Creating, Re-Designing Professional Learning Experiences for Teachers and Museum Educators: Creating Collaborations, Utilizing Best Practices

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DENVER MUSEUM OF NATURE & SCIENCE

WADE INSTITUTE FOR SCIENCE EDUCATION

The Tech Interactive

Informals:

- Provide content resources
- Share innovative use of technology
- Access to real time data
- Model application of science to the real world
- Provide hands-on, investigative learning opportunities
- Provide educators with rich learning experiences they can translate into classroom instruction
- Engage educators in the Science and Engineering Practices
- Offer resources and programs to support implementation of the NGSS in the classroom
- Link educators to community resources
- Extend learning outside the traditional classroom providing instruction that complements classroom learning
- Engage teachers and students in exploring STEM-related careers

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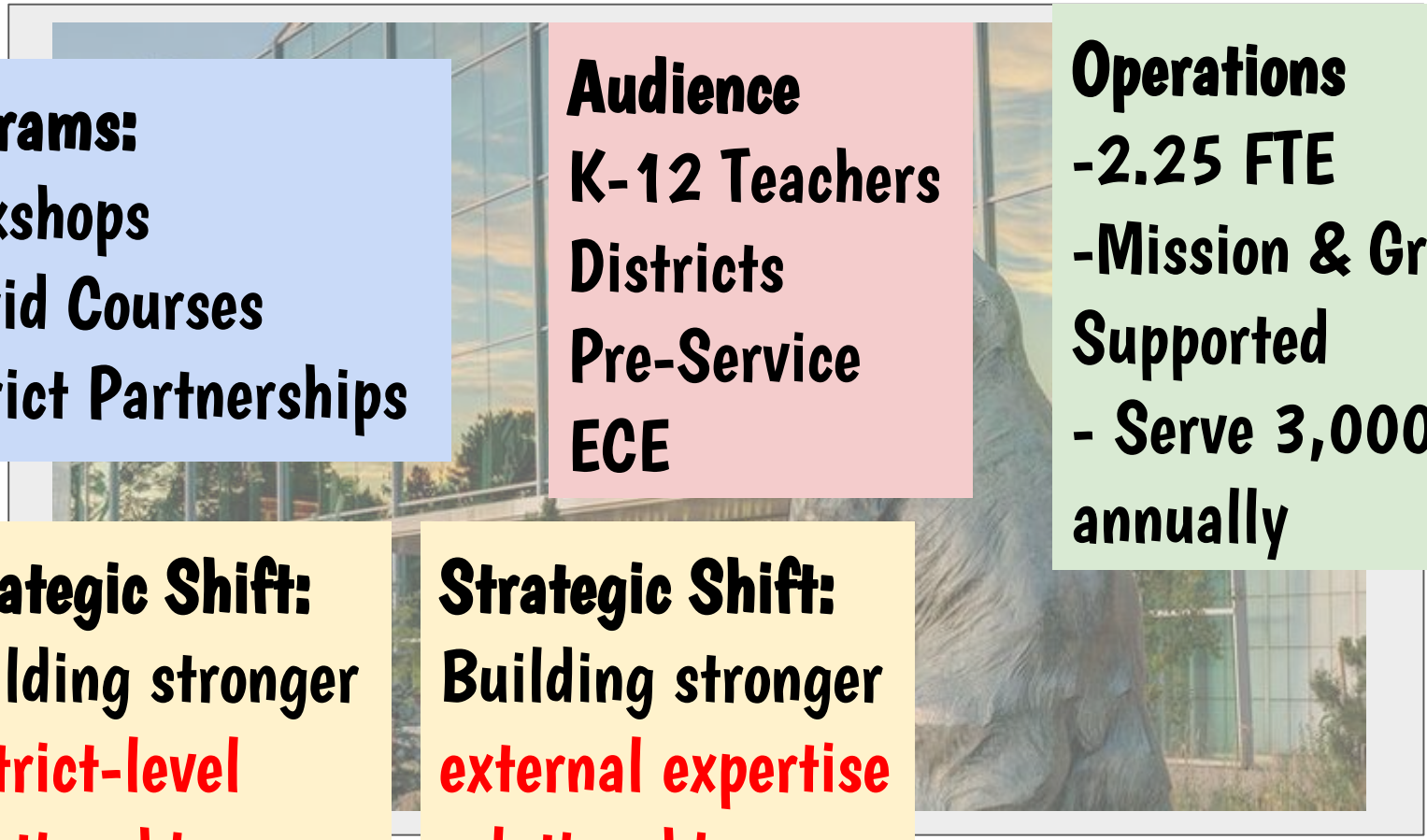

