



# **Defining the STEM Landscape: The Pre-College and First-Year Picture**

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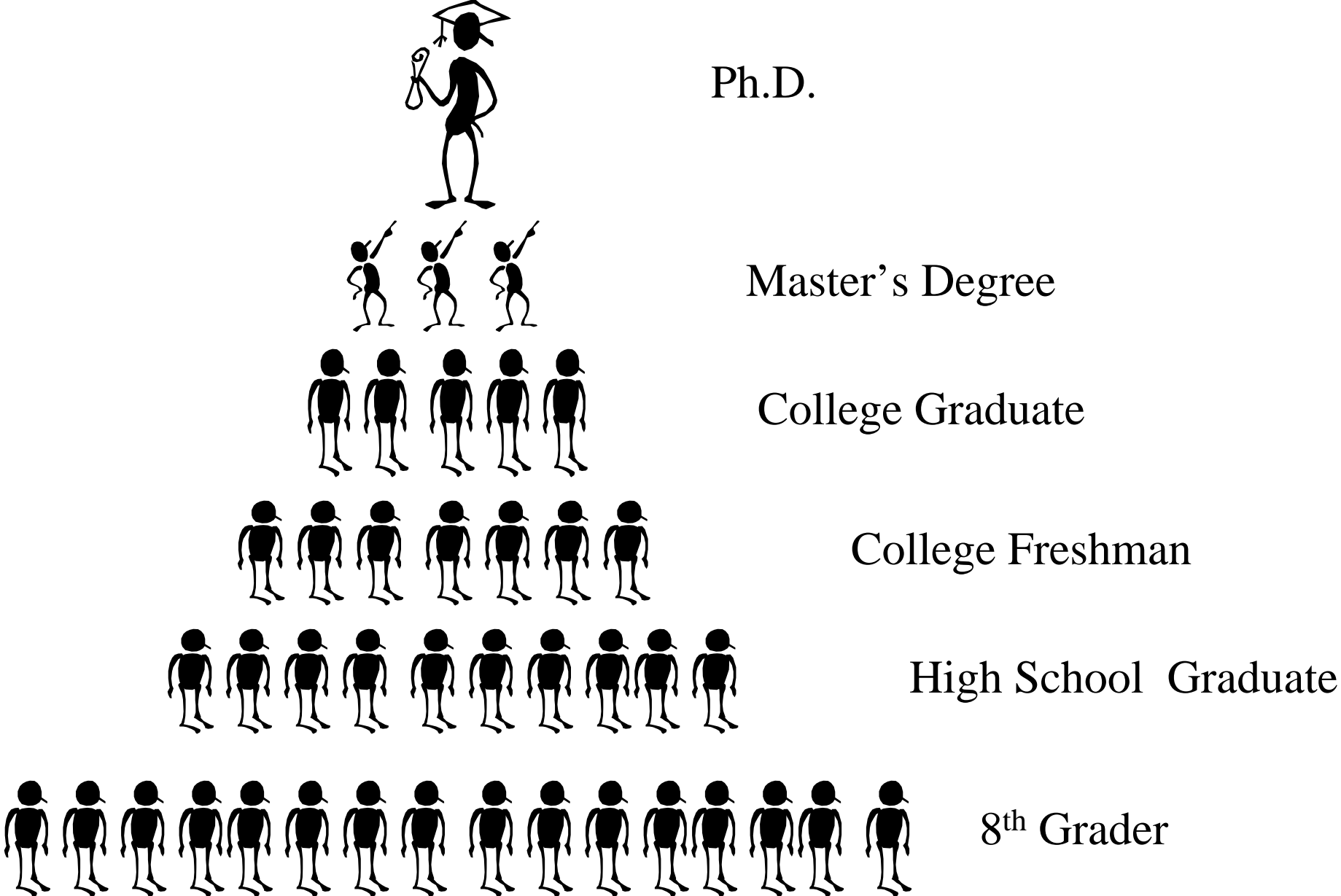
**Presentation at the 2005 CIRTTL Forum  
Addressing the Student Learning Experience:  
Achieving Diversity in STEM Disciplines  
Madison, Wisconsin  
May 25-26, 2005**

