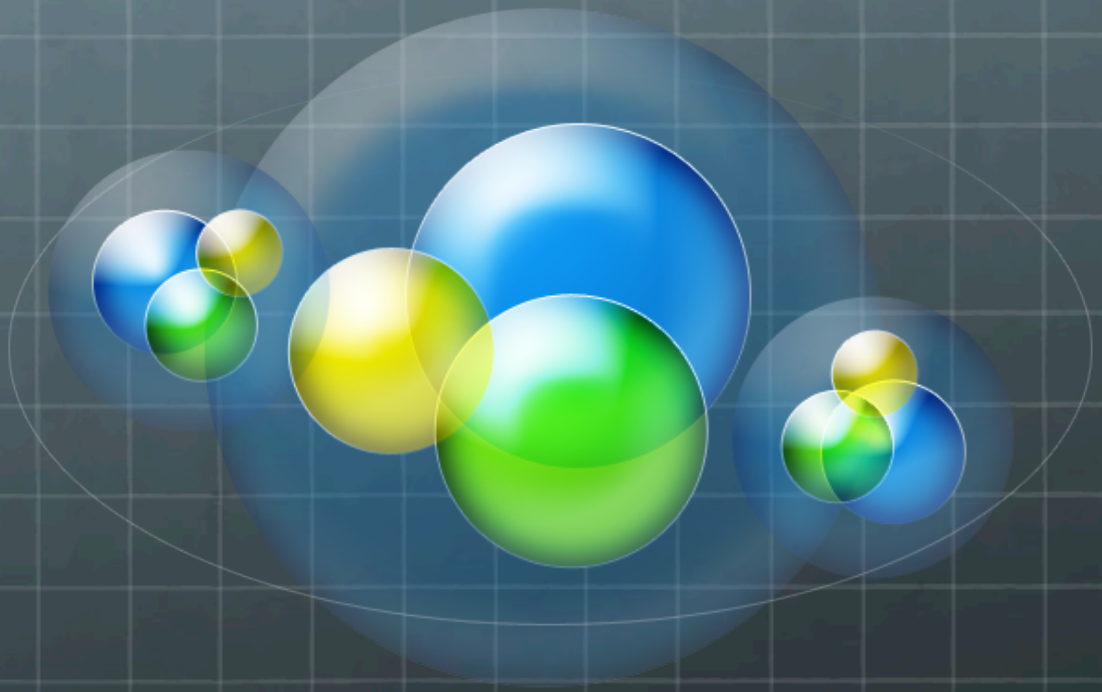
The Next Decade: Space Grant Goals and Objectives



National Council of Space Grant Directors Fall Meeting
Seattle, WA
October 25-27, 2012

SG Goals and Objectives Subcommittee

- **Angela Des Jardins**
  - Director, Montana Space Grant Consortium
- **Luke Flynn**
  - Director, Hawaii Space Grant Consortium
- **Stephen Ruffin**
  - Chair, SG Goals and Objectives Subcommittee
  - Director, Georgia Space Grant Consortium
- **Gary Slater**
  - Director, Ohio Space Grant Consortium
- **Suzanne Smith**
  - Director, Kentucky Space Grant Consortium
- **Scott Tarry**
  - Director, Nebraska Space Grant Consortium
- **Yervant Terzian**
  - Chair, National Council of Space Grant Directors
  - Director, New York Space Grant Consortium

SG Goals and Objectives Outline

- Process
- Sample Survey Results
- Proposed Plan

Process

SG Goals and Objectives Process

1) Participate in Ex-Comm kick-off telecon with each subcommittee of the strategic planning process:
   - National SG History and Accomplishments
   - National SG Strengths and Weaknesses
   - NASA SG Evaluation Processes

2) SG Goals and Objectives subcommittee studies key documents
   - 2011 NASA Strategic Plan
   - NASA Education Design Team Report, 2011
   - NASA Education Portfolio Re-Design
   - Federal STEM Education Strategic Plan (Co-STEM)
   - Space Grant Overview to Obama Transition Team, 2009
   - National Space Grant Strategic Plan, 2002-2006

