Name_____Date_____

Lesson 1 Warm-up-

Solve each problem using a number line model.

1. ½ + ½ + ½ =

2. ¼ + ¼ + ¼ =

3. $^{1}/_{8}$ + $^{1}/_{8}$ + $^{1}/_{8}$ =

Reflect-

- Compare and contrast your answers for questions #1-3.
  Key vocabulary: numerator, denominator, and whole

- Which is the largest sum, and why? .

4.NF.4- Apply & extend previous understanding of multiplication to multiply a fraction by a whole number.

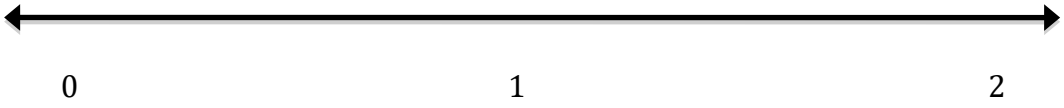
Name_____Date_____

Follows Guided Practice with Slates->Topics: Fraction and Mixed Number Representations and Concepts (See Teacher Notes, p. 5.)

Lesson 1 Practice Set-

Solve each problem using a number line model.

1. ½ + ½ + ½ + ½ =



2. ¼ + ¼ + ¼ + ¼ =

3. $^{1}/_{8} + {}^{1}/_{8} + {}^{1}/_{8} + {}^{1}/_{8} =$

Reflect-

- Compare and contrast your answers for questions #1-3.
  Key vocabulary: numerator, denominator, and whole

- Which is the largest sum, and why?

4.NF.4- Apply & extend previous understanding of multiplication to multiply a fraction by a whole number.

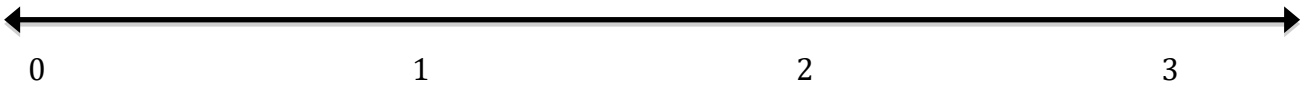
Name_____Date_____

Lesson 1 Homework-

Solve each problem using a number line model.

1. ½ + ½ + ½ + ½ + ½ + ½ =

2. ¼ + ¼ + ¼ + ¼ + ¼ + ¼ =



3. $^{1}/_{8}$ + $^{1}/_{8}$ + $^{1}/_{8}$ + $^{1}/_{8}$ + $^{1}/_{8}$ + $^{1}/_{8}$ =

Reflect-

- When you divide the number line into equal-sized pieces, how do you determine the number of parts between two whole numbers? *Key vocabulary: numerator, denominator, and whole*

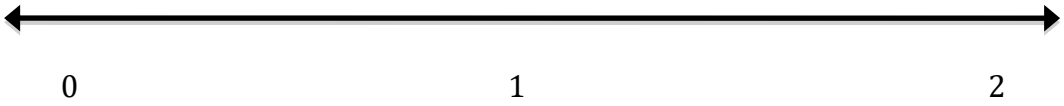
- Which is the largest sum? Why is this so?

Name_____Date_____

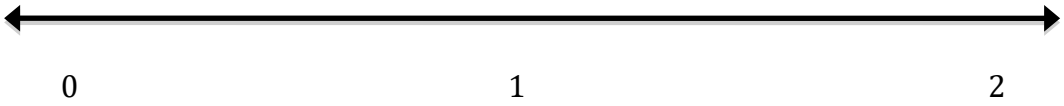
Lesson 2 Warm-up-

Solve each problem using a number line model.

1. $1/3 + 1/3 + 1/3 =$



2. $1/6 + 1/6 + 1/6 =$



3. $1/12 + 1/12 + 1/12 =$

Reflect-

- Compare and contrast your answers for questions #1-3.
  Key vocabulary: numerator, denominator, and whole

- Which is the largest sum? Why is this so?

4.NF.4- Apply & extend previous understanding of multiplication to multiply a fraction by a whole number.

Name_____Date_____

Follows Guided Practice with Slates->Topics: Fraction Concepts & Multiplication as Repeated Addition (See Teacher Notes, p. 7.)

Lesson 2 Practice Set-

PART 1- Solve each problem using a number line model. For #3, write your own fraction addition problem and then solve it.