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Policy Evaluation & Research Center**

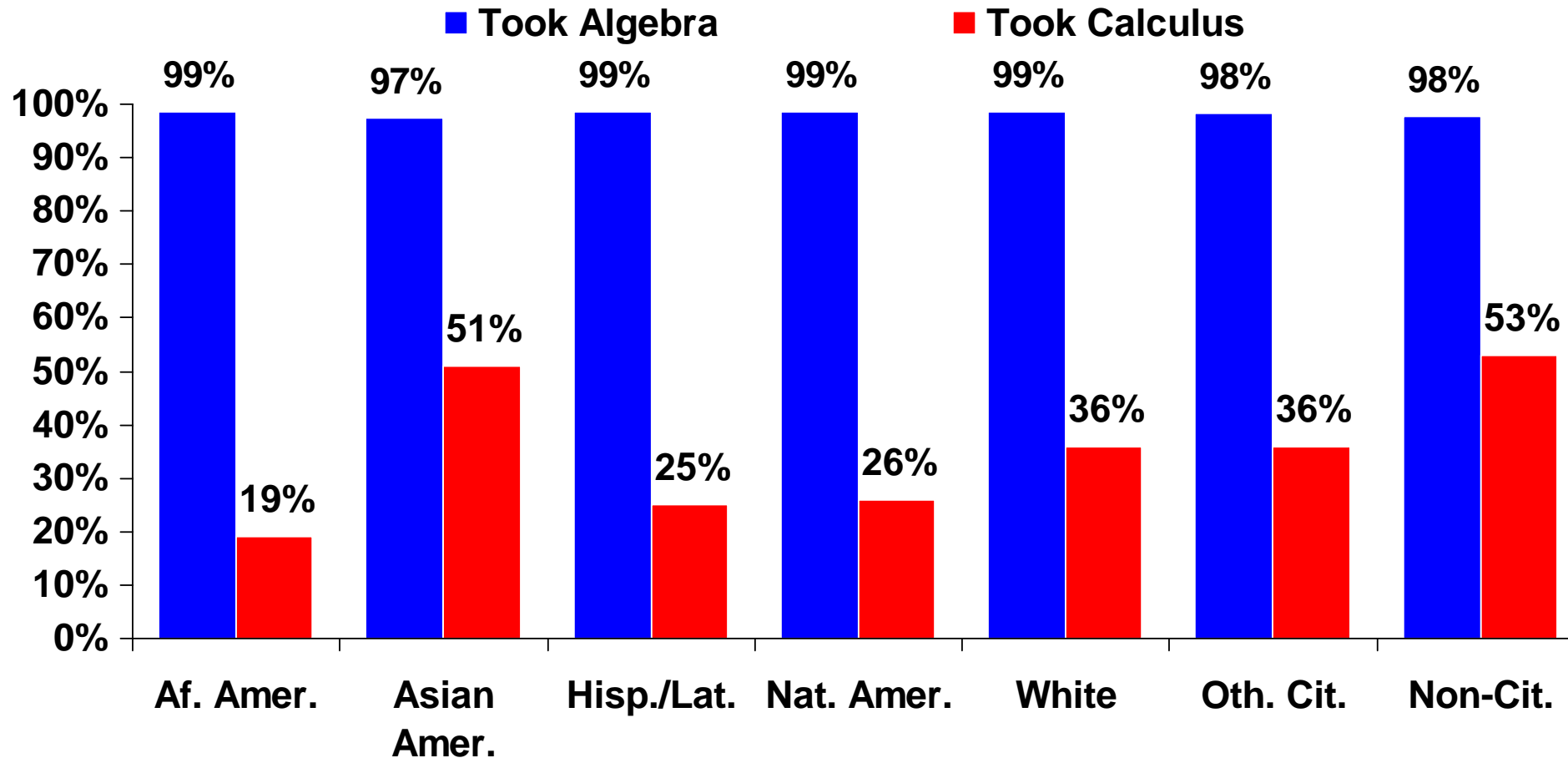


# A Word Problem

# How many African American 8<sup>th</sup> graders does it take to produce one African American Ph.D. in mathematics?