3) Subcommittee evaluates suitability of goals and objectives

4) Subcommittee develops draft set of strategies and major actions.
   - Occurs through committee survey, telecons and email discussions

SG Goals and Objectives Process

4) Conduct survey of all SG Directors to collect feedback on draft strategies and to identify additional strategies and major actions

5) Subcommittee integrates feedback from SG Directors survey to develop modified set of strategies and major actions
   - Occurs through director's survey, telecons and email discussions

6) Conduct presentation and discussion of proposed strategies at Fall National Space Grant Directors Meeting
   - Work to integrate with NASA vision expressed by SG Program Manager
   - Work to provide consistency with SG Strengths and Weaknesses Analysis and SG Evaluation Processes

8) Develop modification of proposed plan based on Fall Meeting input from SG community

Sample Survey Results

Objectives

- **Current Version***
  1) Promote a strong science, technology, engineering, and mathematics education base from elementary through secondary levels while preparing teachers in these grade levels to become more effective at improving student academic outcomes.
  2) Establish and maintain a national network of universities with interests and capabilities in aeronautics, space and related fields.
  3) Encourage cooperative programs among universities, aerospace industry, and Federal, state and local governments.
  4) Encourage interdisciplinary training, research and public service programs related to aerospace.
  5) Recruit and train U.S. citizens, especially women, underrepresented minorities, and persons with disabilities, for careers in aerospace science and technology.

*FY 2010 NASA Training Grant Announcement: NASA Space Grant College and Fellowship Program: http://www.nasa.gov/pdf/418826main_Space%20Grant%202010%20Solicitation%20Rev%20B[1].pdf

Sample Survey Responses

- Strategies proposed for each objective.
- Respondents scores level of agreement with each proposed strategy.
  - Strongly Agree = 2
  - Somewhat Agree = 1
  - Neutral = 0
  - Somewhat Disagree = -1
  - Strongly Disagree = -2
- Free-response questions identified additional strategies for each objective.
- Free response question identified most important actions overall.

Sample Survey Responses
Objective 2 - Strategies
(Slide 1 of 2)

Establish and maintain a national network of universities with interests and capabilities in aeronautics, space and related fields.

7) Better advertise and promote Space Grant and other NASA Higher Education opportunities through more effective use of social media and other methods available to the extensive space grant network. Score=1.11

8) Increase the size of the space grant network and student engagement by seeking and utilizing funding from other entities as well as from NASA. Score=0.8

9) Conduct undergraduate scholarship programs which increase student skills and motivation in aeronautics, space and related STEM fields. Score=1.66

Sample Survey Responses
Objective 2 - Strategies
(Slide 2 of 2)

Establish and maintain a national network of universities with interests and capabilities in aeronautics, space and related fields.

10) Conduct graduate fellowship programs which increase student skills and motivation in aeronautics, space and related STEM fields. Score=1.6

11) Conduct high-quality student group projects and competitions which increase student skills and motivation in aeronautics, space and related STEM fields. Score=1.68

12) Conduct high-quality faculty and student research programs which increase student skills and motivation in aeronautics, space and related STEM fields. Score=1.69

Sample Survey Responses
Objective 2 – Free Response
(Slide 1 of 2)

What additional strategy (or strategies) would be highly effective in achieving Objective 2?

1) I would like to see stronger national engagement of the Space Grant network as a powerful grass roots STEM network. I would like to see more collaboration among Space Grants in going after external (non Space Grant funding).

2) ensure that each STATE has an opportunity to provide at least 1 hands-on workshop / demo for students at a venue with a large audience and broad interest base - think outside the box Graduate students have already selected a STEM focus/career choice ...need to focus on the younger students (including Technical schools and returning students)

3) 8 - we can increase the impact of the space grant network through additional external funded programs 11 - we can partner with other organizations to support group projects and competitions

Sample Survey Responses
Objective 2 – Free Response
(Slide 1 of 2)

What additional strategy (or strategies) would be highly effective in achieving Objective 2?

4) NASA and in-state STEM internship programs. STEM Service Learning programs Promote the development and availability of STEM curriculum in community colleges and rural campuses.

