data sources: interview transcripts; workshop reports; surveys: TL, TI, FC; Admin; e-portfolio]</p> | <p>NES reform strategies are connected to <u>three or more</u> aspects of school reform that promote:</p> <ul style="list-style-type: none"> • Teacher professional growth. • Curriculum improvement (especially in STEM-G areas). • Improving school climate. • Relationships with feeder schools and community. • Leveraging NES funding to pursue additional partnerships (i.e., with local colleges and universities) and funding. | <p>NES reform strategies are connected to <u>at least two</u> aspects of school reform that promote:</p> <ul style="list-style-type: none"> • Teacher professional growth in STEM-G areas is within the team and schoolwide. • Curriculum design (especially in STEM-G areas) strategies are consistent. • Improving school climate. • Relationship with feeder schools and community. • Leveraging NES funding to pursue additional partnerships (i.e., with local colleges and universities) and funding. | <p>NES reform strategies are:</p> <ul style="list-style-type: none"> • Not connected to other aspects of school reform. • Not consistent. • Not addressed as part of relationship with feeder schools. • No attempts are made to leverage NES funding or partnerships. | 8 | |
| 9 | <p><i>Comments on Outcome 1:</i></p> | | | | | |

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| 10 | Outcome 2: Assistance for and technology use by educators in schools with high populations of underserved students | 3-4 points | 1-2 points | 0 points | 16 | |
| 11 | Guideline 1 - Selects, purchases, and uses technological tools with NES funding (which may be supplemented by or enhanced by other sources) [data sources: interview transcripts; technology plan; e-folio] | <u>Meets expectations</u> and: <ul style="list-style-type: none"> • Leverages NES funding for technology purchases with supplemental funding. • Technology purchased is integrated with school goals for STEM-G improvement. | Purchases software and hardware with NES funding that: <ul style="list-style-type: none"> • Supports school implementation of NES project. • Serves students with demographics that qualify for either (or both) Title 1 funding or assistance with English language learning. | Purchases NASA software and hardware with NES funding but: <ul style="list-style-type: none"> • technology purchased does not support school implementation of NES project because of technological, logistical, or training problems. | 4 | |
| 12 | Guideline 2 - School-wide frequency of using technology tools in teaching and professional activities [data sources: interview transcripts; surveys: TL, TI, FC, TLC; e-folio] | <u>Meets expectations</u> and: <ul style="list-style-type: none"> • Integrates DLN into school curriculum. • Participates in additional NASA technology-based opportunities such as the ISS downlink or web-based access to mission data | Teachers demonstrate at least one of the following: <ul style="list-style-type: none"> • Use of technology tools to support STEM-G, reading, language art curriculum. • Participation in DLN activities at the school. | Teachers show no evidence of: <ul style="list-style-type: none"> • Using technology tools to support STEM-G, reading, or language art curriculum. • Participating in DLN activities at the school. | 4 | |
| 13 | Guideline 3 - Teachers report frequency of using the technology in STEM-G context [data sources: interview transcripts; surveys: TLC; e-folio] | <ul style="list-style-type: none"> • Students use technology at least twice a week. • Link to STEM-G content is articulated in learning goals. | <ul style="list-style-type: none"> • Students use technology at least once a week. • Link to STEM-G content is clear. | <ul style="list-style-type: none"> • Students use technology only once or twice a month. • Link to STEM-G content is not clear. | 4 | |
| 14 | Guideline 4 - Teachers report frequency of using the technological tools in preparation for teaching or other professional activities [data sources: interview transcripts; surveys: Admin, TLC; e-folio] | Teachers <u>meet expectations</u> and: <ul style="list-style-type: none"> • Are comfortable with using technology tools for teacher preparation and other professional activities. • Use tools weekly. | Teachers: <ul style="list-style-type: none"> • Use technology tools for teaching preparation and other professional activities. • Use tools when required. • Demonstrate positive attitudes toward using technology as part of STEM-G instruction. | Teachers: <ul style="list-style-type: none"> • Show little to no evidence of using technology tools for teaching preparation or other professional activities. | 4 | |
| 15 | <i>Comments on Outcome 2:</i> | | | | | |

