Engaging Mathematics, Volume II: Grade 3

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Engaging Mathematics, Volume II: Grade 3

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What is *Engaging Mathematics, Volume II: Grade 3*?

1 An instructional resource featuring over 90 Texas Essential Knowledge and Skills (TEKS)-based, classroom-ready mathematics activities that each take approximately 10 to 15 minutes to complete.

2 A TEKS-based resource that addresses all Grade 3 mathematics TEKS and provides—

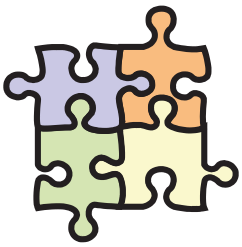
- Rigorous problem-solving tasks
- Manipulative-based tasks
- Vocabulary development tasks
- Sorting and classifying tasks

3 A resource that supports high-quality, research-based instruction by providing activities that can be used for various purposes, including—

- Engaging warm-ups and opening tasks that draw students into relevant and challenging mathematics
- Instructional support for all students, from at-risk to gifted and talented, to help learners articulate, refine, and retain important mathematical concepts, processes, and skills
- Short-cycle, formative assessments that provide immediate and ongoing feedback to guide instruction for the teacher and learning for the student
- Supplemental tasks to support intervention strategies

4 A resource that incorporates the mathematics process standards by promoting—

- Reasoning, generalizing, and problem-solving in mathematical and real-world contexts
- Modeling, using tools, and connecting representations
- Analysis
- Communication



What is found in an Engaging Mathematics TEKS-based activity?

TEKS have been phrased in student-friendly language so that students may gauge their learning.

Common classroom materials are used for ease of preparation. Materials are listed 1-per-student unless otherwise noted. Page titles for student handouts are bolded.

Determining the Unknown in Multiplication or Division Equations, Activity 1 3(5)(D)

Activity Objective

I can determine the unknown value in a multiplication or division equation.

I can explain the connection between a division equation and a related multiplication equation.

Materials

- **Equation Match**
- **Equation Cards**
- Scissors
- Tape or glue

Answer Key

$6 = \boxed{42} \div 7$ $6 \times 7 = \boxed{42}$	$48 \div \boxed{8} = 6$ $\boxed{8} \times 6 = 48$
Number: *42*	**Number:** *8*
$48 \div \boxed{4} = 12$ $12 \times \boxed{4} = 48$	$36 = \boxed{72} \div 2$ $36 \times 2 = \boxed{72}$
Number: *4*	**Number:** *72*
$6 = 36 \div \boxed{6}$ $6 \times \boxed{6} = 36$	$\boxed{72} \div 6 = 12$ $6 \times 12 = \boxed{72}$
Number: *6*	**Number:** *72*

ELPS have been included in the form of a student-friendly language objective.

Debriefing questions are included to assist the teacher with facilitating a post-activity student discussion.

Debriefing Questions

- What multiplication equation did you match to the division equation? Why?
- Is there a different multiplication equation that can be used to help you determine the unknown value in the division equation?
- How did you determine the value that made each equation true?

Communicating about Mathematics

Students may respond by talking to a partner and recording a written response in the space provided.

Possible sentence frame:
For the equation _____, the division equation can be solved with the multiplication equation _____ because _____.

Each activity includes an opportunity for students to articulate and summarize their own learning. A sentence frame is provided for students who may need language support.

Listen For . . .

- *Understanding of using factors or products of multiplication equations to determine the unknown divisor, dividend, or quotient of a division equation.*
- *Understanding that the order of the factors does not change the product.*
- *Understanding that the order of the dividend and divisor may change the quotient as the same multiplication properties do not apply to division.*

Listen/Look For . . .

Appropriate use of vocabulary such as dividend, divisor, factor, product, and quotient, and appropriate placements of these values in the equation.

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Key learning outcomes from the debriefing discussion are summarized here.

Key learning outcomes from the Communicating about Mathematics section are included here.

Texas Essential Knowledge and Skills (TEKS) Alignment Chart

Focus TEKS	Activity	Page
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Focus TEKS	Activity	Page
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Focus TEKS	Activity	Page
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# Equivalent Fractions, Activity 1
3(3)(G)

Activity Objective

I can explain why two fractions are equivalent.