1. $^1/_3 + {}^1/_3 + {}^1/_3 + {}^1/_3 =$

2. $^1/_6 + {}^1/_6 + {}^1/_6 + {}^1/_6 =$

3. _____

PART 2- Write the equivalent multiplication expression for each sum.

Reflect-

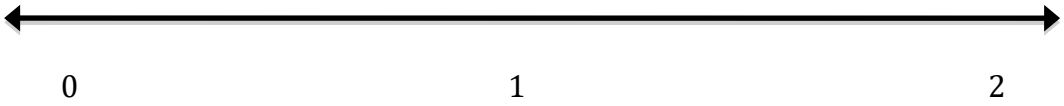
- How are addition and multiplication related?

Name_____Date_____

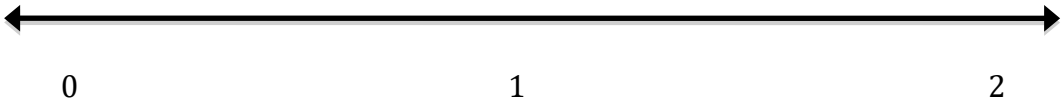
Lesson 2 Homework-

Solve each problem using a number line model.

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



2. $4 \times \frac{1}{6} =$



3. $4 \times \frac{1}{12} =$

Reflect-

Compare your products. Which has the greatest value? Which has the least value? Explain why this is true.
Key vocabulary: numerator, denominator, and whole.

Name_____Date_____

Lesson 3 Warm-up-

Molokai Mike was a mighty crab. He lived on the West End of Molokai. Usually when he went out to find food he only needed to crawl ½ meter from his hole in the sand before he found something to eat. One wave-washed day, however, he was forced to crawl six times farther. How far did Mighty Mike crawl on that day before he found a snack in the sand?

PART 1- Solve the word problem using a number line model.

PART 2- Write a multiplication equation that represents this story.

PART 3-

A) How would the original equation change if Molokai Mike crawled **ten times** farther?

B) How would the original equation change if Molokai Mike usually crawled **¼ meter** in his search for food?

4.NF.4- Apply & extend previous understanding of multiplication to multiply a fraction by a whole number.

Name_____Date_____

Follows Kinesthetic Class Activity-> "Iterating Fractional Parts of a Whole along a Number Line."
(See Teacher Notes, p. 8.)

Lesson 3 Activity-

PART 1- Draw a picture for each situation that we "act out" on our class number line then write multiplication and addition equations for each.

1.

2.

3.

Reflect-

- How is the number of fraction strip copies that we used related to our multiplication equation?

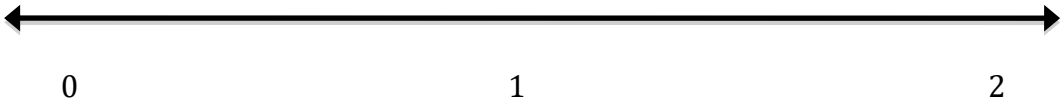
- How does the size of the fraction change the distance we move along the line?

Name_____Date_____

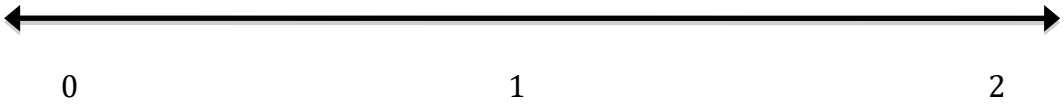
Lesson 3 Homework-

Solve each problem using a number line model.

1. $3 \times \frac{1}{2} =$



2. $6 \times \frac{1}{4} =$



3. $8 \times \frac{1}{4} =$

Reflect-

- Explain how your number line drawings represent the action of multiplication. How is this action related to addition?

Name_____Date_____

Lesson 4 Warm-up-

This year Kualapu'u School is entering a relay team at Makahiki. There are six runners on the team. Each runner will run ¼ of a mile. How far will the team run altogether?

PART 1- Solve the word problem using a number line model.

PART 2- Write equivalent addition and multiplication expressions that represent this story.

PART 3-

A) How would the original expressions change if the Kualapu'u team were **8 runners**?

B) How would the original expressions change if **each runner ran ½ mile**?

4.NF.4- Apply & extend previous understanding of multiplication to multiply a fraction by a whole number.
Name_____Date_____

Follows Kinesthetic Class Activity-> "Running Relays to develop connection to a real-world context." (See Teacher Notes, p. 10.)

Lesson 4 Relay Race Activity-

PART 1- Make a number line drawing, then write equivalent addition and multiplication expressions that model our relay race.

