

# **MATHEMATICAL PREPARATION OF THE FUTURE WORKFORCE**

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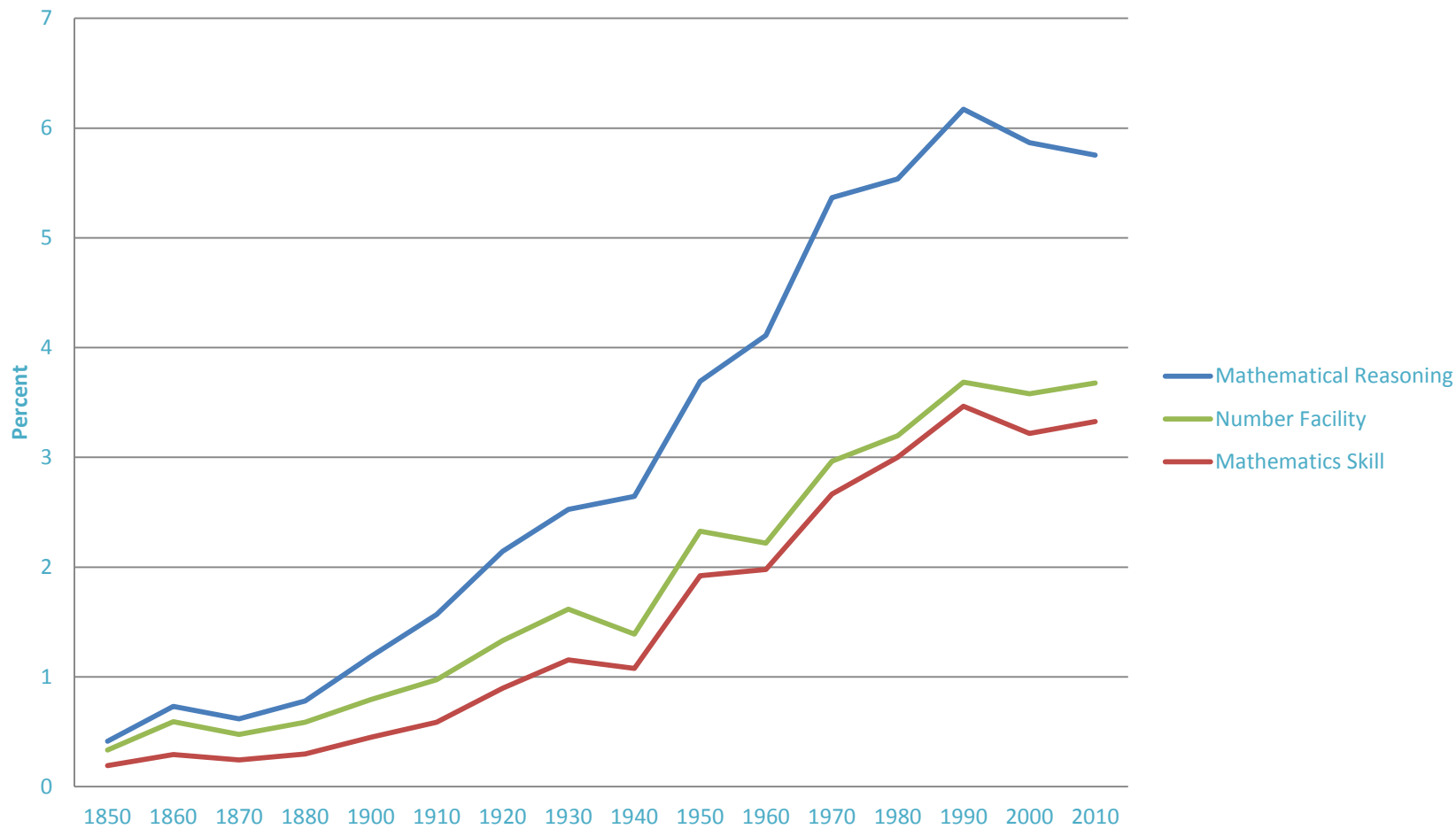
**“Investing in the Next Generation through Innovative and Outstanding Strategies”**

**(INGenIOuS)**

# MATHEMATICAL PREPARATION OF THE FUTURE WORKFORCE

- Mathematical sciences are increasingly an integral and essential component of science, technology, economics, social sciences, and national competitiveness.