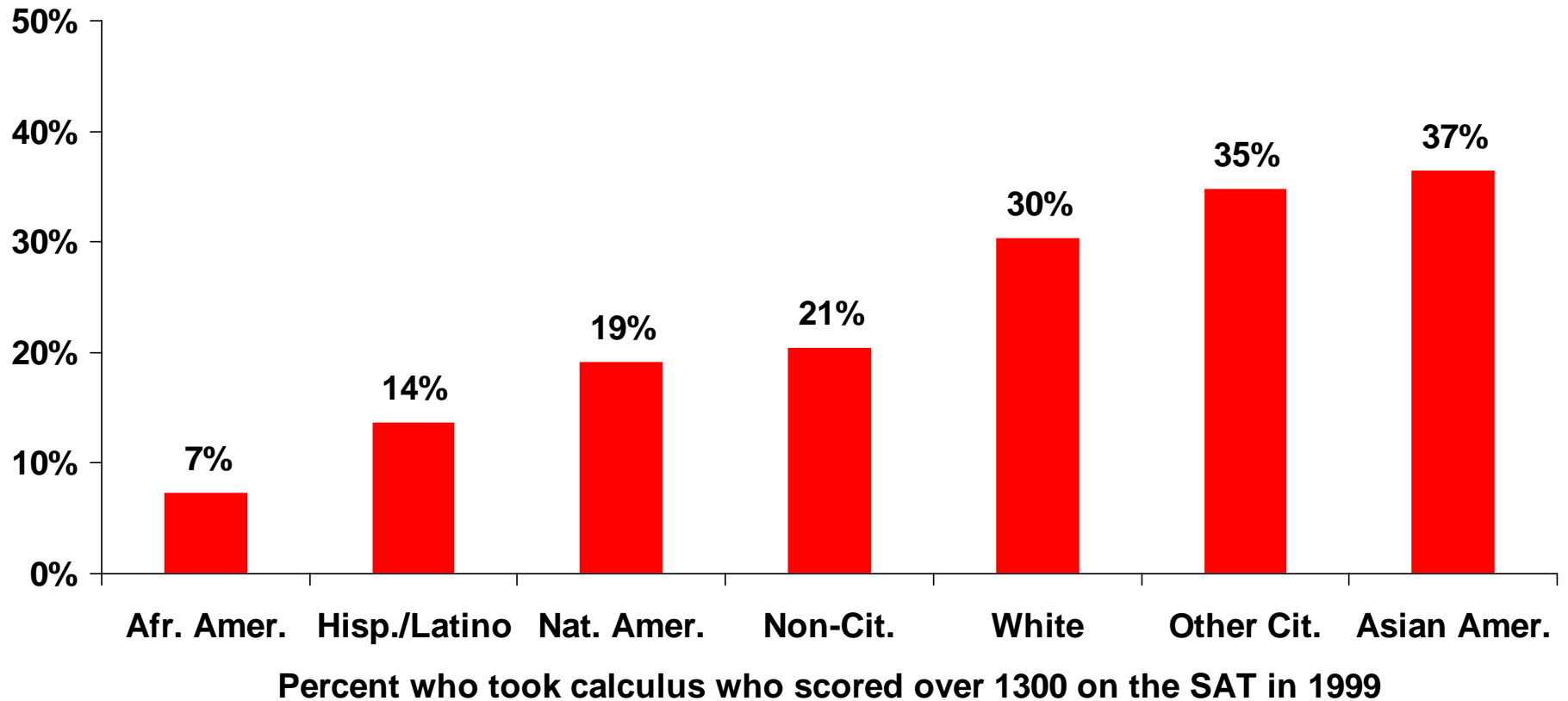


# African American 1999 SAT Takers Had Similar Participation Rates in Algebra but not Calculus



Source: Nettles & Millett analysis of customized data files from the College Board and ETS, 1999.