5) Promote the integration of NASA mentors into student group and capstone projects.

6) I think this is an ever evolving creative opportunity for all the great universities to succeed in given our skills and capabilities.

7) Current funding is not compatible with actual conduct of research programs. Increase NASA and other federal agencies' use of faculty and graduate students to do basic and applied research.

Proposed Plan

Major Actions

- Goal
  - Objectives
    - Strategies

Major Actions

(Slide 1 of 2)

Most important actions Space Grant should take to improve its effectiveness over the next 10 years

1) Increase funding and funding stability.
   - Provides for engagement of more students and educators, especially those from under-represented populations.
   - Expand the funding base to also include support from entities other than NASA.

2) Improve relationship with NASA management and the larger NASA community.

3) Improve visibility of Space Grant programs.
   - Ensure that opportunities and program impact are known across NASA, with local, state and federal government, with students, educators and the public

Major Actions

(Slide 2 of 2)

Most important actions Space Grant should take to improve its effectiveness over the next 10 years

4) Utilize the unique space grant network and pipeline to enhance the impact of K-12 programs.
   - Engage students and educators in inter-disciplinary and experiential training activities

5) Increase industry involvement in space grant.
   - Build national and local partnerships to support internships, collaborative research and enhanced workforce training

6) Conduct collaborative multi-state experiential higher education programs.
   - Should be cooperative and not just competitive activities.

Goal

- **Current Version**

  Contribute to the nation's science enterprise by funding education, research, and informal education projects through a national network of university-based Space Grant consortia.

- **Proposed Changes**
  - None

Objectives

- Proposed changes to the objectives:
  a. Use “Engage in” instead of “Encourage”
  b. Specify STEM focus where appropriate
  c. Change order of objectives to:
    - Acknowledge that our core is national network of universities
    - Agree with the original Space Grant solicitation and better match the Congressional Space Act

Objectives

- Proposed Changes Highlighted

1) ~~2)~~ Establish and maintain a national network of universities with interests and capabilities in aeronautics, space and related STEM fields.

2) ~~3)~~ Engage in cooperative programs among universities, aerospace industry, and Federal, state and local governments.

3) ~~4)~~ Engage in interdisciplinary training, research and public service programs in aeronautics, space and related STEM fields.

4) ~~5)~~ Recruit and train U.S. citizens, especially women, underrepresented minorities, and persons with disabilities, for careers in aerospace science and technology.

5) ~~1)~~ Promote a strong science, technology, engineering, and mathematics (STEM) education base from elementary through secondary levels while preparing teachers in these grade levels to become more effective at improving student academic outcomes.

Strategies for Objective 1

Establish and maintain a national network of universities with interests and capabilities in aeronautics, space and related STEM fields.

a) Better advertise and promote Space Grant and other NASA Higher Education opportunities through more effective use of social media, NASA TV and other methods available to the extensive space grant network.

b) Seek and utilize funding from other entities as well as from NASA to support the space grant network and student engagement.

c) Promote the development and availability of STEM curriculum in community and technical colleges and rural campuses.

d) Conduct undergraduate scholarship, graduate fellowship and faculty and student research programs which increase student skills and motivation in aeronautics, space and related STEM fields.

e) Conduct high-quality student group projects and competitions which increase student skills and motivation in aeronautics, space and related STEM fields. Collaborate with technical experts from NASA, industry and other partners in these programs.

Strategies for Objective 2

Engage in cooperative programs among universities, aerospace industry, and Federal, state and local governments.

a) Increase the interaction between space grant consortia and industry through actions such as increasing the number of student internships in industry and promoting more collaborative research involving industry, faculty and students.

b) Increase the number of industry affiliates in the space grant network and build strategic national and local partnerships with aerospace companies to provide enhanced workforce training.

c) Establish more direct communication and collaboration with local and state governments and school systems to ensure greater inclusion of NASA resources, content, and programs.

d) Obtain greater statewide buy-in by seeking and utilizing funds from state and local governments to expand the impact of space grant programs.

e) Develop a closer relation to the NASA Centers and more direct role in placing students at these Centers.

