NOTICE DIFFERENTIATION STRATEGIES AND WONDER THE EFFECTS FOR EQUITABLE CLASSROOMS

NCTM 2019

OPEN·UP resources™

WHO WE ARE

We’re a nonprofit on a mission to improve education equity and ensure *every* student, in *every* classroom, receives a quality education.

We’re an organization of former educators, parents, and changemakers with a burning passion to help kids and treat districts the way they deserve to be treated.

WHAT WE DO

We provide top-rated curricula for free and support districts with implementations.

SESSION GOAL

To highlight the effective differentiation and scaffolding strategies within a program, which will allow you to identify it in other programs and incorporate it into your own materials.

CONCEPTUAL UNDERSTANDING . . .

What does it really mean?

FACT

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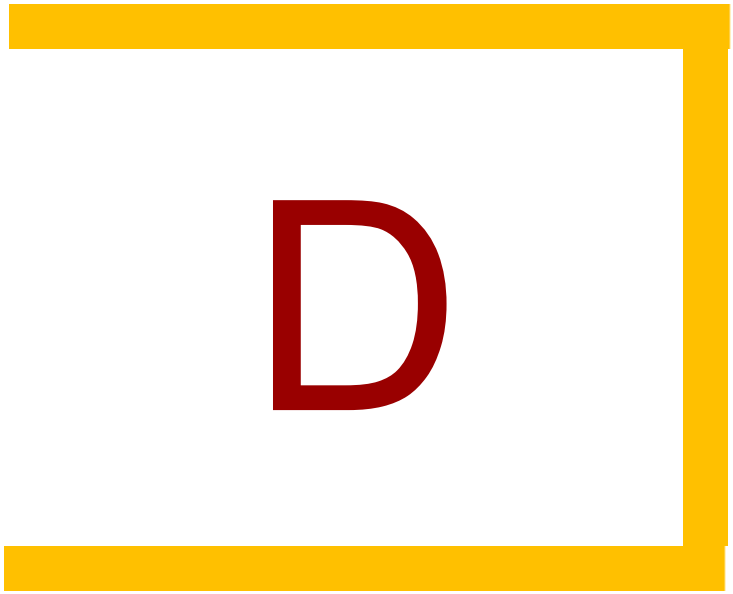

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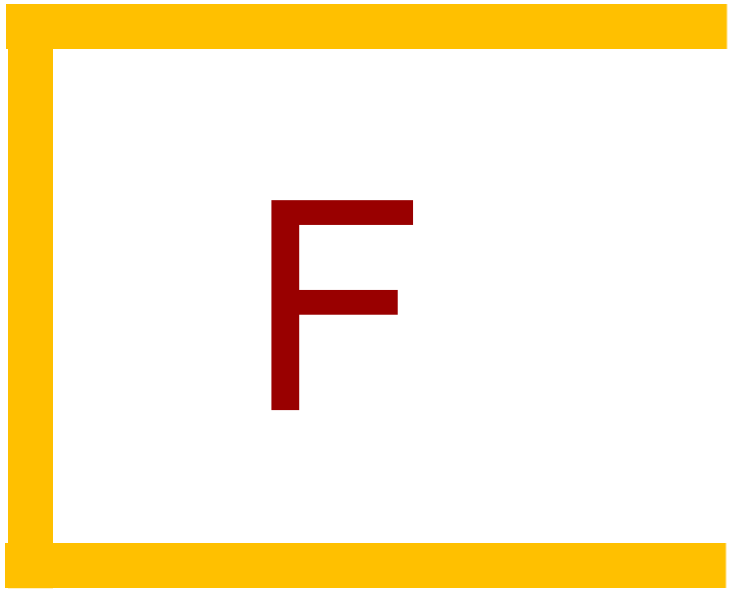

FACT

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WHAT IS THIS WORD?