## Intensity of math competencies in its purest form over time



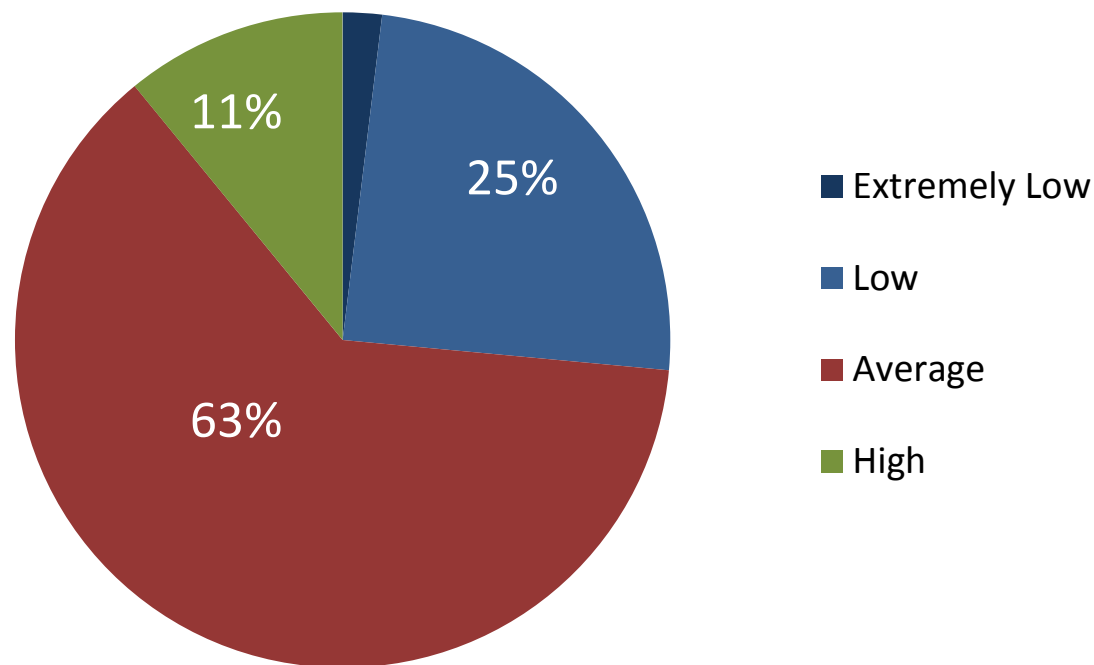
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- Mathematical scientists, for the most part, remain unaware of the expanding role of mathematics and of the needs in mathematics education, thereby limiting the community's ability to respond.

Almost 2/3 of all jobs require some average mathematical knowledge, while a mere 2% require no mathematical skills at all.