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| 16 | | | | | | |
| 17 | | 7-10 points | 3-6 points | 0-2 points | | |
| 18 | <p>Outcome 3: Family involvement in children's learning</p> <p>[data sources: interview transcripts; workshop reports; surveys: SI, TL, TI, FC; Admin; e-folio]</p> | <p>Teachers <u>meet expectations</u> and show evidence that parents:</p> <ul style="list-style-type: none"> • Have opportunities to observe the changes in STEM-G curriculum and teaching strategies. • Have information to appraise teachers for the use of innovative teaching methods; and • Are encouraged to involve children in STEM-G activities outside of school. | <p>Teachers provide evidence that parents:</p> <ul style="list-style-type: none"> • Actively participate in the NASA-sponsored family events. • Are kept informed of NES project and STEM-G activities at the school. • Observe NES activities having a positive impact on overall school climate and community value of STEM-G content and careers. | <p>Parents attend NES-sponsored family involvement activities at the school, but activities:</p> <ul style="list-style-type: none"> • Are held infrequently. • Do not follow NES guidelines for family involvement activities. | 10 | |
| 19 | Comments on Outcome 3: | | | | | |

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| 20 | Outcome 4: Student interest and participation in science, technology, engineering, mathematics, and geography | 2 points | 1 points | 0 points | 8 | |
| 21 | <i>Guideline 1 - Participate productively in STEM-G practices and discourse</i> <i>[data sources: interview transcripts; e-folio]</i> | Teachers report that students participate in the science inquiry process using: <ul style="list-style-type: none"> • Real-time data. • Valid instruments for data collection. • Online scientific instruments (i.e., online telescopes). | Teachers report that students participate in the science inquiry process. | There is no evidence to show that students participate in STEM-G practices and discourse. | 2 | |
| 22 | <i>Guideline 2 -Show noticeable curiosity in STEM-G related topics and events</i> <i>[data sources: interview transcripts; surveys: TL, TI, FC; e-folio]</i> | Teachers report that students question and/or investigate STEM-G-related topics outside the classroom. | Teachers report that students relate STEM-G-related topics discussed in the classroom to current events or local phenomena. | There are no data indicators to show student interest or curiosity in STEM-G. | 2 | |
| 23 | <i>Guideline 3 -Change attitudes about learning</i> <i>[data sources: interview transcripts; surveys: SI; e-folio]</i> | Teachers report that: <ul style="list-style-type: none"> • Students are excited about learning and are asking more questions. • School scores on NES student interest test are above the mean in attitudes toward STEM-G topics and activities. | Teachers report that: <ul style="list-style-type: none"> • Students are excited about learning and are asking more questions. • School scores on NES student interest test are at or near the mean in attitudes toward STEM-G topics and activities. | Students show a neutral or negative attitude towards STEM-G-related activities. | 2 | |
| 24 | <i>Guideline 4 -Actively participates in hands-on and authentic scientific research</i> <i>[data sources: interview transcripts; surveys: SI; e-folio]</i> | Students: <ul style="list-style-type: none"> • Conduct hands-on activities in STEM-G areas • Use technology as part of STEM-G investigations. | Students participate in the hands-on activities or authentic scientific research. | There are no or few signs of student participation in hands-on activities or authentic scientific research. | 2 | |
| 25 | <i>Comments on Outcome 4:</i> | | | | | |

