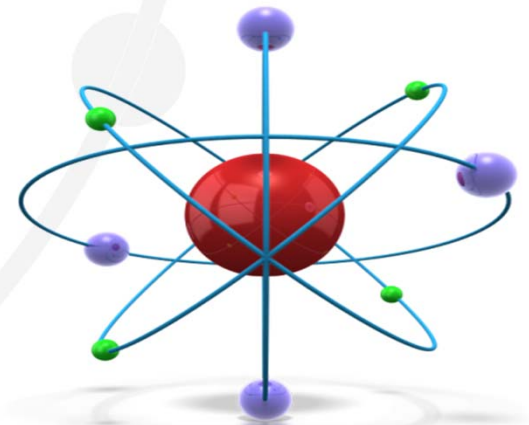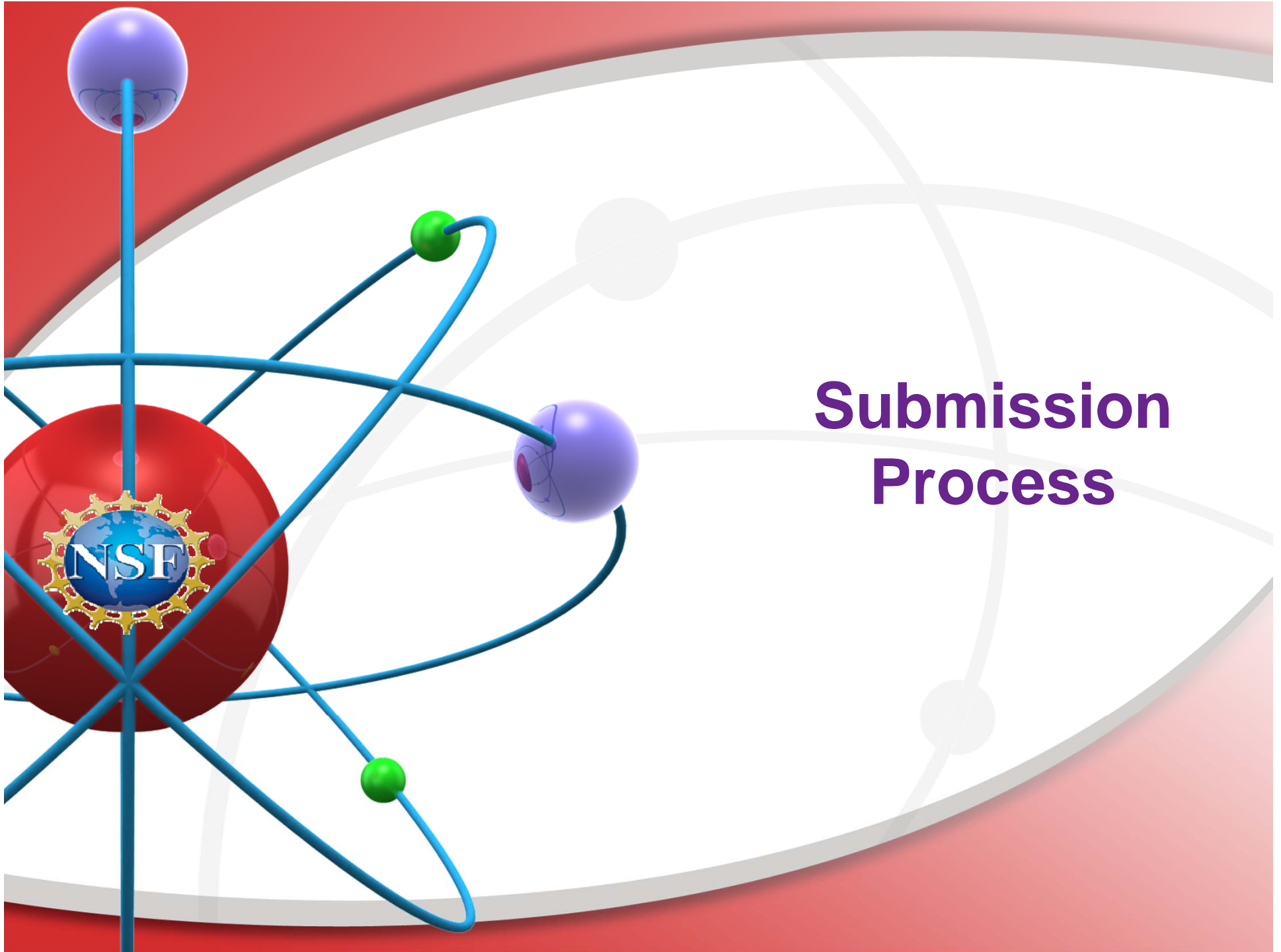# Webinar 102

More About Submitting Competitive Proposals

Advancing Informal STEM Learning (AISL)

AISL SOLICITATION (#13-608)

SESSION AGENDA

❖ Submission Process: Key Issues

❖ Review Process: What happens after I submit my proposal?

