Education in a Global Context

January 10, 2007

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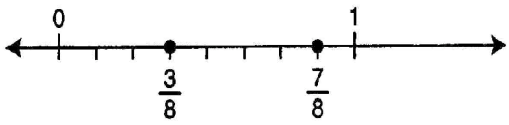
Elementary Students' Performance on a Fractions Problem

4. Which fraction is located between $\frac{3}{8}$ and $\frac{7}{8}$ on the number line?



A. $\frac{3}{8}$

B. $\frac{7}{8}$

C.

D.

Grade 3	Grade 4	Grade 5
19.1	39.8	50.8

Elementary & Middle School Students' Performance on a Fractions Problem

20. What is the value of $\frac{4}{5} - \frac{1}{3} - \frac{1}{15}$?

A.

B.

C.

D.

E.

Grade 3	Grade 4	Grade 5	Grade 6	Grade 7	Grade 8
14.1	21.2	16.7	28.4	37.7	51.2

Middle School Students' Performance on an Algebra Problem

16. If $3(2x-5)+5-(x+5)=2(3-x)$ what does x equal?

A. $\frac{6}{7}$

B. 1

C. 4

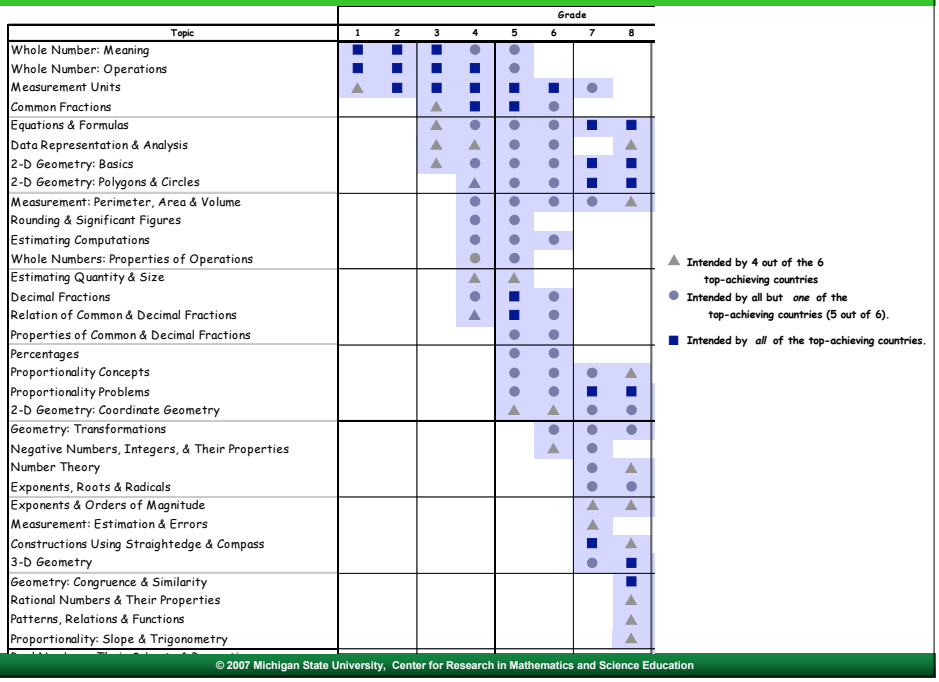
D. 3

Grade 6	Grade 7	Grade 8
19.9	31.5	31.6

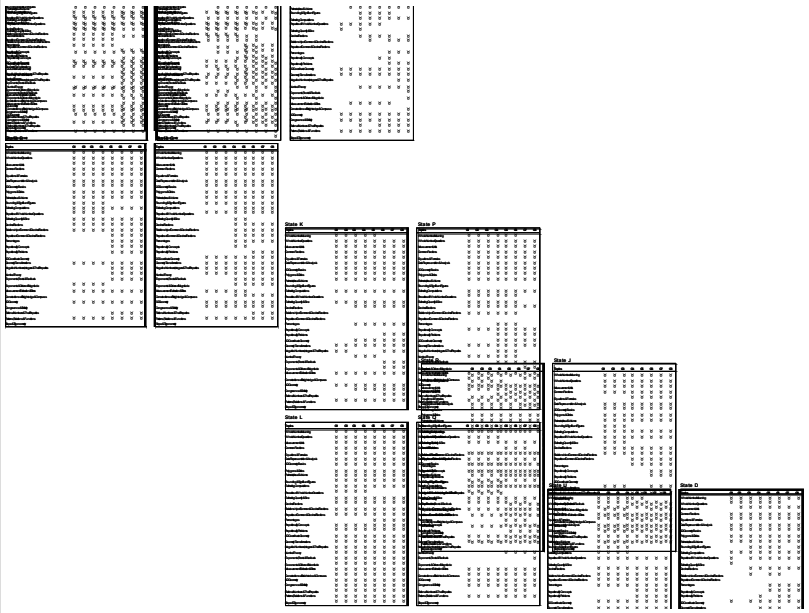
Instructional Content Constructs