Strategies for Objective 3

Engage in interdisciplinary training, research and public service programs in aeronautics, space and related STEM fields.

a) Conduct multi-state, experiential higher education programs. These should be cooperative and not just competitive activities and may include team-oriented interdisciplinary research or design projects and coursework.

b) Enhance publicity and communication of space grant activities in the general public.

c) Support fellowships, research, design programs, space and aeronautics hardware programs, and internships which engage students in interdisciplinary activities.

d) Better communicate and support design competitions sponsored by NASA, FAA, DoD and other federal agencies, professional societies and industry.

Strategies for Objective 4

Recruit and train U.S. citizens, especially women, underrepresented minorities, and persons with disabilities, for careers in aerospace science and technology.

a) Broadly and effectively advertise wide range of STEM opportunities conducted by federal and state agencies, industry and other organizations to students at space grant institutions.

b) Broadly and effectively advertise space grant activities on each campus specifically targeting student and university organizations on campus that serve under-represented populations.

c) Develop and promote programs specifically addressing retention and recruitment issues of under-represented populations.

d) Enhance the impact and integration of Minority Serving Institutions (MSI's) in the space grant national network.

e) Improve efficiency and completeness of data collection processes showing student recruitment, engagement, retention, employment and diversity (geographic, 1st generation in college, Appalachian, disability, gender, race, ethnicity, …). Better utilize this data with stakeholders within each state and nationally to increase support for space grant.

Strategies for Objective 5

Promote a strong science, technology, engineering, and mathematics (STEM) education base from elementary through secondary levels while preparing teachers in these grade levels to become more effective at improving student academic outcomes.

a) Increase collaboration with Colleges of Education and State Departments of Education in training of future teachers and in continuing education programs for current teachers.

b) Promote interaction of university faculty and space grant affiliates with K-12 schools, educators and informal education providers in STEM programs. These interactions should include teacher training workshops involving development and use of NASA relevant content to be infused into classroom settings and STEM curriculum support.

c) Continue and expand hands-on and team-oriented programs engaging K-12 students, educators and informal education organizations.

d) Seek and utilize funding from other federal and state agencies (in addition to NASA) to conduct K-12 STEM programs.

e) Conduct programs which bring K-12 students, educators, and informal education providers to space grant university campuses. Promote interaction between community and higher-education students and faculty.

Summary

- Space Grant has demonstrated strong national impact in crucial STEM engagement activities.
- Effective strategies for broadening this impact on students and the workforce have been developed.
- Six major actions have been identified.
  - A key factor in implementation: Increasing funding and funding stability.

Thank You

Backup Slides

NASA Strategic Plan Goals and Outcomes

Strategic Goal 5: Enable program and institutional capabilities to conduct NASA's aeronautics and space activities.

- Outcome 5.1: Identify, cultivate, and sustain a diverse workforce and inclusive work environment that is needed to conduct NASA missions.
  - *Objective 5*.1.2- Provide opportunities and support systems that recruit, retain, and develop undergraduate and graduate students in STEM-related disciplines.

NASA Strategic Plan Goals and Outcomes

Strategic Goal 6: Share NASA with the public, educators, and students to provide opportunities to participate in our Mission, foster innovation, and contribute to a strong national economy.

- Outcome 6.1: Attract and retain students in STEM disciplines along the full length of the education pipeline.
  - *Objective 6.1.1*- Provide quality STEM curricular support resources and materials
  - *Objective 6.1.2* Provide NASA experiences that inspire student interest and achievement in STEM disciplines