❖ Project Types: Examples

❖ Common Guidelines: Getting started

❖ Questions

❖ Resources

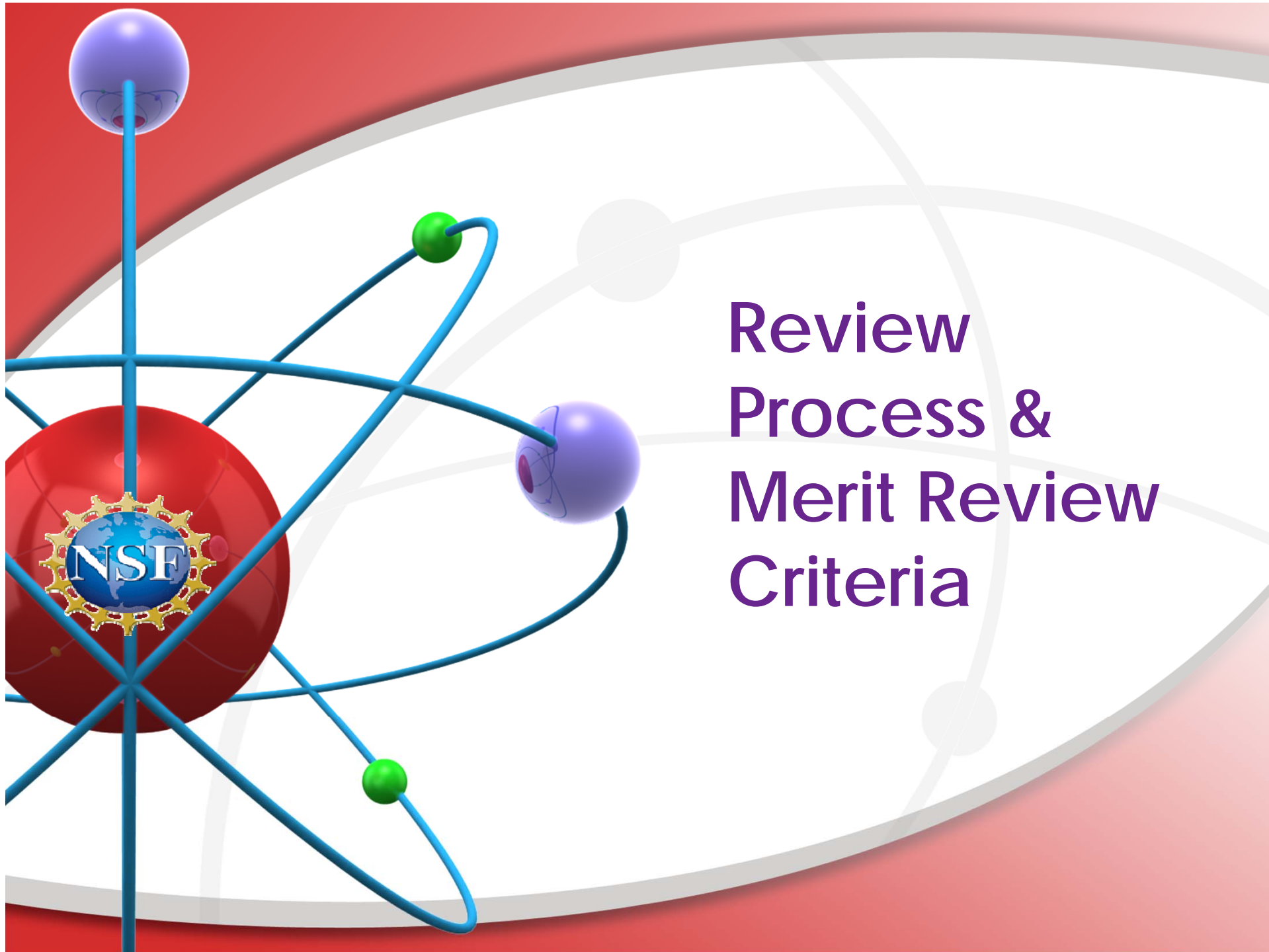# Submission Process

Key Things To Keep In Mind

❖ Submit Proposals Early

❖ NSF FastLane/Grants.gov Registration

❖ Electronic Signed Cover Sheets

❖ Project Reports/Project Outcomes Reports

Review Process & Merit Review Criteria

Proposal Review Process

❖ Proposals are reviewed in panels with a range of external experts (e.g. educational researchers, content experts, educators, developers.

❖ Each proposal will have about 4 reviews.

❖ Each reviewer rates each proposal as Excellent, Very Good, Good, Fair or Poor

Proposal Review Process

❖ The panel writes a summary of the reviews and ranks the proposal as highly competitive, competitive or non-competitive.

❖ This is advisory to NSF.

