# Engaging Teachers in Collaborative 5E Lesson Planning with Effective Teaching Practices


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# Agenda

- Collaborative Planning: What is it?
- Reasoning and Research
- 5Es: What are they?
- Planning a Lesson
- Reflection and Next Steps


LETS
BREAK
THE ICE

# Collaborative Planning
## What is it?

# Plan: The Noun vs. The Verb

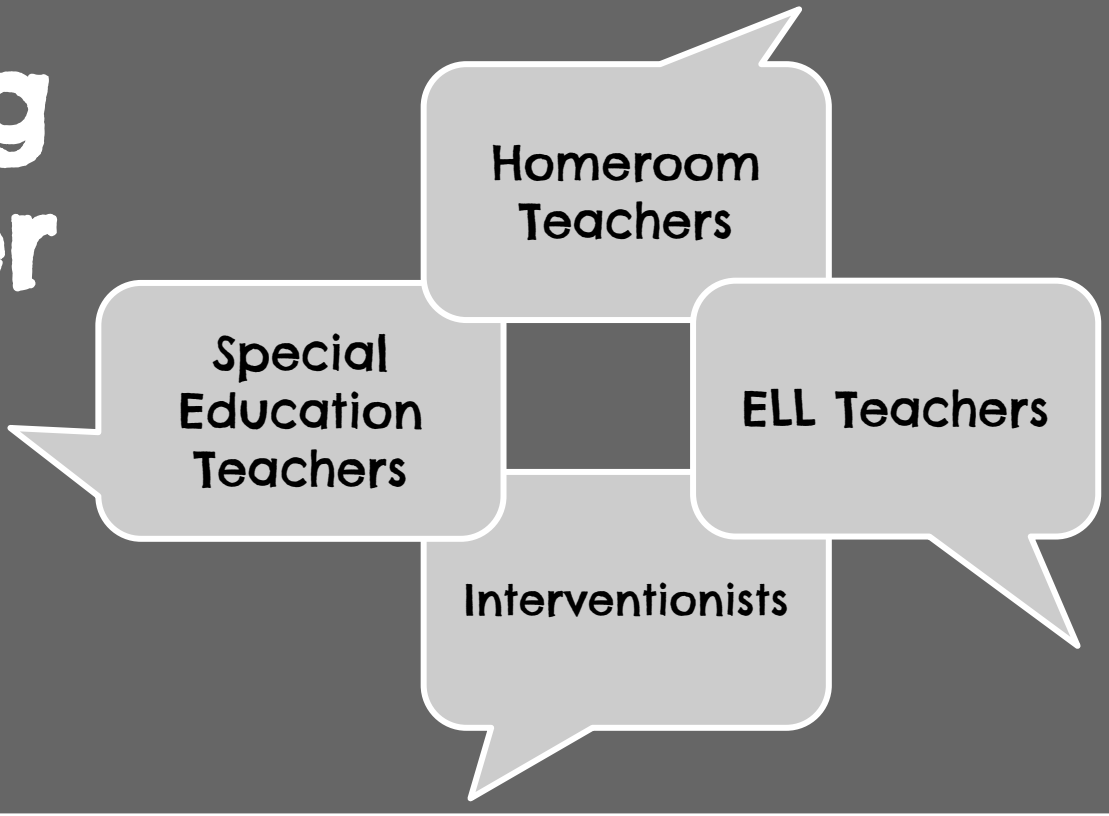
## What it *is not* :

- Pacing
- Teaching “on the fly”
- Skimming the morning of
- Reading lesson verbatim
- Reducing rigor of the math

## What it *is* :

- Taking test prior to planning
- Reading lesson(s) in advance
- Unpacking lesson
- Anticipating student thinking
- High-quality questions & tasks
- Planning for dialogue

# Planning Together



# Responding to Your Class's Needs

- What do students know?
- What don't they know? Why don't they know it?
- What scaffolds might some students need?
- Are there language supports that will help students access math vocabulary?
- Does the problem context need to be changed?
- What manipulatives will be useful?

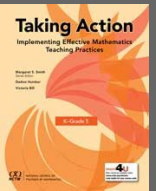
# Reasoning & Research

“

Nothing has a larger impact on student learning than teacher practices.

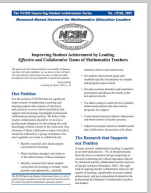

Haycock, K. (1998). “Good teaching matters.” *Thinking K-16.* Washington DC: The Education Trust.

"Every student has the right to participate substantially in all phases of a mathematics lesson and be challenged and supported in developing deep understanding and proficiency in mathematics."



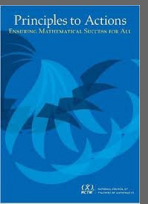

Jackson and Cobb 2010, in Huinker, D. & Bill, V. *Taking action: Implementing effective mathematics teaching practices.* NCTM, 2017.

