

# Serving Our Strongest Students

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Henri Picciotto

The Urban School of San Francisco

[math-ed@picciotto.org](mailto:math-ed@picciotto.org)

<http://www.picciotto.org/math-ed>

What about all the other students?



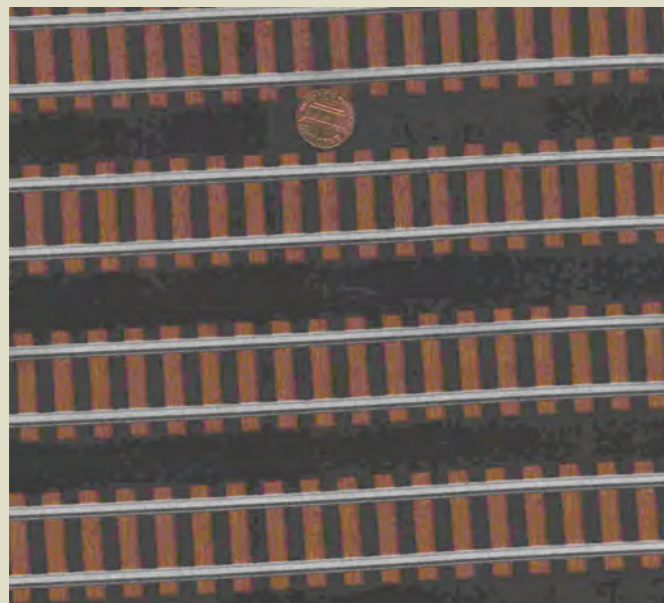
Access

# Importance of strong students

◇ Politically

◇ Philosophically

# Tracking



← this is great!

← where's the engine?

not so easy for a student to switch to a higher track

# Acceleration



# The Power of Culture

- ◇ societal expectations
- ◇ standard curriculum
- ◇ school tradition
- ◇ parental pressure
- ◇ strong students themselves





# Racers vs. Diggers



Other approaches



Access and challenge can coexist



# Some techniques for heterogeneous classes

(All classes are heterogeneous)

◇ Alliance with the strongest students

◇ Support for the weakest

# The Elevator Strategy



Stop on all the floors!

# Every day...

- ◇ Something too difficult
- ◇ Something too easy
- ◇ Something “just right”



# Pacing

◇ Constant forward motion



◇ Eternal review



# Importance of strong students

◇ Politically

◇ Philosophically

◇ Pedagogically



# Curriculum

“No threshold, no ceiling”  
activities in core classes






[www.picciotto.org/math-ed](http://www.picciotto.org/math-ed)