Programs:
Workshops
Hybrid Courses
District Partnerships

Audience
K-12 Teachers
Districts
Pre-Service
ECE

Operations
-2.25 FTE
-Mission & Grant Supported
- Serve 3,000+ annually

Strategic Shift:
Building stronger
district-level
relationships

Strategic Shift:
Building stronger
external expertise
relationships

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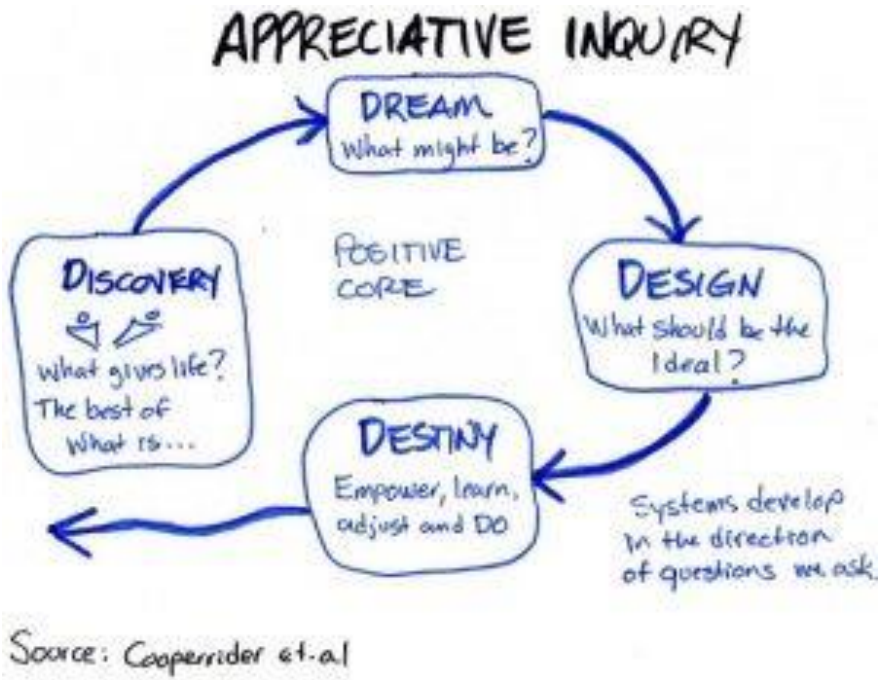
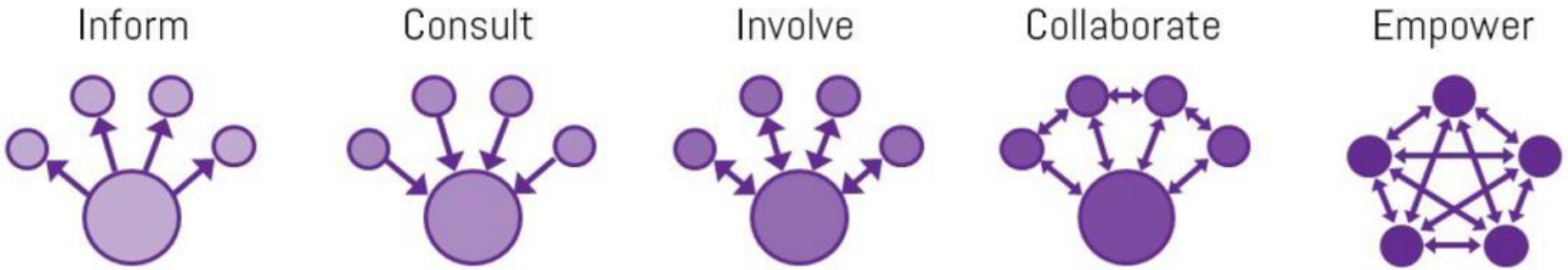


For more: Center for Appreciative Inquiry:
https://www.centerforappreciativeinquiry.net/more-on-ai/the-generic-processes-of-appreciative-inquiry/

Our Commitment to Community Engagement

- We value and prioritize lived experience and community voice.
- We commit to full transparency and accountability.
- We acknowledge that there are historical, institutional, systemic and structural barriers that perpetuate inequity which has silenced community voices over time.
- We commit to partnership in the co-creation and co-ownership of solutions and projects.