"Researcher Judith Warren Little (1990) found that when teachers engage regularly in authentic 'joint work' focused on explicit, common learning goals, their collaboration pays off in the form of high quality solutions to instructional problems, increased teacher confidence, and remarkable gains in student achievement."



National Council of Supervisors of Mathematics (2007). *Improving Student Achievement by Leading Effective and Collaborative Teams of Mathematics Teachers.* Retrieved from www.ncsmonline.org.

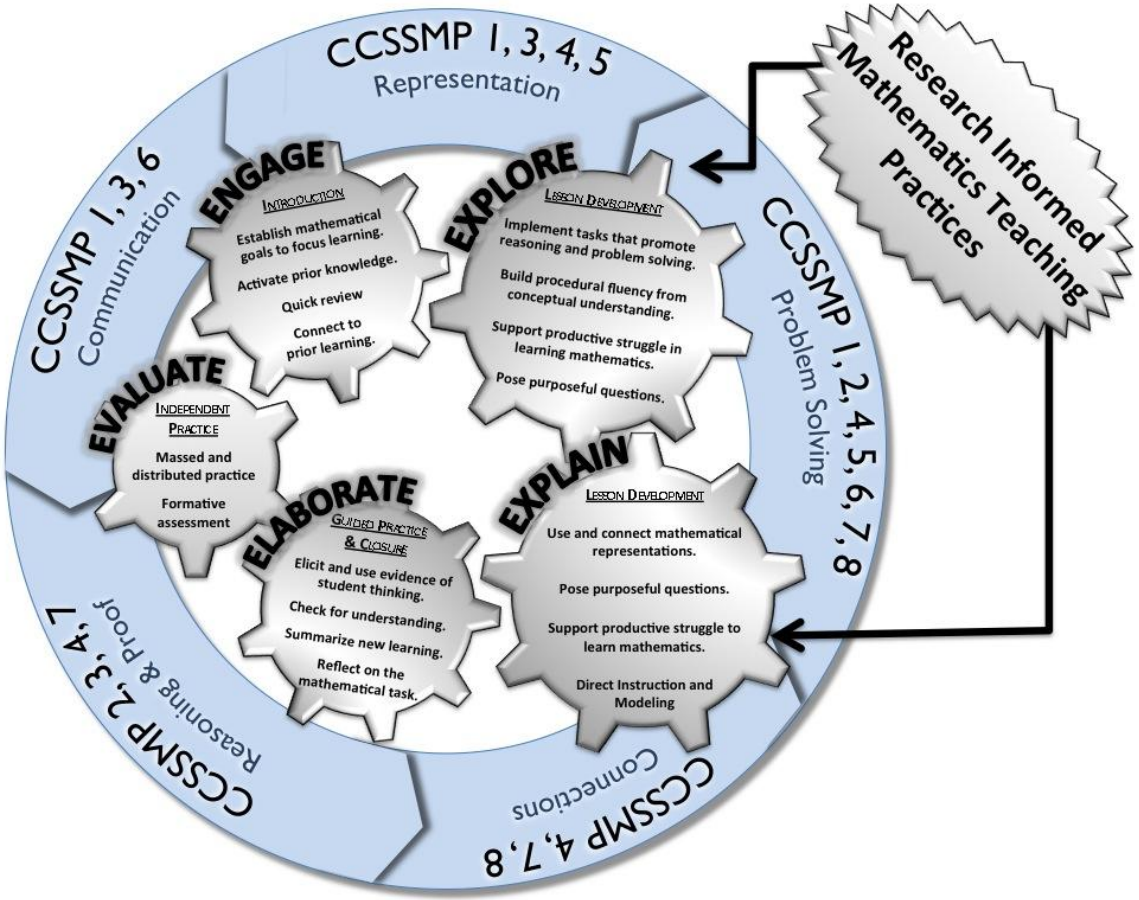
"Effective instruction rests in part on careful instructional planning. Teachers' co-planning of lessons provides one of the greatest opportunities for making a positive difference on student learning."




NCTM. (2014). *Principles to actions: Ensuring mathematical success for all*. Reston, VA: NCTM.