- **Curricular Coherence**
  - Curricular Structure
- **Curricular Focus**
  - Exposure Time (OTL)
- **Curricular Rigor**
  - Level of Cognitive Complexity

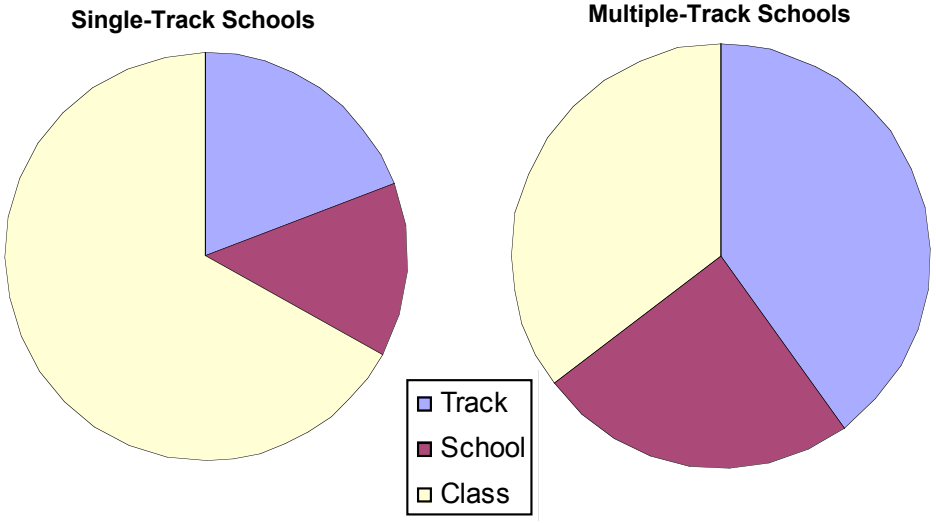
Top Achieving Countries' Mathematics Curriculum



21 U.S. States' Mathematics Curriculum



Variation in the mathematics content index (IGP) in schools having multiple tracks and schools having single tracks



High School Students' Performance on a Functions Problem

The inverse of a function is a logarithmic function in the form $y = \log_b x$. Which equation represents the original function?

A. $y = b^x$

B. $y = bx$

C. $x = b^y$

D. $by = x$

Grade 9	Grade 10	Grade 11	Grade 12
17.0	27.9	28.2	37.5

High School Students' Performance on a Mathematics Literacy Problem

29. Stu wants to wrap some ribbon around a box as shown below and have 25 centimeters left to tie a bow.

How long a piece of ribbon does he need?