# 7% of African Americans Who Took Calculus Had a Combined SAT Score of 1300 in 1999 Compared to 30% of Whites Who Took Calculus





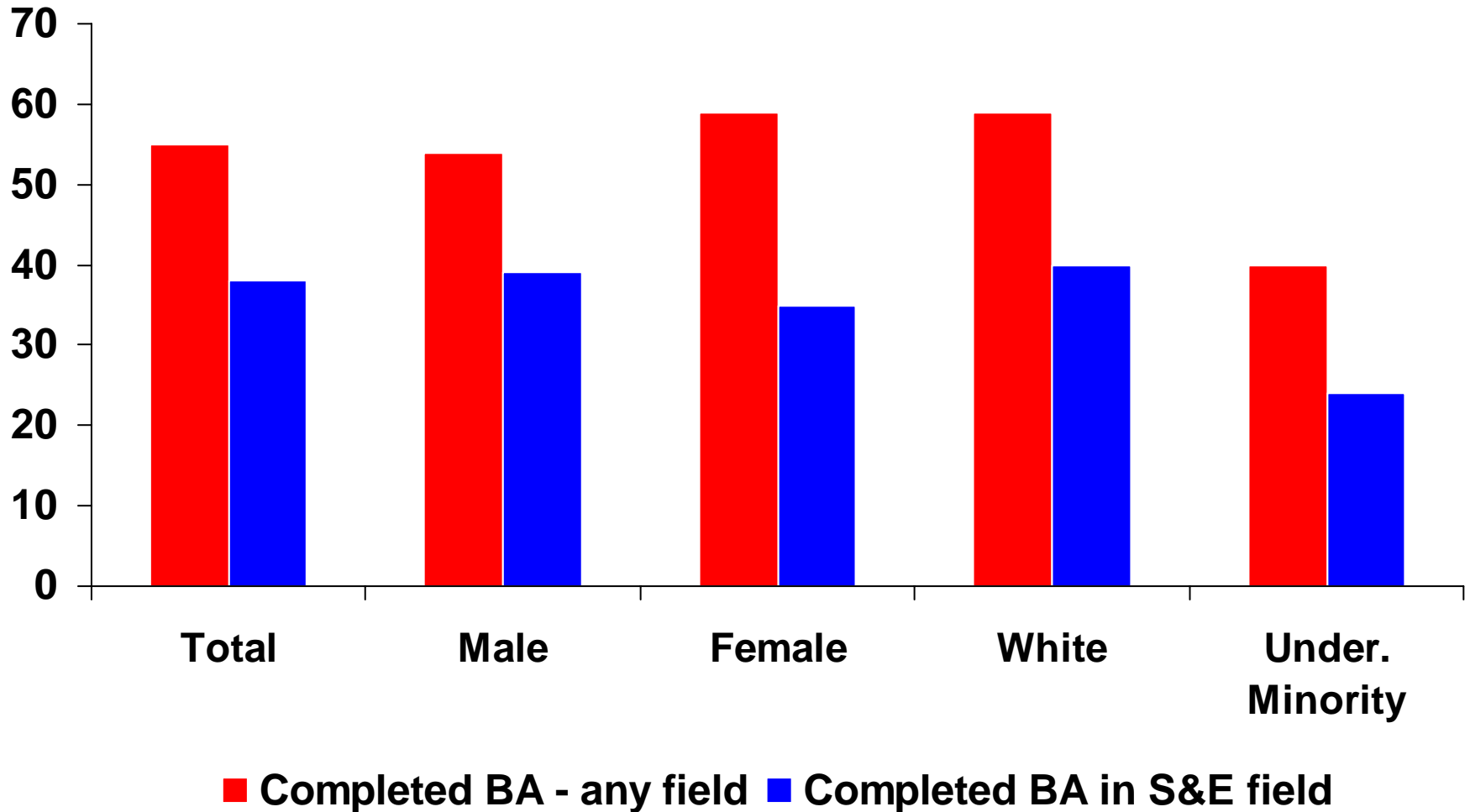
# The Freshman Year: What happens?

