



GETTING TO THE HEART OF EQUITY

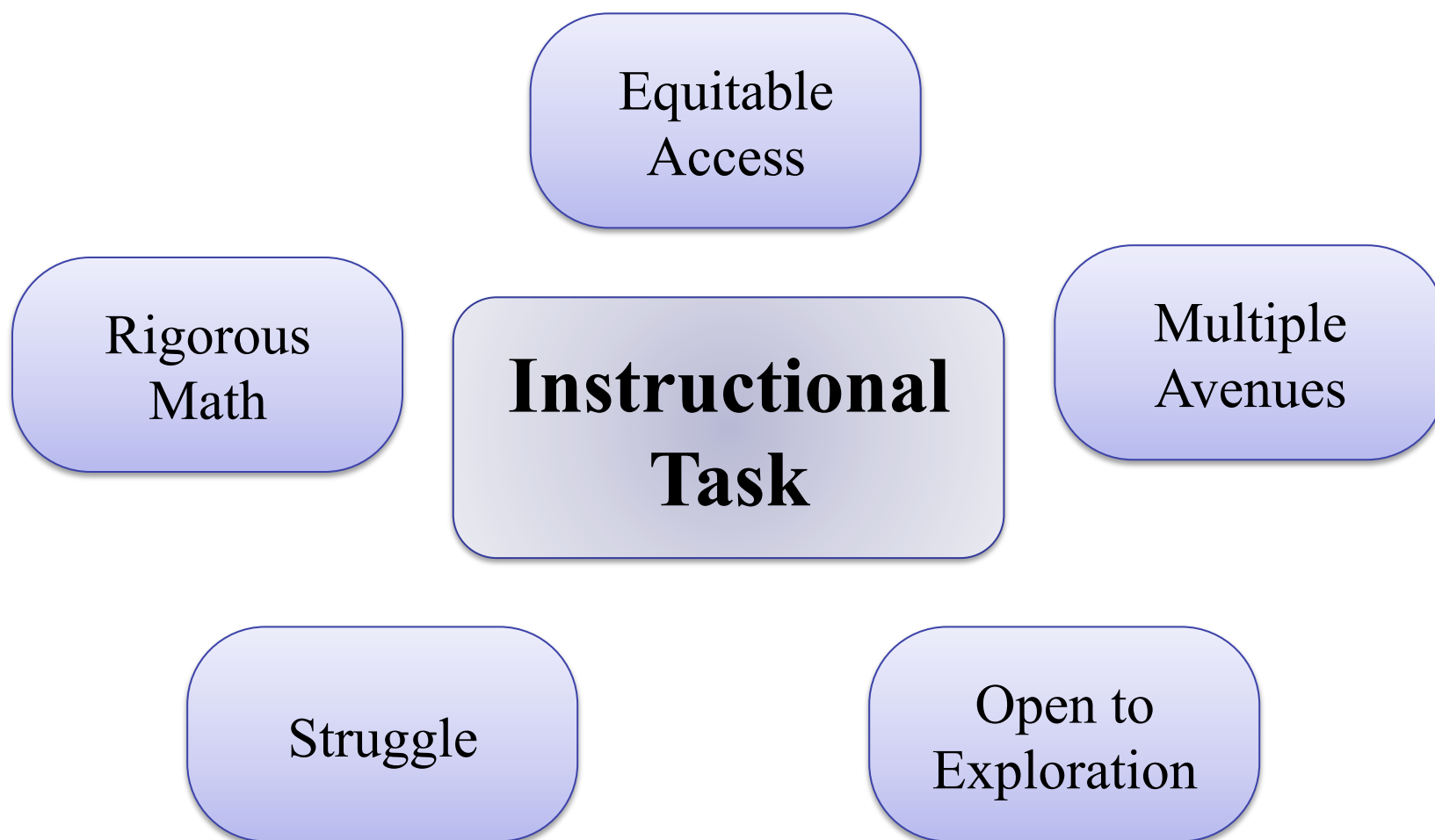
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Session Highlights

- Do some math together
- Analyze characteristics of instructional tasks
- Propose instructional practices that help students reframe their view of themselves as math learners





Equity and Access

Equitable access means

- high expectations,
- adequate time,
- consistent opportunities to learn, and
- strong support

that enable students to be mathematically successful.



Growth Mindset

In a growth mindset, people believe that their most basic abilities can be developed through dedication and hard work – brains and talent are just the starting point. This view creates a love of learning and a resilience that is essential for great accomplishment.

Mindset, Carol S. Dweck Ph.D., 2006, Random House Publishing



Instructional Practices

- We Ask
 - Implement tasks that promote reasoning and problem solving.
- We Listen
 - Facilitate meaningful mathematical discourse.
 - Pose purposeful questions.
 - Support productive struggle.
- We Learn
 - Elicit and use evidence of student thinking.