# Professionalism

# The 5 Es:
# What are they?

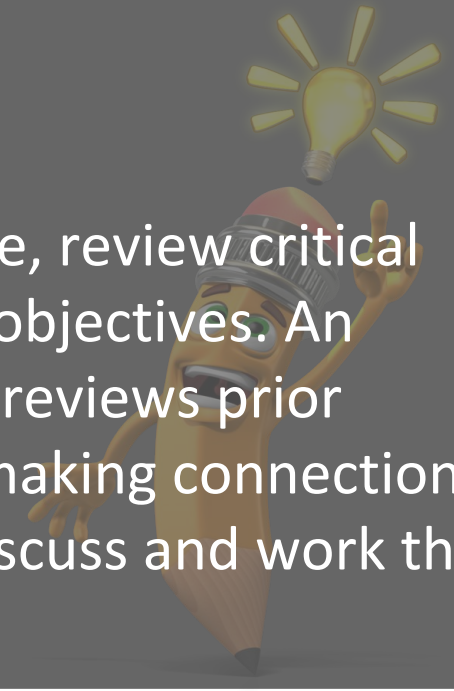



# Research-Informed Instructional Framework

5E Graphic: Delise Andrews, Lincoln Public Schools, Lincoln, NE

# Engage

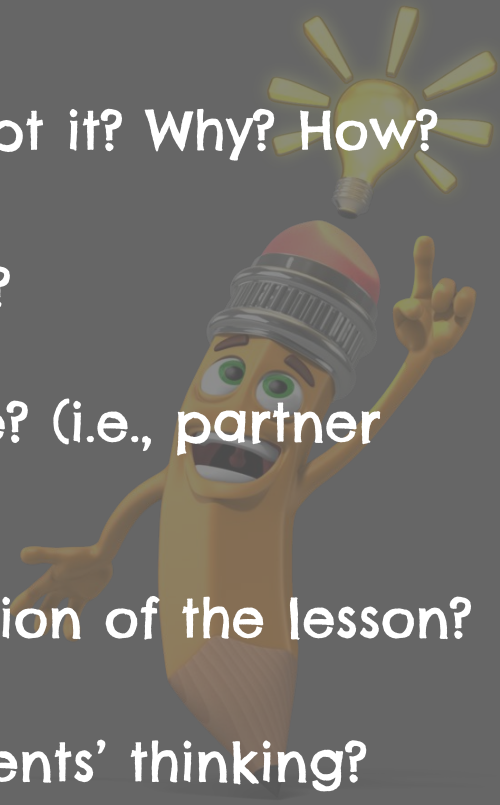
# Engage



Purpose: To activate prior knowledge, review critical prior learning, and share the lesson objectives. An opening problem or task that either reviews prior learning or introduces the topic by making connections is often used. Students are asked to discuss and work the task in pairs or small groups.

# ENGAGE

- Is this the task you will use? Will you adapt it? Why? How?
- What do you want to hear from students?
- What conversation structures will you use? (i.e., partner talk, small group, etc.)
- How much time will you allot to this portion of the lesson?
- What questions will you ask to elicit students' thinking?



## Math Lesson

| Grade: 5 | Lesson: 10.3 |
|---|---|
| **Objective(s):** Find equivalent fractions. | |

**INTRODUCE**

- Write the fractions $\frac{2}{3}$ and $\frac{4}{5}$ on the board.
- **Ask:** Are these fractions equivalent?
- Write the fractions $\frac{1}{2}$ and $\frac{3}{6}$ on the board.
- **Ask:** Are these fractions equivalent?
- Write the fractions $\frac{3}{9}$ and $\frac{1}{3}$ on the board.
- **Ask:** Are these fractions equivalent?
- **Say:** Today we're going to find equivalent fractions.

## Math Lesson "Well-chosen I"

| Grade: 5 | Lesson: 10.3 |
|---|---|
| **Objective(s):** Find equivalent fractions. using models | |

**INTRODUCE** Partners

Engage

- Write the fractions $\frac{2}{3}$ and $\frac{4}{5}$ on the board. – Students draw
- **Ask:** Are these fractions equivalent?

Write the fractions $\frac{1}{2}$ and $\frac{3}{6}$ on the board.

- **Ask:** Are these fractions equivalent?

Write the fractions $\frac{3}{9}$ and $\frac{1}{3}$ on the board.

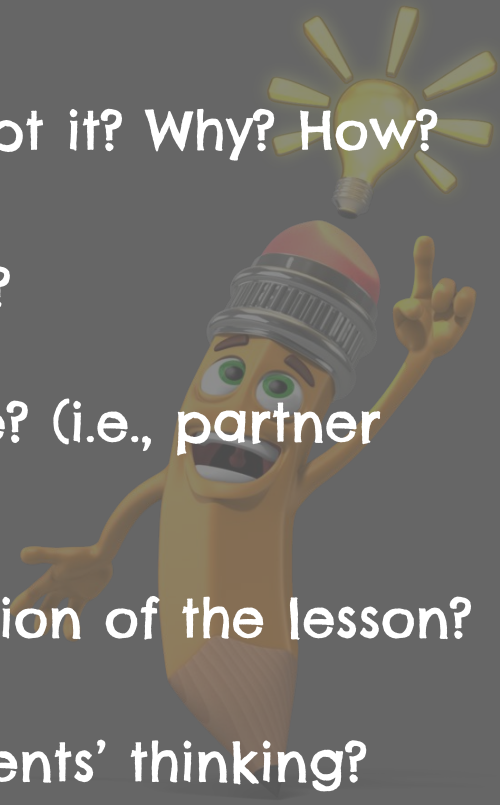
- **Ask:** Are these fractions equivalent?
- **Say:** Today we're going to find equivalent fractions.