❖ Proposals with no ratings above Good may not be discussed in panel.

Proposal Review Process

- ❖ HC proposals are rare; only some of the proposals rated as "highly competitive" are funded.

- ❖ AISL POs meet as a group to review and provide feedback to the cognizant PO for HC proposals.

- ❖ PIs of proposals that are being considered for funding are typically asked questions via email related to reviewer concerns.

- ❖ PIs may also be asked to make budget revisions.
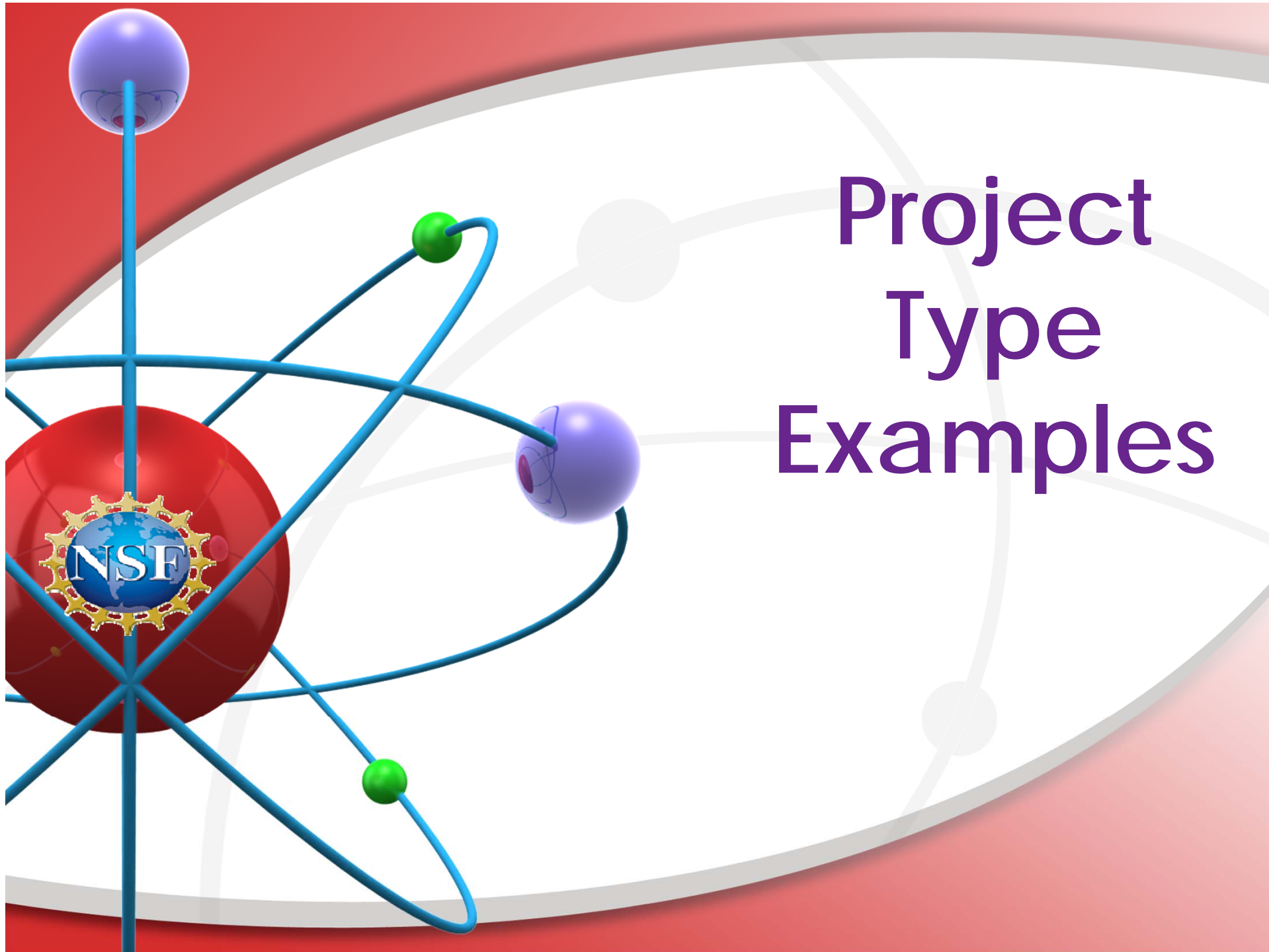
Proposal Review Process

❖ For all proposals, program officers write up an internal review analysis.

❖ PO recommendations are reviewed at higher levels within EHR.

❖ If a project is recommended for award, the proposal is sent to NSF's Division of Financial Management, where the budget & financial management are reviewed.

❖ Only DGA can make the final decision for a grant award.

Proposal Review Process

❖Once a grant award is made, there are several reporting requirements.

❖POs review your project performance via annual reports and other contact.

❖If you are the PI of an award, you should certainly communicate with your PO about significant project developments or issues.