A. 46 cm

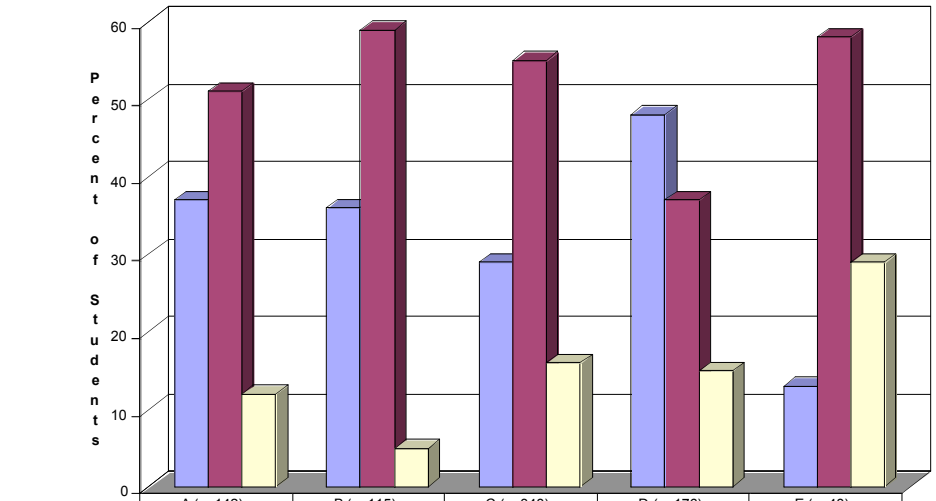
B. 77 cm

C. 65 cm

D. 71 cm

Grade 9	Grade 10	Grade 11	Grade 12
38.0	41.0	43.3	50.2

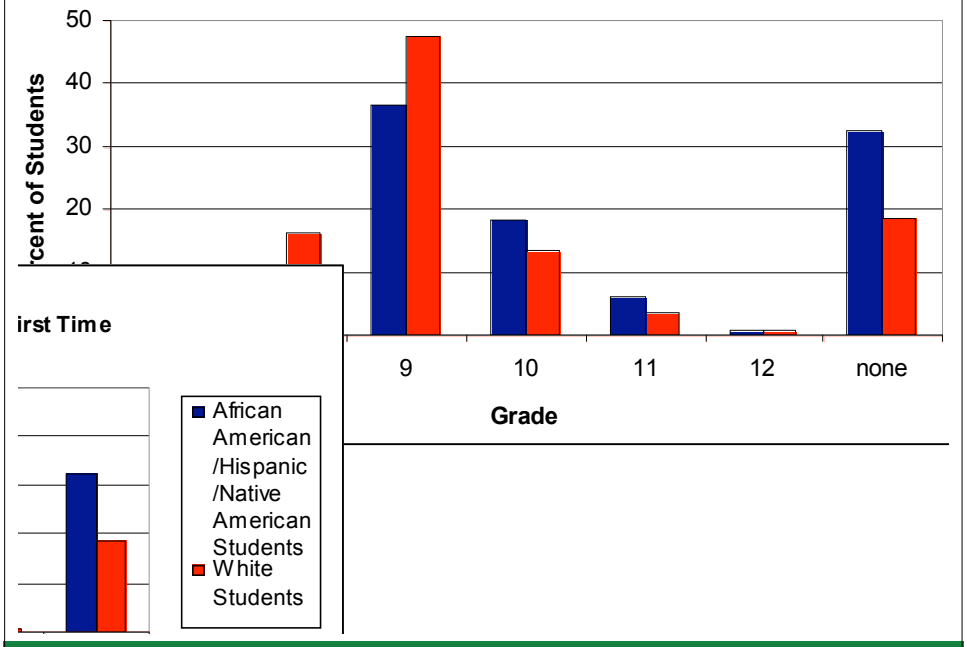
Level of First Mathematics Course in High School



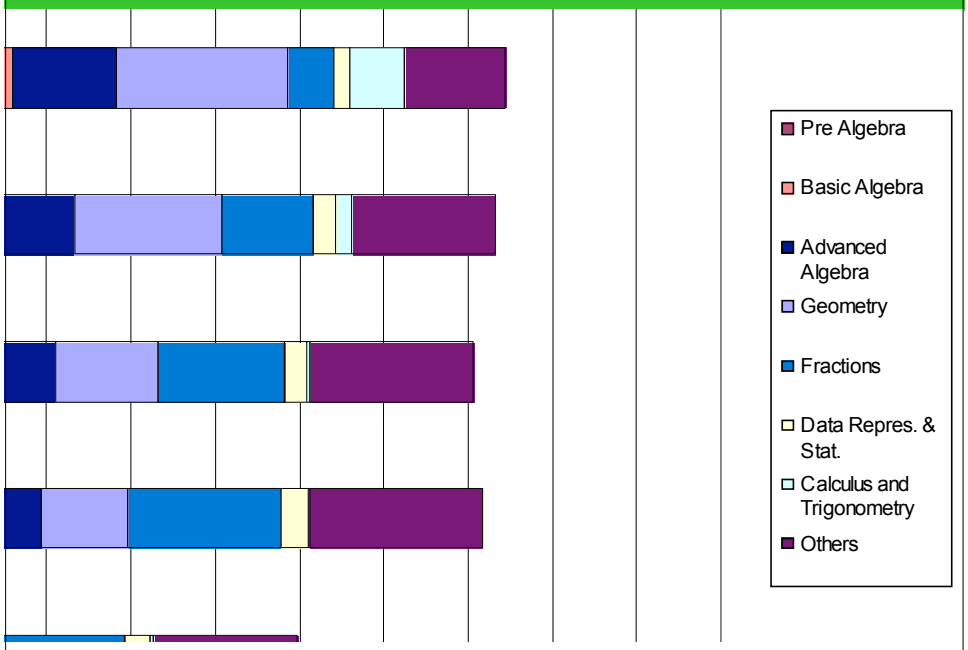
	A (n=142)	B (n=115)	C (n=348)	D (n=176)	E (n=48)
Below Algebra I	37	36	29	48	13
Algebra I	51	59	55	37	58
Above Algebra I	12	5	16	15	29