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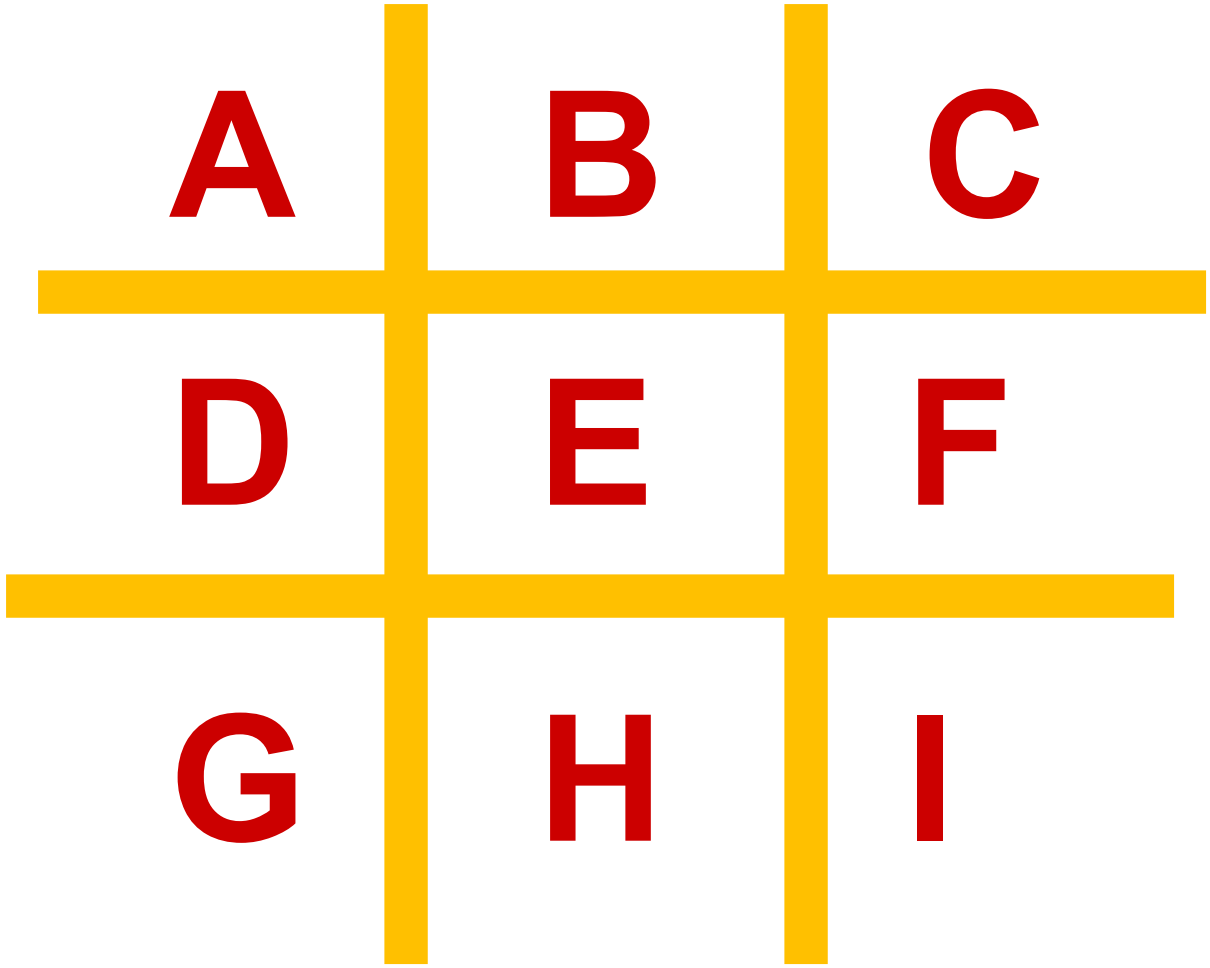
F A C E

CONNECTION . . . CONCEPTUAL UNDERSTANDING?



TRY IT AGAIN!

MEMORIZATION OR UNDERSTANDING

DIFFERENCE?

So what was the difference between your first experience and your second?

LANGUAGE ACQUISITION

Amplify language . . . what does that mean?

LANGUAGE ACQUISITION

Why do we need to intentionally support language acquisition (amplify language) in the context of mathematical sensemaking?