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| 26 | Outcome 5: Student knowledge about careers in science, technology, engineering, mathematics, and geography | 3 points | 2 points | 0-1 points | 9 | |
| 27 | <i>Guideline 1 - Change in self-identity</i> <i>[data sources: interview transcripts; surveys: SI; e-folio]</i> | <ul style="list-style-type: none"> Teachers report that students see themselves as one of the NASA employees. | <ul style="list-style-type: none"> Teachers report that students express interest in pursuing careers at NASA. | <ul style="list-style-type: none"> Students did not express interest in pursuing careers at NASA. | 3 | |
| 28 | <i>Guideline 2 -Increased understanding of and enthusiasm about STEM-G careers</i> <i>[data sources: interview transcripts; surveys: SI, TI; e-folio]</i> | <ul style="list-style-type: none"> Student interest survey scores show increased interest in STEM-G careers. | <ul style="list-style-type: none"> Student Interest survey scores show average (between 2.25-2.75) interest in STEM-G careers. | <ul style="list-style-type: none"> Student interest in NASA careers declines, or survey scores decline. | 3 | |
| 29 | <i>Guideline 3 -Share information with peers and parents</i> <i>[data sources: interview transcripts; surveys: SI; e-folio]</i> | <ul style="list-style-type: none"> There is evidence of student engagement in peer sharing (or training) and sharing with parents. Student presentations are featured at family or community outreach events that related to NES or other STEM-G learning. | <ul style="list-style-type: none"> Opportunities for peer training or cross-school or community-based presentations by students are planned. | <ul style="list-style-type: none"> There is no evidence of students being involved in peer sharing, training, or community presentations. | 3 | |
| 30 | <i>Comments on Outcome 5:</i> | | | | | |

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| 31 | Outcome 6: Student ability to apply science, technology, engineering, mathematics, and geography concepts and skills in meaningful ways | 3 points | 1-2 points | 0 points | 9 | |
| 32 | <i>Guideline 1 - Understand and use scientific explanations of the natural world</i> <i>[data sources: interview transcripts; surveys: SI, TI, FC; e-folio]</i> | There is evidence that students: • Understand and can use scientific explanations in STEM-G problem solving contexts. | There is evidence that students: • Understand and can use scientific explanations. | There is no evidence that students: • Understand or can use scientific explanations. | 3 | |
| 33 | <i>Guideline 2 - Understand, use, and interpret the nature and development of STEM-G topics</i> <i>[data sources: interview transcripts; surveys: SI, TI; e-folio]</i> | Students participate in research projects and/or science competitions such as GLOBE, NES student research conference, school science fairs and receive recognition for achievement through review process. | Students participate in science competitions or STEM-G related research projects. | Students did not participate in any science competitions or STEM-G research projects. | 3 | |
| 34 | <i>Guideline 3 - Increased achievement in math and language arts, reading, and science standardized tests</i> <i>[data sources: interview transcripts; State report card data]</i> | Student achievement scores: • Meet AYP in all areas; <u>and</u> • Exceed district (or state) achievement scores in all areas. | Student achievement scores: • Meet AYP in STEM-G; <u>or</u> • Exceed district (or state) achievement scores in science and/or math. | Student achievement scores: • Do not meet annual progress goals in science and math areas. • Students show no improvements in science and math. • Students do not meet annual progress goals in related subjects, such as language arts. | 3 | |
| 35 | <i>Comments on Outcome 6:</i> | | | | | |

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| 36 | | | | | | |
| 37 | Bonus Points: Great School Rating <i>www.greatschools.net/</i> | If school receives a Great School Rating between 8 and 10, ADD 2 points. | If school receives a Great School Rating between 6 and 7, ADD 1 point. | If school receives a Great School Rating less than 5, ADD 0 points. | 2 | |
| 38 | TOTAL Points | | | | 102 | |
| 39 | *Definition of Data Sources | | | | | |
| 40 | Interview transcripts: | | | | | |
| 41 | 2003 NES school teams were interviewed in the spring of 2005 | | | | | |
| 42 | 2003, 2004, and 2005 cohort case study school teams were interviewed in the spring of 2006 | | | | | |
| 43 | Surveys: | | | | | |
| 44 | SI: Student Interest - taken by case study schools, spring 2006 | | | | | |
| 45 | TL: Team Lead - taken by all NES team leaders, spring 2006 | | | | | |
| 46 | TI: Teacher Involvement - taken schoolwide by NES and non-NES teachers at all NES schools, spring 2006 | | | | | |
| 47 | FC: Field Center Staff - disseminated to field center education staff at all 10 NASA centers, spring 2006 | | | | | |
| 48 | Admin: Administrator - completed by NES team administrators, spring 2006 | | | | | |
| 49 | e-folio: An electronic portfolio for the NASA Explorer Schools project < http://aesp.nasa.okstate.edu/efolio/ > | | | | | |