Unit 5 - Task #1

Use your paper fraction kit to answer the following questions:

1. How are $\frac{1}{2}, \frac{2}{4}, \frac{4}{8}$ the same? How are they different?

The fractions are the same because they cover the same amount; they are equivalent. They are different because the fractional parts are different.

2. How are $\frac{1}{4}$ and $\frac{2}{8}$ the same? How are they different?

They are the same because they represent the same amount. They are different because they have different fractional parts. Eighths are smaller than fourths.

3. What pattern do you notice about $\frac{2}{2}, \frac{4}{4}$, and $\frac{8}{8}$?

For each fraction, the numerator and denominator are the same. They are all equivalent to 1 whole.

4. What do you notice about the size of the fractional parts when the denominator increases? If we drew marks for sixteenths, will it be smaller or greater than the marks for eighths? Explain.

As the denominator increases, the fractional parts get smaller. Sixteenths would be smaller than eighths because you are dividing the whole into more pieces.

I Can Statements:

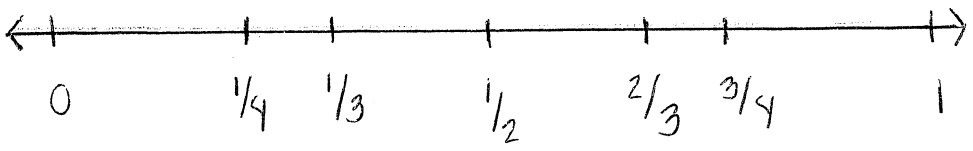
1. I can identify and explain patterns in fractions that represent the same amount.

Unit 5 - Task #2

Part 1:

With your group, place the fraction cards (0, 1, ½, ¼, ¾, 1/3, and 2/3) on the number line.

Draw the number line below.



How did you decide on the location of the fraction?

First, I placed '0' on the left side of the number line and then '1' on the right side. Then, I placed '½' between those numbers. I placed '1/4' halfway between 0 and ½ and '3/4' halfway between ½ and 1. Finally, I know that there are $\frac{3}{3}$ in a whole so I partitioned the number line into thirds and placed '1/3' and '2/3' accordingly.

Do all of your group members agree on the placement of the card? Explain why or why not.

Student answers may vary. Encourage discussion and have students explain why they agree or disagree.

I Can Statements:

1. I can understand benchmarks of 0, ½, and 1.

Unit 5: Task #2

Part 2:

Sort the fractions into three groups: Fractions Close to 0, Fractions Close to $\frac{1}{2}$, Fractions Close to 1.

Fractions Close to 0:	Fractions Close to $\frac{1}{2}$:	Fractions Close to 1:
$\frac{1}{6}$, $\frac{3}{20}$, $\frac{3}{16}$	$\frac{3}{8}$, $\frac{8}{20}$, $\frac{12}{20}$	$\frac{10}{8}$, $\frac{5}{4}$, $\frac{11}{10}$
	$\frac{3}{10}$, $\frac{4}{12}$, $\frac{2}{8}$	$\frac{16}{20}$, $\frac{9}{10}$, $\frac{5}{6}$
	$\frac{4}{9}$, $\frac{5}{14}$	$\frac{3}{4}$, $\frac{10}{12}$, $\frac{13}{16}$

Explain how you're using the numerator and denominator to decide if the fraction is close to zero, one-half, or one whole. You can also use pictures to explain your reasoning.

For fractions close to 0, the numerator is close to 0.

For fractions close to $\frac{1}{2}$, the numerator is close to half of the denominator.

For fractions close to 1, the numerator is close to the denominator or greater than 1 whole.

I Can Statements:

1. I can understand benchmarks of 0, ½, and 1.

Unit 5 - Task #3

Answers will vary.

In small groups, use the index cards to write and place an equivalent fraction to match one of the benchmark fractions displayed on the number line (rope). Use your fractional pieces as a guide to make the equivalent fractions. Write equivalent fraction equations below.

Explain why the fractions are equivalent.

Fractions are equivalent when they represent the same amount on the number line.

After class discussion, copy the class number line below:

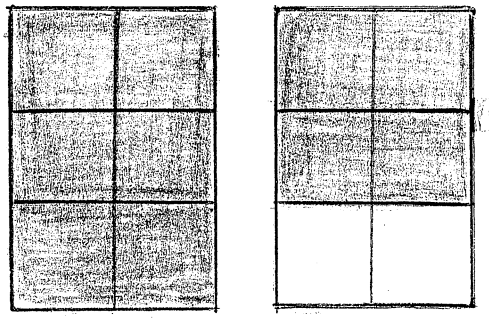
I Can Statements:

1. I can recognize equivalent fractions.
2. I can create equivalent fractions.
3. I can explain why the fractions are equivalent by using a model.

