Math Skills Student Kits – Grade 5 Activities

These activities were selected for use with the Didax® Math Skills Student Kit for Grade 5 (item #211998). You can use the Bookmarks in this PDF file to navigate to the activities.

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PLACE VALUE

NUMBER AND OPERATIONS

STUDENT NAME ....

1. Complete the table for the boldface digit.

	Number	Place value	Expanded form	Meaning
	2,**3**87	hundreds	3 x 100	300
(a)	8,4**6**1			
(b)	**7**,025			
(c)	4,11**4**			
(d)	**2**4,500			
(e)	16**9**,869			
(f)	**3**82,406			
(g)	250,**0**00			
(h)	**2**,555,555			

2. Write the missing numbers in the expanded notation.

(a) 2,403 = 2,000 + ________ + ________ (b) 6,928 = ________ + 900 + ________ + ________

(c) ________ = 5,000 + 400 + 50 + 4 (d) 12,121 = ________ + ________ + 100 + ________ + ________

(e) 125,257 = ________________ + ______________ + 5,000 + ________ + ________ + ________

(f) 2,375,946 = ________________ + ______________ + ____________ + ________ + ________ + ________ + ________

3. Write the value of the four (4) in these numbers.

(a) 241 __________ (b) 314 __________ (c) 1,421,112 __________ (d) 4,088,013 __________

(e) 4,560 __________ (f) 41,231 __________ (g) 541,000 __________ (h) 123,456 __________

4. Write each set of numbers as an addition problem. Use a calculator to find each sum.

(a) 92 + 2,941 + 108 + 6 + 23,400 (b) 42,307 + 59 + 1,050 + 497 + 621,400

(c) Circle the numbers in the ten thousands place value positions.

STUDENT NAME

ADDITION PROBLEMS

NUMBER AND OPERATIONS

1. ***Write the following numbers and add.***

(a) 20, 107, 9, 360, 48 (b) 299; 308, 76; 1,040; 8 (c) 912; 88; 1,000; 265; 2,401

2. Kyle made 325 sandwiches and 244 salads at work on Friday. How many meals were made altogether?

3. Mitchell traveled 348 km one day and 459 km the next. How far did he travel?

4. A movie screened three times on Tuesday with ticket sales of 1,242, 3,154, and 919. How many tickets were sold?

5. A bookshop sold 385 books in May, 465 in June, and 498 in July. How many books were sold altogether?

6. A total of 3,457 students attend one high school and 1,085 attend another. How many students are there altogether?

7. In a phone poll, 4,685 voted "yes" and 5,908 voted "no." How many votes were registered?

8. There was an attendance of 8,058 at a football match on Saturday and 7,285 on Sunday. What was the total?

9. A total of 26,510 people attended a college football game and 88,099 attended a professional football game. What was the total?

10. ***Use a calculator to complete the addition problems.***

(a) 43 + 546 + 409 + 6,821 + 2,634 = ________ (b) 1,688 + 3,689 + 499 + 233 + 26 = ________

11. ***Write your own word problems using the numbers given. Set out and solve each problem.***

(a) 249 + 251 + 205 (b) 2,095 + 8,099

STUDENT NAME

SUBTRACTION PROBLEMS

NUMBER AND OPERATIONS

1. ***Write out the following numbers and subtract the smaller number from the larger.***

(a) 508, 192 (b) 87, 893 (c) 2,064; 1,257 (d) 6,041; 8,239

2. A total of 352 people went to a family fun day. If there were 108 adults, how many children attended?

3. There are 815 DVD covers on the shelf. Of them, 279 have already been rented. How many are still available?

4. From a total of 601 students, 364 are girls. How many boys attend the school?

5. Jake has written 678 words of a 1,000-word essay. How many words does he still have to write?

6. A total of 3,286 people and their dogs registered for a fun run. If 1,069 were children and 890 were dogs, how many were adults?

7. One reality show contestant received 4,001 votes and a second received 3,625. What was the difference?

8. There was an attendance of 3,947 people at one game and 4,703 at another. What was the difference?

9. There are 98,000 tickets available for the playoff game. How many are left if 69,582 have already been sold?

10. ***Use a calculator to complete each problem.***

(a) 500,000 – 423,951 = (b) Subtract 897,462 from 2 million =

11. ***Write your own word problems using the numbers given. Set out and solve each problem.***

(a) 352 – 178 (b) 9,000 – 2,463

STUDENT NAME

MULTIPLICATION PROBLEMS

NUMBER AND OPERATIONS

1. Thirty-three students each have nine books. How many books are there altogether?

2. Fourteen crates each held 63 oranges. How many oranges were there altogether?

3. Each side of a square measures 160 cm. What is the perimeter?

4. How many days are there in 54 weeks?

5. If Lucy works eight hours each day, how many hours would she work in 325 days?

6. If one row seats 118 people, how many people are there in nineteen rows?

7. Exactly 428 newspapers were sold on each of fifteen days. How many were sold altogether?

8. If there are 365 days in one year, how many days are there in fifteen years? (Don't count leap years.)

9. How many weeks are there in fifteen years?

10. Twelve soccer teams each have 16 members. How many members are there altogether?

11. Twenty-five stores each ordered 48 casseroles. How many casseroles were ordered in total?

12. Twelve books each had 132 pages. How many pages were there altogether?

13. Write your own word problems using the numbers given. Set out and solve each problem.

(a) 150 × 85

(b) 44 × 14

STUDENT NAME ....

DIVISION

NUMBER AND OPERATIONS

1. (a) 54 ÷ 9 = ________ (b) 72 ÷ 8 = ________ (c) 100 ÷ 10 = ________ (d) 56 ÷ 7 = ________

2. (a) $20\overline{)480}$ (b) $30\overline{)960}$ (c) $7\overline{)483}$ (d) $6\overline{)906}$ (e) $8\overline{)128}$

3. (a) $45\overline{)92}$ (b) $55\overline{)118}$ (c) $82\overline{)96}$ (d) $39\overline{)783}$ (e) $52\overline{)650}$

4. (a) $32\overline{)104}$ (b) $41\overline{)97}$ (c) $30\overline{)658}$ (d) $31\overline{)589}$ (e) $23\overline{)937}$

5. Ninety-six players were divided into three groups. How many were in each group?

6. A total of 1,464 plums needed to be equally packed into 12 crates. How many were in each crate?

7. The perimeter of a square is 168 cm. How long is each side?

8. There are 945 books equally arranged on 15 shelves. How many books are on each shelf?

9. A total of 904 cartons of milk were delivered to eight stores. How many cartons went to each store?

10. Six children had a combined height of 930 cm. What was their average height?

11. Six people equally shared a restaurant bill that totalled $282. How much did they each pay?

12. A fleet of 13 trucks equally shared 3,577 liters of fuel. How many liters did each truck receive?

13. ***Write your own word problems using the numbers given. Set out and solve each problem.***

a) 564 ÷ 4 (b) 969 ÷ 8

$\frac{1}{2}$ STUDENT NAME ....

DECIMALS

NUMBER AND OPERATIONS

1. Write each number on the place value chart.

	hundreds	tens	ones	•	tenths	hundredths
(a) 82.45				•		
(b) 0.81				•		
(c) 3.08				•		
(d) 127.15				•		
(e) 10.49				•		
(f) 0.95				•		
(g) 106.64				•		
(h) 23.99				•		

2. Order the decimals from least to greatest.

(a) 4.1, 3.7, 8.9, 8.1, 5.5, 2.4, 8.5 ______________________________

(b) 7.6, 7.06, 7.0, 7.1, 7.5, 7.9, 7.55 ______________________________

(c) 0.8, 1.8, 1.08, 0.08, 18.1, 0.85 ______________________________

(d) 21.5, 12.5, 21.05, 12.05, 21.95, 21.0 ______________________________

3. Write the equivalent decimal for the given fractions.

(a) $\frac{1}{2}$ ________ (b) $\frac{9}{10}$ ________ (c) $1\frac{1}{2}$ ________ (d) $5\frac{4}{10}$ ________ (e) $6\frac{35}{100}$ ________

4. Solve.

(a) $\begin{array}{r} 7.9 \\ +\ 8.6 \\ \hline \\ \hline \end{array}$ (b) $\begin{array}{r} 8.3 \\ -\ 6.8 \\ \hline \\ \hline \end{array}$ (c) $\begin{array}{r} 42.55 \\ +\ 36.46 \\ \hline \\ \hline \end{array}$ (d) $\begin{array}{r} 58.07 \\ -\ 26.98 \\ \hline \\ \hline \end{array}$ (e) $\begin{array}{r} 129.72 \\ +\ 649.99 \\ \hline \\ \hline \end{array}$ (f) $\begin{array}{r} 804.31 \\ -\ 574.62 \\ \hline \\ \hline \end{array}$

5. Solve.

(a) $\begin{array}{r} 3.5 \\ \times\ 4.5 \\ \hline \\ \hline \end{array}$ (b) $\begin{array}{r} 6.3 \\ \times\ 0.9 \\ \hline \\ \hline \end{array}$ (c) $\begin{array}{r} 15.2 \\ \times\ 1.1 \\ \hline \\ \hline \end{array}$ (d) $\begin{array}{r} 20.7 \\ \times\ 3.3 \\ \hline \\ \hline \end{array}$ (e) $\begin{array}{r} 105.4 \\ \times\ 0.9 \\ \hline \\ \hline \end{array}$ (f) $\begin{array}{r} 99.9 \\ \times\ 2.0 \\ \hline \\ \hline \end{array}$

6. Solve.

(a) $5\overline{)10.25}$ (b) $6\overline{)18.6}$ (c) $20\overline{)15.40}$ (d) $15\overline{)457.5}$ (e) $25\overline{)100.5}$

2.8 Number & Operations: **The Missing Piece**

Focal Point

Number Sense/Representation – Develop proportional relationships. Reinforce the concept of missing addends. Develop visualization and estimation skills.

Materials

- Pattern blocks

Instructions

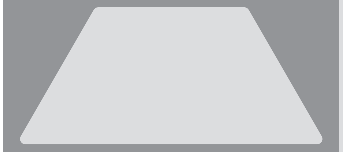
Have the students cover the hexagonal design at the top of the worksheet with hexagons only, then trapezoids only, then blue rhombuses only, and finally triangles only.

Tell them that in each exercise there is a missing pattern block that they will need to cover the design completely. Have them take the blocks indicated but first guess which block is missing. Then have them place the pattern blocks indicated in the hexagonal design at the top of the page, identify the missing block, and record its fraction name.

Remind students that the fraction names for triangles, blue rhombuses, and trapezoids will change when two hexagons equal one whole unit.

Guided Learning

1. What are the fraction names of the triangle, blue rhombus, and trapezoid in this activity?
   Answer: $\frac{1}{12}$, $\frac{1}{6}$, $\frac{1}{4}$
   How have the fraction names changed?
2. What is the value in each exercise when you add the missing piece to the pattern blocks indicated? *1*



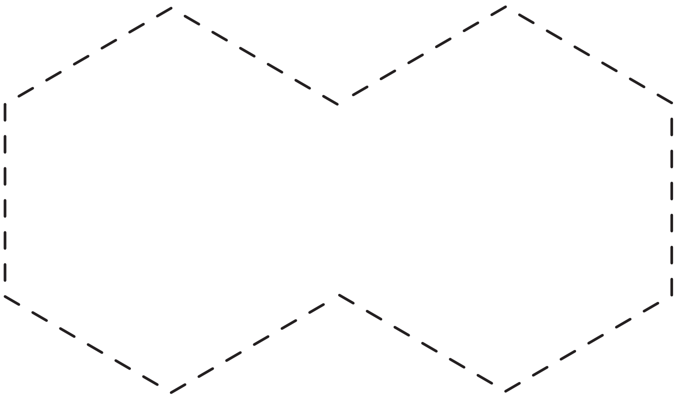
Explore More!

Have the students create two exercises of their own using three different pattern blocks for the two-hexagonal design. Ask students to explain in writing why the fraction names of the pattern blocks may change in different activities.

The Missing Piece

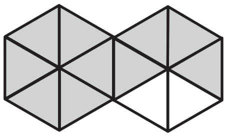
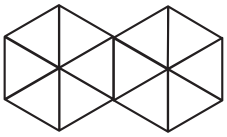
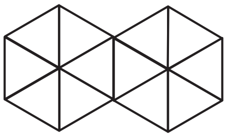
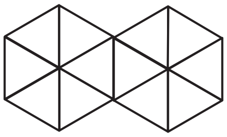
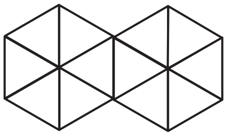
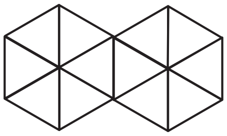
Name: ____________________________

In each of the exercises below, 2 hexagons equal one whole unit.