NASA Strategic Plan Goals and Outcomes

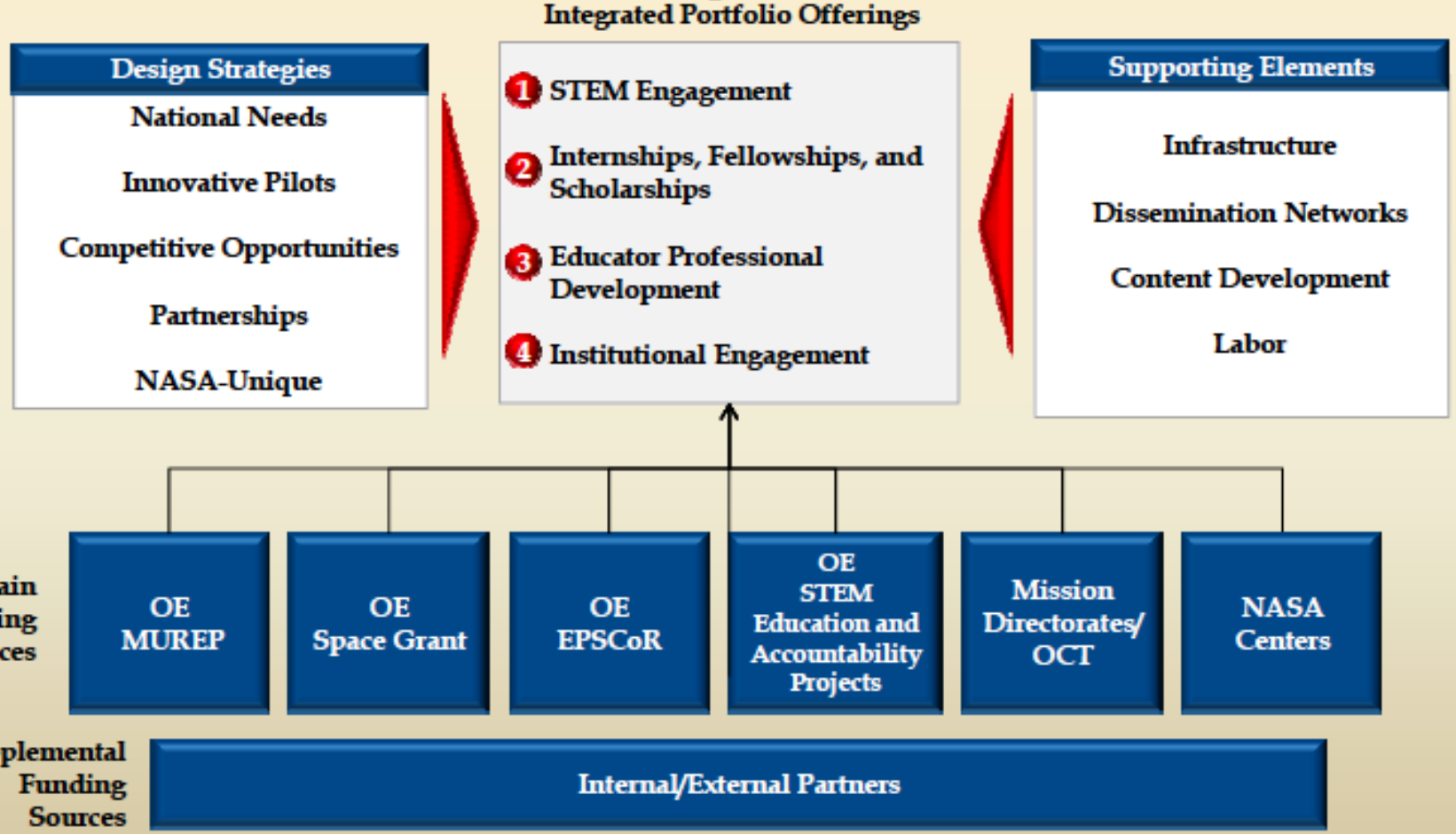
Strategic Goal 6: (Con't)

- Outcome 6.2 Build strategic partnerships that promote STEM literacy through formal and informal means.
  - *Objectives 6.2.1*- Develop NASA leadership role in national STEM improvement efforts, as demonstrated by provision of meaningful educator professional and student experiences, adoption of education technologies, and contributions to STEM education policies and strategies.
- Outcome 6.4: Inform, engage, and inspire the public by sharing NASA's missions, challenges, and results.
  - *Objective 6.4.1*- Use strategic partnerships with formal and informal educational organizations to provide NASA content to promote interest in STEM

