



Lessons Learned from Graduated Nanoeducation Efforts

**2011 National Science Foundation Nanoscale
Science and Engineering Grantee Conference**

Day 2: Focus on Education and Centers

Session: Assessment of Nanoeducation

December 6, 2011



Graduated Nanoeducation Efforts: DRL's Investment in Nano

Institution	Title	Approx. Funding
Centers & Networks (2 Projects)		
Museum of Science	Nanoscale Informal Science Education Network	\$20M
Northwestern University	Center to Develop Nanoscale Science & Engineering Educators with Leadership Capabilities	\$16.7M
Instructional Materials Development (5 Projects)		
Biological Sciences Curriculum Study	Understanding the Science of Nanotechnology	\$272K
Mid-Continent Research for Education & Learning (McREL)	Nano Teach: Professional Development in Nanoscale Science	\$3.3M
McREL	Probing the Nanoworld	\$1.1M
SRI International	Nanosense: The Basic Science Behind Nanoscience	\$925K
University of Michigan	A Workshop to Identify and Clarify Nanoscale Learning Goals	\$122K
Informal Science Education (4 Projects)		
Cornell University	Too Small To See	\$1.9M
Earth Talk Incorporated	Earth & Sky Nanoscale Science and Engineering Radio Shows	\$528K
Oregon Public Broadcasting	Nanotechnology: The Convergence of Science and Society	\$2.1M
Twin Cities Public Television	DragonflyTV GPS: Investigating Nanoworld	\$1.9M



NSEE Education Resources Produced

Educational Researchers

The Theoretical Perspective

Researchers, Evaluators, Curriculum Designers, etc.

Science Researchers

The NSE Content Perspective

Nanofabrication Facilities, Physicists, Chemists, etc.

Front-Line Educators

The Audience Perspective

Classroom Teachers, TV and Radio Producers, Museum Staff, etc.

Educational Resources

Teaching Aids, Audio/Visual Products, Traveling Exhibits, Infrastructure, etc.

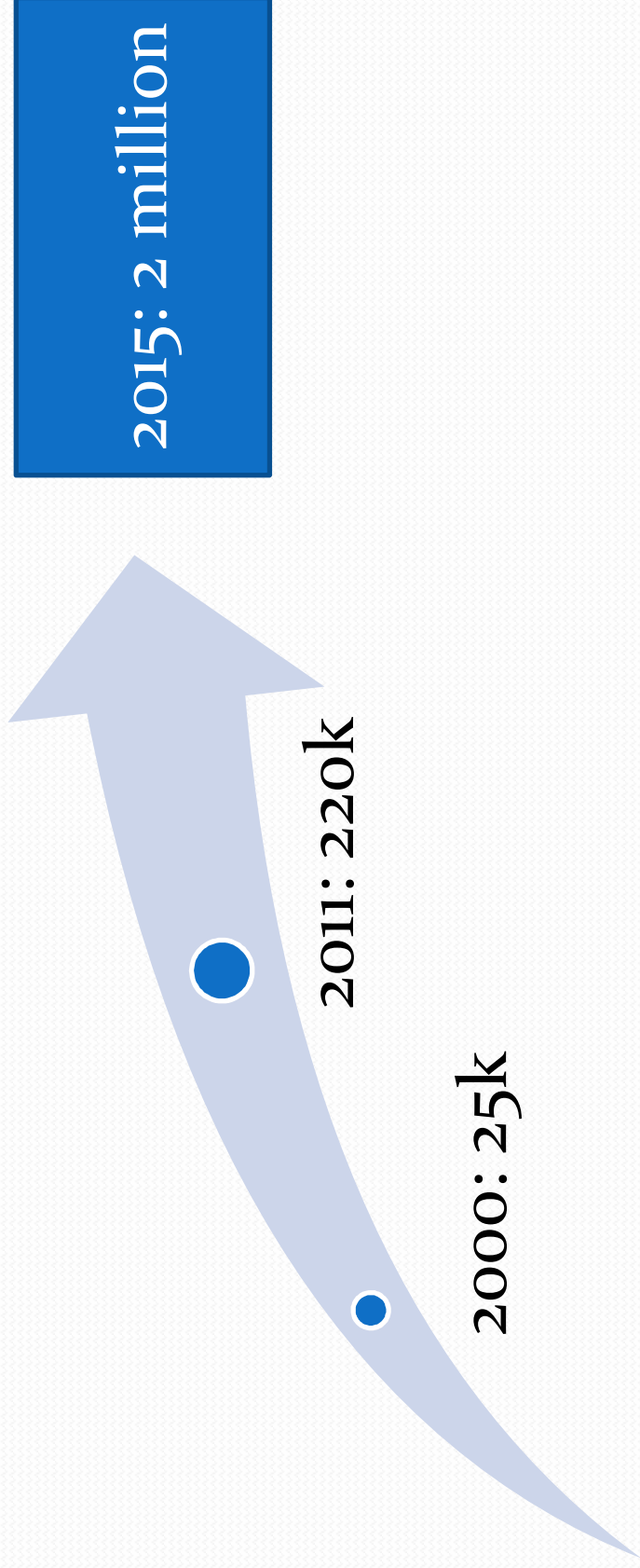


Why do we need these resources?