COMMUNITY ENGAGEMENT SPECTRUM



Exchange of information, ideas, and resources.
Exercise power at different levels.
Collaboration and contribution in the decision-making

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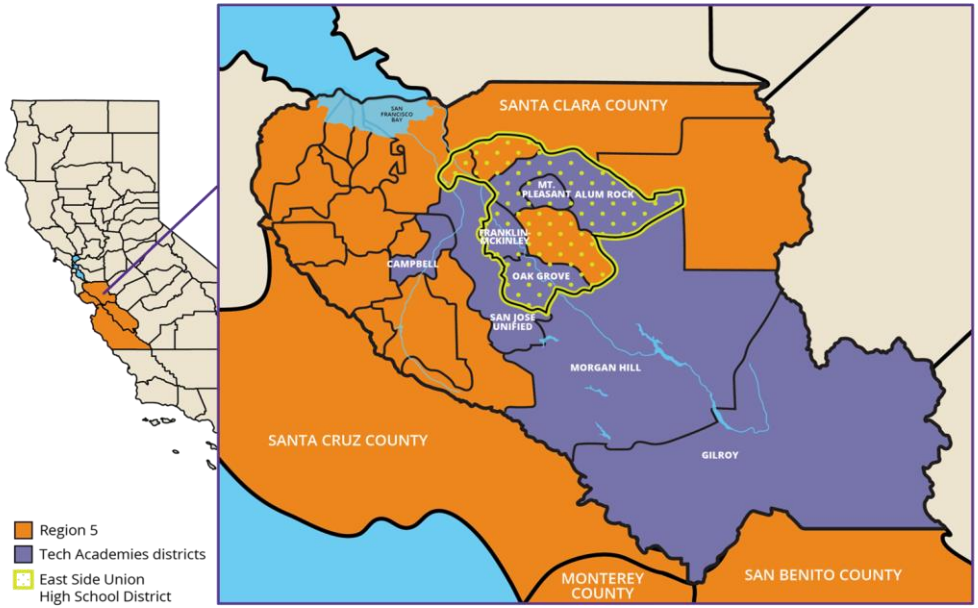
Deep Local and Global

A tale of two methods

The Bowers Institute

Tech Academies Fellowship Districts

The Tech Academies Fellowship Program is a partnership between The Tech, San Jose State University and partner school districts in San Jose and south county and their expanded learning (after-school) programs.



- Alum Rock Union School District
- Campbell Union School District
- Campbell Union High School District
- East Side Union High School District
- Franklin-McKinley School District
- Gilroy Unified School District
- Morgan Hill Unified School District
- Mount Pleasant Elementary School District
- Oak Grove Elementary School District
- San Jose Unified School District

Tech Academies Two-Year Fellowships

40 educators **(K-12)** selected yearly for the two-year fellowship.

Year 1	Year 2
Focus: **Engineering integration** into instruction	Focus: **Leadership development, Model site**, systems to **expand/sustain**
• 4 Community of Practice meetings • Observe an engineering lesson with students. • Try engineering lessons with students.	• Two-week Summer Institute (ME or SE) • 4 Community of Practice meetings • Co-facilitate one Community of Practice. • Support others in the district with engineering instruction.

Supports focus on:

Engineering Design Process and Problem Solving Skills

NGSS and CCSS alignment and integration

Mechanical engineering and hands-on building

Software engineering and coding

21st century skills

Tech Academies impact

Our train-the-trainer model triples our impact, reaching over 1,500 educators and more than 115,000 students!

	2015	2016	2017	2018	Total
Tech Academy Participants	41	102	96	95	334
EEL/SEEL-led PD	NA	377	422	421	1,129
Total Educators	41	479	518	516	**1,554**
Students Impacted	1,055	14,718	18,773	25,833	**60,379**
Lesson Downloads	159	482	651	157	1,449
Students Impacted	6,300	13,294	28,510	8,020	**56,124**

TOOLS for Districts

Define STEM	Develop strategy	Implement
Your STEM vision and shared definition for all students	**Your STEM integration strategy with stakeholder inputs**	**Your STEM implementation plan across the district**
OUTCOMES		
Create a vision and shared definition for STEM education district-wide	**Design a STEM integration strategy**	**Identify one grade level to pilot the strategy**

Let’s Scale It!

Why do you want to scale?

- Increase Impact! Put our IP to good use!