Fraction strips
White boards

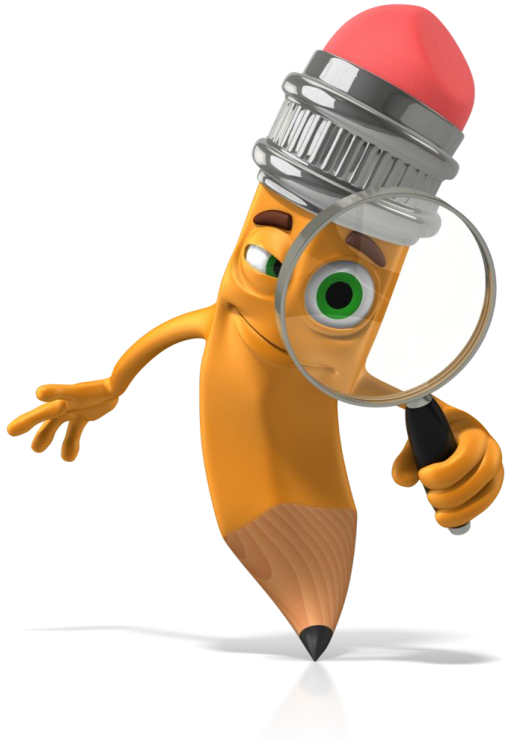
How do you know?
Show us on your model

# ENGAGE

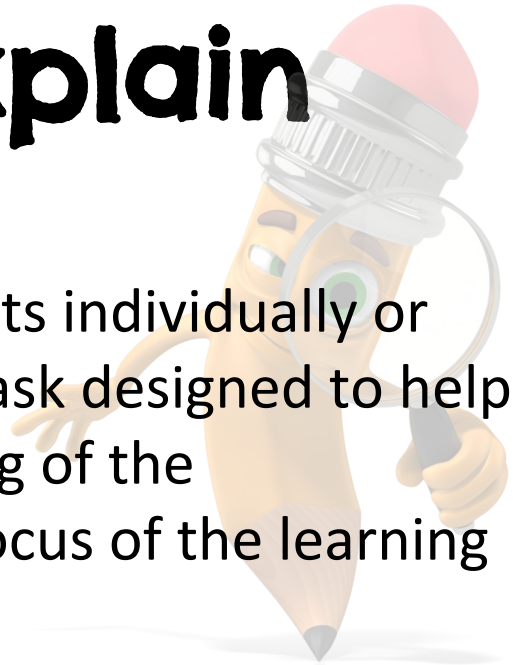
- Is this the task you will use? Will you adapt it? Why? How?
- What do you want to hear from students?
- What conversation structures will you use? (i.e., partner talk, small group, etc.)
- How much time will you allot to this portion of the lesson?
- What questions will you ask to elicit students' thinking?



# Explore and Explain



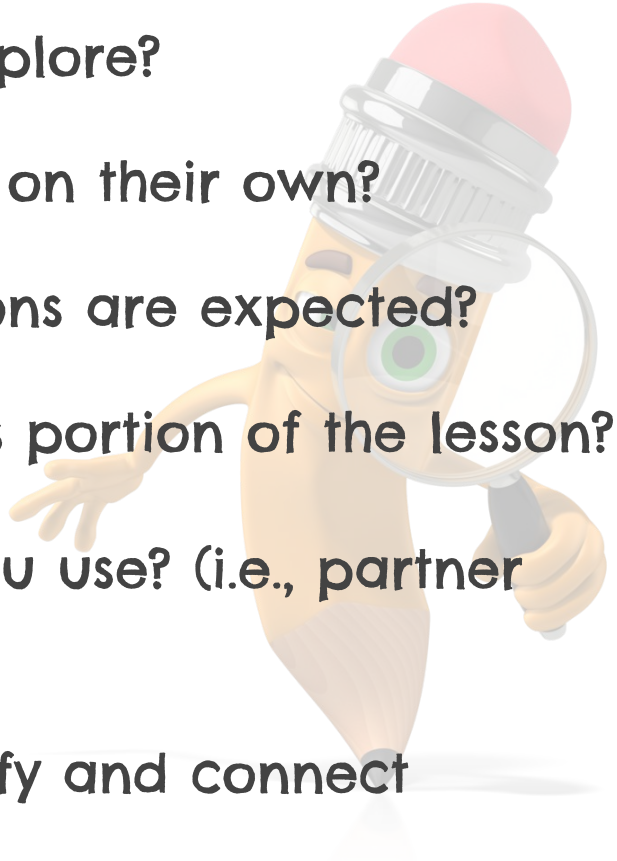
# Explore and Explain



Purpose: To actively engage students individually or collaboratively in a mathematical task designed to help them develop a deep understanding of the mathematical concept that is the focus of the learning objective.

## EXPLORE / EXPLAIN

- What math concept will students explore?
- What are students likely to discover on their own?
- What conceptions and misconceptions are expected?
- How much time will you allot to this portion of the lesson?
- What conversation structures will you use? (i.e., partner talk, small group, etc.)
- What questions will be used to clarify and connect students' ideas?