1. What is the context in which these resources were necessary?
2. What would it look like if these resources “worked” or were effective?
3. Where are these resources and the students/learners that accessed them?



What are the workforce needs?



Source: NSF



MANHATTAN
STRATEGY GROUP

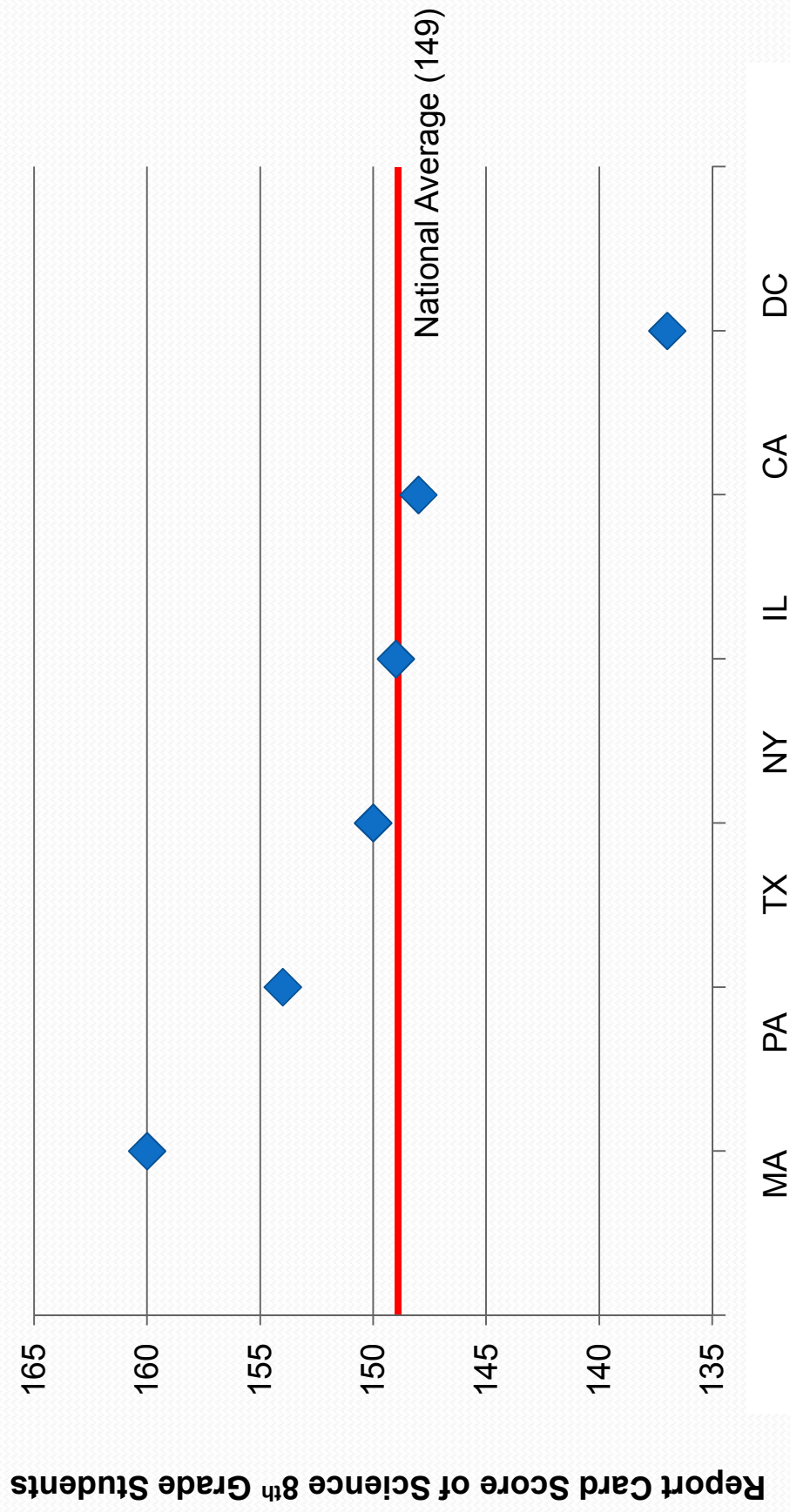


Lessons Learned

- **Effective Nanoeducation resources can and have been developed and they work**
 - **Success:** All projects produced Nanoeducational resources that were used AND yielded evidence of learning
 - **Challenge:** Resource development requires intensive interdisciplinary collaboration between partners which takes commitment
- **Resources impacted those who accessed them**
 - **Success:** These projects collectively met the goal of impacting more than 10,000 students and teachers, which was stated in the original solicitation
 - **Challenge:** We have a BIG need – 220,000 Nanoliterate workers NOW – and limited evidence of impact beyond those who directly accessed the resources produced by the 11 projects



Current Intersection of Education and Infrastructure



Select States with Investment in Nanotechnology Infrastructure





Call to Action

- **Increase coordination at all levels (project, program, office, and agency) to capitalize on existing knowledge, resources, and infrastructure.**
 - Improve collaboration within projects
 - Improve integration across projects
- **Increase public awareness of the importance of nanotechnology**
 - Resource saturation
 - Stock the pipeline
 - Adapt into mainstream science curricula