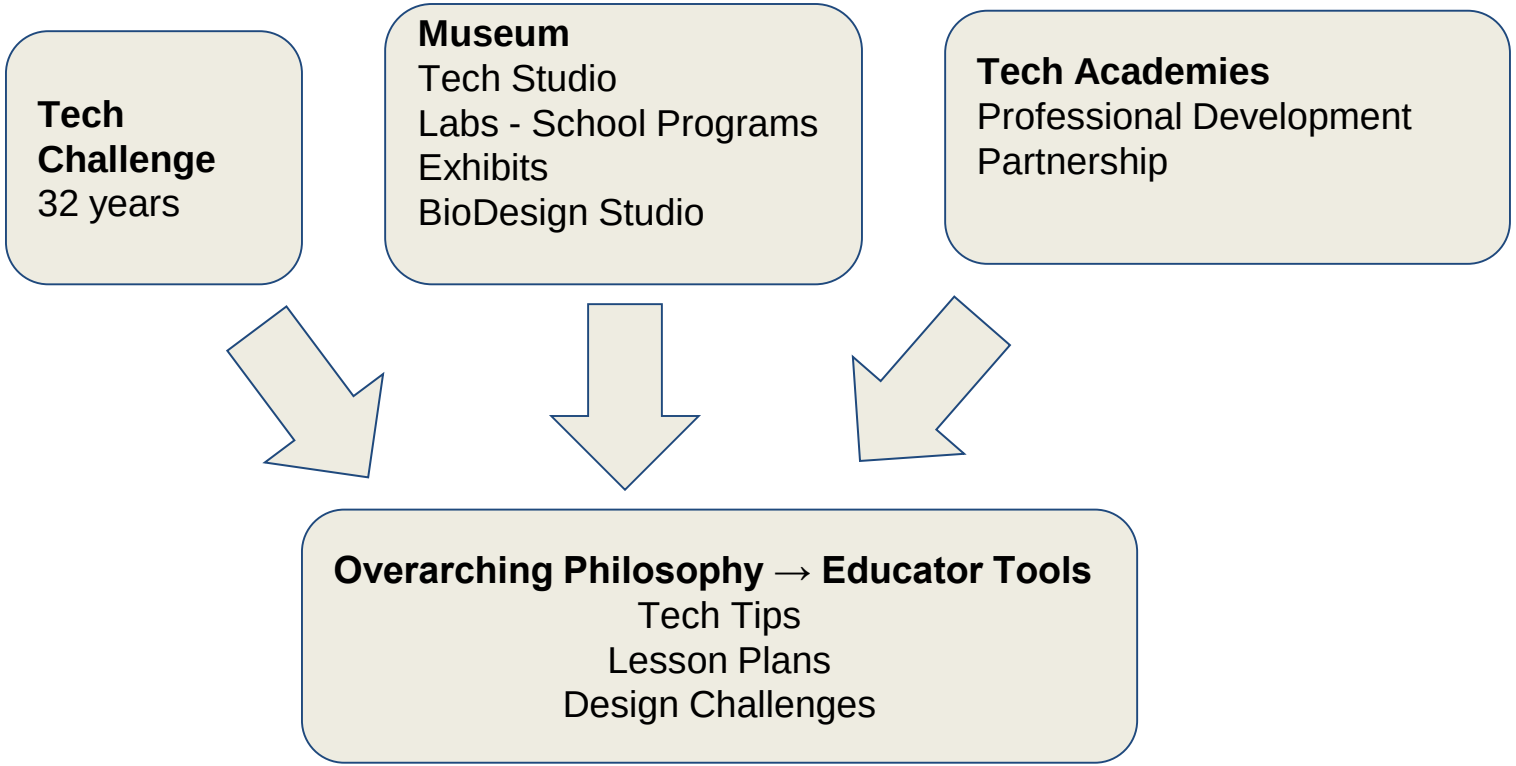
What do you want to scale?

- Yes!

Where do you want to scale?

- Yes!

Scaling - Tools for Educators



Online Tools - Hooray!

The Tech Interactive

Buy tickets IMAX Become a member

- Custom Professional Development & Events
- Field Trips
- Educational IMAX Films
- Science Labs
- Innovation Labs
- The Tech Academies
- Tech Academies Fellowship
- STEM Pathways
- Our impact
- The Tech Challenge

What is Design Challenge Learning?