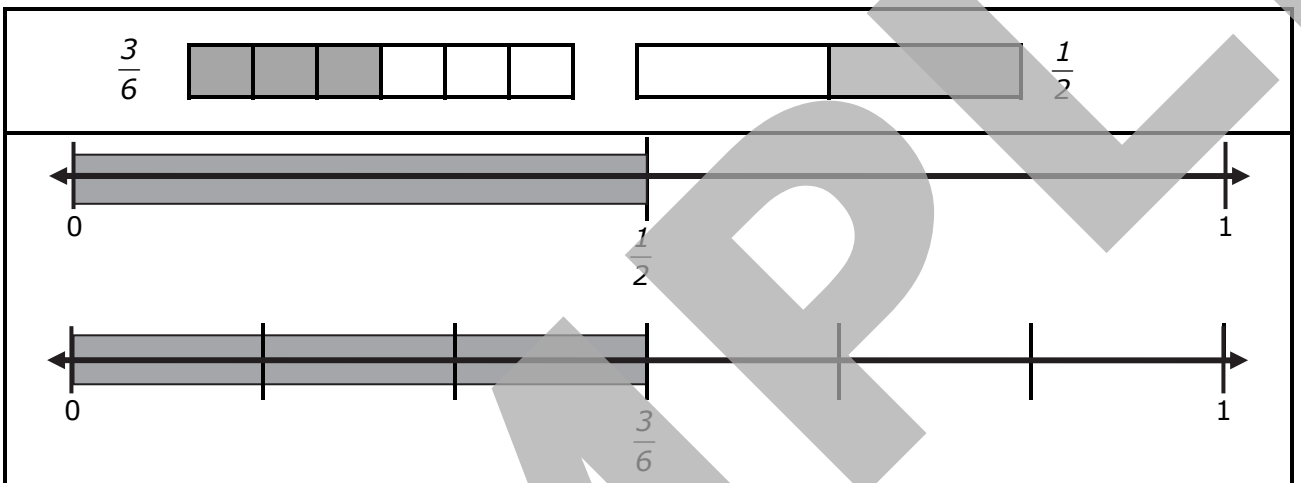
I can prove two fractions are equivalent.

Materials

- **Are They Equivalent?**
- Colored pencils
- Patty paper

Answer Key

Possible answers.



The area model shows that $\frac{3}{6}$ represents the same area as $\frac{1}{2}$.

The number line shows that $\frac{3}{6}$ represents the same distance from 0 on a number line as $\frac{1}{2}$.

Debriefing Questions

- How did you use represent each fraction with the area model and number line?
- How are the area model and number line used similarly when proving that two fractions are equivalent? How are they used differently?

Listen For . . .

- *Understanding that two fractions are equivalent if and only if they represent the same portion of the same size whole or if they represent the same distance on a number line.*
- *Understanding that fractions are represented as area with an area model and distance on a number line.*

Communicating about Mathematics

Students may respond by talking to a partner and recording a written response in the space provided.

Possible sentence frame:
The patty paper helps prove that the fractions are equivalent because _____.

Listen/Look For . . .

Understanding that placing the copied models on the patty paper on the other models helps prove that the shaded portion of the area model or the distance represented on the number line are the same.

Student Name: _____ Date: _____

Are They Equivalent?

Jane said $\frac{3}{6} = \frac{1}{2}$. Help prove Jane's statement is true.

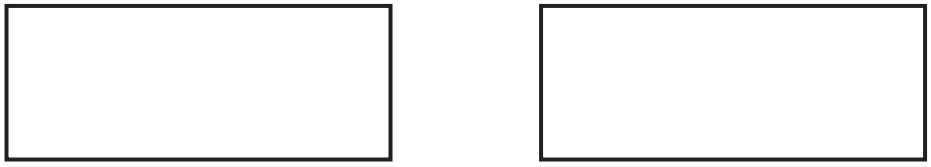
1 Use one colored pencil to represent $\frac{3}{6}$ on an area model and a number line.