Number line drawing-

Equations- _____

PART 2- Make a number line drawing, then write equivalent addition and multiplication equations for another "pretend" relay race in which each person runs the same fractional distance. You choose the number of runners on a team and the relay leg distance. Find the total distance.

Number of Runners- _____ Relay Leg Distance- _____

Total Distance Relay Team Runs- _____

Number line drawing-

Equations - _____

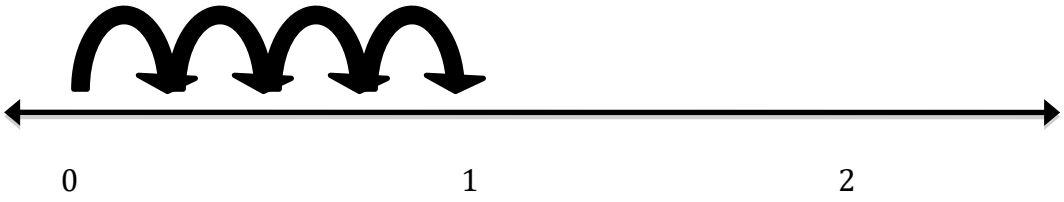
4.NF.4- Apply & extend previous understanding of multiplication to multiply a fraction by a whole number.
Name_____Date_____

Lesson 4 Exit Pass-

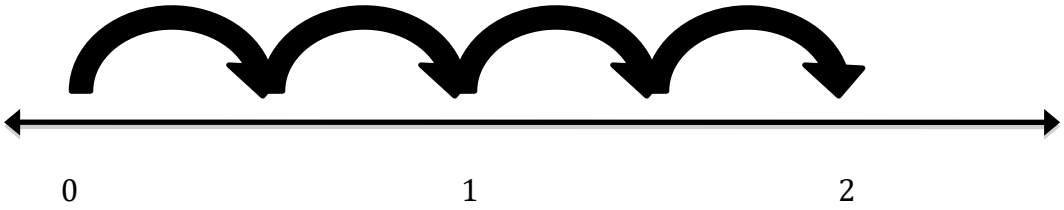
Part 1- Match each picture to a relay team letter: A, B, C, or D.

A. 3 X ¼ B. 3 X ½ C. 4 X ¼ D. 4 X ½

_____1.

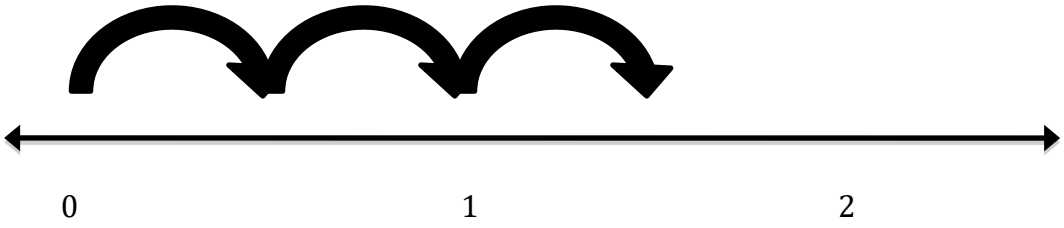


_____2.



_____3.

_____4.



Part 2- Use the back of this page to explain your reasoning.

4.NF.4- Apply & extend previous understanding of multiplication to multiply a fraction by a whole number.

Name_____Date_____

Lesson 5 Entry Ticket-

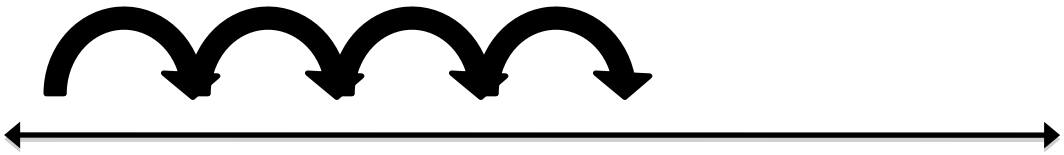
Part 1- Match each picture to a relay team letter: A, B, C, or D.