- College is the first place in the scientific/mathematic pipeline where the migration is almost entirely out of, not into the pool. (Berryman, 1983)
- Compounding the science/mathematics college migration problem is the fact that women and underrepresented minorities have relatively high departure rates.

(Berryman, 1983; Garrison, 1987).

# Masking the Loss?

## Degree Completion Rates of Freshmen Who Intended to Major in S&E



Source: National Science Foundation (2002) *Science and Engineering Indicators- 2002*

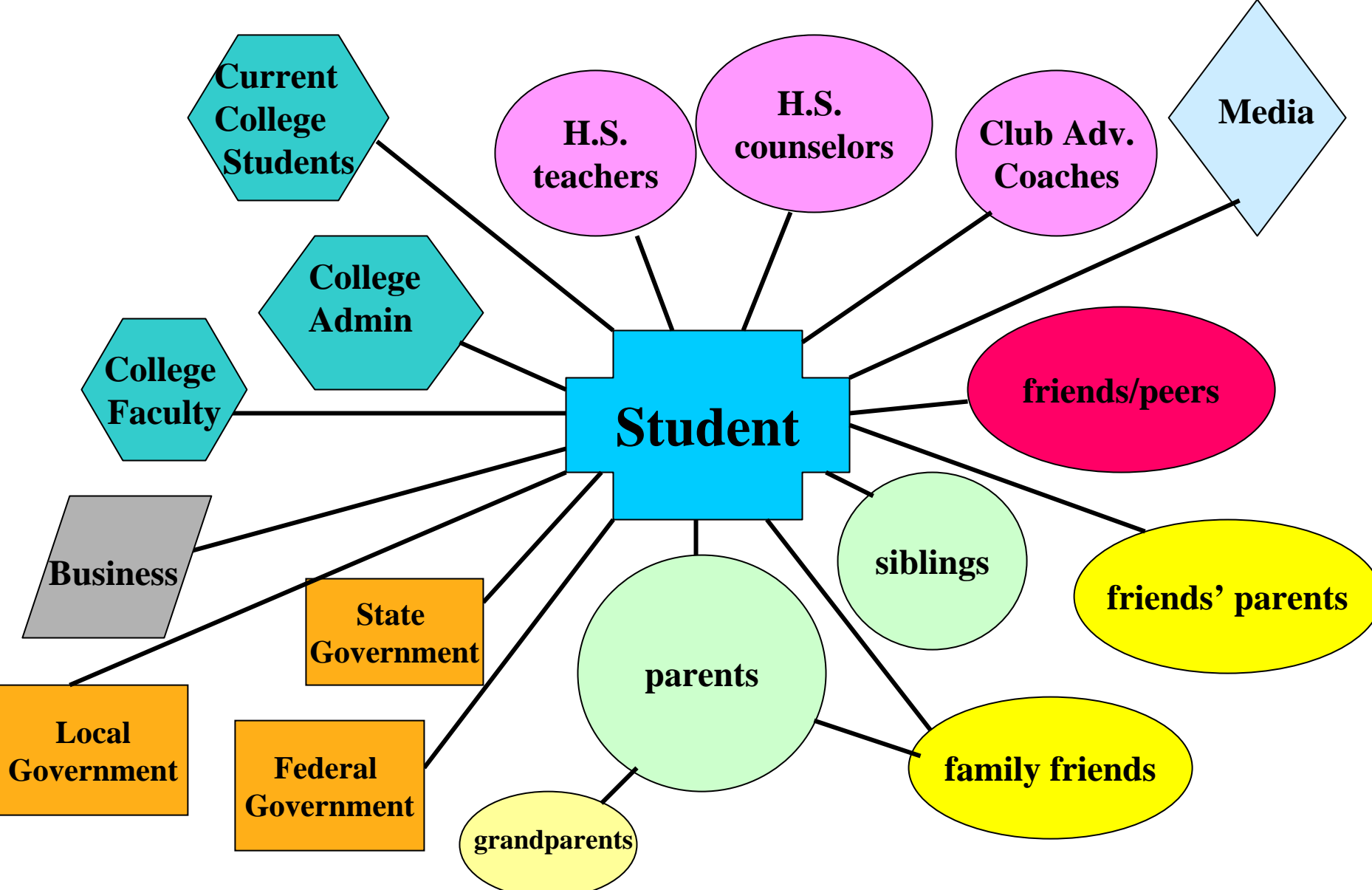


## ***Investing in Human Potential: Science and Engineering at the Crossroads***

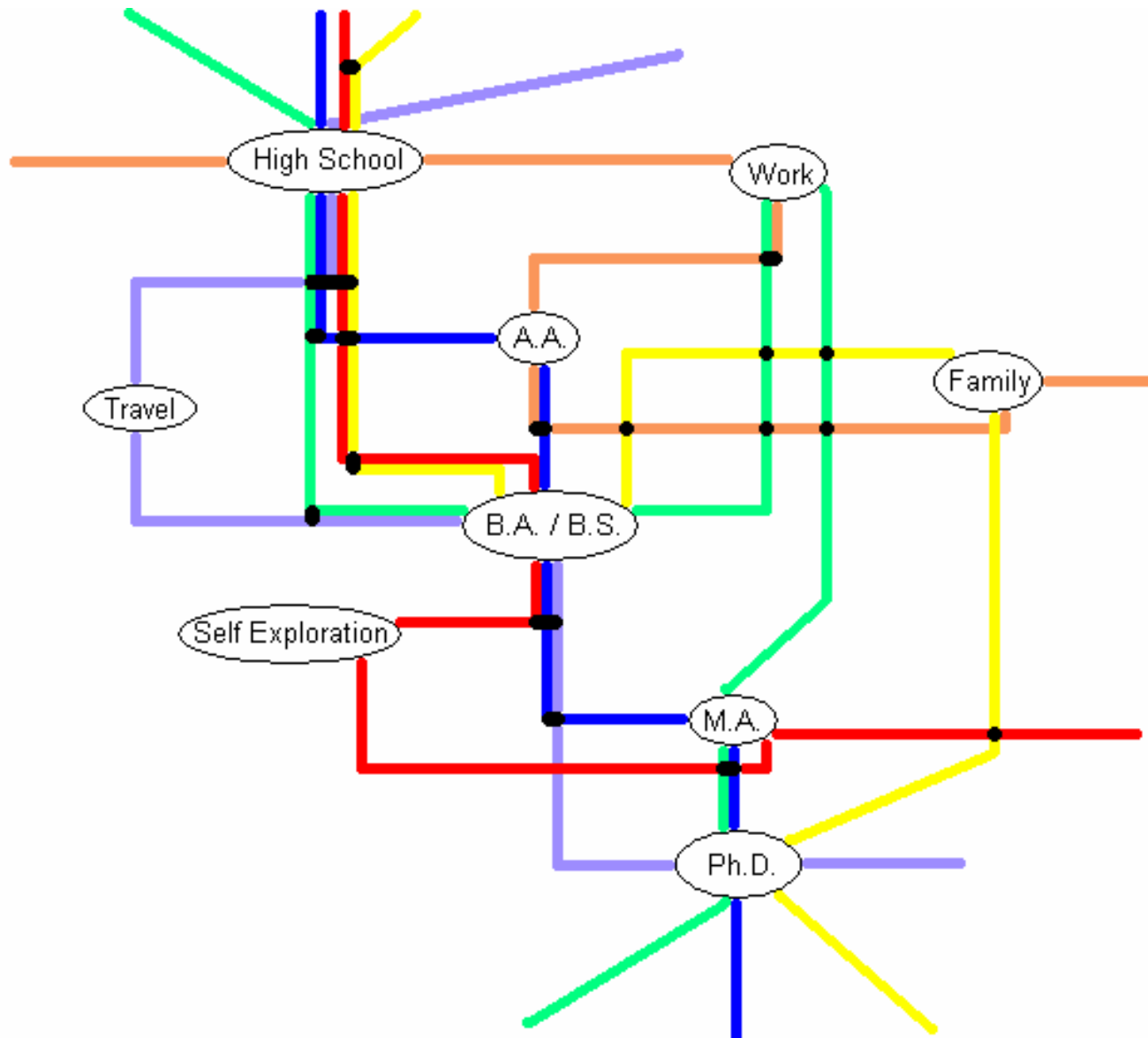
Academic institutions and departments should “monitor carefully the progress of students, especially female and minority students and those with physical disabilities, to determine where attrition is occurring. Further, careful analysis may be warranted to determine the causes of those losses.”