School Districts

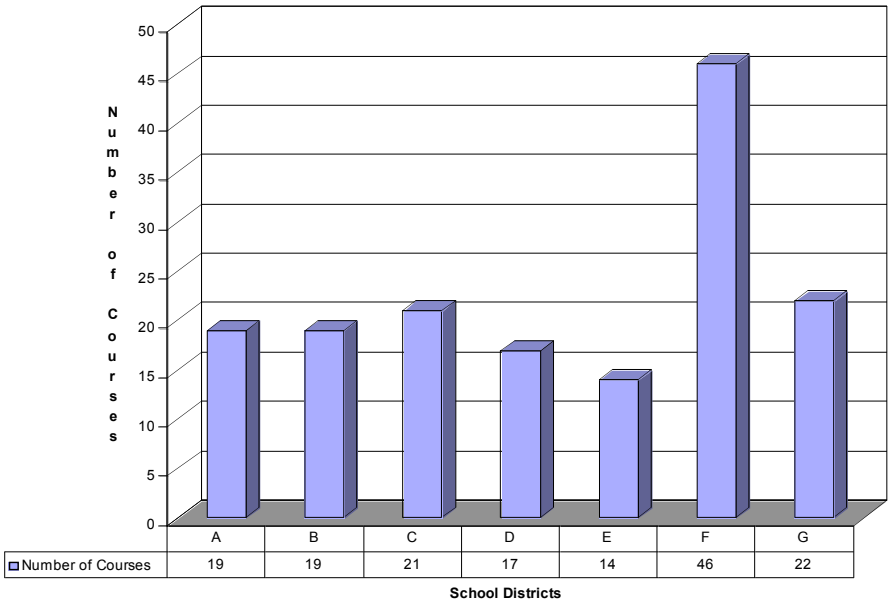
Percent of Students Taking Algebra I for the First Time



Amount of Mathematics Across Grades 7-12



Number of Mathematics Courses Offered in 7 Districts



Number of Course Patterns for Meeting High School Mathematics Requirement in 7 Districts