Fill in the design with the pattern blocks indicated. Then find the missing block(s) that will make one whole unit.

Give the fraction name for the missing block. See Example 1 below.

PATTERN BLOCKS	SHADED AREA	MISSING BLOCK	FRACTION NAME
1. 2 trapezoids + 2 blue rhombuses		+ **blue rhombus** = 1	$\frac{1}{6}$
2. 3 trapezoids + 1 triangle		+ = 1	
3. 1 hexagon + 2 triangles		+ = 1	
4. 1 trapezoid + 1 triangle + 1 blue rhombus		+ = 1	
5. 2 blue rhombuses + 2 triangles		+ = 1	
6. 3 triangles + 3 blue rhombuses		+ = 1	

2.9 Number & Operations: **Some Sum!**

Focal Point

Number Sense/Representation/Problem Solving – Develop the concept of equivalence. Use various strategies to add fractions together.

Materials

- Pattern blocks
- Triangular grid paper (page 136)

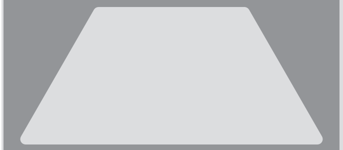
Instructions

Have students read the directions at the top of the page carefully. Ask them why the fraction names for the pattern blocks are different from those in activities such as Space Station.

Model Exercise 1 on an overhead projector, if available. Ask students to take pattern blocks representing $\frac{1}{12} + \frac{1}{12}$ and place them on the hexagonal design at the top of the page. Then have them find one block that will cover the remaining area completely. Ask: What is its fraction name? Have the students complete Exercises 2–6.

Guided Learning

1. Which exercises have the same fraction value for the answer? Why?
2. What two fractions can you name that will cover the entire area?
3. What are other names for 1? *Answer:* $\frac{2}{2}$, $\frac{4}{4}$, $\frac{6}{6}$, $\frac{12}{12}$, ...



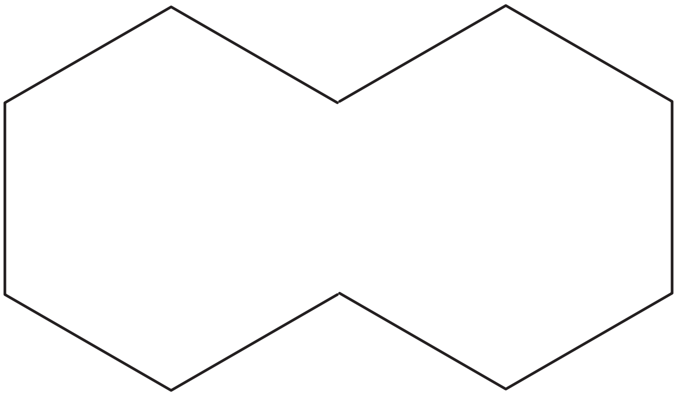
Explore More!

Have the students arrange the following fractions from smallest to largest. To check their answer, have them model each fraction by placing the appropriate pattern blocks on the two-hexagonal design (equal to 1 unit). Then, have them illustrate the following fractions on triangular grid paper: $\frac{2}{2}$, $\frac{1}{6}$, $\frac{3}{4}$, $\frac{6}{12}$, $\frac{3}{12}$

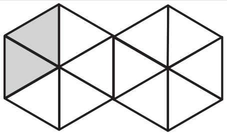
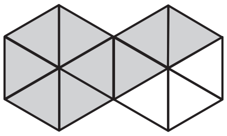
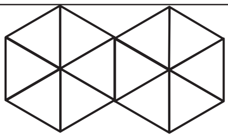
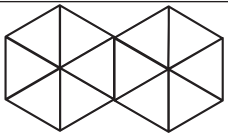
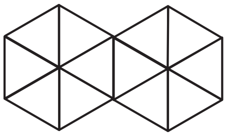
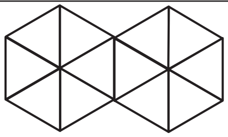
Some Sum!

Name: ______________________________

If 2 hexagons together equal 1 whole unit, the hexagon equals $\frac{1}{2}$, the trapezoid equals $\frac{1}{4}$, the blue rhombus equals $\frac{1}{6}$, and the triangle equals $\frac{1}{12}$.



1. Take the blocks indicated by their fraction name and place them in the outline at the left.
2. Find the one-color equivalent block or blocks.
3. Complete the table below as shown in examples 1 and 2.

				NUMBER VALUE
1.	$\frac{1}{12} + \frac{1}{12} =$		**= 1 triangle + 1 triangle = 1 blue rhombus =**	______
2.	$\frac{1}{2} + \frac{1}{4} =$		**= 1 hexagon + 1 trapezoid = 3 trapezoids =**	______
3.	$\frac{1}{12} + \frac{1}{6} =$		=	______
4.	$\frac{1}{6} + \frac{2}{6} =$		=	______
5.	$\frac{4}{12} + \frac{1}{6} =$		=	______
6.	$\frac{1}{4} + \frac{3}{6} =$		=	______

4.9 Measurement: **Degree Power**

Focal Point

Measurement – Introduce the concept of degrees in angle measurement.

Materials

- Pattern blocks

Instructions

Remind students that in the Forming Flowers activity, they put together pattern blocks to form a straight angle above and below a horizontal straight line. The two straight angles also formed the central angle of the flower—a circle, which equals 360 degrees.

Have the students place orange squares on the figure at the top right side of the worksheet. Ask: How many orange squares does it take to fill the space around the central point shown by the arrow on the figure? *4*

Say: The angle around that point is 360 degrees. So, each angle of the 4 orange squares that cover that point should be 360 divided by 4, or 90 degrees. We can use this measure of 90 degrees to help us find out the measure of all the angles of our pattern blocks.

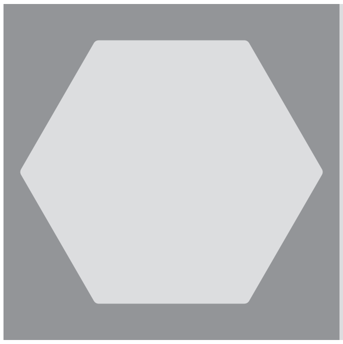
Have the students place the tan rhombus next. Ask: How many acute angles of the tan rhombus does it take to exactly cover a right angle? *3*

How many degrees are in one acute angle of a tan rhombus? *30, or 90 divided by 3*

Have the students find the measure of the angles indicated and record their answers in the spaces provided. They may use pattern blocks to help, if necessary.

Guided Learning

1. How many right angles form the central angle of the circle? *4*
2. What is the measure of the central angle? *360 degrees* The right angle? *90 degrees*
3. What is the measure of the obtuse angles of the blue rhombus and the hexagon? *120 degrees*
4. What is the measure of the obtuse angles of the tan rhombus? *150 degrees*
5. What is the measure of the acute angles of the triangle and the blue rhombus? *60 degrees*
6. What is the measure of the acute angles of the tan rhombus? *30 degrees*
7. Which angles of the pattern blocks are complementary? Explain.
8. Which angles of the pattern blocks are supplementary? Explain.



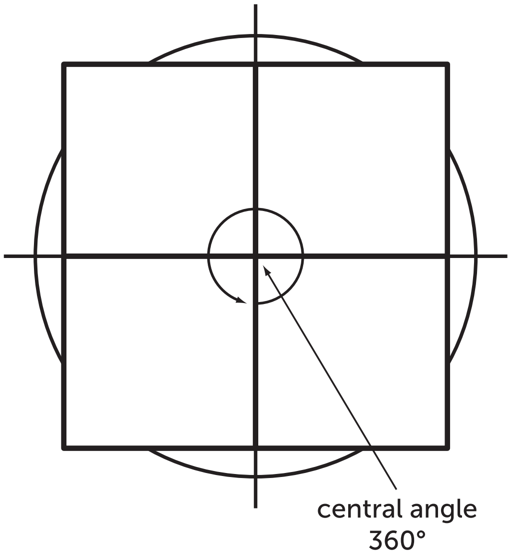
Explore More!

Have the students find the measure of a straight angle and justify their answer.

Degree Power

Name: ____

As you will recall from the Forming Flowers activity (page 83), a circle is the geometric figure that all one-color “flowers” have in common. The central angle of the circle measures 360 degrees.

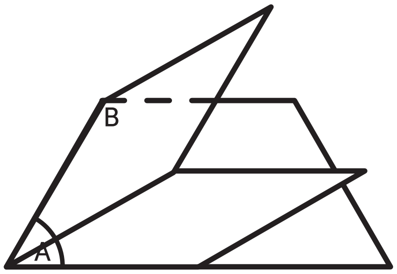


Put 4 orange squares on the circle to the right.

1. The central angle of any circle contains 4 right angles. How many degrees are in each right angle? ____________________

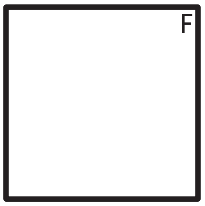
2. Since 3 acute angles of the tan rhombus make a right angle, how many degrees are in each acute angle?______________
How do you know?______________
____
____

Using the acute angle of the tan rhombus, find the measure of each of the following angles.

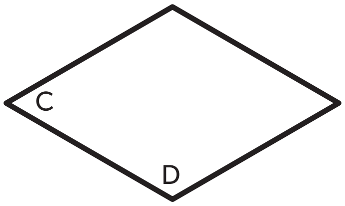


Angle A _____

Angle B _____

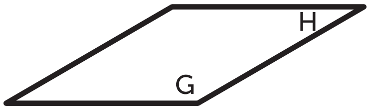


Angle F _____



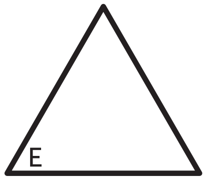
Angle C _____

Angle D _____

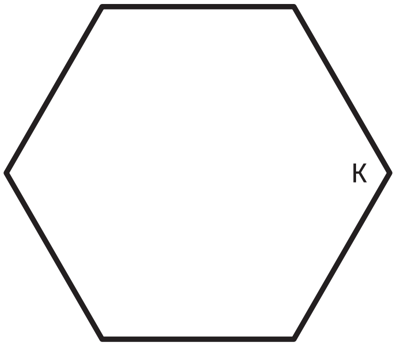


Angle G _____

Angle H _____



Angle E _____



Angle K _____

4.10 Measurement: **Sum Angles**

Focal Point

Measurement – Reinforce the concept of measurement of angles to determine that (a) the sum of the angles of a triangle equals 180 degrees and (b) the sum of the angles of a quadrilateral equals 360 degrees.

Materials

- Pattern blocks
  - 3 tan rhombuses
  - 1 blue rhombus
  - 6 triangles
  - 2 trapezoids
  - 1 square
  - 1 hexagon

Instructions

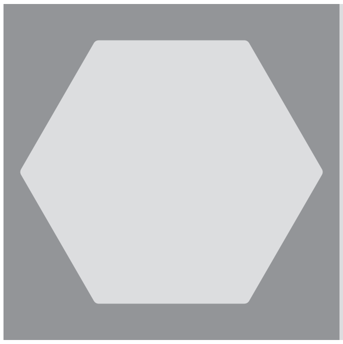
Reinforce the understanding that the number of degrees in a circle, the measure of the central angle, is 360 degrees. Remind students that since 4 right angles cover the central angle, the measure of each right angle is 90 degrees.

Ask: What is the measure of the acute angle of the tan rhombus? *30 degrees* Have the students explain their answer. *3 acute angles of the tan rhombus are congruent to the right angle.*

Have the students use pattern blocks to find the angle measurements of the triangle, the blue rhombus, and the trapezoid, and record their findings in the spaces provided.

Guided Learning

1. What is the sum of the measure of the angles in a triangle? Explain.
2. What is the sum of the measure of the angles in a square? Explain.
3. What is the sum of the measure of the angles in a blue rhombus? Explain.
4. Using what you have learned, what would you predict to be the sum of the measure of the angles in the tan rhombus? Explain.
5. Is the sum of the measure of the angles of the trapezoid 540 degrees? Why not? How many sides does the trapezoid have? Angles? Where did Pedro make an error?
6. What is the sum of the measure of all of the angles of a quadrilateral? Why?



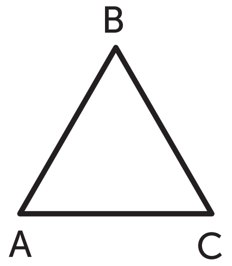
Explore More!

The yellow hexagon equals 2 trapezoids or 6 triangles. Have the students predict the sum of the measure of its angles. Using what they have learned about measurement, have them find the measure of each angle of the hexagon. Then, have them find the sum of the measure of its angles.