2 Use a different colored pencil to represent $\frac{1}{2}$ on a different area model and a different number line.

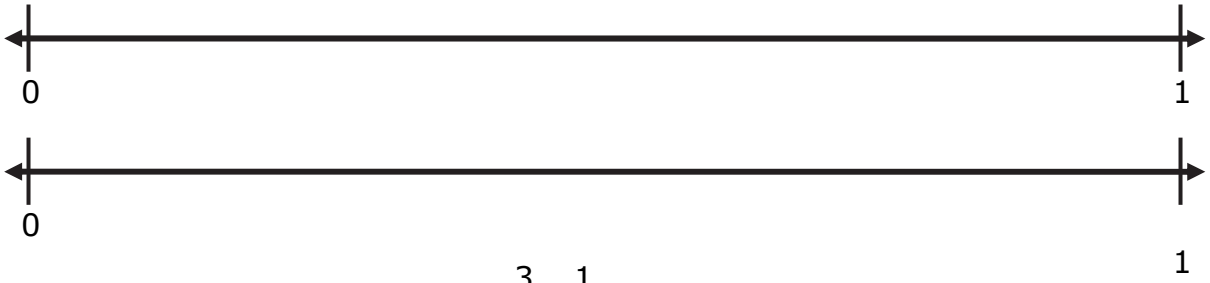
3 Copy each model of $\frac{3}{6}$ onto patty paper.

4 Lay this over the models that represent $\frac{1}{2}$.

Area Models:



Number Lines:



5 How do the models prove that $\frac{3}{6} = \frac{1}{2}$?

Communicating about Mathematics

How did the patty paper help you prove that $\frac{3}{6}$ and $\frac{1}{2}$ are equivalent?

_____

_____

_____

_____

_____

_____

# Representing Addition and Subtraction, Activity 1
3(5)(A)

Activity Objective

I can represent one- and two-step problems involving addition and subtraction.

I can explain how strip diagrams change based on the mathematical relationships in problems.

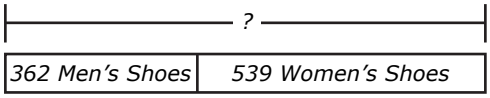
Materials

- **Shopping at the Mall**

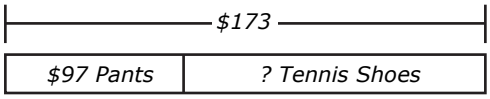
Answer Key

Possible answers.

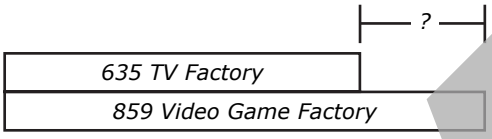
1



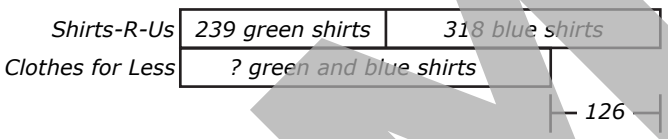
2



3



4



Debriefing Questions

- What information is given in the problem? What information are you asked to determine?
- How does the strip diagram represent the situation?
- Based on your representation and the situation, which operation(s) can be used to solve the problem?

Listen For . . .

- *Understanding that the strip diagram is used to represent the context of a problem to support solving the problem with appropriate operations.*
- *Understanding how the relationships in the context of the problem prompt the use of addition through counting-up or subtraction.*

Communicating about Mathematics

Students may respond by talking to a partner and recording a written response in the space provided.

Possible sentence frame:
The strip diagrams in Problem _____ and Problem _____ are similar because _____. They are different because _____.

Listen/Look For . . .

Understanding that strip diagrams may vary based on the mathematical relationships in the context of the problem and the information provided in the problem.

Student Name: _____ Date: _____

Shopping at the Mall

Represent each of the problems using a strip diagram.

---

1 The Shoe Stop has 362 pairs of men's shoes. They have 539 pairs of women's shoes. How many pairs of men's and women's shoes does the store have?

---

2 Tyler paid $173 for two new pairs of pants and new tennis shoes. The pants cost a total of $97. How much did the new tennis shoes cost?

---

3 Last week the TV Factory had 635 visitors. The Video Game Factory had 859 visitors. How many more visitors went to the Video Game Factory than the TV Factory?

---

4 Shirts-R-Us has 239 green shirts and 318 blue shirts. Clothes for Less has 126 fewer green and blue shirts than Shirts-R-Us. How many green and blue shirts does Clothes for Less have?

Communicating about Mathematics

Choose two of the problems above. How are the strip diagrams similar? How are they different?

_____

_____

_____

_____

_____

_____