A Problem

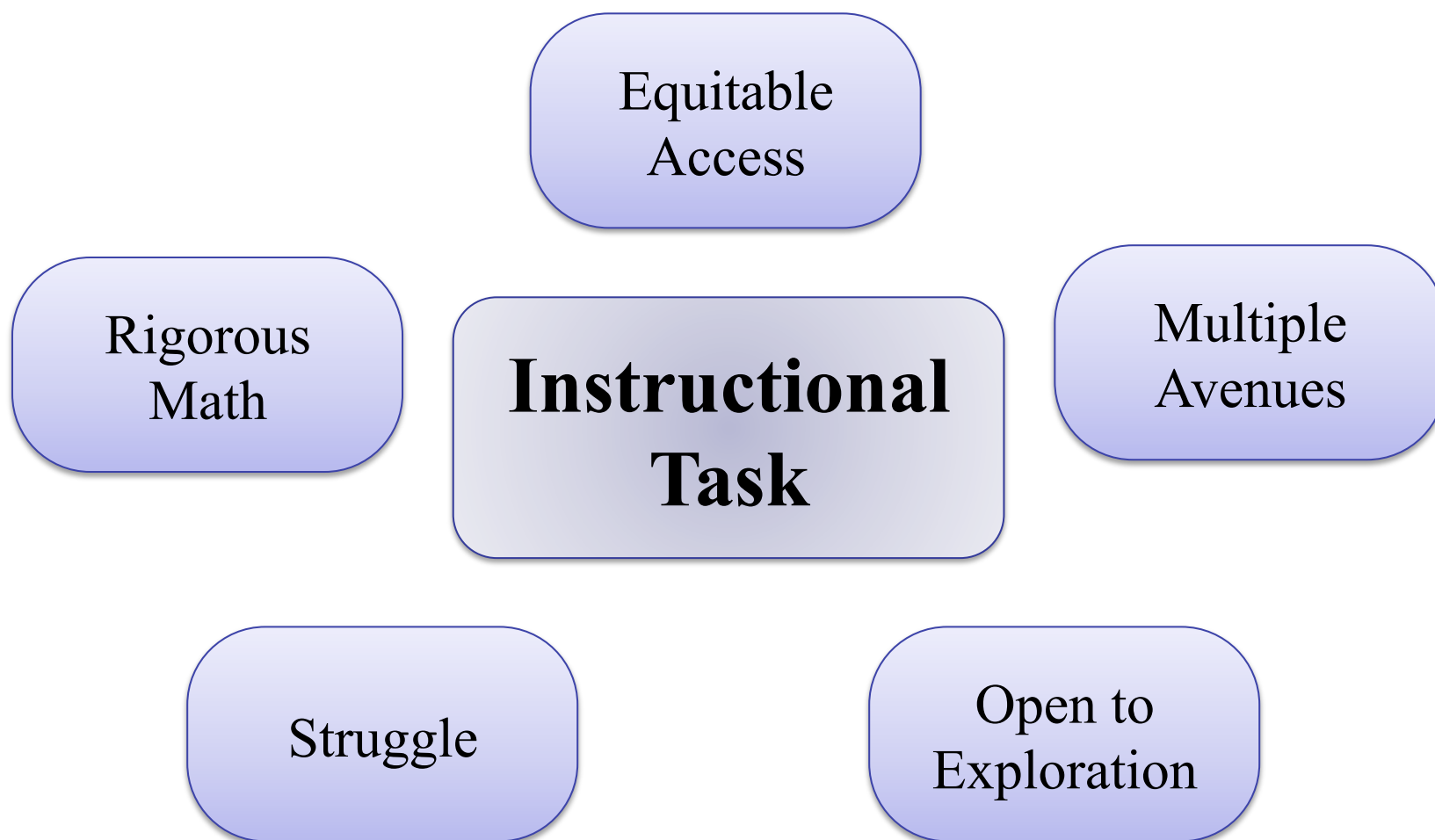
While talking with a student...

$$\begin{array}{rcl}
 & 3 \times 7 & = 21 \\
 +1 \curvearrowright & & +1 \\
 & 4 \times 8 & = 32
 \end{array}
 \quad
 \begin{array}{c}
 \curvearrowright +11 \\
 \curvearrowleft
 \end{array}$$

The student noticed that each number in the second problem was an increase of 1 from the first problem. She wondered if that was going to happen all the time or if there were other problems for which it also was true.

Questions

- Are there other problems like this one?
- What generalizations can be made from this student's observation?
- What do you know for sure?
- What do you want to know that you don't?
- What are you wondering?