A. 3 X $^1/_3$ B. 3 X ¼ C. 4 X $^1/_3$ D. 4 X ¼

_____1.

0 1 2

_____2.

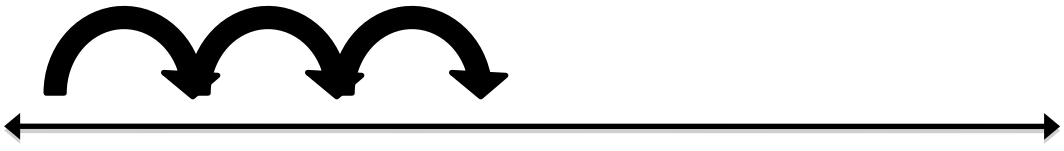


0 1 2

_____3.

0 1 2

_____4.



0 1 2

Part 2- Use the back of this page to explain your reasoning.

Name_____Date_____

See Teacher Notes, p.11 for Materials Information for this Small Group Activity

<u>Lesson 5 Activity</u>- Represent Relay Total Distances: <1, =1, >1

Ten-Step Directions Checklist:

_____Step 1- Fold your poster board lengthwise into thirds.

_____Step 2- Label the three sections of your poster board:
Number Line A) <1 Total Distance,
Number Line B) = 1 Total Distance
Number Line C) >1 Total Distance

_____Step 3- Use a meter stick to draw an open number line in each section.

_____Step 4- Use the paper strips provided to measure off the distance of two units on each number line.

_____Step 5- Mark the locations of: 0, 1, and 2 on each number line.

_____Step 6- Decide as a group what denominator you would like to work with.

_____Step 7- Fold all paper strips to represent the same denominator. How many parts make up your whole? What is the denominator?

_____Step 8- **Represent a relay with a total distance that is < 1.** Tape one folded paper strip with one or more parts turned under onto number line A**.** Draw hops above each fractional part and label. What is the total distance represented? Write equivalent addition and the multiplication expressions this distance.

_____Step 9- **Represent a relay with a total distance that is = 1.** Tape one folded paper strip onto number line B**.** Draw hops above each fractional part and label. What is the total distance represented? Write equivalent addition and the multiplication expressions this distance.

_____Step 10- **Represent a relay with a total distance that is >1.** Tape two folded paper strips onto number line C. One or more parts of the 2nd paper strip may be turned under. Draw hops above each fractional part and label. What is the total distance represented? Write equivalent addition and the multiplication expressions this distance.

Name_____Date_____

Lesson 5 Homework-

Make up three different relays that meet the following criteria. The distance for the first relay race must be less than one, the distance for the second relay race should equal one, and the distance for the third relay race should be greater than one. Write equations and draw number lines for each.

A- Total relay race distance is less than one.

Equations- _____

Number line drawing-

B- Total relay race distance is equal to one.

Equations- _____

Number line drawing-

C- Total relay race distance is greater than one.

Equations- _____

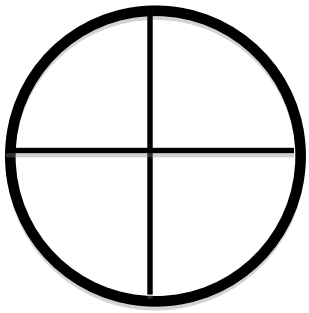
Number line drawing-

Name_____Date_____

Lesson 6 Warm-up-

Mrs. Trinidad called Mr. Link on the phone during class. She asked if he could please send $1/4$ of the 12 boys in his class to the cafeteria to help set up chairs for the spelling bee. How many boys should Mr. Link send?

PART 1- Solve the word problem using an area model to distribute the group.



PART 2- Solve the word problem using a number line to show $1/4$ X 12.

PART 3- Partner Share / Team Talk Questions

- Did you arrive at the same answer using the two different models?
- How is taking $1/4$ of 12 the same as making 12 hops that are each $1/4$ of a unit long?
- Which method do you prefer? Why?
- Would this be true if you had to take $1/4$ of 60? Why, or why not?

4.NF.4- Apply & extend previous understanding of multiplication to multiply a fraction by a whole number.

Name_____Date_____

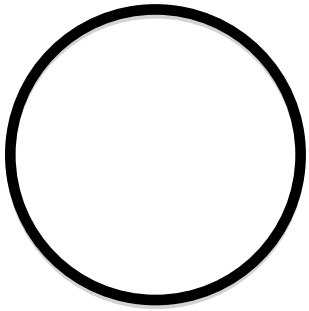
Follows Guided Practice with Slates->Topic: "Practicing Using the Area Model to Take Part of a Set" (See Teacher Notes, p.12.)

Lesson 6 Partner Work-

TASK 1- Write a multiplication expression that has one whole number factor and one fraction factor. For your whole number factor, pick a number that would make you decide to use an area model to solve.