Sum Angles

Name: ____

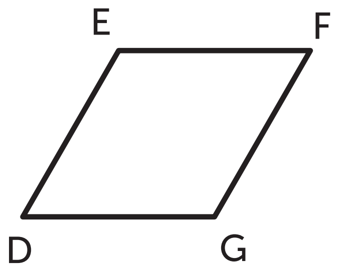
The right angle (90°) of the square can be formed by putting together the acute angles of 3 tan rhombuses. Therefore, the measure of each acute angle of a tan rhombus is 30°.



Find the measure of each angle of triangle ABC.

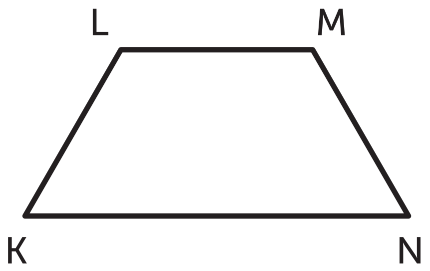
Angle A = ________
Angle B = ________
Angle C= ________
The sum of the measure of the angles of the triangle is ________.

James says, “The blue rhombus is equivalent to two triangles. Therefore, the measure of its angles is 360 degrees.”



Find the measure of each angle of the blue rhombus DEFG.

Angle D = ________
Angle E = ________
Angle F = ________
Angle G = ________
The sum of the measure of the angles of the blue rhombus is ________.



Pedro says, “The trapezoid is equivalent to the blue rhombus and the triangle. Therefore, the measure of its angles is 360 degrees plus 180 degrees, or 540 degrees total.”

Find the measure of each angle of trapezoid KLMN.

Angle K = ________
Angle L = ________
Angle M = ________
Angle N = ________
Is the sum 540°? Explain. ______________________________

Find the sum of the measure of the angles of the tan rhombus and the square. Is the sum of the measure of the angles the same for all pattern block quadrilaterals? ________________

____

5.5 Algebra: Hexagons or Triangles

Focal Point

Algebra/Problem Solving – Make organized lists to solve numerical problems. Create and explain patterns and algebraic relationships.

Materials

- Pattern blocks

Instructions

Have the students do the following:

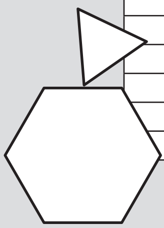
1. Cover Diagram A in the worksheet with triangles.
2. Cover Diagram B with triangles. Ask themselves: How many do you need?
3. Record their findings on the given table.
4. Find out how many triangles they need to cover 3, 4, and 5 hexagons.
5. Complete the table.
6. Look at the pattern in the table and answer questions 2, 3, and 4.
7. Explain in writing how they would find the number of triangles for *n* hexagons.
8. Write the rule in the space provided.

Guided Learning

1. How does the number of triangles change as you increase the number of hexagons? Why?
2. The numbers in the numerical sequence will always be a multiple of which number? Why?
3. If you were increasing the number of trapezoids instead of hexagons each time, the numbers in the sequence would always be a multiple of which number? Why?
4. What is the rule for finding the number of triangles for *n* trapezoids? *n x 3*

Explore More!

Using only triangles, have the students make the apple shown. How many triangles do they need? Have them make a table showing how many triangles are needed to make 1 apple, 2 apples, 3 apples, ... 10 apples. Have them predict how many triangles are needed to make 100 apples, 199 apples. Why do they think so?



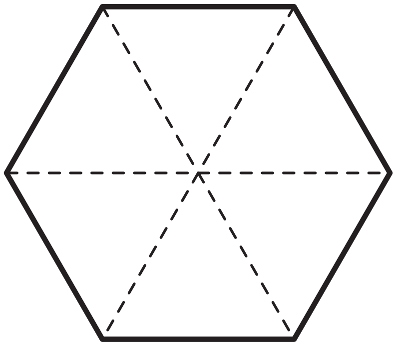
Numer of Apples	Number of Triangles
1	7
2	14
3	21
10	70
100	700
199	1,393

Hexagons or Triangles

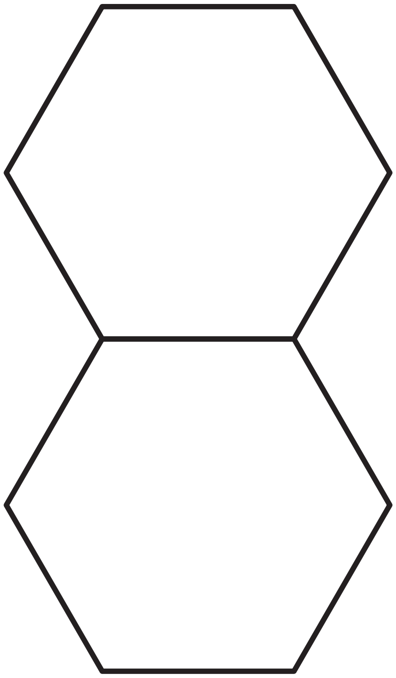
Name: ______________________________

Six triangles make a hexagon. How many triangles do you need to make 2 hexagons? Cover the 2 hexagons below.

1. How many triangles do you need to make 3 hexagons? 5 hexagons? Complete the table below.



A



B

Number of Hexagons	Number of Triangles
1	6
2	
3	
4	
5	
6	
7	
8	
9	
10	

Look at the pattern in the table.

2. How many triangles would you need to make 50 hexagons? ________ triangles

3. How many triangles would you need to make 100 hexagons? ________ triangles

4. How many triangles would you need to make 199 hexagons? ________ triangles

5. Explain in writing how you would find the number of triangles for any number (*n*) of hexagons. ____

6. Write a rule for finding the number of triangles for any number (*n*) of hexagons.

5.6 Algebra: **Creating Stars**

Focal Point

Algebra/Problem Solving – Make organized lists to solve numerical patterns. Write an equation to represent a function from a table of values.

Materials

- Pattern blocks

Instructions

Have the students do the following:

1. Use blue rhombuses to create a star like the one shown on the worksheet.
2. Place triangles on top of the blue rhombus star.
3. Write the number of triangles needed to make a congruent star in the space provided in the table.
4. Build another star that is congruent to the first star. How many blue rhombuses do they need to make 2 stars? How many triangles? Record their answers in the table.
5. Build 3, 4, and 5 stars. Look for the numerical pattern.
6. Complete the table through 10 stars without making additional pattern block stars.
7. Answer questions 1 through 6.
8. Write a rule for finding the number of triangles for any number (*n*) of stars.

Guided Learning

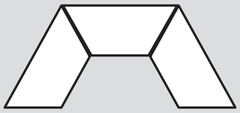
1. Look at the stars formed by blue rhombuses in the table. The number of blue rhombuses (4, 8, 12, ...) is always a multiple of 4. Why?
2. The number of triangles is always a multiple of what number? Why?
3. What is the relationship of the number of blue rhombuses to triangles? *1 to 2*
4. What is the relationship for the number of stars to blue rhombuses? *1 to 4*
5. What is the relationship for the number of stars to triangles? *1 to 8*
6. What is the algebraic equation for finding the number of triangles "T" for any number of stars "n"? $n = 8T$

Explore More!

Have the students make a bridge, as shown. How many trapezoids did they use? How many triangles could form a congruent figure?

Have them make a table indicating how many trapezoids and how many triangles are needed to make 1 bridge, 2 bridges, 3 bridges, ... , 10 bridges; to make 1,000 bridges; to make 999 bridges.

Numer of Bridges	Number of Trapezoids	Number of Triangles
1	3	9
2	6	18
3	9	27
10	30	90
1,000	3,000	9,000

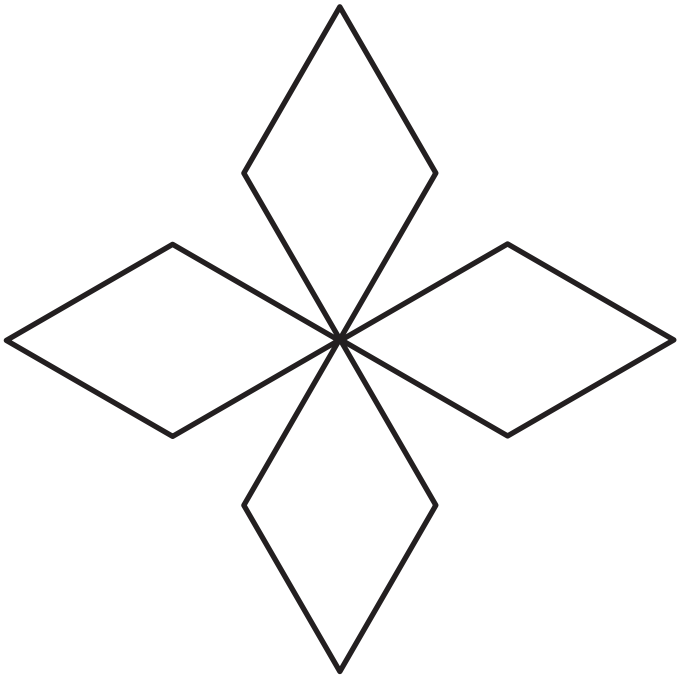


Creating Stars

Name: ______________________________

Using blue rhombuses, Elizabeth formed a star like the one shown. Cover the blue rhombus star with triangles.

Number of Stars	Number of Blue Rhombuses	Number of Triangles
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		



Record all your answers to questions 1–3 in the table. Then look at the pattern in the table and answer questions 4–7.

1. How many triangles did you need to make a congruent star? ______

2. How many blue rhombuses would you need to make 2 stars? ______ 5 stars? ______

3. How many triangles would you need to make 2 congruent stars? ______ 5 stars? ______

4. How many blue rhombuses would you need to make 50 stars? ______ 49 stars? ______ 200 stars? ______

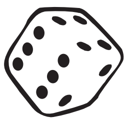
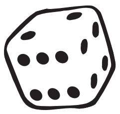
5. How many triangles would you need to make 50 stars? ______ 49 stars? ______ 200 stars? ______

6. Explain in writing how you would find the number of blue rhombuses for any number (*n*) of stars. ______________________________

7. Write a rule for finding the number of triangles for any number (*n*) of stars.

____

Positive/Negative Numbers Dice Graph

+  – 

How to Play

Green die = positive number. Red die = negative number.

1. Toss a green die and a red die. Find the sum or difference.

Example: *green die = 3, red die = 5. Compute: (+3) + (–5) = –2.*

2. Fill in a box above the answer to the dice toss.

3. How many boxes can you fill in 25 tosses?

–5	**–4**	**–3**	**–2**	**–1**	**0**	**+1**	**+2**	**+3**	**+4**	**+5**

1.2

Equivalent Fractions

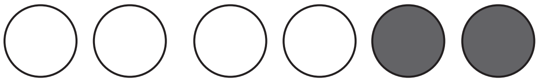
Example: ○ ○ ● ● $= \frac{2}{4} = ?$

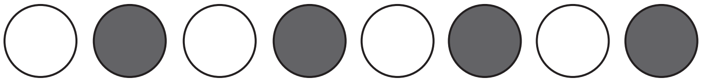
Suppose we want to find an equivalent fraction for $\frac{2}{4}$. First we need to define the whole. Let’s use 4 two-color counters to represent “1”—the whole. If we want to reduce $\frac{2}{4}$ to an equivalent fraction, we will make two of the four counters red and the other two yellow. Then we can see that $\frac{2}{4}$ also equals one of the two groups, $\frac{1}{2}$.

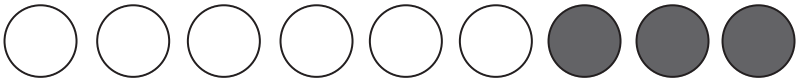
Name: ______________________________ Date: ________________________

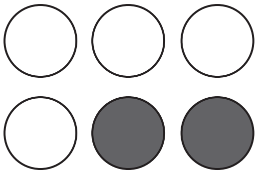
Practice Finding Equivalent Fractions

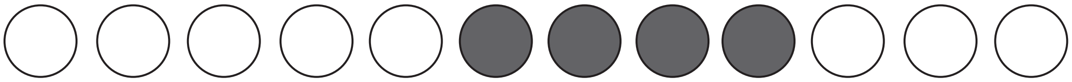
Find an equivalent fraction for each of the following.