❖The CAISE website (informalscience.org) has a variety of resources that support PI project management and evaluation.

Evaluation & External Review

Evaluation & External Review processes are to:

1. Ensure that projects get appropriate, rigorous input throughout the life of the project so that the research and development components of the project are actively improved as a result.

2. Ensure there is accountability: The federal govt is funding you to enact as specific project—Did you end up meeting the goals of your project? What was the quality of your work?

3. all projects must build knowledge—advance the field through research, evaluation, or a hybrid. There are as many permutations as there are proposals.

Most critically, each PI team figure out what makes the most sense to meet their project's goals and include a clear design and description of an evaluation and external review plan in their proposal.

As a reminder, the Evaluation & External Review criteria have been updated for the 13-608 solicitation. Think about these criteria in relationship to the examples.

A Clarification about the Examples

❖ The AISL awards included as examples in this presentation are illustrative of various ways PIs have addressed issues related to proposal development.

❖ We have chosen these award because we think that they--although written for another solicitation--may help potential PIs think about the similarities and differences among the five project types as well as components of proposals.

❖ **These are NOT exemplars**; nor are they the only or necessarily the best ways to address project design issues.

❖ Please consider them in the manner in which they are included: as illustrative of issues that need to be addressed and ways some PIs have thought about addressing them.

Pathways

❖ Exploratory development work or feasibility studies

❖ Should lead to field-advancing proposals of other project types

❖ Should produce evidence, findings and/or deliverables that form basis for further work

❖ Should state how project informs future work & advances field

❖ Funding up to $300,000 (duration up to 2 years)
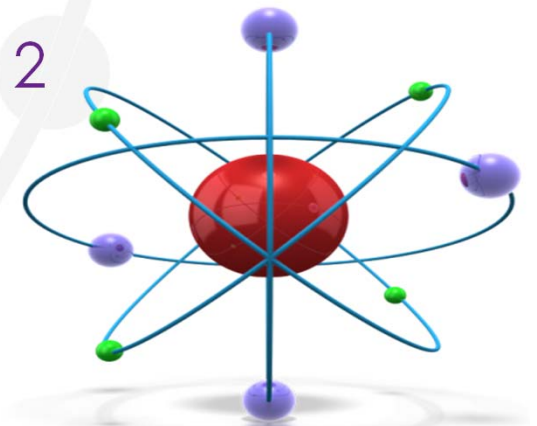
Developing a Citizen Science Program Model to Engage Underrepresented Minority Groups (1324962)

❖ Project Rationale/Purpose:

  ❖ Conduct initial testing of a citizen science model designed to specifically engage and sustain participation by youth and families from communities underrepresented in STEM. The model components are based on extensive review of practice and literature.

  ❖ After this initial testing and analysis of components, a more robust model would be developed and implemented as a larger project.

❖ Project Design:

  ❖ Includes specific ways for community participants to increase responsibilities through continued participation.

❖ Dissemination Plan:

  ❖ White paper; presentations to similar projects and community groups

❖ Evaluation & External Review

  ❖ External evaluator examines components of the model to begin to identify which components may affect: levels of participation, retention in program, and learning of STEM principles

This example is NOT an exemplar. It is included only to illustrate issues related to proposal development.

Apprenticeships in Sustainability Science and Engineering Design (1323804)

❖ **Project Rationale**

  ❖ To understand how to motivate and prepare at-risk youth for careers in green technology and determine the extent to which digital-storytelling can increase youths' proficiency in STEM, content knowledge and practices.

  ❖ The apprentice model is one that is used successfully with undergraduates, the project is investigating its applicability to high school aged students.

❖ **Project Design**

  ❖ Compares learning outcomes for youth assigned to 1 of 2 engineering apprenticeship programs: (1) design-build and (2) digital-storytelling about the design-build experiences. Uses a tiered apprenticeship model where youth move from less to more active roles in developing designing sustainability projects.
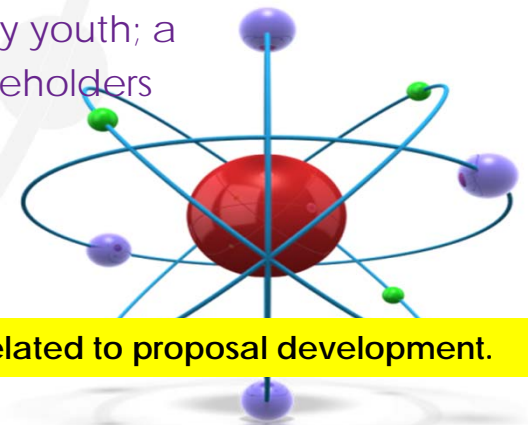
❖ **Dissemination Plan**

  ❖ Public screenings and facilitated discussions of the films created by youth; a project portal to keep participant, community, and university stakeholders connected; presentations and publications