- conceptual learning is dependent upon language
- Shifts in practice as a result of CCSS and NCTM

LANGUAGE ACQUISITION

Why do we need to scaffold learning to amplify language?

- making meaning involves challenging problems
- making meaning involves communicating about math

LANGUAGE ACQUISITION

What role does prompting student thinking play in language development?

- formative feedback

LANGUAGE ACQUISITION

Let’s explore how this happens . . .

NOTICE AND WONDER - ACTIVITY LEVEL

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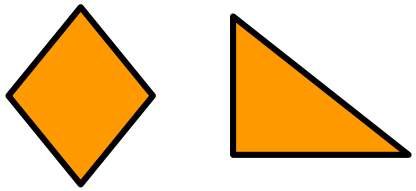

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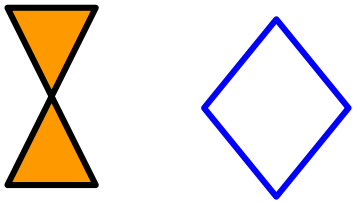

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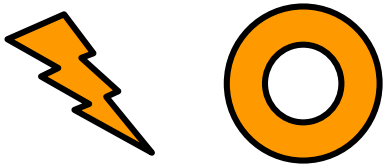

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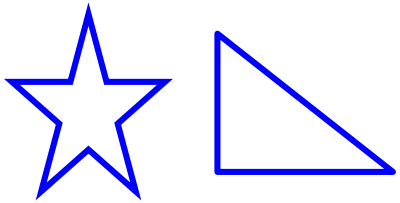

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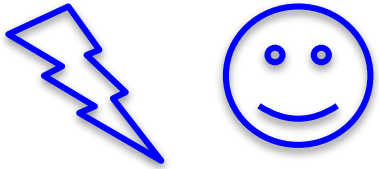


NEW TERMINOLOGY – RECEPTIVE vs. PRODUCTIVE

new terminology		
lesson	receptive	productive
6.2.1	**ratio** __ to __ __ for every __	
6.2.2	diagram	
6.2.3	recipe batch same taste	**ratio** __ to __ __ for every __
6.2.4	mixture same color check (an answer)	batch
6.2.5	**equivalent ratios**	
6.2.6	**double number line diagram** tick marks representation	diagram
6.2.7	**per**	
6.2.8	**unit price** how much for 1 at this rate	**double number line**
6.2.9	**meters per second** constant speed	
6.2.10	**same rate**	**equivalent ratios**

RECEPTIVE TO PRODUCTIVE

Lesson Narrative

In previous lessons, students learned that if two situations involve equivalent ratios, we can say that the situations are described by the **same rate**. In this lesson, students compare ratios to see if two situations in familiar contexts involve the same rate. The contexts and questions are:

- Two people run different distances in the same amount of time. Do they run at the same speed?
- Two people pay different amounts for different numbers of concert tickets. Do they pay the same cost per ticket?
- Two recipes for a drink are given. Do they taste the same?

In each case, the numbers are purposely chosen so that reasoning directly with equivalent ratios is a more appealing method than calculating how-many-per-one and then scaling. The reason for this is to reinforce the concept that equivalent ratios describe the same rate, before formally introducing the notion of unit rate and methods for calculating it. However, students can use any method. Regardless of their chosen approach, students need to be able to explain their reasoning (MP3) in the context of the problem.

> Diego paid $47 for 3 tickets to a concert. Andre paid $141 for 9 tickets to a concert. Did they pay at the **same rate**? Explain or show your reasoning.