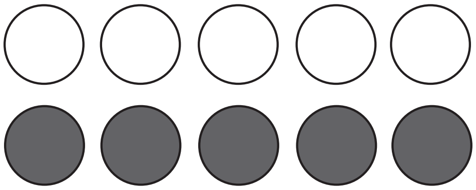
1.  Y = ____________

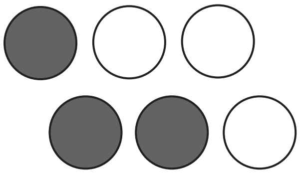
2.  R = ____________

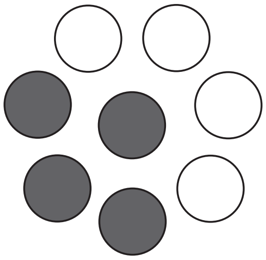
3.  R = ____________

4.  Y = ____________

5.  Y = ____________

6.  Y = ____________

7.  R = ____________

8.  R = ____________

Name: ______________________________ Date: ______________________________

Practice Finding Equivalent Fractions

Demonstrate the following fractions and their equivalence with two-color counters. Use yellow counters to represent the denominator. Draw your answers to show the equivalence. (The first one has been done for you.)

1. $\frac{8}{10} = \frac{4}{5}$ ○○ ○○ ○○ ○○ ●●

2. $\frac{10}{12} = \frac{5}{6}$ ______________________________

3. $\frac{1}{2} = \frac{2}{4}$ ______________________________

4. $\frac{3}{4} = \frac{6}{8}$ ______________________________

5. $\frac{6}{9} = \frac{2}{3}$ ______________________________

6. $\frac{3}{5} = \frac{6}{10}$ ______________________________

7. $\frac{1}{9} = \frac{2}{18}$ ______________________________

8. $\frac{4}{12} = \frac{1}{3}$ ______________________________

9. $\frac{1}{3} = \frac{3}{9}$ ______________________________

1.3 Improper Fractions

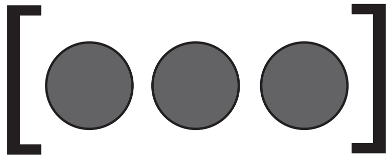
Main Ideas

Improper fractions are fractions in which the numerator is greater than the denominator.

While the label “improper” has historically been given to this kind of fraction, there is really nothing improper about it. These fractions are nothing more than *rational numbers,* which are defined as: Any number that is in the form of ratio $\frac{a}{b}$, where a and b are integers and $b \neq 0$. Remember, a *ratio* is simply a comparison of two things.

Example 1

If 3 R = 1, what does this model equal?



$= 1\frac{1}{3} = \frac{4}{3}$

Example 2

If 2 R = 1, what does this model equal?

$= \frac{4}{2} = 2$

Name: ______________________________ Date: ________________________

Practice with Improper Fractions

Use your two-color counters to solve the following and then draw your results. (The first one has been done for you.)

1. $\frac{3}{2}$ = ? If ○ ○ = 1, then ○ = $\frac{1}{2}$ and [○ ○] ○ = $\frac{3}{2}$ or $1\frac{1}{2}$.

2. $\frac{5}{3}$ = ______________________________

3. $\frac{5}{2}$ = ______________________________

4. $\frac{4}{2}$ = ______________________________

5. $\frac{9}{4}$ = ______________________________

6. $\frac{6}{2}$ = ______________________________

7. $\frac{5}{4}$ = ______________________________

Do you see a pattern? Could you change an improper fraction to a mixed number without using the two-color counters? State the pattern, or rule, in your own words.

____

____

____

1.6

Adding Fractions with Like Denominators

Suppose you wish to add two fractions with like denominators.

Example 1: $\frac{1}{6} + \frac{3}{6} = ?$

The first step is to choose the whole (1). Let's choose the following:

○ ○ ○ ○ ○ ○ = 1.

Then ○ $= \frac{1}{6}$ and ○ ○ ○ $= \frac{3}{6}$. So ○ ○ ○ ○ $= \frac{4}{6}$.

Therefore, $\frac{1}{6} + \frac{3}{6} = \frac{4}{6}$.

Example 2: $\frac{1}{5} + \frac{2}{5} = ?$

Let ○ ○ ○ ○ ○ = 1.

Then ○ $= \frac{1}{5}$ and ○ ○ $= \frac{2}{5}$. So ○ + ○ ○ $= \frac{3}{5}$.

Therefore, $\frac{1}{5} + \frac{2}{5} = \frac{3}{5}$.

Example 3: $\frac{1}{3} + \frac{1}{3} = ?$

Let ○ ○ ○ = 1.

Then ○ $= \frac{1}{3}$ and ○ $= \frac{1}{3}$. So ○ ○ $= \frac{2}{3}$.

Therefore, $\frac{1}{3} + \frac{1}{3} = \frac{2}{3}$.

Name: ______________________ Date: ______________________

Practice Adding Fractions with Like Denominators

Solve the following. Use your counters if you need to.

1. $\frac{1}{4} + \frac{2}{4} =$ __________

2. $\frac{2}{3} + \frac{1}{3} =$ __________

3. $\frac{1}{5} + \frac{2}{5} =$ __________

4. $\frac{2}{5} + \frac{3}{5} =$ __________

5. $\frac{1}{6} + \frac{5}{6} =$ __________

6. $\frac{2}{5} + \frac{7}{5} =$ __________

7. $\frac{3}{8} + \frac{5}{8} =$ __________

Do you see the pattern? (This one is easy to see, isn't it?) Describe it in your own words.

____

____

____

1.7

Adding Fractions with Unlike Denominators

Now let's look at adding fractions in which the denominators are not alike. Take, for example, $\frac{1}{3}$ and $\frac{1}{2}$. What would the solution of this type of problem look like?

Example 1: $\frac{1}{3} + \frac{1}{2} = ?$

First, we need to define the whole (1): ○ ○ ○ ○ ○ ○ = 1.

We choose the above whole because we want to find numbers that are divisible into 2 equal parts and also 3 equal parts. Six counters will satisfy this situation.

So ○ ○ = $\frac{1}{3}$ and ○ ○ ○ = $\frac{1}{2}$.

Therefore, ○ ○ ○ ○ ○ = $\frac{5}{6}$ because $\frac{1}{3} = \frac{2}{6}$ and $\frac{1}{2} = \frac{3}{6}$.

Example 2: $\frac{1}{4} + \frac{1}{2} = ?$

What is the common denominator? The answer is 4. So let this model equal one whole:

○ ○ ○ ○ = 1.

So ○ = $\frac{1}{4}$ and ○ ○ = $\frac{1}{2}$.

Therefore, ○ ○ ○ = $\frac{3}{4}$ because $\frac{1}{2} = \frac{2}{4}$, and adding another $\frac{1}{4}$ equals $\frac{3}{4}$.

Name: ______________________ Date: ______________________

Practice Adding Fractions with Unlike Denominators

Solve the following. Use your counters if you need to.

1. $\frac{1}{5} + \frac{3}{10} =$ ____________

2. $\frac{1}{2} + \frac{3}{4} =$ ____________

3. $\frac{1}{8} + \frac{1}{4} =$ ____________

4. $\frac{1}{3} + \frac{1}{4} =$ ____________

5. $\frac{4}{5} + \frac{1}{2} =$ ____________

6. $\frac{2}{3} + \frac{2}{5} =$ ____________

7. $\frac{1}{2} + \frac{3}{8} =$ ____________

Do you see the pattern? Can you state the rule (called the "algorithm")?

1.8

Subtracting Fractions with Like Denominators

Example 1:

Let's have students examine $\frac{2}{3} - \frac{1}{3} = ?$ using yellow counters to represent the positive fraction and red counters to represent the fractional part being subtracted.

Let ○ ○ ○ = 1.

Then ○ ○ $= \frac{2}{3}$ and ● $= \frac{1}{3}$, so ○ ○ ● $= \frac{1}{3}$.

So the difference between $\frac{2}{3}$ and $\frac{1}{3}$ is $\frac{1}{3}$.

Example 2:

Now let's examine $\frac{3}{4} - \frac{1}{4} = ?$

Let ○ ○ ○ ○ = 1.

Then ○ ○ ○ $= \frac{3}{4}$ and ● $= \frac{1}{4}$, so ○ ○ ○ ● $= \frac{2}{4}$.

So the difference between $\frac{3}{4}$ and $\frac{1}{4}$ is $\frac{2}{4}$.

Name: ______________________________ Date: ________________________

Practice Subtracting Fractions with Like Denominators

Solve the following. If you have difficulty, use the two-color counters.

1. $\frac{7}{8} - \frac{3}{8} =$ __________

2. $\frac{3}{5} - \frac{1}{5} =$ __________

3. $\frac{3}{4} - \frac{1}{4} =$ __________

4. $\frac{4}{5} - \frac{1}{5} =$ __________

5. $\frac{2}{3} - \frac{1}{3} =$ __________

6. $\frac{4}{7} - \frac{2}{7} =$ __________

7. $\frac{3}{8} - \frac{1}{8} =$ __________

Do you see the pattern? Is this algorithm similar to the pattern for adding fractions? Explain.

____

____

____

1.9

Subtracting Fractions with Unlike Denominators

Example 1:

Let's have students examine $\frac{3}{4} - \frac{1}{2} = ?$ Let ○ ○ ○ ○ = 1.

Then ○ ○ ○ = $\frac{3}{4}$ and ● ● = $\frac{1}{2}$.

So ○ ○ ○ ● ● = $\frac{1}{4}$, and $\frac{3}{4} - \frac{2}{4} = \frac{1}{4}$.

Example 2:

Let's have students examine $\frac{2}{3} - \frac{1}{2} = ?$

Let ○ ○ ○ ○ ○ ○ = 1.

Then ○ ○ ○ ○ = $\frac{2}{3}$ or $\frac{4}{6}$, and ● ● ● = $\frac{1}{2}$ or $\frac{3}{6}$.

So ○ ○ ○ ○ ● ● ● = $\frac{4}{6} - \frac{3}{6} = \frac{1}{6}$,

which is the same thing as saying $\frac{2}{3} - \frac{1}{2} = \frac{1}{6}$.

Name: ______________________________ Date: ________________________

Practice Subtracting Fractions with Unlike Denominators

Solve the following. If you have difficulty, use the two-color counters.

1. $\frac{1}{2} - \frac{1}{8} =$ __________

2. $\frac{1}{2} - \frac{3}{8} =$ __________

3. $\frac{2}{3} - \frac{1}{4} =$ __________

4. $\frac{5}{6} - \frac{1}{2} =$ __________

5. $\frac{3}{4} - \frac{1}{3} =$ __________

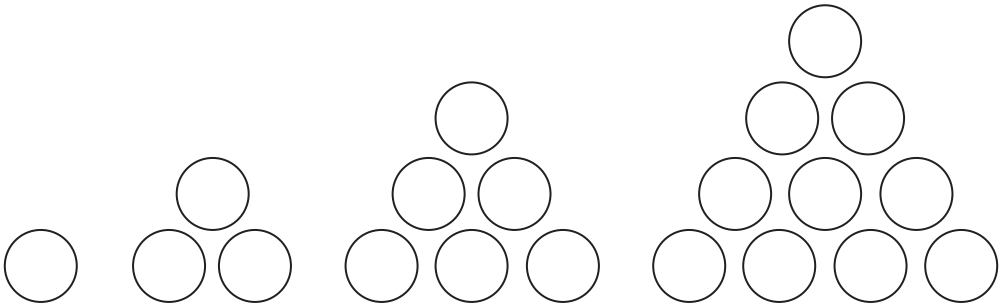
6. $\frac{5}{8} - \frac{1}{2} =$ __________

Name: ______________________________ Date: ______________________

Shape Sequence

A sequence of two-color counters is pictured below. Build the shapes shown. (In this activity, the color of the counters does not matter.)

The object of this activity is to determine how many counters there would be in the 25th position of the sequence. Obviously, it would take a long time to find out the number of counters in the 25th position if you had to build each shape in the sequence. But you don't have to! You should be able to spot the pattern by looking at just the four shapes below.



See whether you can discover the formula to find the number of counters in *any* position—but especially the 25th place. Enter the information in the table below to help you.

Let *N* = the number of counters and *P* the position in the sequence.

N	1	3	6	10		?	
P	1	2	3	4		25	

1. The number of counters in the 25th position is ______________________.

2. The formula is ______________________________________.

Name: ______________________________ Date: ________________________

How Many Moves?

The question to be answered in the activity is:

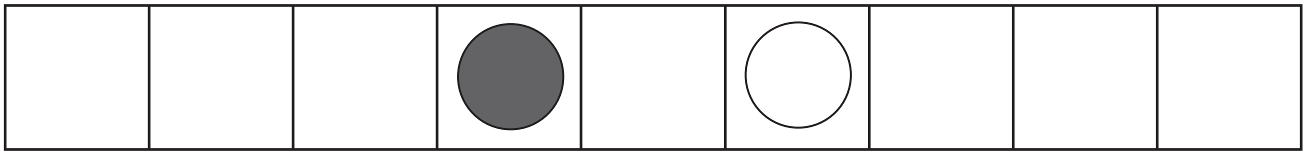
What is the least number of moves it would take to rearrange 8 counters (4 red and 4 yellow) on the grid following the rules below?