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Another Problem

The 9s...

$$1 \times 9 = 9$$

$$2 \times 9 = 18$$

$$3 \times 9 = 27$$

$$4 \times 9 = 36$$

$$5 \times 9 = 45$$

$$6 \times 9 = 54$$

$$7 \times 9 = 63$$

$$8 \times 9 = 72$$

$$9 \times 9 = 81$$

The 8s...

$$1 \times 8 = 8$$

$$2 \times 8 = 16$$

$$3 \times 8 = 24$$

$$4 \times 8 = 32$$

$$5 \times 8 = 40$$

$$6 \times 8 = 48$$

$$7 \times 8 = 56$$

$$8 \times 8 = 64$$

$$9 \times 8 = 72$$

The 7s...

$$1 \times 7 = 7$$

$$2 \times 7 = 14$$

$$3 \times 7 = 21$$

$$4 \times 7 = 28$$

$$5 \times 7 = 35$$

$$6 \times 7 = 42$$

$$7 \times 7 = 49$$

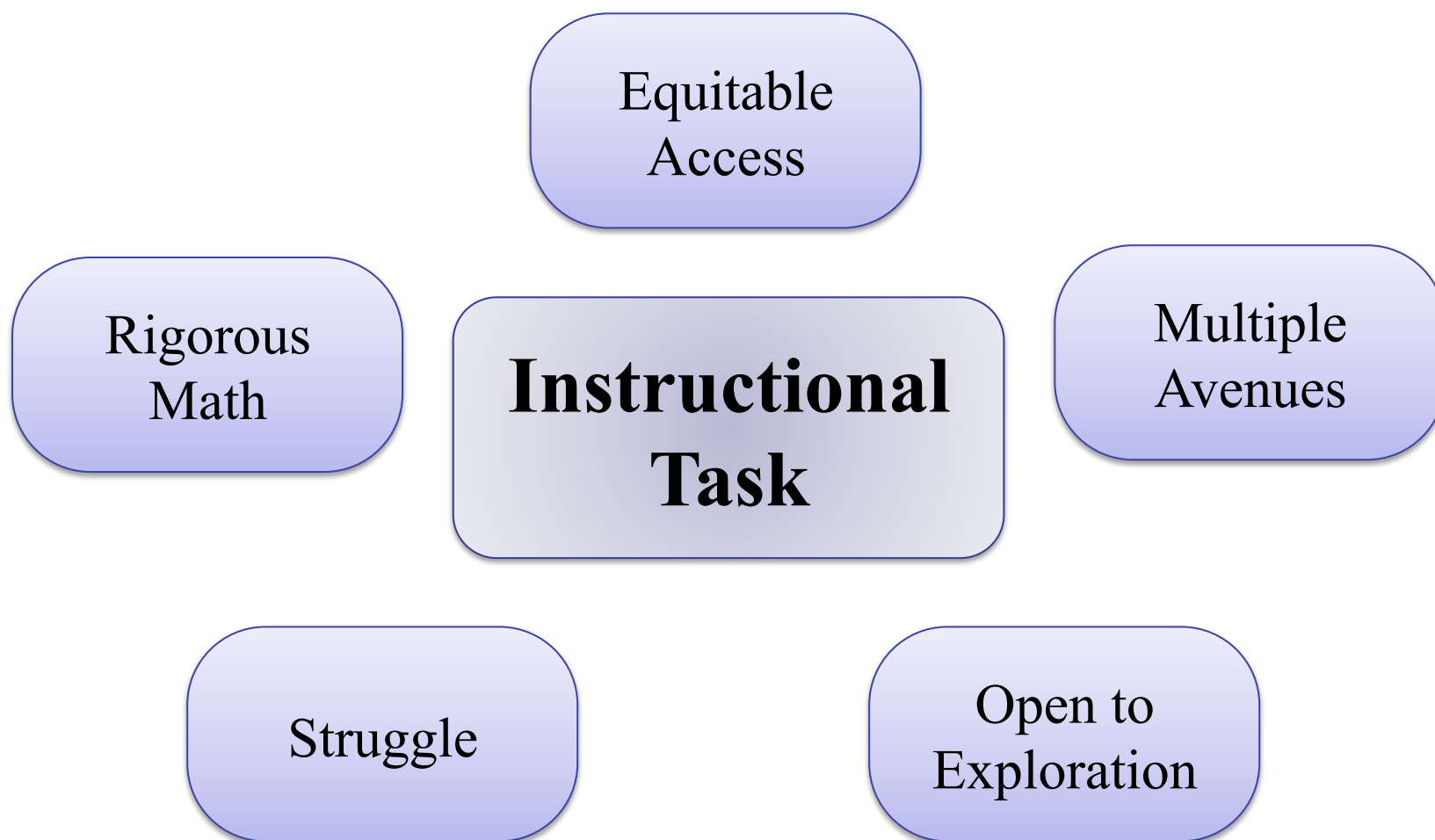
$$8 \times 7 = 56$$

$$9 \times 7 = 63$$

Questions

We all know the 9's trick....

- What is the 8's trick?
- How is it related to the 9's trick?
- What about a 7's trick? A 6's trick?
- What is going on and can we make a generalization?





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The Routine of Questions

- What pattern, rule or relationship seems to be true? Is it true for all cases?
- How are things changing? What steps are repeating?
- What operation shortcuts could be useful?
- How can I describe the rule or relationship?
- How can I “undo” or reverse the process?
- What generalization describes the pattern?



Final Thoughts...

- Curiosity is a driver of motivation – how you pose tasks can ignite curiosity
- Look for tasks that:
 - Focus on rigorous math
 - Are equitable and accessible
 - Promote struggle
 - Have more than one avenue to explore
 - Are open to exploration



Thank You

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