# EXPLORE/EXPLAIN

**DEVELOP**

- Draw a circle on the board. Split the first one in half vertically and color one-half of the circle. Ask students what fraction is being shown. Write $\frac{1}{2}$ on the board.
- Draw a perpendicular line through the circle. Ask students what circle is being shown now. Write $\frac{2}{4}$ on the board.
- **Say:** *Even though these are two different fractions, they are equivalent to one another. The amount that is shaded didn't change, there are just more parts to the circle.*
- Tell students that for two fractions to be equivalent, we must be able to multiply or divide the numerator and denominator by the same number.
- **Ask:** *What can we multiply both the numerator and the denominator by in $\frac{1}{2}$ to have it equal $\frac{2}{4}$?*
- Show students other fractions that are equiva
- Write $\frac{2}{3}$ on the board. Show students other fra
- **Ask:** *What did I multiply the numerator and th*

Explore & Explain

**DEVELOP** "Draw a circle on your board. Draw a line in it to show $\frac{1}{2}$."

- ~~Draw a circle on the board~~. Split the first one in half vertically and color one-half of the circle. Ask students what fraction is being shown. Write $\frac{1}{2}$ on the board. Whole group, students have boards
- ~~Draw a perpendicular line through the circle. Ask students what circle is being shown now. Write $\frac{2}{4}$ on the board~~. How can we use this to show $\frac{2}{4}$? What do you notice?
- **Say:** *Even though these are two different fractions, they are equivalent to one another. The amount that is shaded didn't change, there are just more parts to the circle.* ← Goal is for students to say this
- ~~Tell students that for two fractions to be equivalent, we must be able to multiply or divide the numerator and denominator by the same number~~. Use your fraction strips to show another fraction that is equivalent to $\frac{1}{2}$
- **Ask:** ~~*What can we multiply both the numerator and the denominator by in $\frac{1}{2}$ to have it equal $\frac{2}{4}$?*~~ How can we use x or ÷ to prove these are true?
- ~~Show students other fractions that are equivalent to $\frac{1}{2}$~~. Ask students to add to board
- Write $\frac{2}{3}$ on the board. Show ~~students~~ other fractions that are equivalent to $\frac{2}{3}$. (Examples: $\frac{4}{6}$, $\frac{6}{9}$, and $\frac{8}{12}$.)
- **Ask:** *What did I multiply the numerator and the denominator by to get each of these fractions?* you

$\frac{1}{2} = \frac{2}{4}$ $\frac{1}{2} = \frac{3}{6}$ $\frac{1}{2} = \frac{4}{8}$ Why → Value of 1

**GUIDED PRACTICE** Students @ desks working on boards

- Have two students come to the board

## EXPLORE / EXPLAIN

- What math concept will students explore?
- What are students likely to discover on their own?
- What conceptions and misconceptions are expected?
- How much time will you allot to this portion of the lesson?
- What conversation structures will you use? (i.e., partner talk, small group, etc.)
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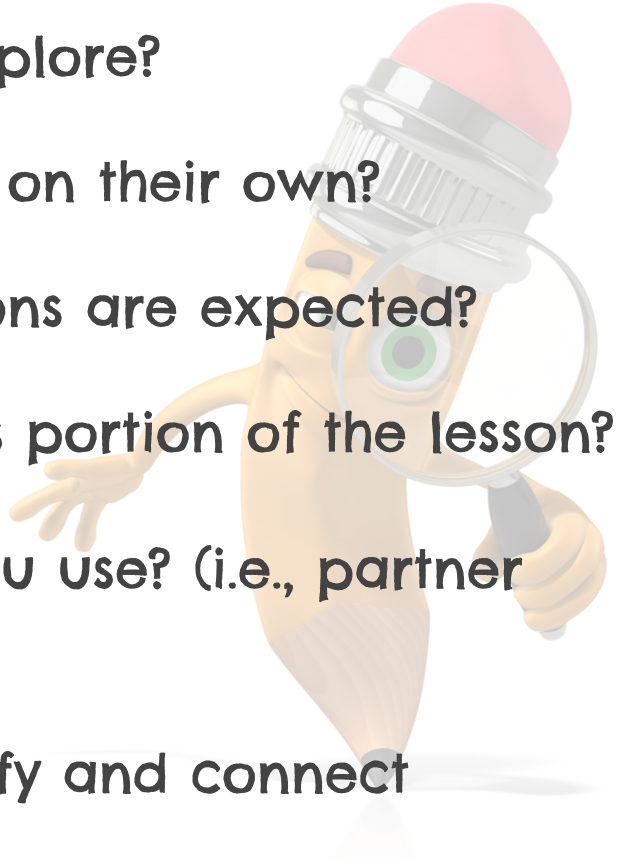
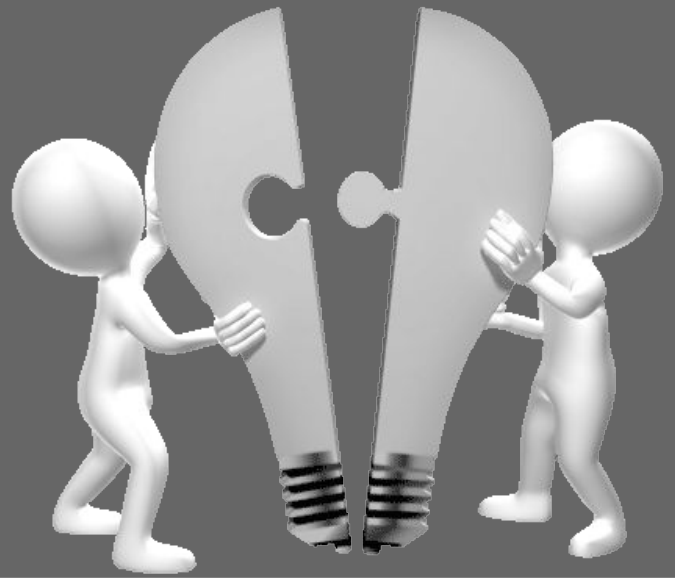