❖ **Evaluation & External Review**

 ❖ External evaluator and an external advisory board

Research in Service to Practice

- ❖ Advances knowledge & <u>provides evidence base for practice</u>

- ❖ Primary focus on research questions

- ❖ Qualitative or quantitative data (evidence) and involve range of techniques

- ❖ Can also be syntheses or meta-analyses

- ❖ Includes literature review & detailed research plan

- ❖ Researchers and practitioners are close collaborators

- ❖ Funding from $300K to $2 million for 2-5 years

17
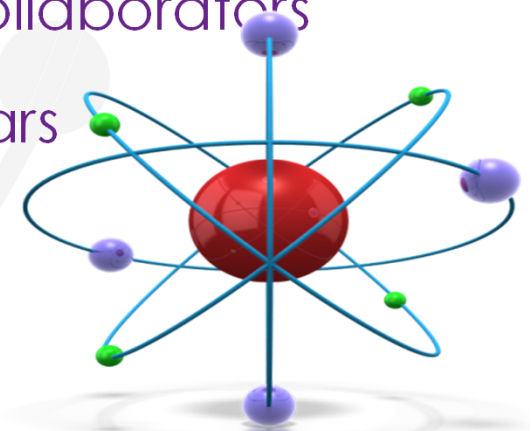
DEVISE: Developing, Validating, and Implementing Standardized Evaluation Instruments (1010744)

❖Project Rationale

- ❖ Develop validated evaluation tools for use by citizen science projects.
- ❖ Design tools around the range of impacts outlined in the new Framework for evaluating ISE projects
- ❖ Tools can also be useful in researching impacts of public participation in scientific research

❖Project Design

- ❖ Develop evaluation tools
- ❖ Develop an evaluation toolkit including validated evaluation tools

❖Evaluation and External Review

- ❖Advisory Board that meets (2 days/year) with project team and works through various issues
- ❖External evaluator

Making Connections: Exploring Culturally-Relevant Maker Experiences through an Iterative, Cross-Institutional Approach (1323584)

❖ Project Rationale

  ❖ Design-based research study to examine how community engagement techniques can be used to co-design and implement culturally-relevant marketing, activities, and events focused on Making that attract families from underrepresented audiences and ultimately engage them in meaningful informal STEM learning

❖ Project Design

  ❖ 3 phases of research designed to answer:

    1) what families do while they are at the museum,

    2) how and why they choose to engage in Making activities, and

    3) whether and how museum visits potentially influencing children's interest and participation in STEM.

❖ Evaluation & External Review

  ❖ An evaluator who serves as an external check of quality for accountability

  ❖ Three research advisors with expertise in different areas: methods, engagement, and learning.

This example is NOT an exemplar. It is included only to illustrate issues related to proposal development.

Innovations in Development

- ❖ Builds knowledge through the development of innovative products

- ❖ Builds on evidence from prior practice & research

- ❖ Describes an explicit theory & logic model/theory of action

- ❖ Includes plan & process for design, development & implementation

- ❖ Includes plan for knowledge building through research and/or evaluation

- ❖ Funding: $500K to $3 million for 2-5 years
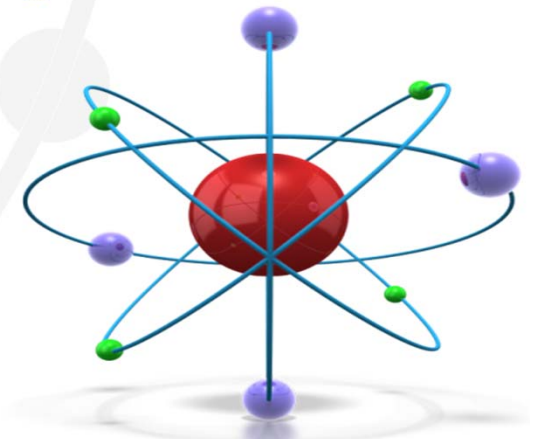
Collaborative Research Advancing Informal STEM Learning Through Scientific Alternate Reality Games (1323306)

