Module 4

Topic: Responsive Instruction & Teacher Decision-Making

The purpose of this professional development session is to provide teachers the opportunity to discuss what is easy and what is hard for them and their students in the mathematics classroom. Teachers have the opportunity to consider how to respond to student answers, and how to make decisions that would stabilize student learning.

Pedagogical Elements

- Verbalize difficulties teachers and students face in the mathematics classroom
- How to respond effectively to student in order to stabilize learning
- Recognize difference between reactive and responsive instruction

Activities

Task

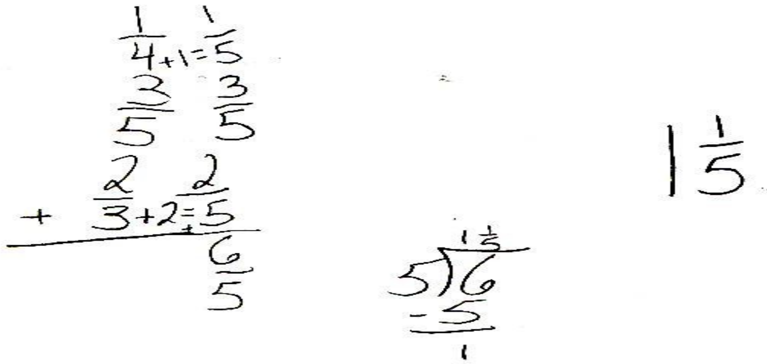
- What mathematical concepts have you found difficult for students to learn? Why do you think these concepts are difficult for students to learn? How do you usually address these difficulties?
- What mathematical concepts have you found easy for students to learn? Why do you think these concepts are easy for students to learn? How do you usually address these concepts?
- Post responses on chart paper
- What are some questions students ask, or issues you encounter in working with students, that you find challenging to deal with?
- An "unfair" coin has a heads side which weighs two and one-half times heavier than the tails side. If you toss this unfair coin 100 times, how many of those times would you expect to see heads? Explain why. A student says 0% because the heavy side will land due to gravity. How do you respond?
- A student says, “I don’t understand why a negative times a negative is positive.” How do you respond to this student?
- Johnny: Why do we invert and multiply when dividing fractions?
- Define concave polygons

  Molly: A polygons is concave if it has at least one angle larger than 180^0.

  Steve: A polygon is convex if the line segment connecting any pair of points in its interior falls entirely in the interior of the polygon.

  Ellie: A polygon is concave if there is at least one straight line through the polygon that crosses more than two sides.

  How do you respond to these students?
- Jessica needs to buy rope for a school project. She needs lengths of one-fourth foot, three-fifths foot, and two-thirds foot. How much rope does Jessica need? This is sample student work:



- The ratio of boys to girls in one class is 4/7. The ratio of the boys to girls in another class is 7/9. what is the ratio of boys to girls when the two groups are joined?
  Group 1: 11/17 since we add the numerators and then we add the denominators.
  Group 2: 36/49 – we cross multiply.
  Group 3: We are just adding fractions so take the common denominator and then add the numerators.
  How do you respond to these students?

Task

- Discuss the Teacher Decision-Making Map
- Discuss stabilizing of the first, second, and third orders
- Recall the rope problem. Show stabilizing map.
- In small group, select two problems and map out how a teacher could go about dealing with those problems. Map out short and long term impact of the different decisions a teacher can make.

Materials

Technology

- Laptop
- Document Projector
- Document Camera

Supplies

- Chart Paper/Markers
- Copies of handouts for Stabilizing Student Thinking
- Copies of handouts for Teacher Decision-Making Map

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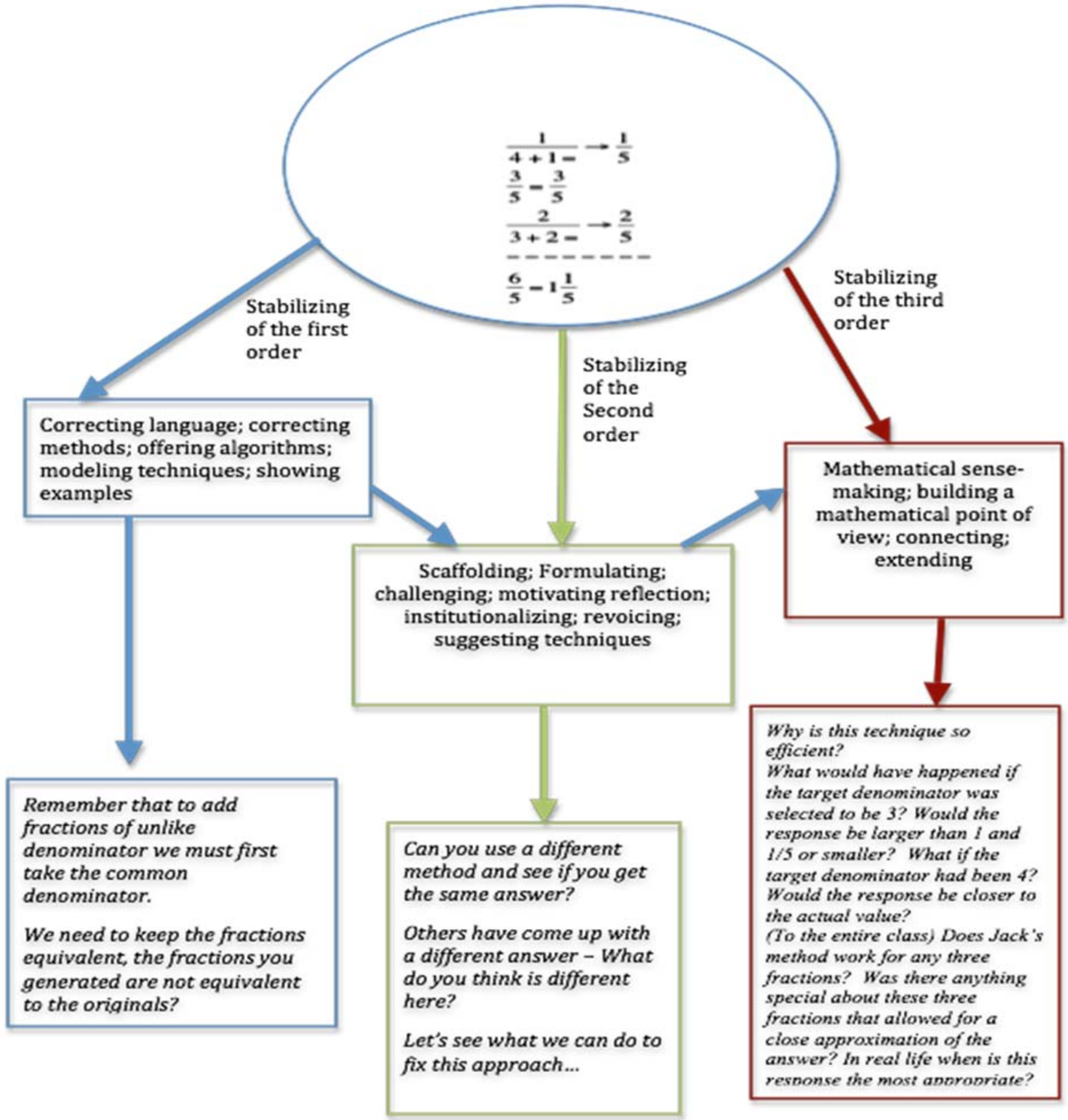
Stabilizing Student Learning



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Teacher Decision-Making Map

Problem Situation	Teacher Decision Space	Short-term Outcomes	Long-term Outcomes