Rules:

- The object of the activity is to reverse the order of the yellow and red counters. Red moves from left to right, and yellow moves from right to left.
- You cannot jump a counter of the same color, but you can jump **one and only one** of the other color **or** move forward one space if it is open.
- Start and end with the middle square open. Remember, you want to rearrange the counters in the least number of moves.

Directions:

Begin with one pair (as shown below). Move according to the above rules, count the number of moves, record data, and look for a pattern. Then add another pair and try again. Keep playing until you have four pairs on the grid (4 red and 4 yellow).



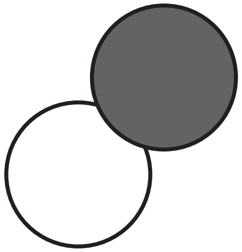
1. What is the least number of moves it would take to rearrange 8 counters on the grid?

____

2. If M = the number of moves and P = the number of pairs of counters, what is the formula?

____

How Many Moves? Game Board



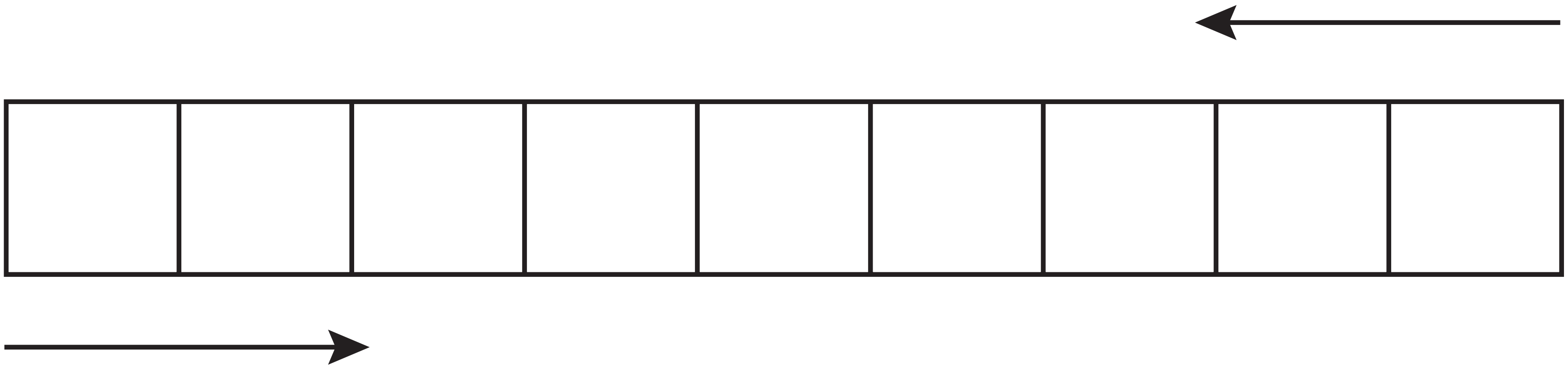
Directions:

Reverse the order of the yellow and red counters. Red moves from left to right, and yellow moves from right to left. Start and end with the middle square open.

You cannot jump the same color, but you can jump one and only one counter of the other color or move forward one space, if the space is open.

How many moves will it take to rearrange 8 counters?

Yellow moves right to left.



Red moves left to right.

STUDENT NAME ....

VOLUME AND CAPACITY

MEASUREMENT

1. (a) 1 L = ________ mL (b) 2 L = ________ mL

(c) 5,000 mL = ________ L (d) 2.5 L = ________ mL

(e) 4,500 mL = ________ L (f) 4.4 L = ________ mL

(g) 6.1 L = ________ mL (h) 2,490 mL = ________ L

2. ***Find six items used in your home that are measured in milliliters. Write the items in order of their total capacity. Start with the smallest capacity.***

	Item	**Capacity**
Smallest		**mL**
Largest		

3. ***Calculate the difference between the following measurements of capacity.***

(a) 1 L and 500 mL = ________ L or ________ mL

(b) 2 L and 400 mL = ________ L or ________ mL

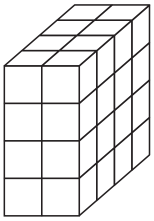
(c) 4 L and 1,500 mL = ________ L or ________ mL

(d) 10 L and 2,500 mL = ________ L or ________ mL

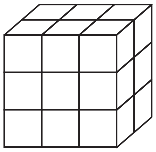
4. How many 5 mL doses are in a 45 mL bottle of medicine? ________

5. How many 250 mL cups of water are needed to fill a 4 L container? ________

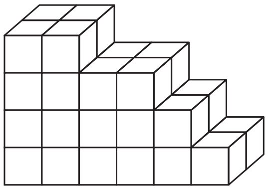
6. ***Find the volume of these models. (Each cube = 1 cm³).***



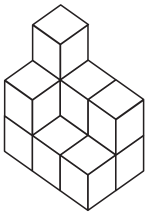
(a) V = ☐ cm^3



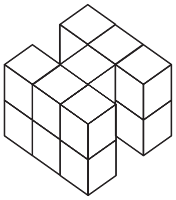
(b) V = ☐ cm^3



(c) V = ☐ cm^3



(d) V = ☐ cm^3



(e) V = ☐ cm^3

7. ***Find the volume of the following. (Volume = L × W × H)***

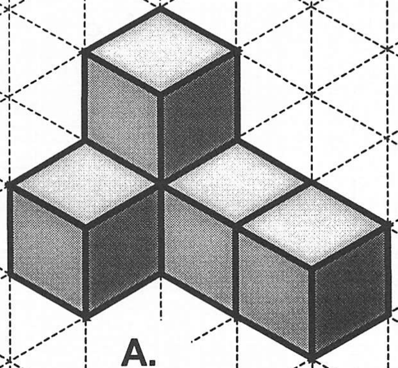
(a) Length = 2 m Width = 1 m Height = 2 m Volume = ☐ m^3

(b) Length = 3 m Width = 2 m Height = 3 m Volume = ☐ m^3

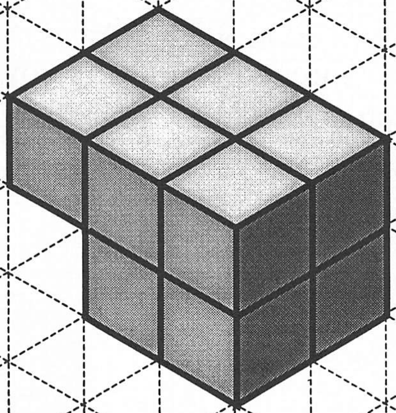
(c) Length = 5 m Width = 2 m Height = 10 m Volume = ☐ m^3

Name ______________________________

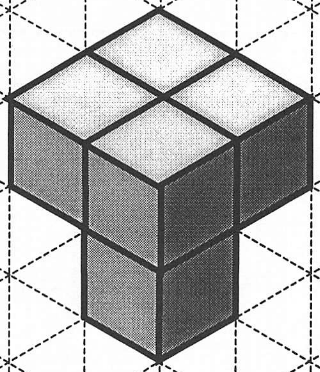
Two of the structures shown here can be joined to form a 12-cube rectangular model. Identify these two structures by looking at the images. Check your estimation by building the models and snapping them together.



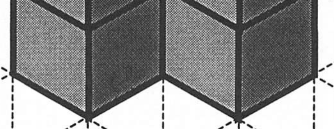
A.



B.



C.



D.

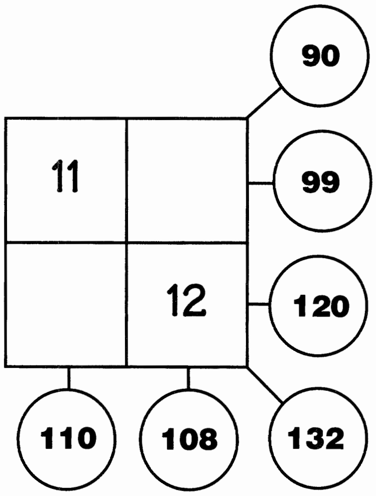
✳ <u>Challenge:</u> On a blank piece of isometric grid paper, design your own similar activity. You will need to use Omnifix Cubes to help you select the two structures that join to make a solid. Draw them first and then draw similar structures with small differences. Ask a friend or family member to identify the two structures that connect. Be sure to tell them what the volume of the final structure will be.

Date ______________ Name ______________________

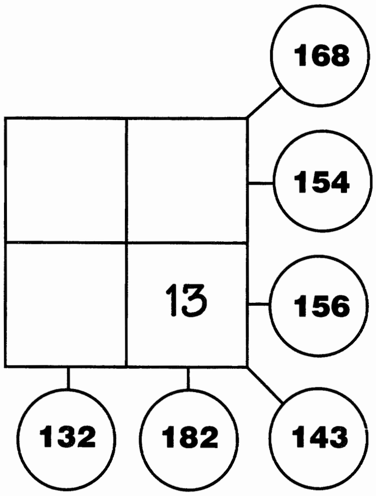
Products Galore I

Arrange the listed factors to produce the indicated products. The first two are started for you.

