Objectives

- **Presentation:**
  - Significance of building early STEM skills
  - Using numeracy and early math as an example, demonstrate:
    - Behavior and brain science basis for appropriateness of STEM in early childhood
    - Essential aspects of mathematics in early childhood
    - Role of parents, caregivers, teachers and community
  - Discuss policy implications and needs
  - Provide resources for further study

- **Q & A**

- **Activity and discussion**
Kindergarten Entry Numeracy Skill Gaps
(In months of learning) ¹

-11.2

Low-Income (Below 200% FPL)

-10.8

Hispanic

-8.9

African American

At or Above 200% FPL
4th Grade Math Proficiency (2017 NAEP)²
International Comparisons

- U.S. rankings in **math** (out of 71 countries) \(^3\)
  - 2000: 19\(^{th}\)
  - 2012: 38\(^{th}\)
- 59% of high school graduates are not academically ready for college-level math classes \(^4\)
- U.S. rankings in **science** \(^5\)
  - 2000: 14\(^{th}\)
  - 2016: 24\(^{th}\)
“Math is the language of STEM”

- “It is the foundational element that enables the development of skills in science, technology and engineering.”
- Infants can reason, problem solve and test physical hypotheses.
- Entering kindergartners have ability to think concretely and abstractly and use a range of scientific reasoning processes.
- Students engaged in STEM by the time they are adolescents are more likely to pursue the field as adults.
Implications

- Economic/Workforce
  - 3 million STEM jobs remain unfulfilled  
  - STEM sector grew by 17% from 2008-2018, compared to 9.8% for all other occupations

- Military
  - 71% of Americans between 17-24 are ineligible to serve in the military (education accounts for 25%)
Potential Strategies

- Colorado House Bill 17-1201
  - Seal of STEM
  - Pathway for developing skills and motivation early on (notification officially starts in 6th grade)
- ASU offers STEM-concentration option for K-8 teachers
Presentation

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References