**Source: The American Association for the  
Advancement of Science (AAAS) (1991)**

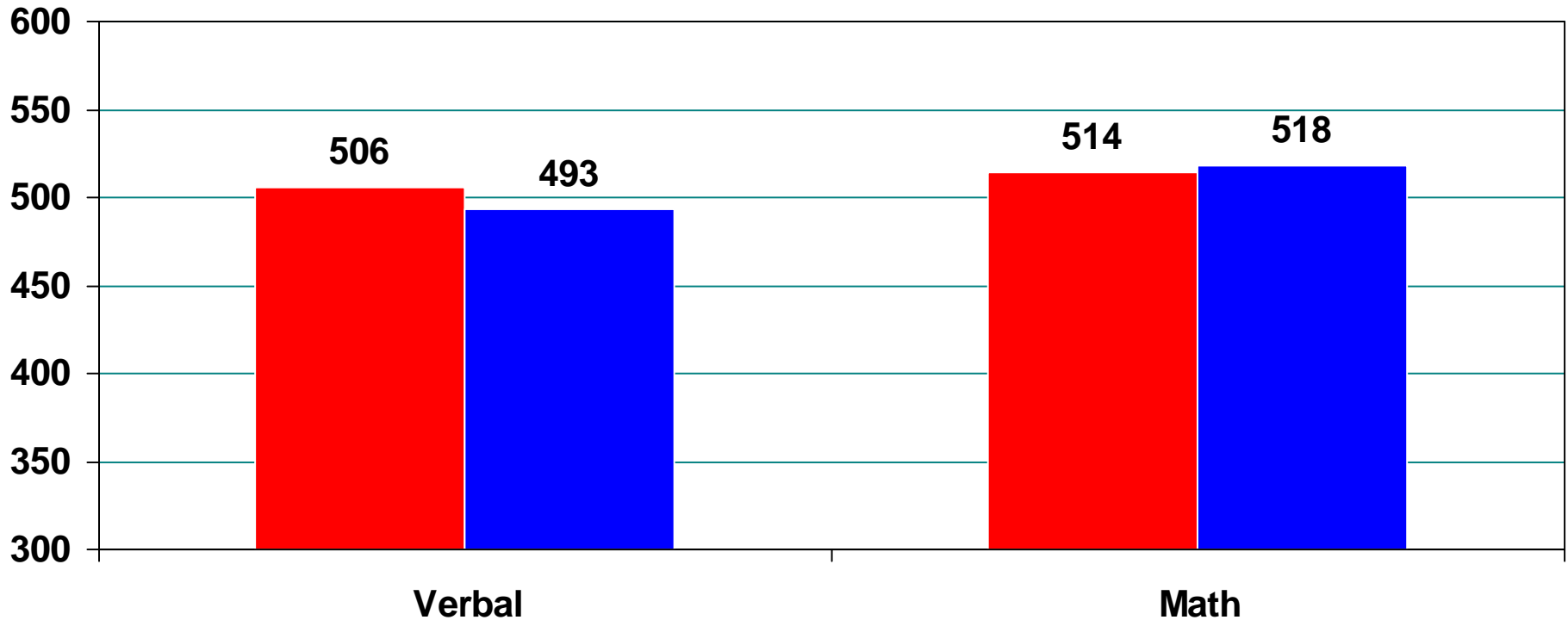
# A Student's World



# The Educational Subway



## One group to consider: 8<sup>th</sup> Graders Who Achieve Comparable SAT I Scores to College Bound Seniors



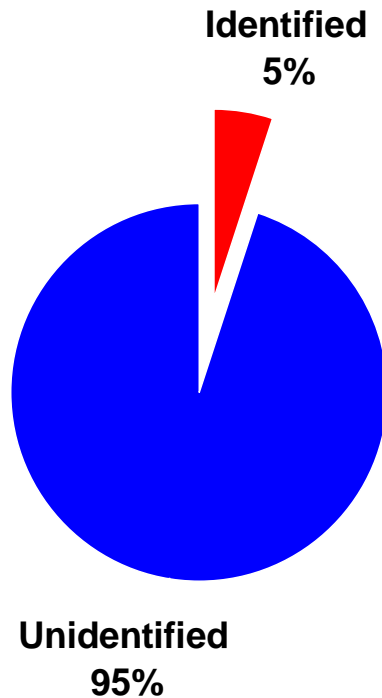
■ **2001 College Bound Seniors (N=1.3 million)**

■ **2000/2001 8th Grade SAT Test Takers (N=65,382)**

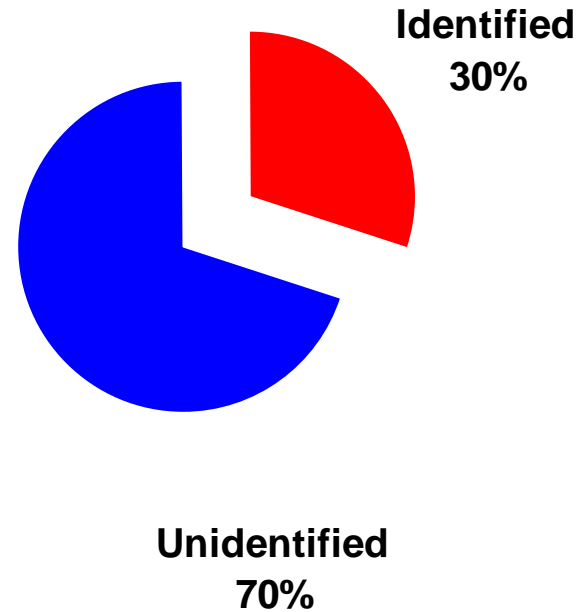
Sources: College Board Website: SAT I Test Scores of Nontraditional Test Takers  
College Board (2001) 2001 College Bound Seniors: A Profile of SAT Program Test Takers

# What proportion of the total population of possible S&E able students do the 65,000 represent?

## Possibility 1



## Possibility 2





# Math and Engineering Courses are 4 of the 5 Most Popular Courses Among CTY students

- Algebra and its Applications
- Geometry and its Applications
- Mathematical Modeling,
- and Principles of Engineering Design

More than a quarter of all first-time Goldman Sachs Supported CTY students enrolled in these four courses.





# Policy Evaluation & Research Center

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