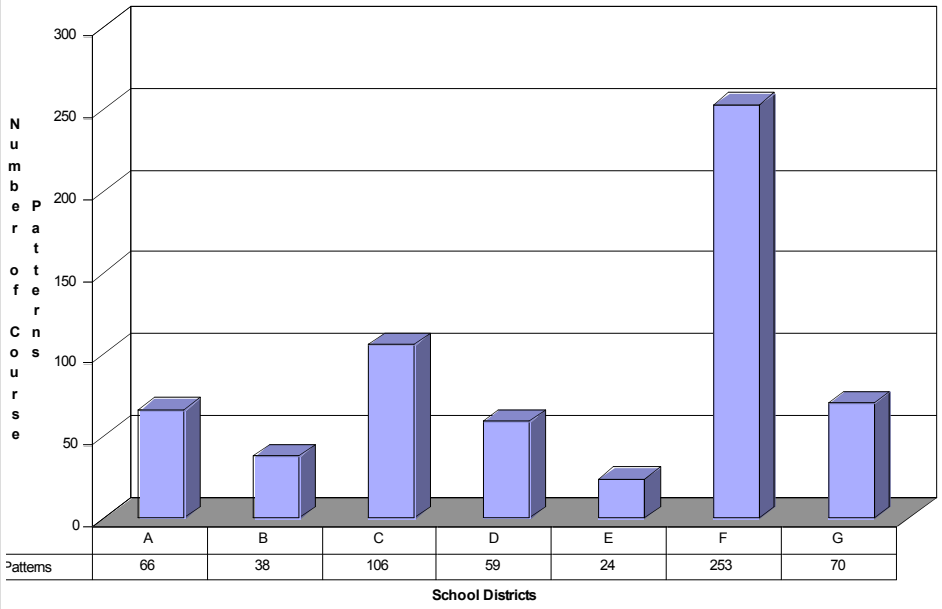
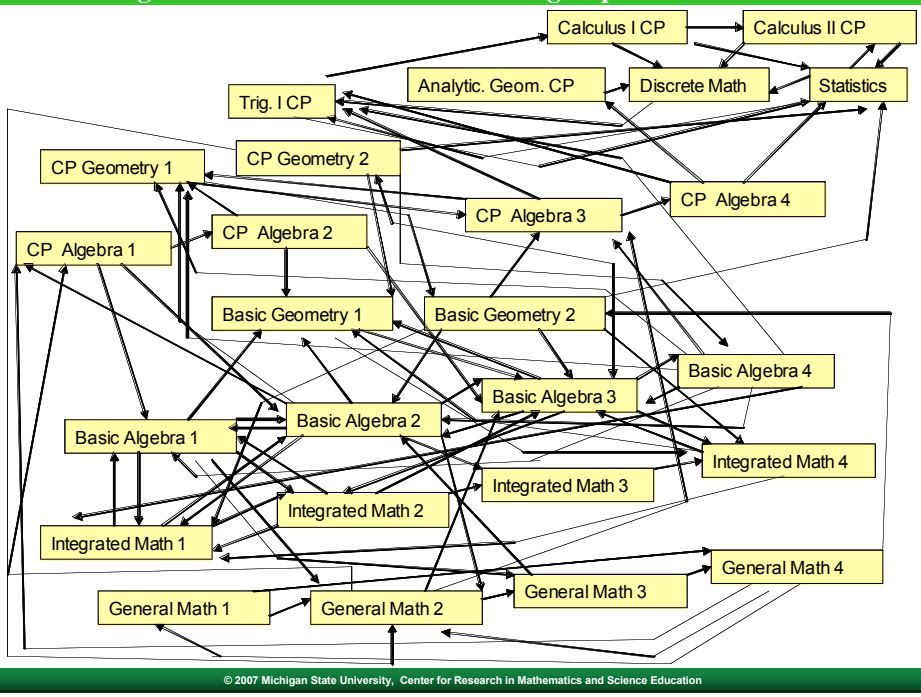


Diagram of Mathematics Course-Taking Sequences in District F



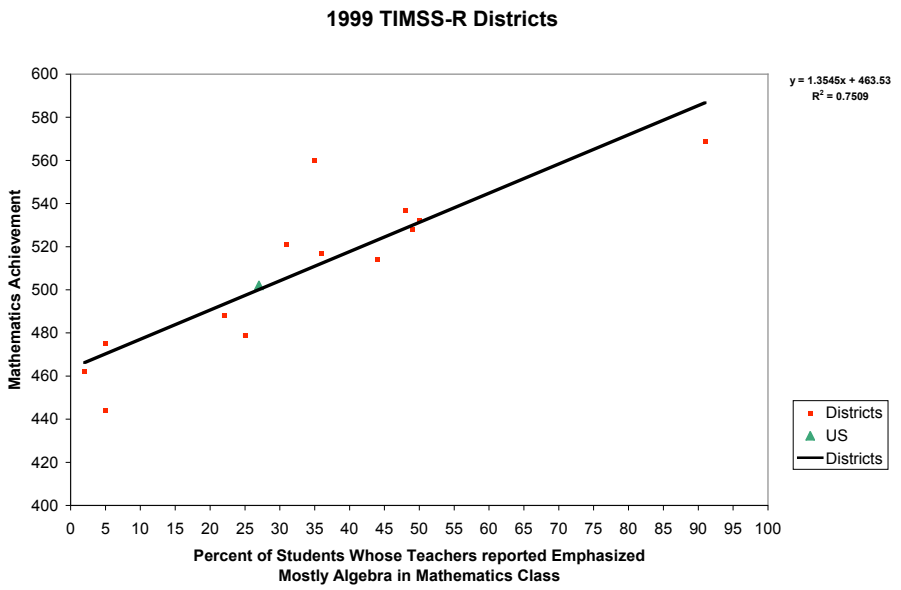
Minimal Standards?