Expression- _____

Area Model-



Solution- _____

TASK 2- Write a multiplication expression that has one whole number factor and one fraction factor. For your whole number factor, pick a number that would make you decide to use a number line model to solve.

Expression- _____

Number Line Model-

Solution- _____

TASK 3-PARTNER TALK

What whole numbers did you pick for your two models? How are these numbers different? Explain your choice.

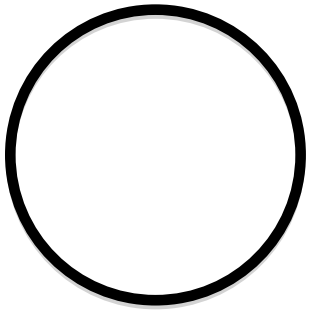
Name_____Date_____

Lesson 6 Homework-

TASK 1- Write a multiplication expression that has one whole number factor and one fraction factor that you will then solve with an area model.

Expression- _____

Area Model-



Solution- _____

TASK 2- Write a multiplication expression that has one whole number factor and one fraction factor that you will then solve with a number line model.

Expression- _____

Number Line Model-

TASK 3-REFLECT

What does the size of the whole number factor have to do with the type of model that you might use to solve your expression?

4.NF.4- Apply & extend previous understanding of multiplication to multiply a fraction by a whole number.

Name_____Date_____

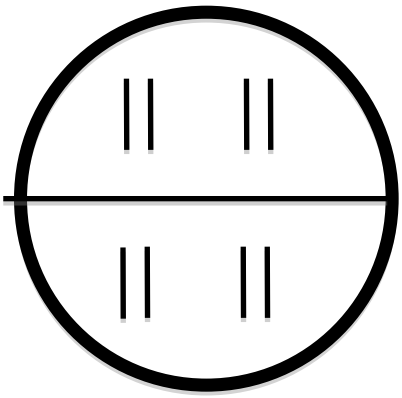
Lesson 7 Entry Ticket-

Teacher Directions- Shade one part of each picture before Xeroxing.

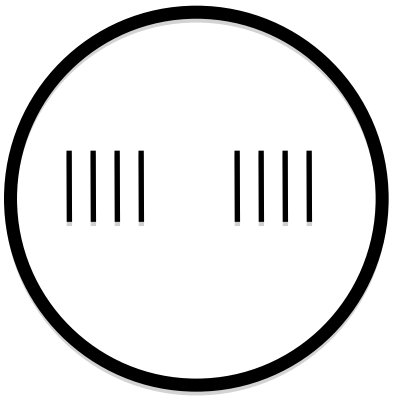
Part 1- Match Expressions A, B, C, D to Pictures 1, 2, 3, 4 by writing the expression in the blank and then solving.

A. ½ X 8 B. ½ X 12 C. ¼ X 8 D. ¼ X 12

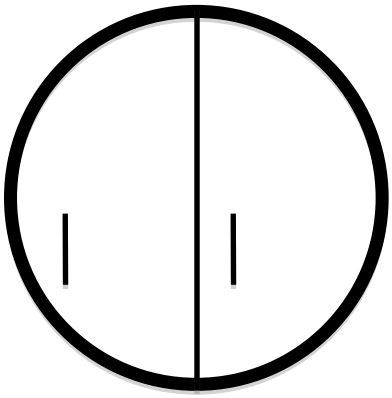
1. _____



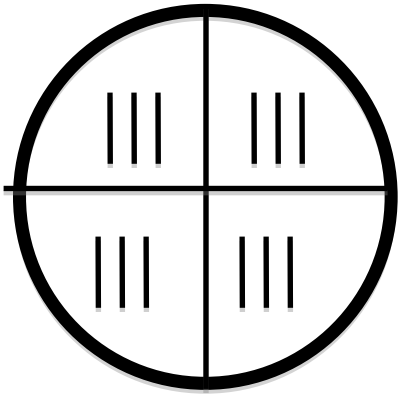
2. _____



3. _____



4. _____



Part 2- Solve one expression using a number line drawing.

- **Explain why the solutions are the same.**

Name_____Date_____

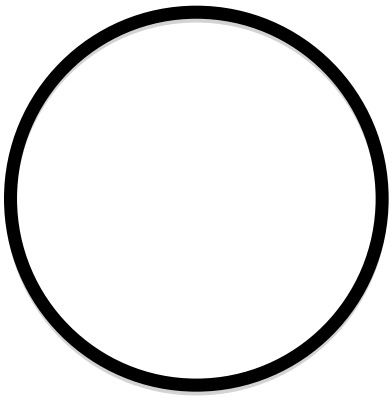
Lesson 7 Group Task-

Part 1- Make up your own whole number X fraction expressions.