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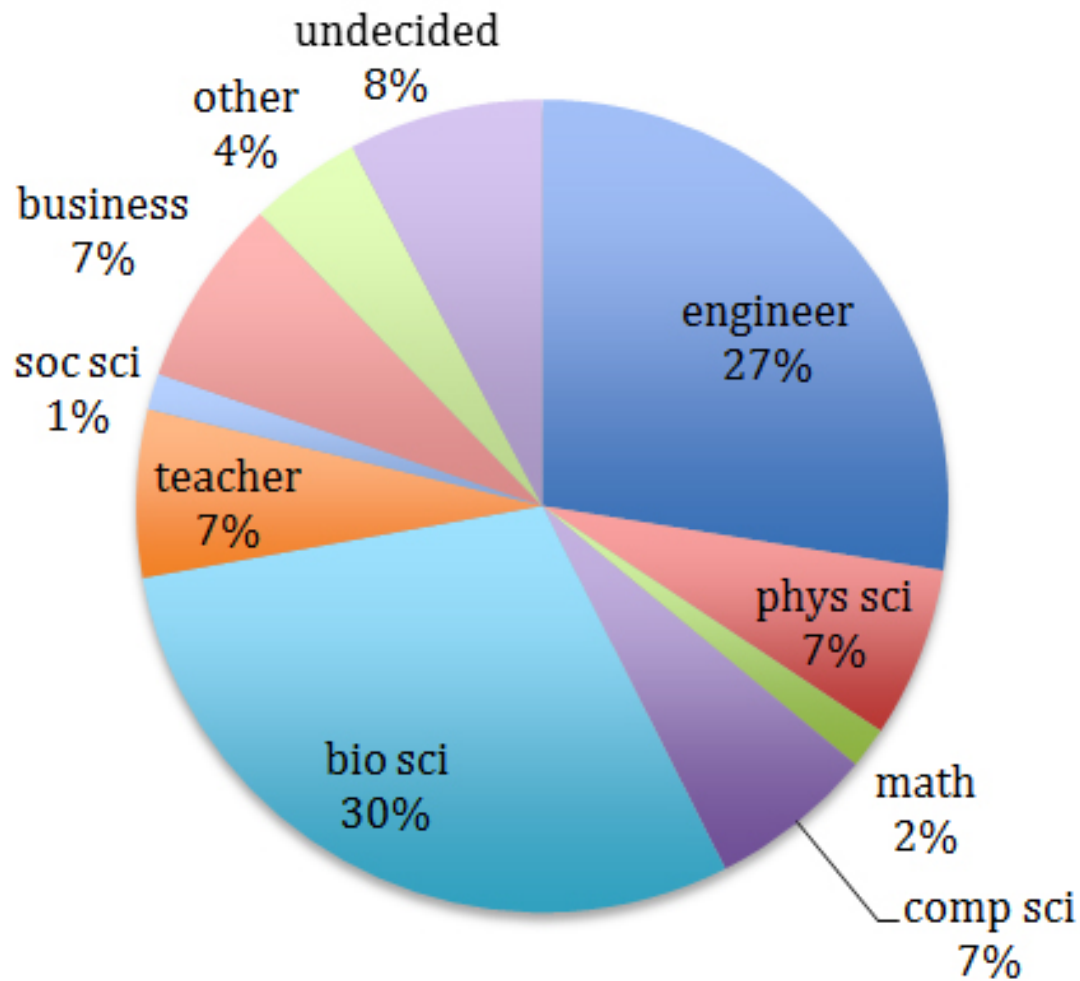
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# TWO MAJOR STRANDS

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- ◆ Mathematical sciences must attract and produce more broadly trained mathematical sciences majors.

# Who do we have in our Classes?

- **College Algebra.** Fewer than 10% intend technical/scientific careers. Fewer than 9% register for Calculus I and fewer than 1% enroll in Calculus III.
- **Calculus I.** Fewer than 10% are in Math or Physical Sciences and only 2% of these are Math.



**Figure 1: Distribution of intended careers of all Calculus I students. N = 11,466.**

# Alternate Pathways

- College Algebra should NOT be a General Education Math course.
- Alternate Mathematics Pathways should be developed for different degree/career goals.
- Alternate degree options should be developed for the mathematics major.

# Curriculum and Pedagogy

- Losing students in calculus and STEM majors is a great cost to our nation's intellectual and scientific well being.
- Survey (Bressoud et al) concludes in Calculus I student confidence dropped effectively -0.46 of a point and enjoyment of mathematics dropped effectively -0.27 of a point on a scale 1-6.
- Largest drops at large research universities; women disproportionately drop STEM; underprepared students more likely to drop.

# WORKSHOP OUTCOMES

- Improve public awareness of usefulness of math in STEM AND non STEM careers.
- Engage in preparation of students for nonacademic careers.
- Bridge academia with BIG.
- Develop new curricular pathways and embrace best practice pedagogies.
- Diversify incentives, rewards, and recognition in academia.