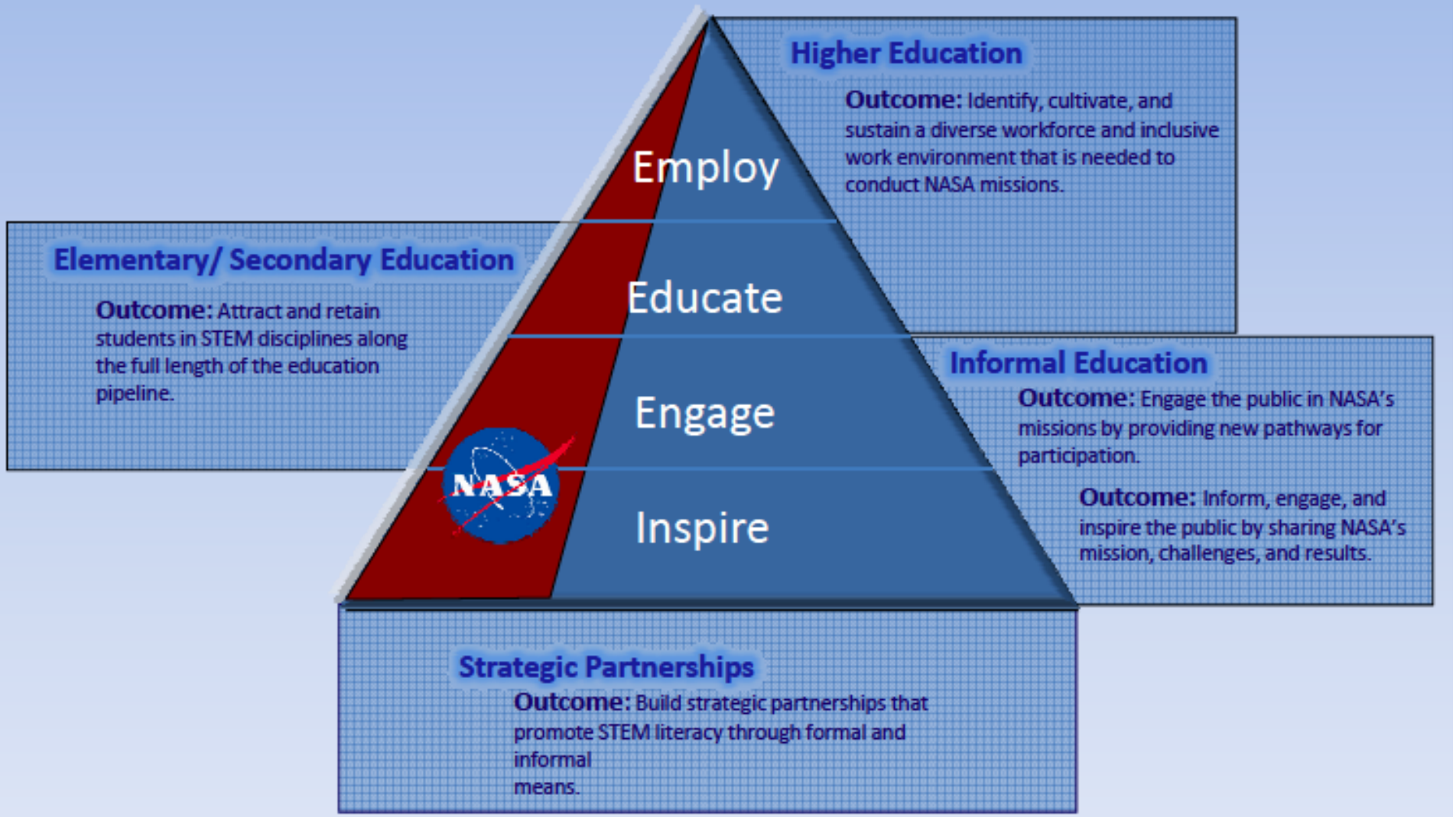
Portfolio Design Team

The portfolio offerings incorporate design strategies, supporting elements, and funding sources to offer a comprehensive portfolio that meets the Agency's priorities

Portfolio Development Architecture



STEM Education Framework



NASA Education Vision

*To advance **high quality** Science, Technology, Engineering, and Mathematics **(STEM) education** using **NASA's unique** capabilities.*