- One course in each:
  Mathematics, **Biology, Chemistry, Physics**
- Algebra II/Biology/Chemistry/Physics
  - Less than 30 % of ALL Students
  - Less than 5 % of Voc/Tech Students
  - About 15 % of General Academic Students
  - About 40 % of College Preparatory Students

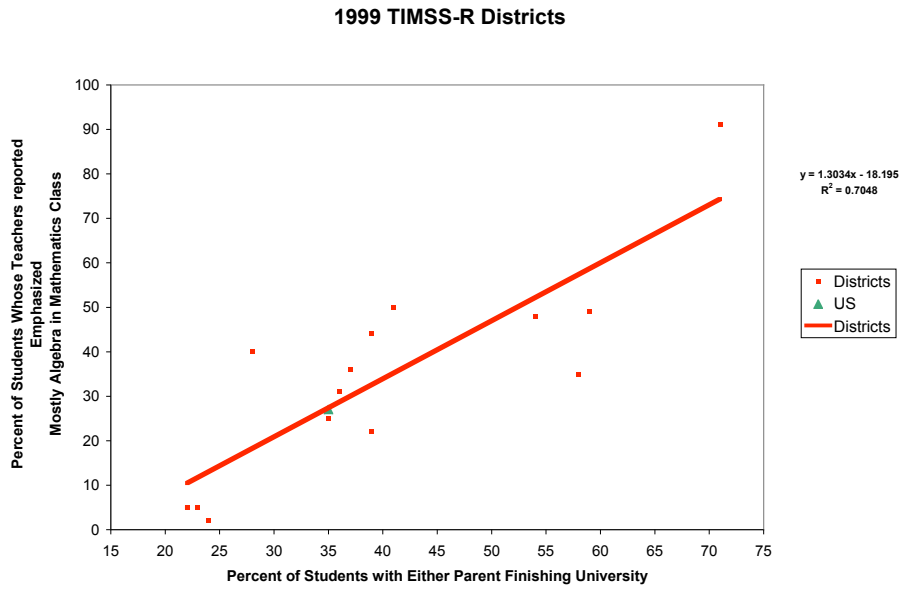
Minimal Standards?

- One course in each:
  Mathematics, **Biology, Chemistry, Physics**
- Algebra II/Biology/Chemistry/Physics
  - Less than 20 % of ALL Black Students
  - Less than 5 % of Black Voc/Tech Students
  - About 11 % of Black General Academic Students
  - About 32 % of Black College Preparatory Students

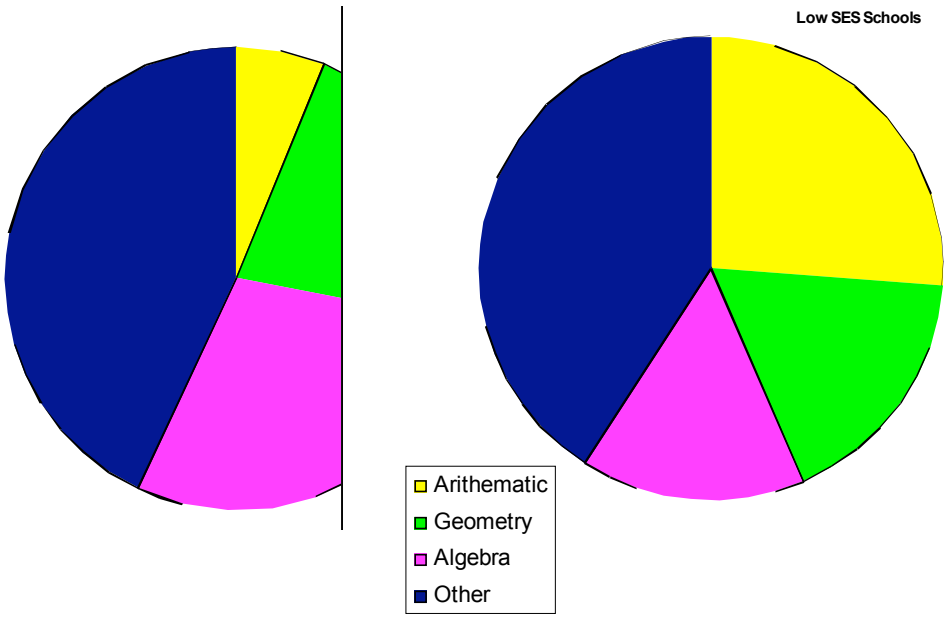
Relationship between Algebra Instruction and Student Achievement