- ❖ Project Rationale
  - ❖ Main goal = help realize the potential of large-scale Alternate Reality Games (ARGs) as effective tools STEM learning and positive engagement.
  - ❖ ARGs are an emerging genre of interactive, transmedia storytelling that support collaboration, sense-making, information synthesis, and problem solving
  - ❖ Builds on an NSF EAGER grant that demonstrated the value of ARGs as learning tools
- ❖ Project Design
  - ❖ ARGs co-created with teens using iterative development and prototyping process; includes ongoing evaluation. Content then repurposed for use in/with museum audiences, libraries, and afterschool programs
  - ❖ Research study about strategies for making ARGs transformative and replicable informal STEM learning tools
- ❖ Dissemination Plan
  - ❖ Crowd-source model for attracting audience to project; workshops held with museum staff, librarians, and formal educators; research papers, presentations, and evaluation & technical reports
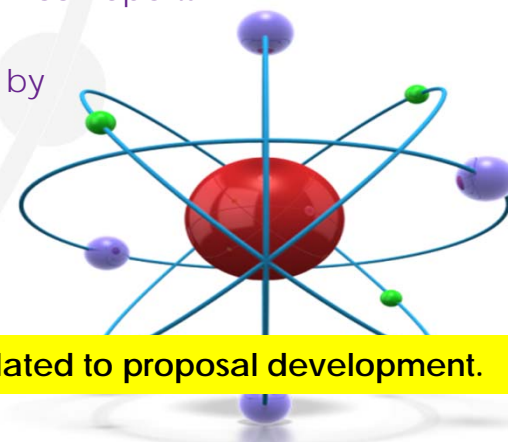- ❖ Evaluation & External Review
  - ❖ Independent evaluation of the impact of each ARG on the stated outcomes by an external Advisory board with varied expertise
- ❖ Management Plan
  - ❖ Archive public web content, including in-game websites; data files and associated metadata accessible via digital repository hosted by the partner university

Designing Our World: A Community Envisioning Girls as Engineers (1322306)

- ❖ Project Rationale
  - ❖ Leverage an existing exhibit, girls' activity groups, and social media to enhance participants' engineering-related interests and identities.
    - ❖ Focuses on understanding the development of engineering-related identity
  - ❖ Clearly builds on previous practice, funded awards, and literature
- ❖ Project Design
  - ❖ 1) connecting adult stakeholders to change messages girls receive about engineering, 2) creating innovative community-based programs to complement an engineering exhibition transformed into a hub for engaging community around girls' STEM-identities, and 3) leveraging these to research girls' engineering-related identities.
- ❖ Evaluation & External Review
  - ❖ External evaluators for evaluation and research oversight
  - ❖ Advisors for various aspects of the project
- ❖ Management Plan
  - ❖ Diverse expertise: team of educators, researchers, exhibition people, cyberlearning professionals

This example is NOT an exemplar. It is included only to illustrate issues related to proposal development.

Broad Implementation

- ❖ Expands models, programs, technologies, assessment or other advances that have documented record of success

- ❖ Expands reach: age, gender, geography, etc.

- ❖ Includes plan & process for design, development, & implementation

- ❖ Builds knowledge through research and/or evaluation

- ❖ Funding $500K to $3 million for 2-5 years
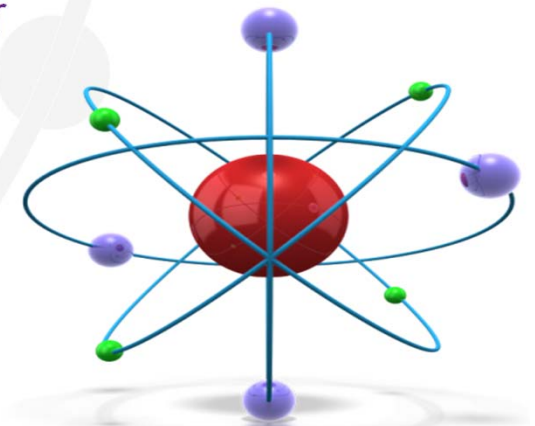
TechBridge (1323776)

❖ **Project Rationale**

  ❖ Increase girls' engineering, technology, science skills and interest in STEM careers

  ❖ Advance research on the scale-up, sustainability and impact of the model

❖ **Project Design**

  ❖ Model includes five previously evaluated components: curriculum, career exploration, PD for staff & teachers, family engagement, and dissemination

  ❖ Project deliverables include expansion of model to 3 cities, 24 school sites, and 200 participants

  ❖ Research will study: to what extent to new sites model program; does project have similar impacts on participants and are these impacts sustained; do new sites maintain high quality of delivery

❖ **Evaluation**

  ❖ Quasi-experimental design will investigate project outcomes, including looking at factors related to the effectiveness of scaling, organizational impacts, capacity building, sustainability and replication potential

Peep's World/El Mundo de Peep (1222607)

- ❖ Project Rationale
  - ❖ Summative evaluation from previous work documents that when presented with materials, children who watched PEEP were significantly more likely to initiate a question(science inquiry skill) for exploration.
  - ❖ Create PEEP'S WORLD/EL MUNDO DE PEEP, a Web-based "Digital Hub," in both English *and* Spanish, that will maximize the extensive collection of proven and award-winning preschool science and math assets
  - ❖ Impacts: (1) help English- and Spanish-speaking preschoolers effectively apply science and mathematical inquiry and process skills; (2) empower English- and Spanish-speaking parents…
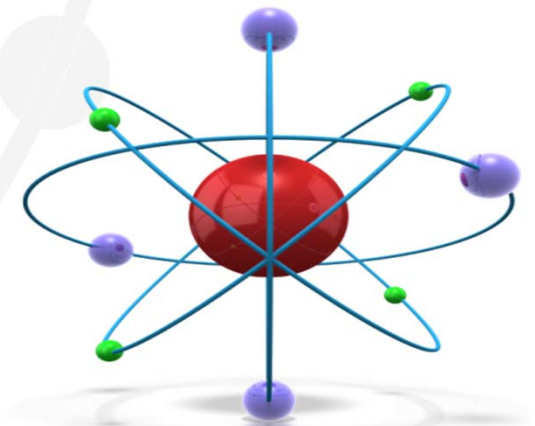- ❖ Project Design
  - ❖ Conduct a formative evaluation of the family childcare educator resources.