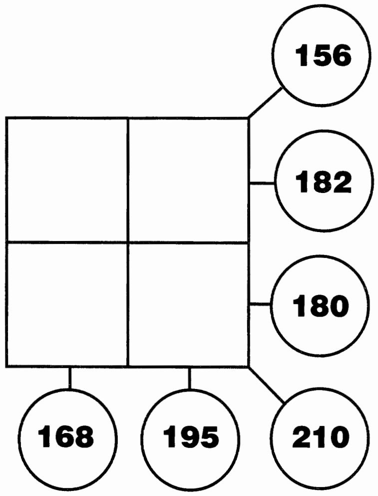
1. Factors: 9, 10, 11, 12



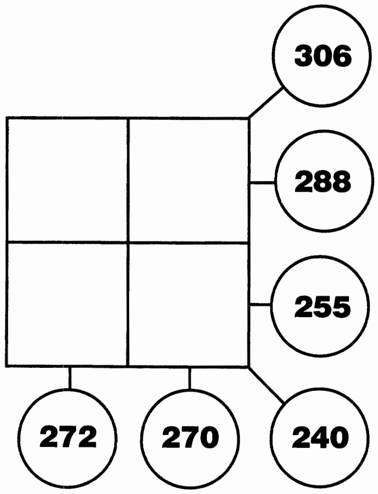
2. Factors: 11, 12, 13, 14



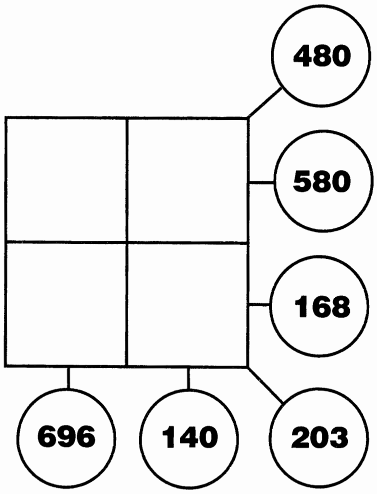
3. Factors: 12, 13, 14, 15



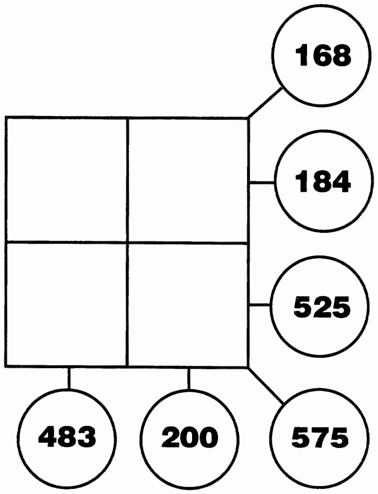
4. Factors: 15, 16, 17, 18



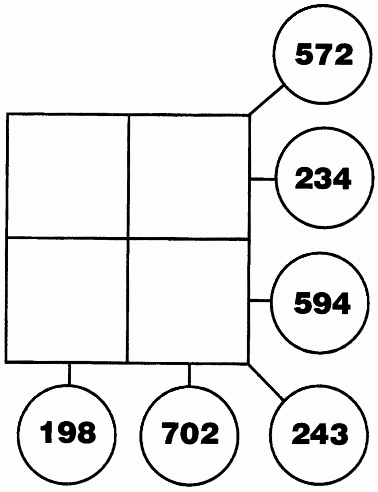
5. Factors: 7, 20, 24, 29



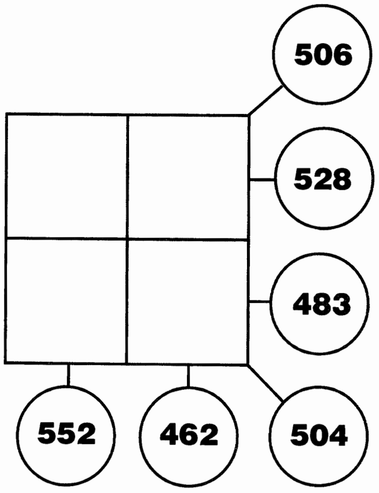
6. Factors: 8, 21, 23, 25



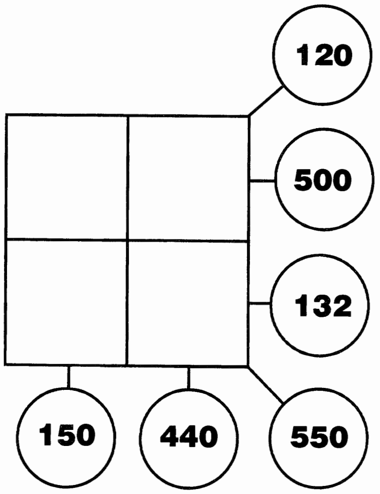
7. Factors: 9, 22, 26, 27



8. Factors: 21, 22, 23, 24



9. Factors: 6, ?, 22, 25

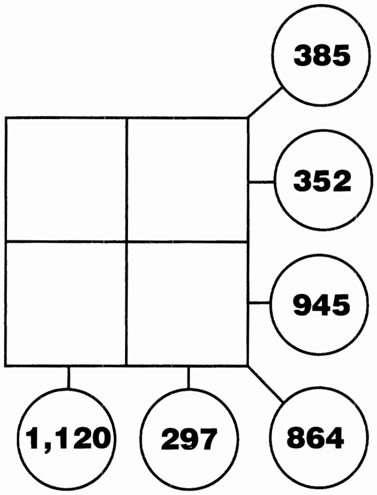


Date ____________________ Name ________________________________

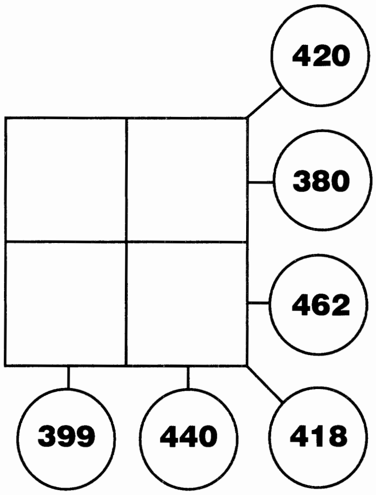
Products Galore II

Arrange the listed factors to produce the indicated products.

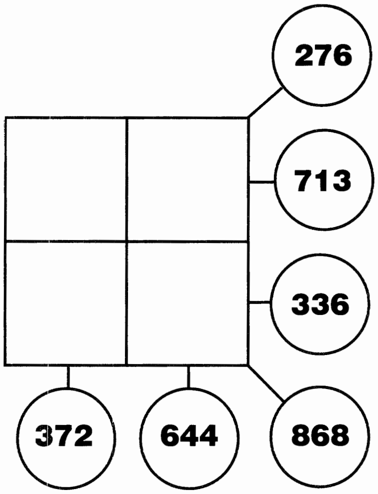
1. Factors: 11, 27, 32, 35



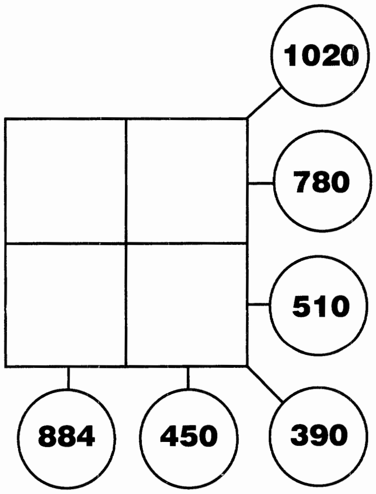
2. Factors: 19, 20, 21, 22



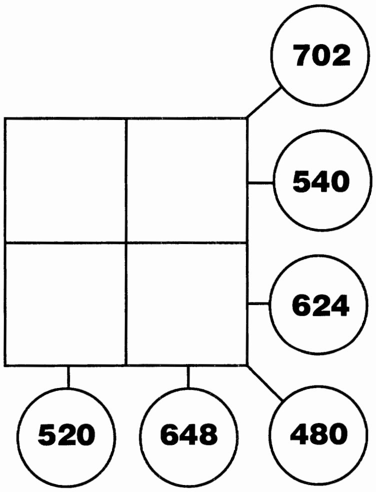
3. Factors: 12, 23, 28, 31



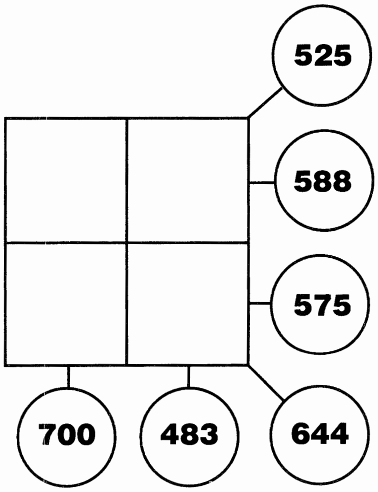
4. Factors: 15, 26, ?, 34



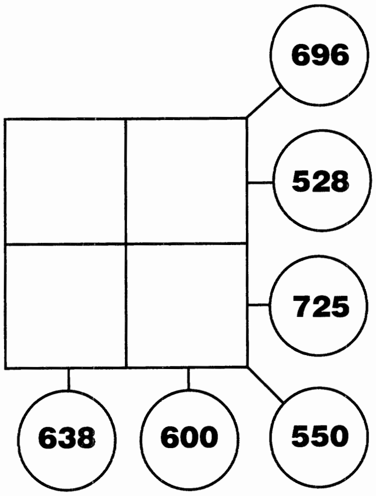
5. Factors: 20, ?, 26, 27



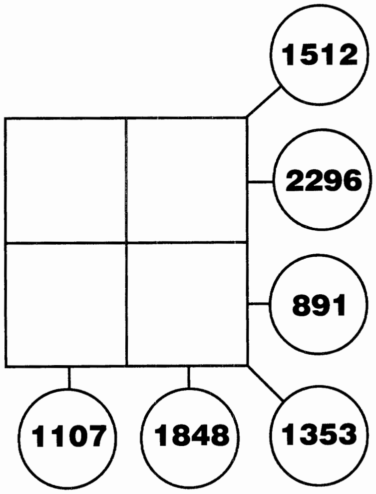
6. Factors: 21, 23, ?, 28



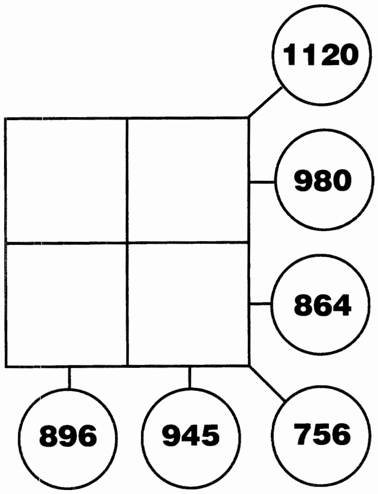
7. Factors: ?, 24, ?, 29



8. Factors: 27, ?, ?, 56



****9.** Factors between 26 and 36



Fraction Arrangements

Topic: Mentally Computing Fractions

Object: Compute two created fractions to reach close to a target amount.

Groups: Pair players or 2 players

Materials for each group

- *Fraction Arrangements* recording sheet (for each player), p. 86
- 3 sets of Digit Cards (0's and 7's removed), p. 150

Tip *Use* Fraction Arrangements B, *p. 87, when students become comfortable with* Fraction Arrangements A *and are ready for the greater challenge of mentally multiplying and dividing fractions.*

Directions

1. One player mixes the three sets of Digit Cards and stacks them face down. For Round 1 each pair draws five cards and uses four of the drawn digits to form two fractions that equal a sum close to one whole.
2. When both pairs are ready, they share their fraction arrangements, announcing the resulting sum. After the opposing pair verifies the arrangement as correct, the equation is recorded.
3. Next members of each pair determine who is closest to the target number by computing the difference between their answer and the target amount. After the opposing pairs verify these differences, the pair with the lowest difference receive 1 point for that round.

		Answer	Target	Difference	Score
Round 1	$\frac{\boxed{3}}{\boxed{6}} + \frac{\boxed{6}}{\boxed{9}} =$	$1\frac{1}{6}$	1	$\frac{1}{6}$	1
Round 2	$\frac{\boxed{5}}{\boxed{4}} - \frac{\boxed{6}}{\boxed{8}} =$	$\frac{1}{2}$	$\frac{1}{2}$	0	

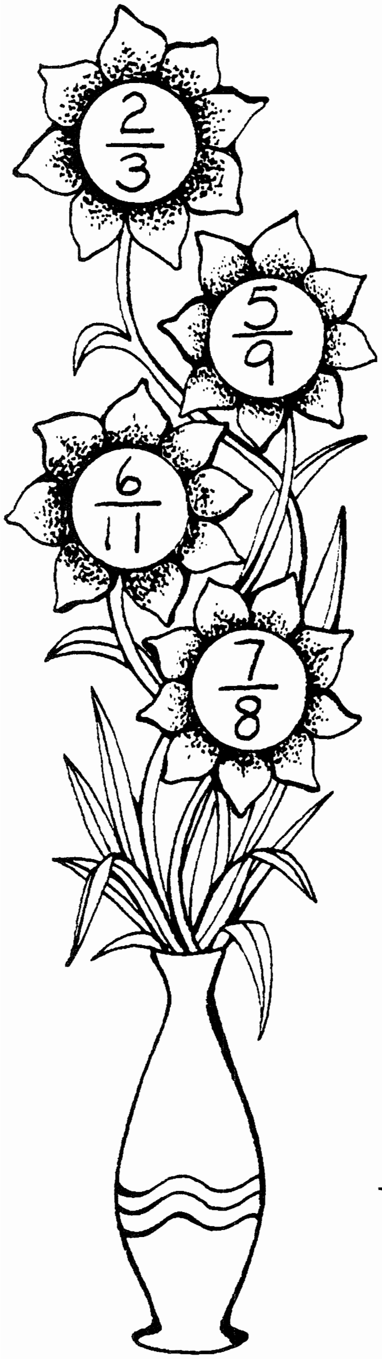
4. The used cards are set aside and each pair draws five new cards. The pairs play round two by following the same steps, while seeking a difference close to $\frac{1}{2}$.
5. After every two rounds remix and restack all the Digit Cards.
6. In the last round, the pairs get to choose which operation to use with their two arranged fractions.
7. After up to eight rounds are played, the scores are totaled. The pair with the highest score wins.

Making Connections

Promote reflection and make mathematical connections by asking:

- Which fractions were easier to reach? Explain.
- Which digits were more difficult to place?
- What arrangements helped you get close to the target numbers?

Fraction Arrangements A



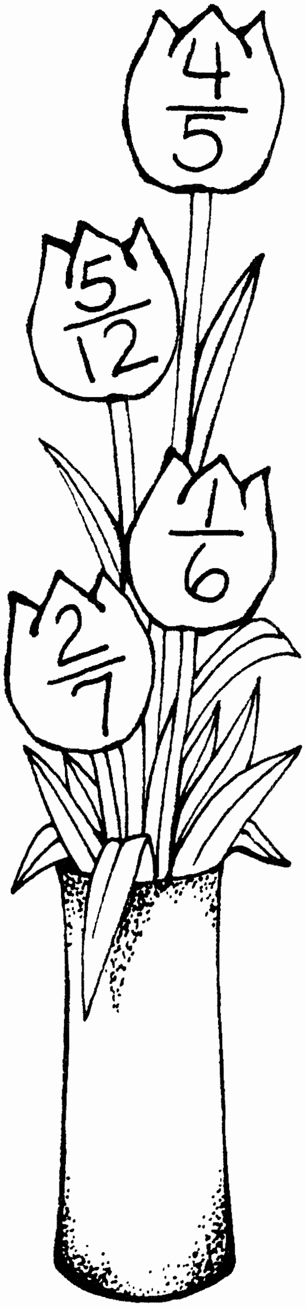
		Answer	Target	Difference	Score
Round 1	$\frac{\square}{\square} + \frac{\square}{\square} =$	____	1		
Round 2	$\frac{\square}{\square} - \frac{\square}{\square} =$	____	$\frac{1}{2}$		
Round 3	$\frac{\square}{\square} - \frac{\square}{\square} =$	____	$\frac{1}{4}$		
Round 4	$\frac{\square}{\square} + \frac{\square}{\square} =$	____	$\frac{3}{4}$		
Round 5	$\frac{\square}{\square} - \frac{\square}{\square} =$	____	1		
Round 6	$\frac{\square}{\square} + \frac{\square}{\square} =$	____	$1\frac{1}{4}$		
Round 7	$\frac{\square}{\square} - \frac{\square}{\square} =$	____	$\frac{3}{4}$		
Round 8	$\frac{\square}{\square} \bigcirc \frac{\square}{\square} =$	____	$\frac{2}{3}$		

____

Total Score

Fraction Arrangements B

		Answer	Target	Difference	Score
Round 1	$\frac{\square}{\square} + \frac{\square}{\square} =$	___	$1\frac{1}{2}$		
Round 2	$\frac{\square}{\square} - \frac{\square}{\square} =$	___	$\frac{1}{3}$		
Round 3	$\frac{\square}{\square} \times \frac{\square}{\square} =$	___	$\frac{1}{4}$		
Round 4	$\frac{\square}{\square} \div \frac{\square}{\square} =$	___	2		
Round 5	$\frac{\square}{\square} \div \frac{\square}{\square} =$	___	$\frac{3}{4}$		
Round 6	$\frac{\square}{\square} \times \frac{\square}{\square} =$	___	1		
Round 7	$\frac{\square}{\square} \bigcirc \frac{\square}{\square} =$	___	$\frac{1}{2}$		
Round 8	$\frac{\square}{\square} \bigcirc \frac{\square}{\square} =$	___	$1\frac{1}{4}$		



_______ **Total Score**

Digit Cards

0		
1	2	3
4	5	6
7	8	9

Rolling Decimals

Topic: Converting Fractions to Decimals

Object: Complete recording sheet with many different decimals.