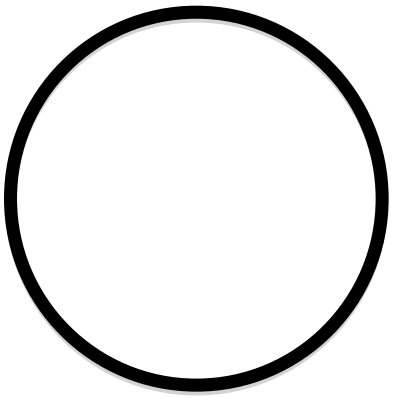
A. ___ X ___ B. ___ X ___ C. ___ X ___ D. ___ X ___

Part 2- Create four visuals that match your expressions, but don't solve. (You will be challenging another group or the class!)

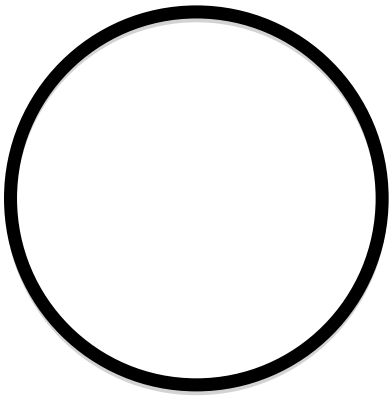
1. _____



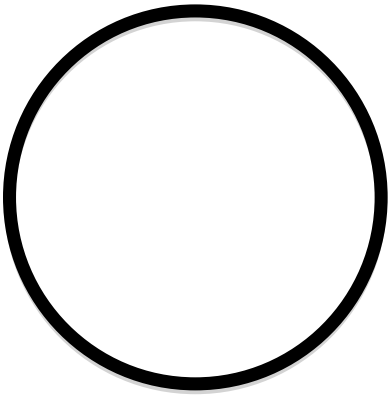
2. _____



3. _____



4. _____



Name_____Date_____

Lesson 7 Homework-

Use either an area model or a number line model to solve each problem.

A) ¼ X 32 = _____

B) $^1/_3$ X 24 = _____

C) ½ X 16 = _____

Thinking Questions:

Why do problems A, B, and C have the same answer?

How is taking one share of a group related to division?

4.NF.4- Apply & extend previous understanding of multiplication to multiply a fraction by a whole number.

Name_____Date_____

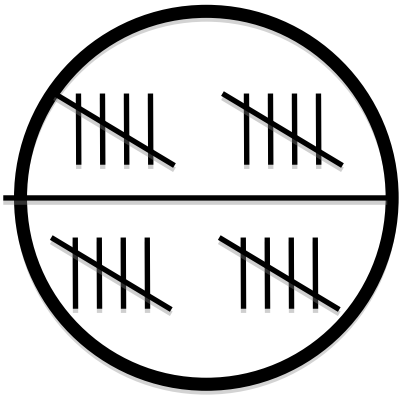
Teacher Directions- Shade <u>one</u> part of each picture before Xeroxing.

Lesson 8 Entry Pass-

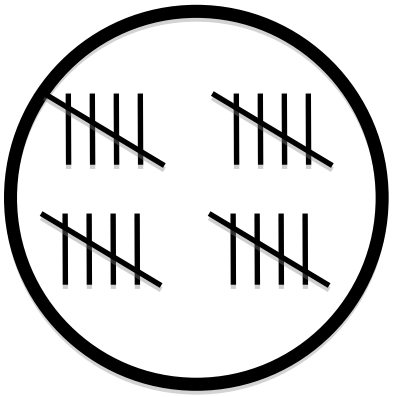
Part 1- Match Expressions A, B, C, D to Pictures 1, 2, 3, 4 by writing the expression in the blank and then solving.