Design Challenge Learning is a dynamic way for learners to become creative problem-solvers. Design challenges use real-world problems to engage learners in an iterative and collaborative process to build innovator mindsets that are key to future success.

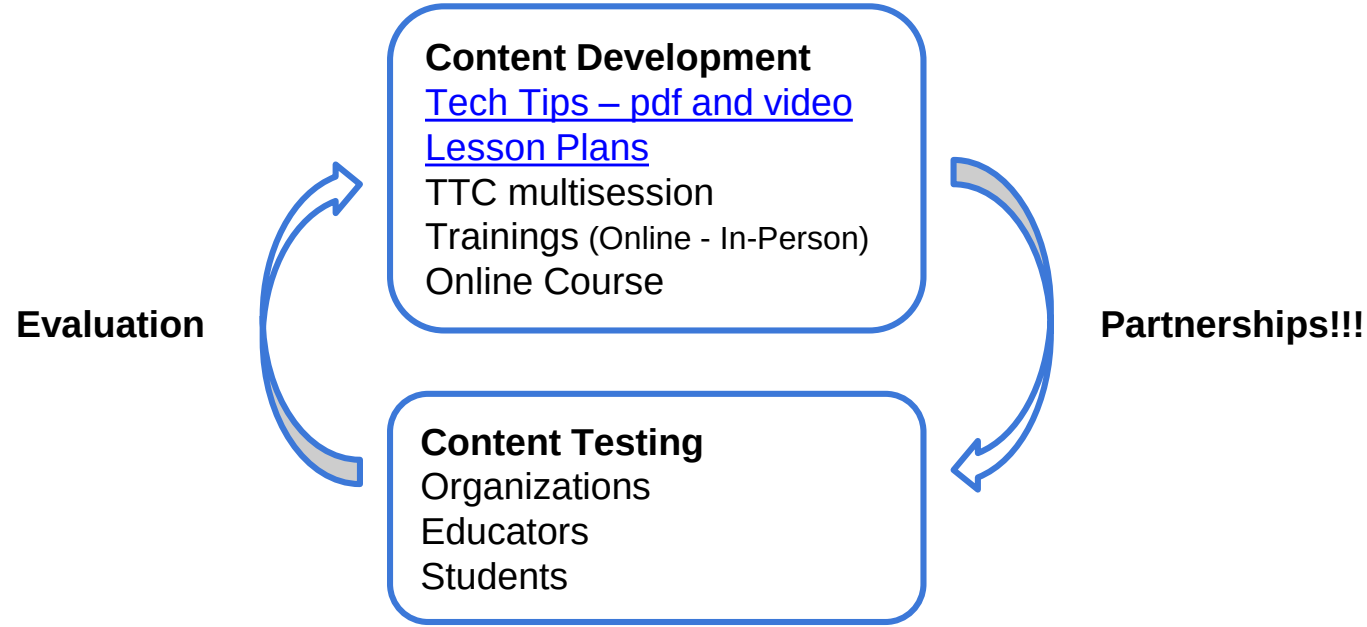
Design Challenges and Lessons

Our lessons integrate Design Challenge Learning and engineering practices across science, math and language arts curricula in both the classroom and out-of-school settings. Our single and multi-session lessons have real-world

Tech Tips

Created by educators, these short guides on facilitating design challenges, promoting engineering and fostering innovator mindsets are excellent references for both novice and experienced Design Challenge Learning educators.

DCL Educators Tools Scaling – FY19-20



Training Format

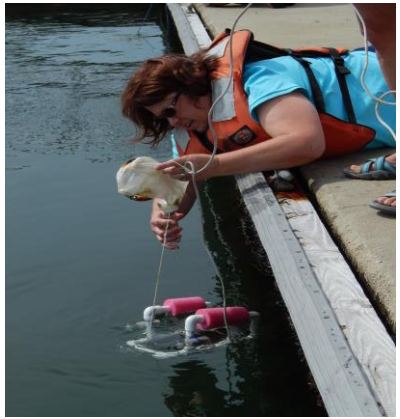
- Experience an engineering design challenge (physical build).
- Experience a TGG design challenge (systems challenge).
- Reflect on Facilitation Techniques.
- Create an Action Plan for incorporating Design Challenges into their Curriculum
- Follow up with remote support to ensure follow through on implementation and evaluation.