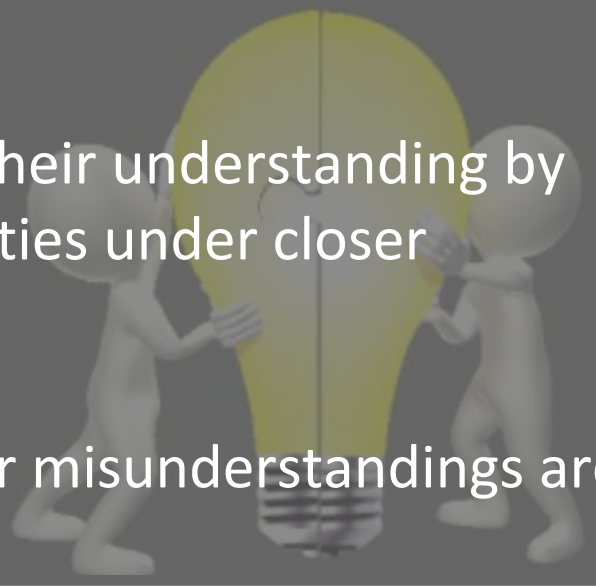
# Elaborate



# Elaborate

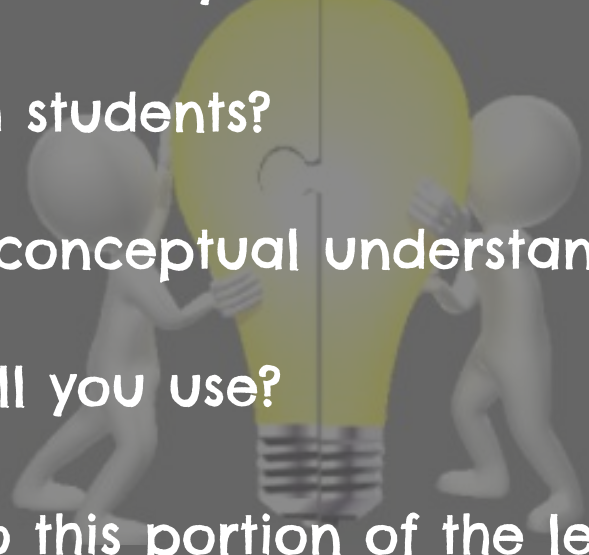
Purpose: Have students deepen their understanding by engaging in guided practice activities under closer monitoring by the teacher.

This phase ends with closure after misunderstandings are clarified.



# ELABORATE

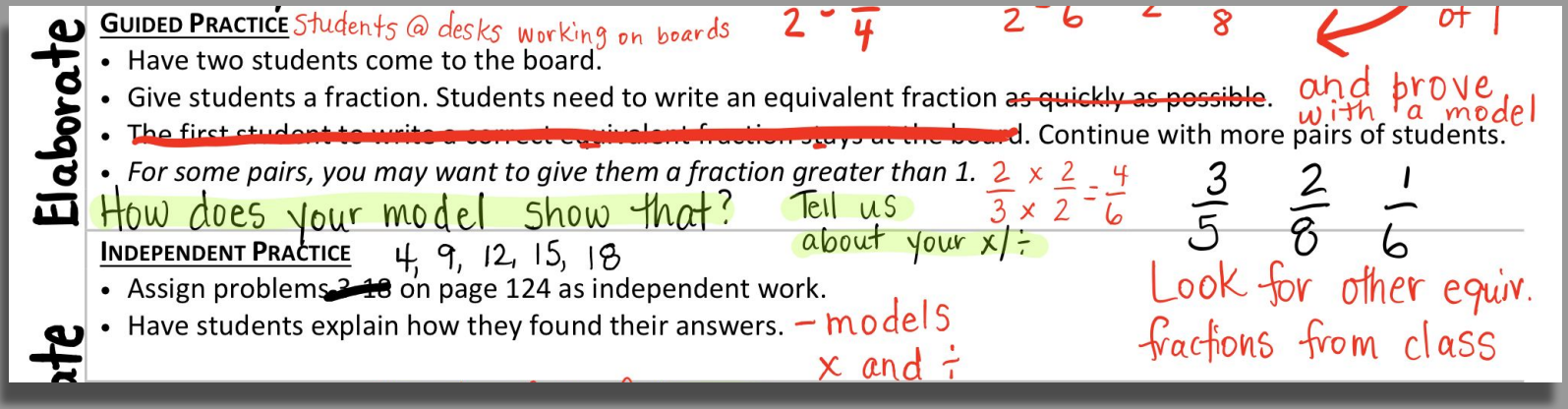
- Work the selected task
- Does the task need to be adapted? Why? How?
- What do you want to hear from students?
- How will students demonstrate conceptual understanding?
- What conversation structures will you use?
- How much time will you allot to this portion of the lesson?