A. ½ X 16 B. ½ X 20 C. ¼ X 16 D. ¼ X 20

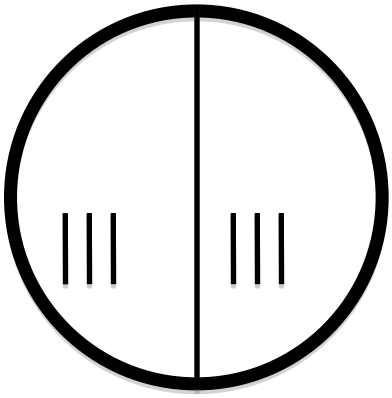
1. _____



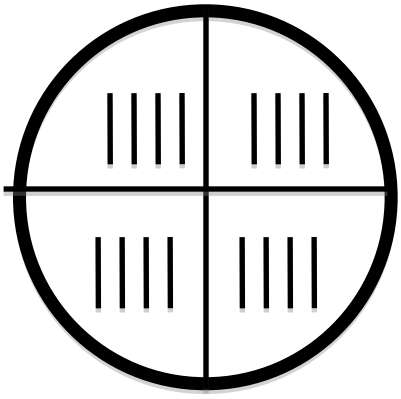
2. _____



3. _____



4. _____



Thinking Questions:

- How is taking part of a whole similar to division?

Name_____Date_____

Lesson 8 Group Task-

I. Write a word problem that requires multiplying a whole number by a fraction.

II. Solve your problem using an area or a number line model, or both.

III. Write one or more equivalent expressions that represent your story.

Name_____Date_____

Lesson 8 Homework-

I. Write a word problem that requires multiplying a whole number by a fraction.

II. Solve your problem using an area or a number line model, or both.

III. Write one or more equivalent expressions that represent your story.

IV. Practice presenting your story, visual, and equivalent expressions to someone at home; tomorrow we will be sharing our work in class.

4.NF.4- Apply & extend previous understanding of multiplication to multiply a fraction by a whole number.
Name_____Date_____

Lesson 9 Warm-up-

Write the matching expression for each word problem in the blank then solve with a number line or area model.

A. ½ X 36 **B. ½ X 18** **C. ¼ X 36** **D. ¼ X 18**

1. *Molokai Dolphin Swim Club has decided to hold a fundraiser. Swimmers will swim a ¼ mile course around the wharf and collect money for each lap. If Ms. Forbes swims 18 laps, how many miles does she swim altogether?*

_____

2. *If 4 students volunteer to sit on the bench for the last 36 minutes of a match, how long will each student sit out if they each take a quarter share of the time remaining?*

_____

3. *Elijah and his brother Jaius want to bake cookies for their homerooms at school. If they each take ½ of the 36 cookies that they bake together, how many cookies will they each bring to school?*

_____

4. *Farmer John has a fenced chicken coop area that is 18 square feet. He decides to divide the area into two equal areas so that he can keep the rooster away from the hens. How much area will be on either half?*

_____

4.NF.4- Apply & extend previous understanding of multiplication to multiply a fraction by a whole number.

Name_____Date_____

Lesson 9 Group Task-

Listen to each presentation carefully. Take down notes on the main idea. Ask questions afterward that will help you to better understand the question posed. Write the expression that represents the problem and then solve it using a number line or area model.

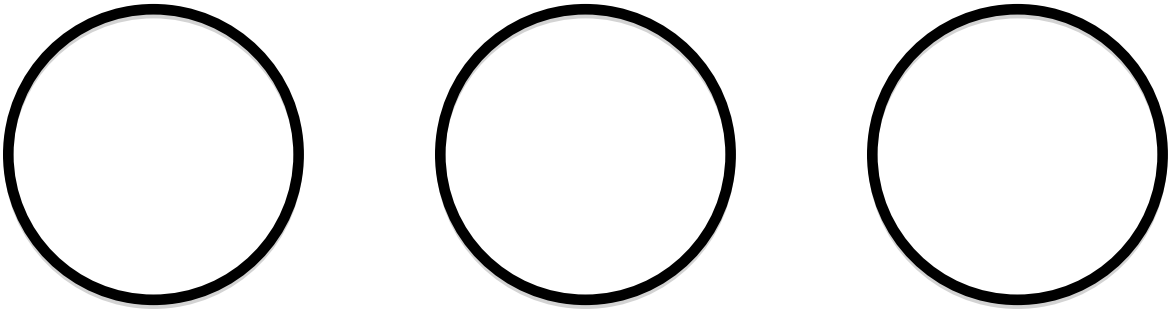
Presentation #1- Main idea- Expression- _____ Picture- Solution- _____	**Presentation #2-** Main idea- Expression- _____ Picture- Solution- _____
Presentation #3- Main idea- Expression- _____ Picture- Solution- _____	**Presentation #4-** Main idea- Expression- _____ Picture- Solution- _____

Name_____Date_____

Lesson 10 Warm-up-

Ms. Forbes wants to award the eight students in class who have turned in their homework every day this quarter. She buys 3 pizzas- one pepperoni, one cheese, and one pineapple and cheese. She would like to share the three pizzas equally between the eight students. How much is a one-eighth share of the 3 pizzas?