Conferences, Symposia & Workshops

- ❖ Relate to AISL program goals

- ❖ Focus on development of communities of practice, field-advancing practice, assessments, & research agendas

- ❖ Proposals request >$50,000, due on deadline

- ❖ Proposals up to $50,000 may be submitted at any time

21st Century Learning in Natural History Settings: A Conference to Initiate Research-Driven Innovation in Informal Natural History Learning (DRL-1100810)

Project Rationale/Purpose:

- 3-day national conference
- to develop collaborative learning **research agenda** on natural history learning and
- to establish **an infrastructure** for communication and collaboration to pursue the research agenda.

- **Project Design**:
  - Workshop with scientists and educators from 20+ museums
  - Pre-meeting conference participant calls & presentations;
  - Post-meeting agenda writing
- **Dissemination Plan**: Conferences, publications
  - Watson and Werb. 2013. "One Hundred Strong," *Curator* (56, 255-265)
- **Evaluation & External Review**
  - Advisory board: scientists, educators, exhibition people, learning researchers, etc.
  - External evaluator

Common Guidelines for Educational Research and Development

NSF 13-126 - Joint effort between NSF and the Institute for Education Sciences at the U.S. Department of Education
http://www.nsf.gov/pubs/2013/nsf13126/nsf13126.pdf?WT.mc_id=USNSF_124
NSF 13-127 - Set of FAQs
http://www.nsf.gov/pubs/2013/nsf13127/nsf13127.pdf

Why do we need "Common Guidelines?"

- ❖ The American education system needs stronger evidence provided at a faster pace

- ❖ More constrained federal resources demand that NSF and ED purposefully build on each other's research and development portfolios

- ❖ A cross-agency vocabulary and set of research expectations is critical for effective communication

What do we mean by "Common Guidelines?"

A cross-agency framework that describes:

- ❖ Broad types of research and development

- ❖ The expected *purposes*, *justifications*, and *contributions* of various types of research to knowledge generation about interventions and strategies for improving learning

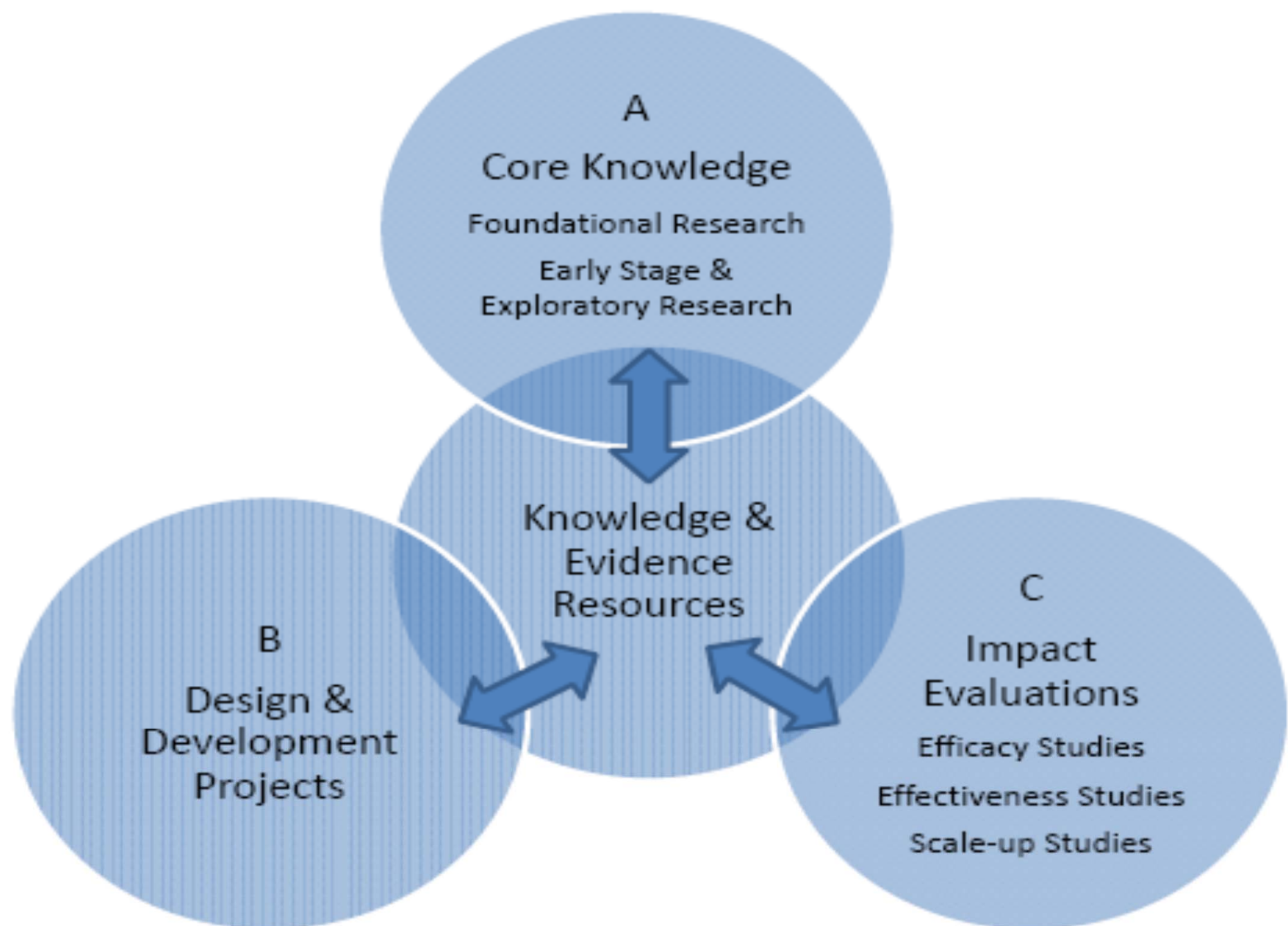# Implications for Decision-Making Within Each Agency