Groups: 2 players or pair players

Materials for each group

- *Rolling Decimals* recording sheet (for each player), p. 105
- 2 number cubes (1-6)

Tip *When students are ready to convert more challenging fractions, use the recording sheet for* Rolling Decimals B *with two different number cubes (1–6 and 3-4-5-6-8-9).*

Directions

1. The first player rolls the two number cubes and uses the two numbers to form a proper fraction. If doubles are rolled, the player rolls again.
2. The player identifies the **proper** fraction and converts the fraction to a decimal rounded to the nearest hundredth.
3. Next the player records the rounded decimal within a correct range on her or his recording sheet. (When decimals fit within two ranges, the player has a placement choice.)
4. The second player follows these same steps. Players continue to alternate turns rolling, converting, and recording appropriately.
5. It is important for the players to realize how points are earned. Each player receives one point for every recorded decimal. (When players record more than one decimal on a range line, the decimals must be different.) The first player to record at least one decimal in each of the seven ranges receives three bonus points and the playing ends.
6. At this point each player determines her or his score. The player with the higher score wins.

.1 ____________ .2 **.22**

.21 ______________ **.34**

.28 .33 ________ .4 **.42**

.45 ____________ .5 **.53**

.57 .6 ________ .67 **.7**

.72 ______________ **.85**

.79 ______________ **.9**

Score: ____ 3 points (finished first)

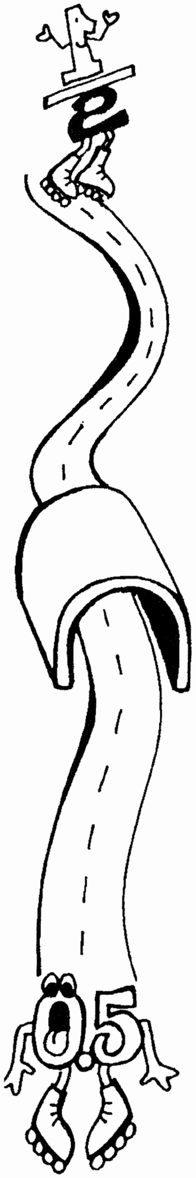
____ 1 point for each recorded decimal

____ Total

Making Connections

Promote reflection and make mathematical connections by asking:

- Which range lines were more difficult to complete? Please explain.
- How would you record differently in future games?



Rolling Decimals A

.1 ______________ .22

.21 ______________ .34

.28 ______________ .42

.45 ______________ .53

.57 ______________ .7

.72 ______________ .85

.79 ______________ .9

Score: _____ 3 points (finished first)

_____ 1 point for each recorded decimal

_____ Total

Rolling Decimals B

.1 ______________ .23

.2 ______________ .35

.31 ______________ .48

.42 ______________ .58

.56 ______________ .67

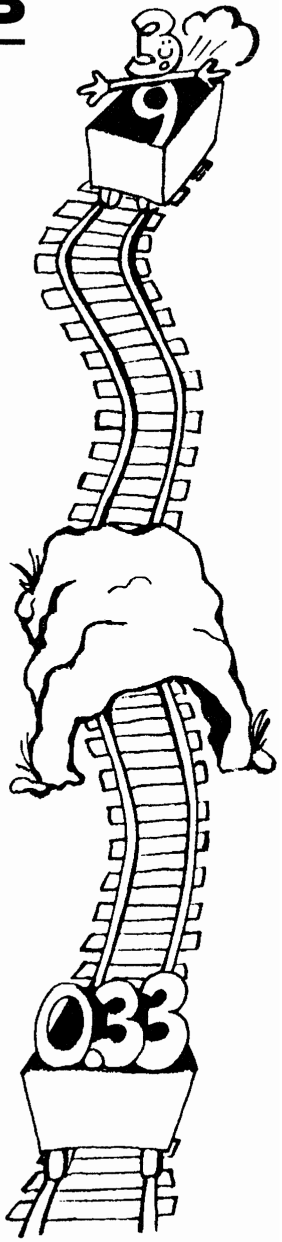
.63 ______________ .77

.72 ______________ .9

Score: _____ 3 points (finished first)

_____ 1 point for each recorded decimal

_____ Total



53 Read, Write, and Represent Decimals

Math Standard Read, write, and compare decimals to thousandths.

Grouping(s)

Small guided math group or workstation

Materials

For the student:

- 100-bead number line (BNL)
- "Read, Write, and Represent Decimals" Cards (page 149)
- Recording Sheet (page 150)

Overview

Students draw a card and model the decimal on the BNL.

Presenting the Activity

1. Students draw a card and read the word form of the decimal.
2. Students build the quantity on the BNL.
3. Students record the decimal on the recording sheet.

Extension

Students write other decimals in word form and give their problems to a partner to write in decimal form and fraction form.

Guided Learning

Ask:

- How did you interpret the problem?
- How do you know that you are correct?

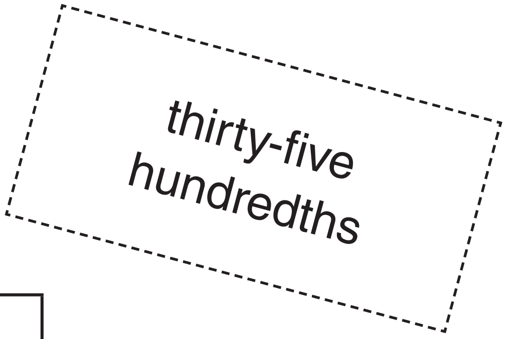
Assessing Student Responses

- Was student successful in expanding the number?

  Y / N / Emerging

- Could student explain the concept?

  Y / N / Emerging



thirty-five hundredths

Read the word form.	Write the decimal.
Twenty-two hundredths	0.22

Activity 53: "Read, Write, and Represent Decimals" Cards

ten-tenths	twenty-hundredths	thirty-five hundredths
forty-four hundredths	five-tenths	sixty-seven hundredths
seven-tenths	nine-tenths	nineteen hundredths
eighty-two hundredths	ninety-nine hundredths	one-tenth
two-tenths	three-tenths	four-tenths
six-tenths	eight-tenths	nine-tenths
fifty-eight hundredths	seventy-seven hundredths	thirty-nine hundredths
forty-six hundredths	eighty-five hundredths	fifty-one hundredths

Name ______________________________ Date ____________________

Activity 53: "Read, Write, and Represent Decimals" Recording Sheet

Write the decimal three ways. The first one is done for you.

Word Form	Standard Form	Fraction Form
twenty-five hundredths	0.25	$\frac{25}{100}$

56 Model Addition of Decimals

Math Standard Add, subtract, multiply, and divide decimals to hundredths using concrete models and strategies.

Grouping(s)

Whole group or small guided math group or workstation

Overview

Students draw a card and model addition of decimals to hundredths on the BNL.

Materials

For the student:

- 100-bead number line (BNL)
- "Model Addition of Decimals" Cards, Sets A and B (pages 155–156)
- Recording Sheet (page 157)

For the teacher:

- Demonstration BNL, document camera

Presenting the Activity

1. Review and model strategies for adding decimals with students. Show the table below with a document camera, if possible.
2. Students draw a card and model the problem on their BNLs.
3. Students record the sum on the recording sheet, noting the strategy used.

Guided Learning

Ask:

- How many tenths? How many hundredths?
- Let's add the tenths and then let's add the hundredths (see example below).
- Let's add to the next tenth and then count on. Example: 0.19 + 0.26 becomes 0.20 + 0.25.

Assessing Student Responses

- Was student successful in adding the decimals?

  Y / N / Emerging

- Could student use a variety of strategies?

  Y / N / Emerging

Strategy Idea Bank		
Add tenths and hundredths.	**Partial sums: Add parts at a time.**	**Make the numbers "friendly" so they are easy to add.**
Example: 0.25 + 0.42 1st: Add up tenths: 0.2 + 0.4 2nd: Add up hundredths: 0.05 + 0.02 3rd: Add both parts: 0.67	**Example: 0.79 + 0.12** 1st: Add it up in parts: 0.79 + 0.10 2nd: Add 0.89 + 0.02 3rd: Add up the amount: 0.91	**Example: 0.72 + 0.29** 1st: Add 0.01 to 0.29 to get 0.30 2nd: Take 0.01 from 0.72 to get 0.71 3rd: New problem is 0.71 + 0.30 = 1.01

Activity 56: "Model Addition of Decimals" Card Set A

0.27 + 0.19	0.22 + 0.18	0.33 + 0.17
0.15 + 0.20	0.84 + 0.45	0.55 + 0.25
0.49 + 0.40	0.62 + 0.50	0.75 + 0.09
0.68 + 0.07	0.72 + 0.28	0.10 + 0.04
0.09 + 0.08	0.91 + 0.49	0.92 + 0.08
0.25 + 0.19	0.33 + 0.28	0.64 + 0.27
0.15 + 0.25	0.84 + 0.48	0.55 + 0.29
0.89 + 0.47	0.31 + 0.21	0.70 + 0.19
0.68 + 0.27	0.71 + 0.29	0.50 + 0.05

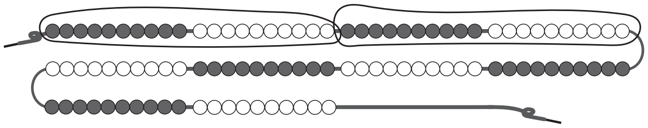
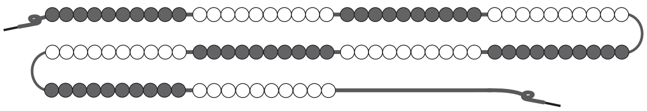
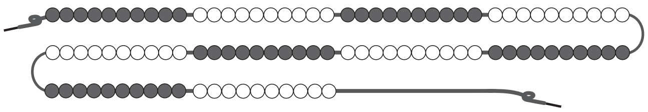
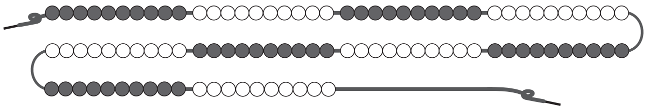
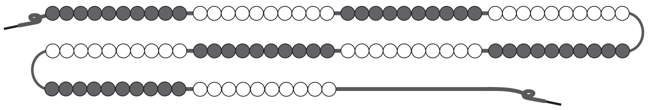
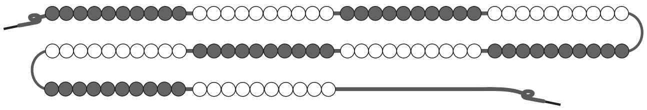
Activity 56: “Model Addition of Decimals” Card Set B

Write an equation with a sum of 0.10.	Write an equation with a sum of 0.20.
Write an equation with a sum of 0.30.	Write an equation with a sum of 0.40.
Write an equation with a sum of 0.58.	Write an equation with a sum of 0.62.
Write an equation with a sum of 0.75.	Write an equation with a sum of 0.82.
Write an equation with a sum of 0.99.	Write an equation with a sum of 1.0.
Write an equation with a sum greater than 0.57.	Write an equation with a sum less than 0.44.
Write an equation with a sum in between 0.50 and 0.88.	Make up your own equation adding decimals.