Center for Innovative Teaching  
summer courses

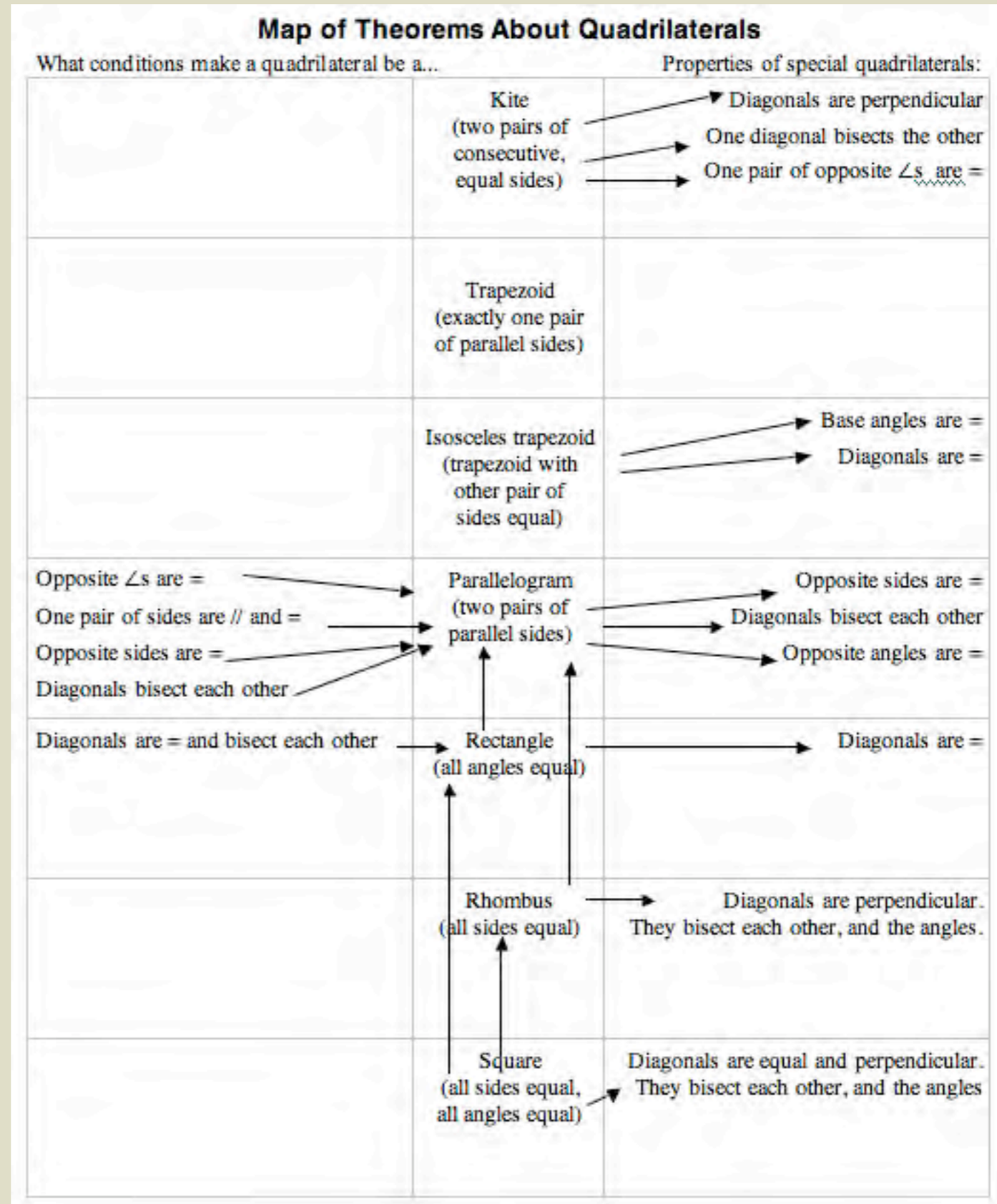
# Curriculum

more depth

Example:

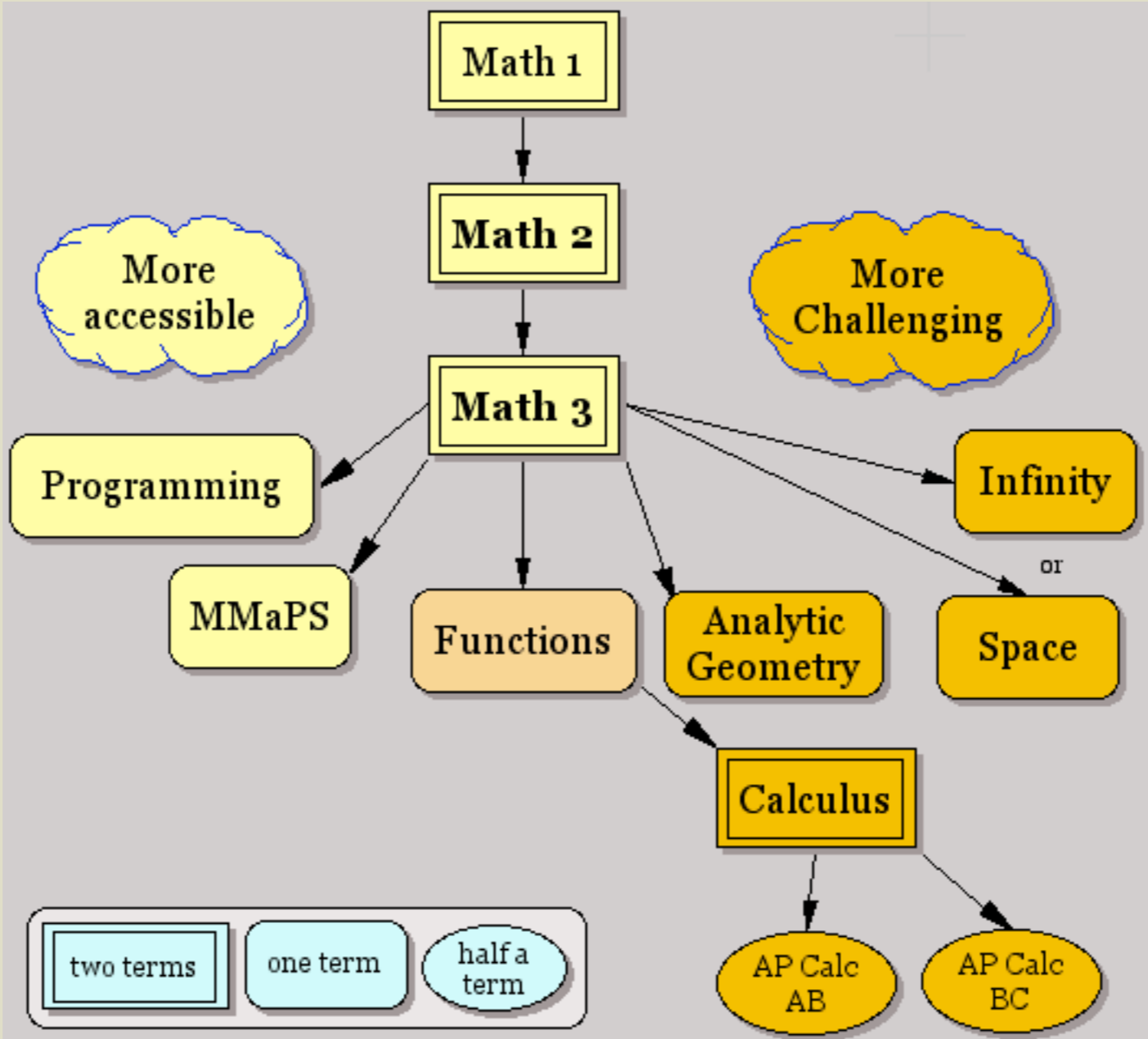
Map of Theorems About Quadrilaterals		
What conditions make a quadrilateral be a...		Properties of special quadrilaterals:
	Kite (two pairs of consecutive, equal sides)	
	Trapezoid (exactly one pair of parallel sides)	
	Isosceles trapezoid (trapezoid with other pair of sides equal)	
	Parallelogram (two pairs of parallel sides)	
	Rectangle (all angles equal)	
	Rhombus (all sides equal)	
	Square (all sides equal, all angles equal)	

# Example:



# Curriculum

more electives



# Space

- ◇ Transformational geometry
  - Matrices
- ◇ Symmetry
  - Abstract algebra
- ◇ Dimension
  - 3D: polyhedra
  - 4D: introduction



# Infinity

## ◇ Infinite sets

- Cantor

## ◇ Proof

- by contradiction
- by mathematical induction

## ◇ Dynamical systems

- iteration and chaos

## ◇ Fractals:

- self-similarity
- recursion and programming

# Summary

- ◇ Elevator strategy
- ◇ Constant forward motion
- ◇ “No ceiling” activities
- ◇ Some topics in depth
- ◇ Breadth through electives