- ❖ Guidelines will inform decision-making for agencies (individually and jointly) across different topic areas
- ❖ Analyze the developmental status of awards and progress within various portfolios
- ❖ Identify areas of education research and development needing additional resources/emphasis
- ❖ Help ensure that agencies fund robust research and development efforts

Implications for Practitioners & Peer Reviewers

- ❖ Guidelines provide guidance regarding what high-quality research design looks like

- ❖ Guidelines can help the field develop a better understanding of stages of education research, what they address and might be expected to produce

- ❖ Guidelines can help conceptualize & communicate how the proposed R&D fits into a broader evidence-building agenda

A
Core Knowledge

Foundational Research

Early Stage &
Exploratory Research

Knowledge &
Evidence
Resources

B
**Design &
Development
Projects**

C
**Impact
Evaluations**

Efficacy Studies

Effectiveness Studies

Scale-up Studies

Do the Guidelines preclude or privilege any research methodologies?

❖No. The Guidelines do not preclude or favor any research methods, but they do underscore the importance of ensuring that the methods are well described, justified, and appropriate to the research questions that are posed.

❖Qualitative and quantitative approaches may be used in all of the six research genres that are described in the Guidelines.

What should I know & do about the Common Guidelines now?

❖ The Common Guidelines influenced the development of solicitation 13-608, particularly **3. Project Description (Narrative)** (pg. 7-9).

❖ Read the Common Guidelines. Get to know them. Discuss them with colleagues. They will likely become more and more important in future solicitations.

CAISE: InformalScience.org

❖ InformalScience.org website: redesigned and now compiles a large number of previously independent websites.

❖ Resource for potential AISL PIs: http://informalscience.org/nsf-aisl (or just look for NSF AISL in the upper middle on the informalscience.org homepage).

❖ Midway down the NSF AISL page is **Resources for Working with National Science Foundation Support**, which includes many evaluation resources as does http://informalscience.org/evaluation/evaluation-resources

❖ There are other proposal related resources, including CAISE-produced ones at http://informalscience.org/about/informal-science-education/resources.

NSF Resources for PIs

❖ What has AISL funded?
http://www.nsf.gov/awardsearch/

   ❖ Put in AISL to see the vast range of what has recently been funded or just click on the link from the AISL webpage:
http://www.nsf.gov/funding/pgm_summ.jsp?pims_id=504793

   ❖ Also try key words related to your proposal topic/area; there are many search options to explore

❖ NSF Grant Proposal Guide (GPG) is very helpful as are FAQs: http://www.nsf.gov/bfa/dias/policy/

   ❖ IRB and other information is also on this page.

Final Suggestions

- Submit early

- Spell check; Check **grammar & punctuation** (professional editor?)

- Talk early with Program Officers (POs); email

  DRLAISL@nsf.gov

- **Post Submission**: Take follow-up questions from NSF seriously

Reviewing for NSF?

Interested in Serving as A Reviewer:

❖ *Experience the Proposal Review Process*

❖ *Serve as a Content/Field Expert*

❖ *Contribute To Funding Decisions & Field Advancement*

Additional questions or interest in in being a reviewer:
DRLAISL@nsf.gov