Funding/Business Models

Tech Academies: Contributed Revenue - funded for 10 year (4 years ago)

Scaling: Contributed Revenue → Contributed and Earned

Wade Institute for Science Education Professional Development Programs



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Our Mission

The Wade Institutes promotes and enables high quality, inquiry-based, hands-on science, technology, engineering and mathematics education by catalyzing collaborations of informal and formal education institutions.

Our programs connect classroom teachers and informal educators with science, technology and engineering content expertise, inquiry-based instructional methods, regional STEM resources, and peer learning communities.

We help educators discover first hand the value of minds-on, hands-on, inquiry-based learning and master innovative ways to spark students' curiosity for STEM.

Our Programs are Unique

We focus on science **content** as well as **pedagogy** so participants expand their science and engineering knowledge and they also gain the skills to effectively bring this knowledge into their classrooms and engage their students.

Our programs are always **partnerships** with local educational organizations, cultural institutions, institutions of higher education and STEM businesses and industries as well as STEM researchers and professionals.

Professional Development Learning

Our Mission

The Wade Institute's mission is to foster minds-on, hands-on inquiry-based science education.

What We Do

Our programs connect classroom teachers and informal educators with science, technology and engineering content expertise, inquiry-based instructional methods, regional STEM resources, and peer learning communities.

How We Do It

We accomplish this through developing collaborations of museums, science and technology centers, STEM businesses, colleges and universities and other non-profit organizations to provide professional development courses and programs for K-12 educators.

Programs

- Customized Professional Learning Services at the District/School Level
- Professional Development Seminar Series
- Focus Workshops
- Professional Development Institutes for K-12 Educators

Professional Development Institutes

Engage teachers in an exciting professional development experience that leads to their understanding and being comfortable using inquiry-based, hands-on, minds-on pedagogy to teach STEM activities in their classroom. They include one-week, hybrid, two–week graduate courses during which teachers work with educators from 3-5 collaborating institutions, experiencing inquiry learning, exploring local resources, and expanding their science content knowledge.

Customized Professional Learning Programs

Tailored to needs of schools and school districts. Programs bring science content and educational expertise directly to schools and school districts and include multiple contact points.

Focus workshops

Two-day professional learning opportunities that provide a deep dive into content and inquiry with investigations focusing on one stem discipline. These workshops are offered in collaboration with 1 or more partner institutions.

Yearly Reach

Focus Workshops	60 teachers
Customized Professional Learning Services	500 teachers
Professional Development Institutes	125 teachers

Funding Sources

- User Fees
- Grants
- Contractual with school/school districts
- Corporate Support

Collaborations Develop Relationships with schools, community and each other because they . . .

- Provide content resources
- Give teachers access to local researchers
- Offer opportunities for student involvement in citizen science
- Give teachers the resources to bring application of science to the real world into their classrooms
- Engage teachers in hands-on, investigative learning opportunities that can be translated into the classroom
- Connect teachers to local community resources to support implementation of the standards and SEPs in the classroom

- Extend learning outside the traditional classroom, providing instruction that complements classroom learning
- Engage teachers and students in exploring STEM-related careers

Best Practices for Professional Development Programs

- Long-term, sustained and intensive
- Integrates content and pedagogy
- Modeling of teaching strategies
- Models and engage teachers in instructional practices that support learning
- Connects to classroom practice and include supports
- Connects to standards/frameworks
- Incorporates the Science and Engineering Design practices and learning progressions
- Establishes a supportive culture
- Provides models for adapting materials and teaching effectively with them
- Creates opportunities for teachers to share/network/work collaboratively
- Embraces online technology

- Shares local and regional resources for teachers and classrooms
- Clarifies objectives and regularly points out where participants are in the process
- Structured but adaptable facilitation
- Provides opportunities to reflect on learning
- Participants move between roles as “adult learners” and that of “teachers”
- Participation and/or support of school leadership
- Provides continued support during and after PD session(s)
- Facilitators debrief, use tools for surfacing participants learning
- Provides feedback loop for both participant and PD provider
- Provides professional learning points and/or graduate credit
- Recognizes that teachers have different backgrounds and learning needs
- Is off sufficient depth to be meaningful
- Includes discussion of what participants experienced and its implications for their own classrooms

Break Out Groups – Tools Focus

- Planning Professional Development Programs and Partnerships
- Community Engagement
- Evaluation Planning and Integration

Three Rotation (10 minutes each)

Closing Thoughts - Lessons Learned

- Listening to needs and following best practices.
- Staying true to your mission and strengths
- Setting expectations within your organization (and with funders) regarding change.

Thoughts - Questions

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