Name ______________________________ Date ____________________

Activity 56: "Model Addition of Decimals" Recording Sheet

The first one is done for you.

Problem	Solution	Strategy (circle one)
0.21 + 0.19	  0.20 + 0.20 = 0.40	Partial sums [✓ Compensation] Friendly numbers Other: __________
	 	Partial sums Compensation Friendly numbers Other: __________
	 	Partial sums Compensation Friendly numbers Other: __________

57

Model Subtraction of Decimals

Math Standard Add, subtract, multiply, and divide decimals to hundredths using concrete models and strategies.

Grouping(s)

Whole group or small guided math group or workstation

Overview

Students draw a card and model subtraction of decimals to hundredths on the BNL.

Materials

For the student:

- 100-bead number line (BNL)
- "Model Subtraction of Decimals" Cards (page 158)
- Recording Sheet (page 159)

For the teacher:

- Demonstration BNL
- Document camera

Presenting the Activity

1. Review and model strategies for subtracting decimals with students. Show the table below with a document camera, if possible.
2. Students draw a card.
3. Students model subtraction of decimals on the BNL.
4. Students record the difference on the recording sheet, noting the strategy used.

Guided Learning

Ask:

- Which strategy did you use?
- Is there another way?

Assessing Student Responses

- Was student successful in subtracting the decimals?

  Y / N / Emerging

- Could student explain the strategy used?

  Y / N / Emerging

Strategy Idea Bank		
Count up.	**Partial differences: Take away parts at a time.**	**Make the numbers "friendly" so they are easy to subtract.**
Example: 0.78 – 0.49 1st: Add up to nearest tenth: 0.49 + 0.01 = 0.50 2nd: Add up to subtrahend 0.7: 0.50 + 0.28 = 0.78 3rd: How much did you count up?: 0.29	**Example: 0.75– 0.42** 1st : Take away 0.30 to get to 0.45 2nd: Take away 0.03 to get to 0.42 3rd: Add up the amount subtracted: 0.30 + 0.03 = .33	**Example: 0.72 – 0.29** 1st: Add 0.01 to 0.29 to get 0.30 2nd: Add 0.01 to 0.72 to get 0.73 3rd: New problem is 0.73 – 0.30 = 0.43

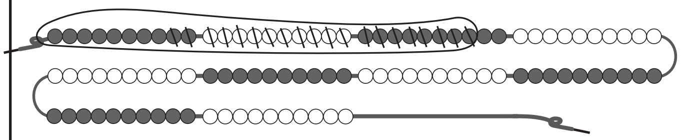
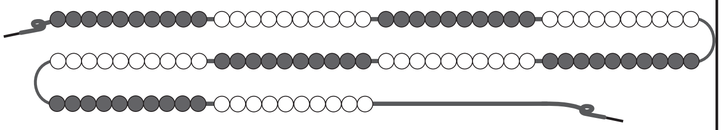
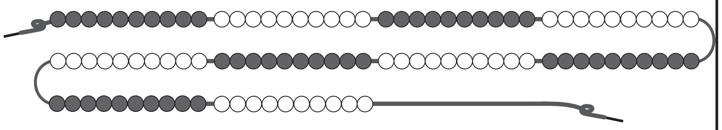
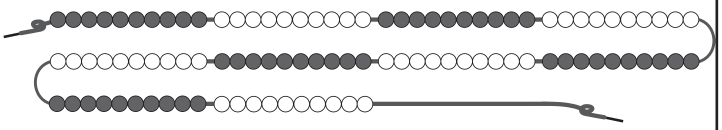
Activity 57: "Model Subtraction of Decimals" Cards

0.27 – 0.19	0.22 – 0.18	0.33 – 0.17
0.35 – 0.20	0.84 – 0.45	0.55 – 0.25
0.49 – 0.40	0.62 – 0.50	0.75 – 0.09
0.68 – 0.07	0.72 – 0.28	0.10 – 0.04
0.09 – 0.08	0.91 – 0.49	0.92 – 0.74
0.25 – 0.19	0.33 – 0.28	0.62 – 0.57
0.45 – 0.25	0.84 – 0.48	0.55 – 0.29
0.89 – 0.47	0.31 – 0.21	0.70 – 0.19
0.68 – 0.27	0.71 – 0.29	0.50 – 0.05

Name ______________________________ Date ____________________

Activity 57: "Model Subtraction of Decimals" Recording Sheet

The first one is done for you.

Problem	Solution	Strategy (circle one)
0.27 – 0.19	 0.27 + 0.01 = 0.28 0.19 + 0.01 = 0.20 New problem: 0.28 – 0.20 = 0.08	Count up Partial differences [✓ Friendly numbers] Other: __________
		Count up Partial differences Friendly numbers Other: __________
		Count up Partial differences Friendly numbers Other: __________
		Count up Partial differences Friendly numbers Other: __________

58 Model Multiplication of Decimals

Math Standard Add, subtract, multiply, and divide decimals to hundredths using concrete models and strategies.

Grouping(s)

Small guided math group or workstation

Overview

Students draw a card and model multiplication of decimals on the BNL.

Materials

For the student:

- 100-bead number line (BNL)
- "Model Multiplication of Decimals" Cards (page 160)
- Recording Sheet (page 161)

For the teacher:

- Demonstration BNL
- Document care

Presenting the Activity

1. Review and model strategies for multiplying decimals with students. Show the table below with a document camera, if possible.
2. Students draw a card.
3. Students solve the decimal multiplication problem on the BNL.
4. Students record the product on the recording sheet, noting the strategy used. Possible strategies include Repeated Addition, Partial Product, Area Model, and Traditional Method.

Guided Learning

Ask:

- Which strategy did you use?
- Is there another way?

Assessing Student Responses

- Was student successful in multiplying the decimals?

  Y / N / Emerging

- Could student explain the strategy used?

  Y / N / Emerging

<table>
<tr><th colspan="2">Strategy Idea Bank</th></tr>
<tr><th>Multiply hundredths by a whole number.</th><th>Multiply tenths by a whole number.</th></tr>
<tr><td>Example: 2 × 0.05
1st: Partition the number of hundredths:
2 groups of 0.05
2nd: Add to find the total:
0.05 + 0.05 = 0.10</td><td>Example: 3 × 0.10
1st: Partition the number of tenths:
3 groups of 0.10
2nd: Add to find the total:
0.10 + 0.10 + 0.10 = 0.30</td></tr>
</table>

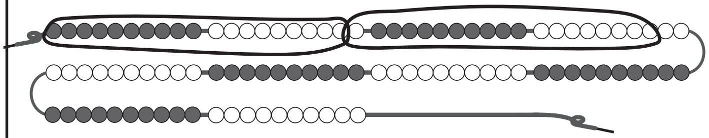
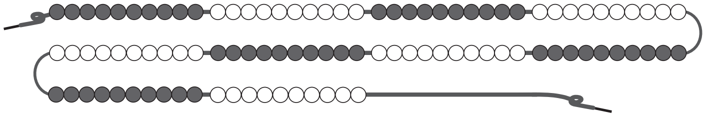
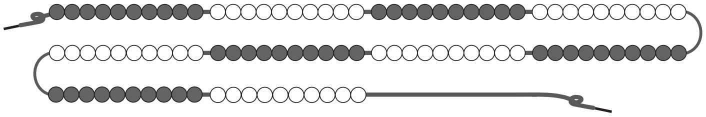
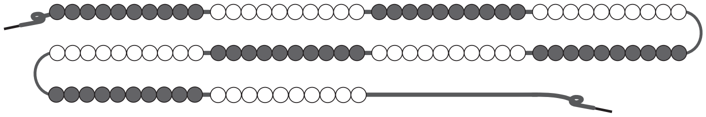
Activity 58: "Model Multiplication of Decimals" Cards

2×0.19	1×0.18	3×0.17
5×0.15	0.8×0.04	5×0.05
4×0.09	6×0.07	7×0.09
9×0.02	7×0.02	1×0.04
9×0.10	1×0.20	2×0.40
2×0.10	3×0.20	6×0.10
5×0.20	8×0.10	4×0.20
7×0.10	4×0.25	7×0.07
3×0.30	3×0.25	5×0.15

Name ______________________ Date ______________

Activity 58: "Model Multiplication of Decimals" Recording Sheet

The first one is done for you.

Problem	Solution	Strategy (circle one)
2 × 0.19	 0.19 + 0.19 = 0.38	[✓ Repeated addition] Partial product Area model Traditional method
		Repeated addition Partial product Area model Traditional method
		Repeated addition Partial product Area model Traditional method
		Repeated addition Partial product Area model Traditional method

59 Model Division of Decimals

Math Standard Add, subtract, multiply, and divide decimals to hundredths using concrete models and strategies.

Grouping(s)

Small guided math group or workstation

Overview

Students draw a card and model division of decimals on the BNL.

Materials

For the student:

- 100-bead number line (BNL)
- "Model Division of Decimals" Cards (page 162)
- Recording Sheet (page 163)

For the teacher:

- Demonstration BNL, document camera

Presenting the Activity

1. Review with students the strategies for dividing decimals (see examples below).
2. Model decimal multiplication on the demonstration BNL as necessary. For example, 0.12 ÷ 4: Grab 14 beads and then partition those beads into 4 groups (4 groups of 3).
3. Students draw a card and solve the decimal division problem on the BNL.
4. Students record the quotient on the recording sheet, noting the strategy used. Possible strategies include Repeated Subtraction, Partial Quotient, Area Model, and Traditional Method.

Guided Learning

Ask:

- Which strategy did you use?
- Is there another way?

Assessing Student Responses

- Was student successful in dividing the decimals?

  Y / N / Emerging

- Could student explain the strategy used?

  Y / N / Emerging

Strategy Idea Bank	
Divide hundredths by a whole number.	**Divide tenths by a whole number.**
Example: 0.12 ÷ 4 1. Equally partition the dividend amount designated by the divisor (4 groups). 2. How much is in a group? If you divide 12 cents between 4 people, how much will each person get?	**Example: 0.20 ÷ 4** 1. Equally partition the dividend amount designated by the divisor (4 groups). 2. How much is in a group? If you divide 20 cents between 4 people, how much will each person get?

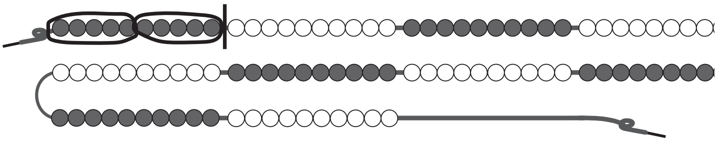
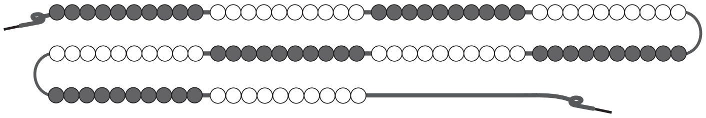
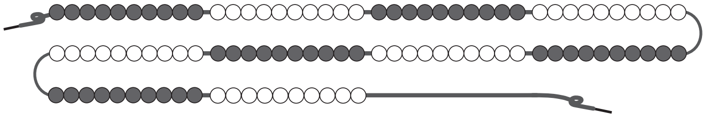
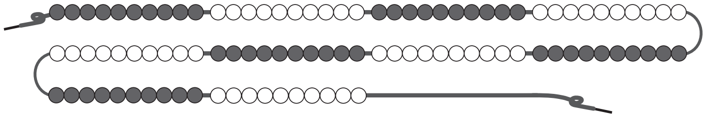
Activity 59: "Model Division of Decimals" Cards

0.10 ÷ 2	0.10 ÷ 5	0.10 ÷ 10
0.10 ÷ 1	0.12 ÷ 3	0.12 ÷ 4
0.12 ÷ 12	0.12 ÷ 6	0.08 ÷ 2
0.08 ÷ 4	0.08 ÷ 8	0.06 ÷ 1
0.06 ÷ 2	0.06 ÷ 3	0.04 ÷ 4
0.04 ÷ 2	0.14 ÷ 2	0.14 ÷ 7
0.20 ÷ 4	0.25 ÷ 5	0.30 ÷ 5
0.40 ÷ 2	0.50 ÷ 5	0.60 ÷ 4
0.70 ÷ 2	0.80 ÷ 4	0.90 ÷ 9

Name ______________________________ Date ____________________

Activity 59: "Model Division of Decimals" Recording Sheet

The first one is done for you.

Problem	Solution	Strategy (circle one)
0.10 ÷ 2	 2 groups of 0.05 0.10 ÷ 2 = 0.05	[✓ Repeated subtraction] Partial quotient Area model Traditional method
		Repeated subtraction Partial quotient Area model Traditional method
		Repeated subtraction Partial quotient Area model Traditional method
		Repeated subtraction Partial quotient Area model Traditional method