# ELABORATE

**GUIDED PRACTICE**

- Have two students come to the board.
- Give students a fraction. Students need to write an equivalent fraction as quickly as possible.
- The first student to write a correct equivalent fraction stays at the board. Continue with more pairs of students.
- *For some pairs, you may want to give them a fraction greater than 1.*



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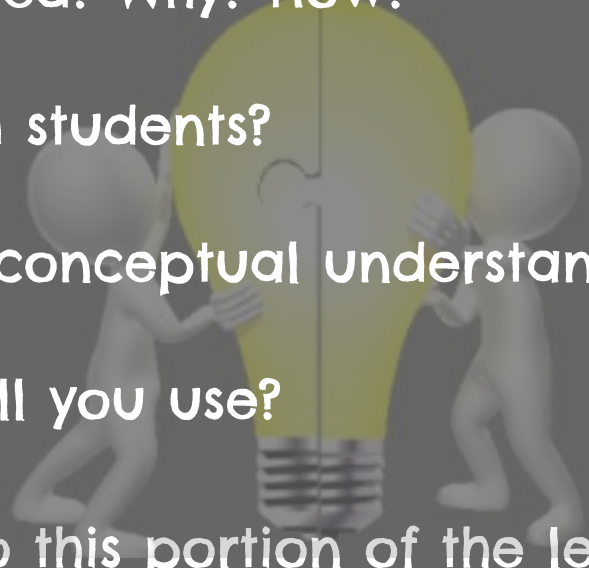

# Evaluate

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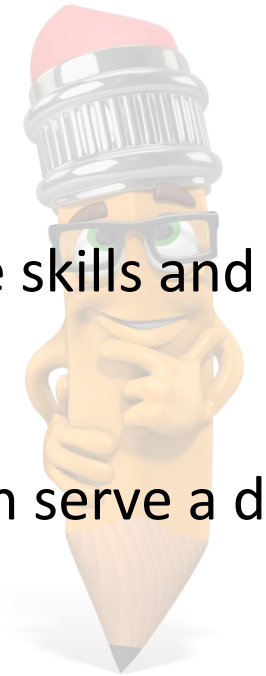
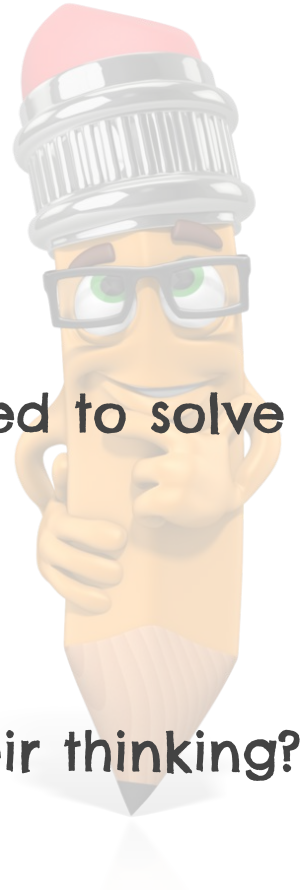


Purpose: Have students demonstrate the skills and concepts they've learned.

Summative assessment opportunities can serve a dual purpose as formative assessments.

# EVALUATE

- Do the assignment or take the test
- What questions do you anticipate students will struggle with?
- What are the different strategies your team used to solve the problems?
- In which lessons are those skills taught?
- How will you prepare students to represent their thinking?



**INDEPENDENT PRACTICE**

- Assign problems 3-18 on page 124 as independent work.
- Have students explain how they found their answers.