PROGRESSION OF DISCIPLINARY LANGUAGE
AMPLIFY NOT SIMPLIFY

Progression of Disciplinary Language

Interpret

- ratio notation (Lesson 1)
- different representations of ratios (Lesson 6)
- situations involving equivalent ratios (Lesson 8)
- situations with different rates (Lesson 9)
- tables of equivalent ratios (Lessons 11 and 12)
- questions about situations involving ratios (Lesson 17)

Explain

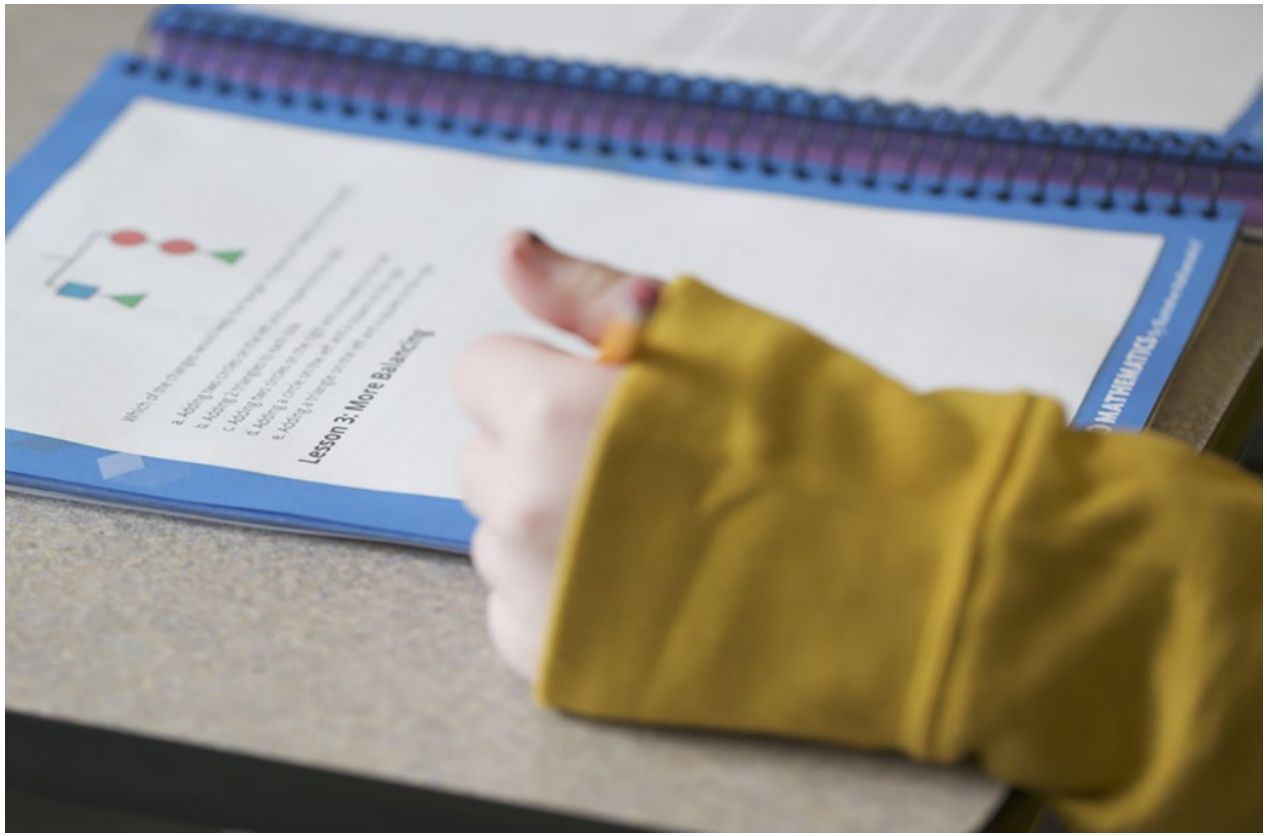
- features of ratio diagrams (Lesson 2)
- reasoning about equivalence (Lesson 4)
- reasoning about equivalent rates (Lesson 10)
- reasoning with reference to tables (Lesson 14)
- reasoning with reference to tape diagrams (Lesson 15)

Compare

- situations with and without equivalent ratios (Lesson 3)
- representations of ratios (Lessons 6 and 13)
- situations with different rates (Lessons 9 and 12)
- situations with same rates and different rates (Lesson 10)
- representations of ratio and rate situations (Lesson 16)

CLOSURE

What would you like to learn more about?



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