PART 1- Solve the word problem using an area model to partition (break apart) each pizza into eighths. How many slices will each person get? What fraction of a whole pizza does this equal?



PART 2- Write the expression(s) that represent this word problem.

_____

PART 3- Solve this expression using a number line model.

PART 4- Partner Share / Team Talk Questions

- Compare and contrast the two different models that you used.
- How is taking $1/8$ of 3 the same as making 3 hops that are each $1/8$ of a unit long?

Name_____Date_____

Lesson 10 Partner Work-

TASK 1- Solve the problems below using either a number line or area model.

1. $^1/_8$ X 4

2. One-third of nine

3. $^1/_5$ X 10

4. One-fourth of two

5. $^1/_2$ X 14

6. One-half of 50

TASK 2-PARTNER TALK

How did the size of the whole number influence the type of model that you used to solve the problem? Explain.

Name_____Date_____

Lesson 10 Homework-

TASK 1- Solve the problems below using either a number line or area model.

1. $^1/_4$ X 4

2. One-ninth of nine

3. $^1/_5$ X 20

4. One-fourth of eight

5. $^1/_2$ X 30

6. One-half of 100

TASK 2-REFLECT
How did the size of the whole number influence the type of model that you used to solve the problem? Explain.

Name_____Date_____

Lesson 11 Warm-up-

A plane goes down in the South Pacific. The four survivors must share the food and water that remains. If there are only 2 gallons of water and 16 pre-packaged meals, what is a one-fourth share of the water and a one-fourth share of the meals?

PART 1- Write expressions for and then solve the two parts of this word problem using number line or area models.

Expression- _____
¼ share of **water** = _____

Expression- _____
¼ share of **meals** = _____

PART 2- Partner Share / Team Talk Questions

- Which model did you use for each part of this question?

- How did the size of the whole number and the size of the fraction's denominator influence your choice of model?

Name_____Date_____

Lesson 11 Group Jigsaw-

Your teacher will assign you one of the three problems below.
For your assigned problem, write the expression and then solve with a number line or area model.

1. The *Molokai High School Football Team has decided to hold a fundraiser. They decide to sell pom-poms to the spectators who attend game. If they sell $\frac{1}{3}$ of the 210 pom-poms that they ordered at their first game of the season, how many pom-poms did they sell, and, how many pom-poms do they still have left?*

_____

2. Kualapu'u School has 24 teachers on its staff. *If one-eighth of the teachers catch the flu and have to stay home, how many substitute teachers need to be called in?*

_____

3. *Mr. Link fills his 5-gallon water jug at the cafeteria each morning. If he spills one-tenth of it as he hurries to class one day, how much water does he spill in the hallway?*

_____

Extra Credit-
Make up your own *whole number multiplied by a fraction* word problem and solve it with a number line or area model.

4.NF.4- Apply & extend previous understanding of multiplication to multiply a fraction by a whole number.

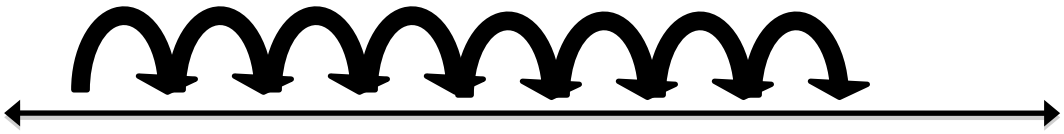
Name_____Date_____

Lesson 11 Exit Pass

Write the matching expression for each word problem in the blank then solve with a number line or area model.

A. ½ X 16 **B. ½ X 8** **C. ½ X 4** **D. ¼ X 8**

1. _____



0 1 2

2. _____

0 1 2

3. _____

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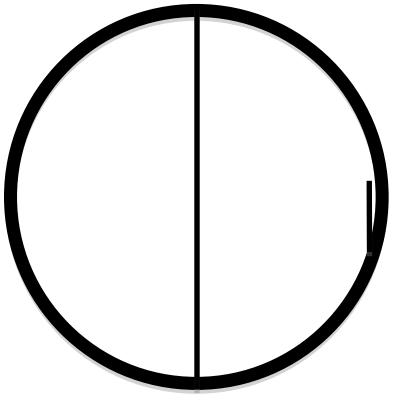

4. _____