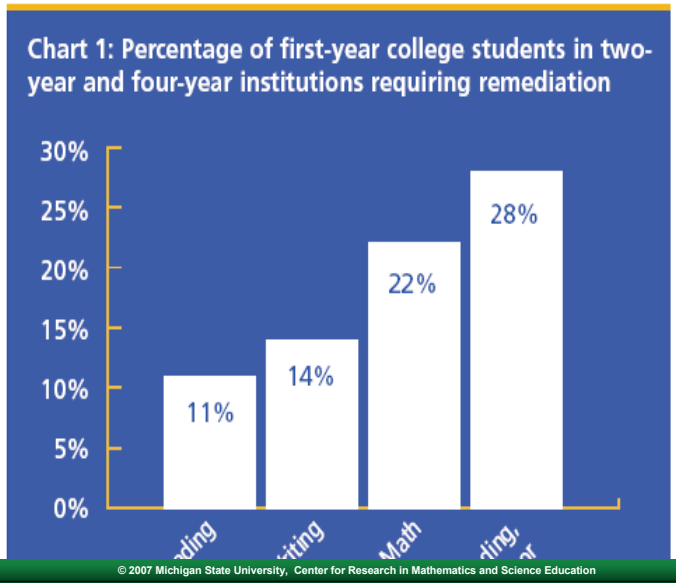
Relationship between Parents' Education and Algebra Instruction



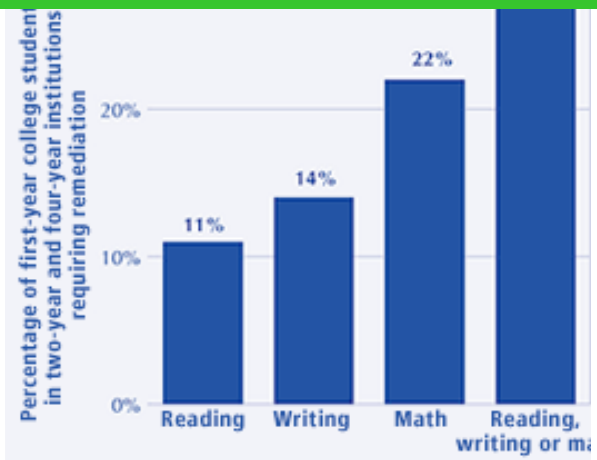
Teachers Coverage of Mathematics Topics in Two Types of Schools



Percent of First Year College Students in 2-year and 4-year Institutions Requiring Remediation



Those who require remediation in college often fail to earn a degree

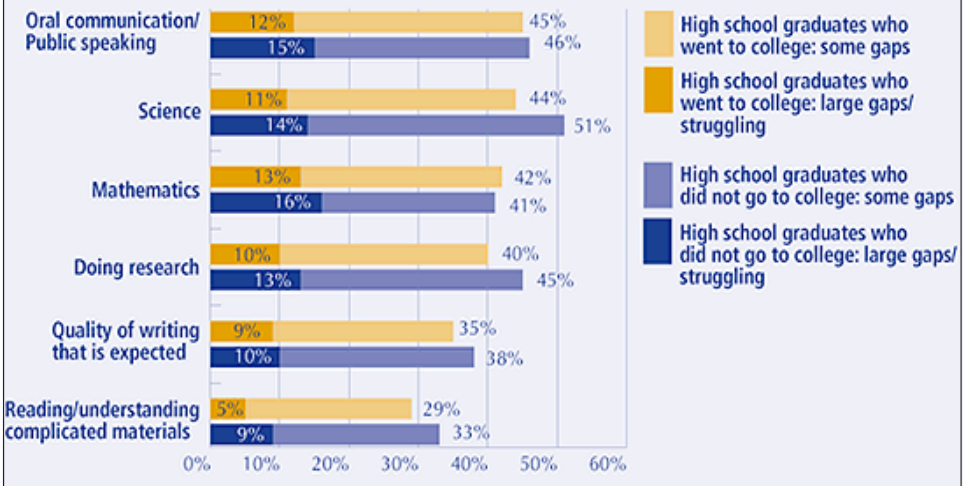


Source: National Center for Education Statistics, Remedial Education at Degree-Granting Postsecondary Institutions in Fall 2000, *2003.*

And Those Who Do Often Fail To Earn a Degree

Many High School Graduates Report Gaps in Their Preparation

In each area, percentage saying there are at least some gaps in their preparation



Source: Peter D. Hart Research Associates, Inc./Public Opinion Strategies, Rising to the Challenge: Are High School Graduates Prepared for College and Work? *Prepared for Achieve, Inc., 2005.*