**ASSESS AND CLOSE**

- Have students share the answers they wrote for items 4, 7, 14, 15, and 18.
- **Ask:** *What did you multiply or divide the numerators and denominators by to find equivalent fractions?*

Evaluate

**INDEPENDENT PRACTICE** 4, 9, 12, 15, 18 about your x/÷

- Assign problems ~~3-18~~ on page 124 as independent work.
- Have students explain how they found their answers. – models x and ÷

Look for other equiv. fractions from class

**ASSESS AND CLOSE** was the value of the fraction you

- Have students share the answers they wrote for items 4, ~~7~~ 9, ~~14~~ 12, 15, and 18.
- **Ask:** *What ~~did you~~ multiply or divide the numerators and denominators by to find equivalent fractions?* Why ?

↳ Exit ticket on sticky note

# EVALUATE

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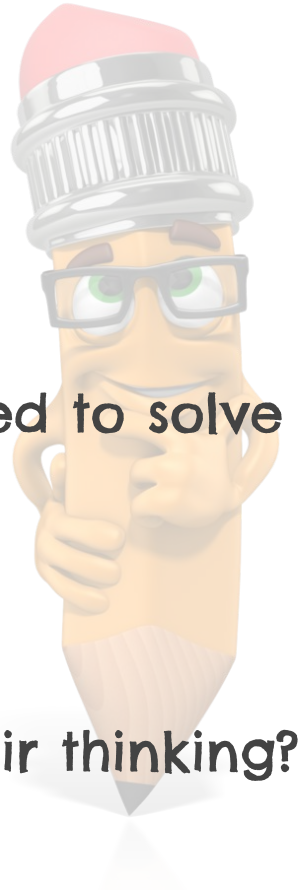

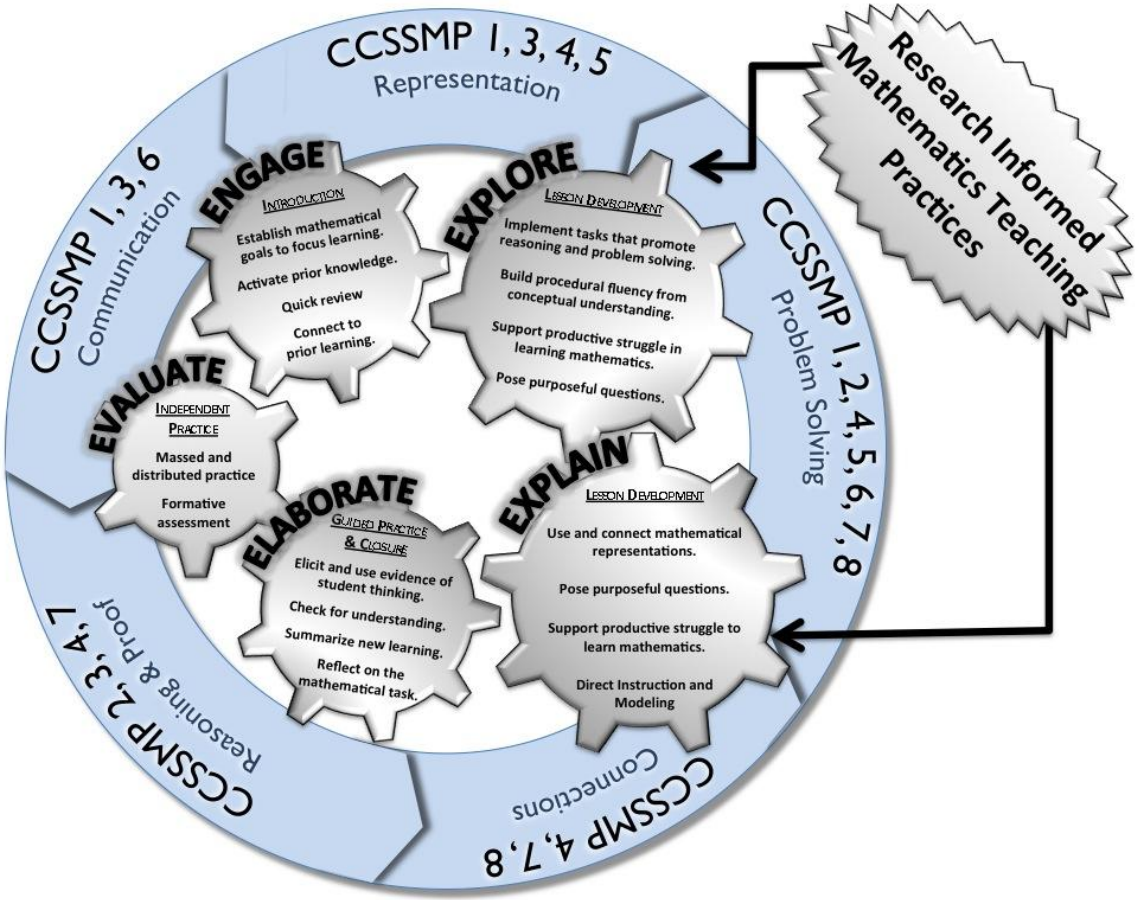


# Research-Informed Instructional Framework

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www.futureme.org


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