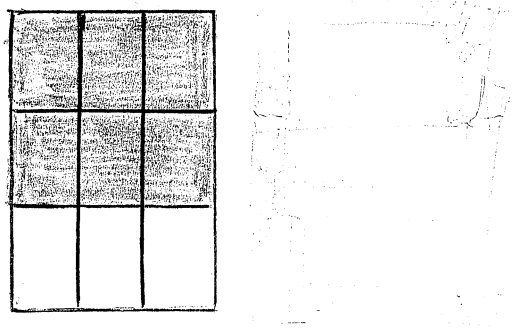
Unit 5 - Task #4

Find the missing numerator or denominator. Explain your solution using a picture.

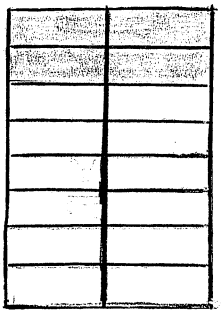
(a) $\frac{5}{3} = \frac{10}{6}$



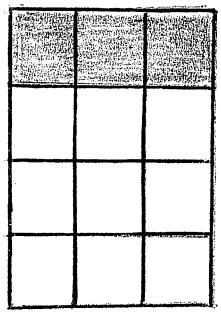
(b) $\frac{2}{3} = \frac{6}{9}$



(c) $\frac{2}{8} = \frac{4}{16}$



(d) $\frac{1}{4} = \frac{3}{12}$

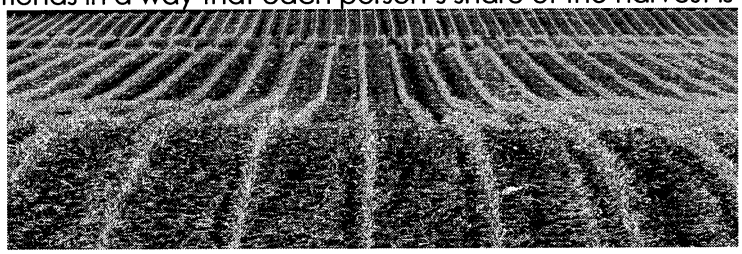


I Can Statements:

1. I can recognize equivalent fractions.
2. I can create equivalent fractions.
3. I can explain why the fractions are equivalent by using a model.

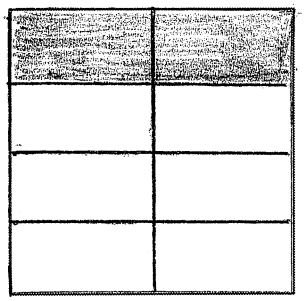
Unit 5 - Task #5

A garden is divided into rows of various vegetables. Corn is planted in $\frac{1}{4}$ of the garden. The garden is going to be shared with family and friends in a way that each person's share of the harvest is one-fourth corn.



1. Show how the garden can now be partitioned vertically to represent two people sharing the corn. What fraction of the newly divided garden is corn? Record an equation.

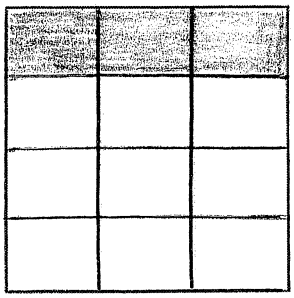
2 People Sharing the Corn:



$\frac{1}{4} = \frac{2}{8}$

2. Show how the garden can now be partitioned vertically to represent three people sharing the corn. What fraction of the newly divided garden is corn? Record an equation.

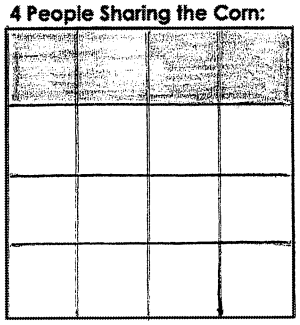
3 People Sharing the Corn:



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

3. Show how the garden can now be partitioned vertically to represent four people sharing the corn. What fraction of the newly divided garden is corn? Record an equation.

4 People Sharing the Corn:



$\frac{1}{4} = \frac{4}{16}$

4. Look at the fractions and the diagrams. What patterns do you notice about the fractions and the diagrams?

As the number of people sharing the corn increases the number of vertical folds increases by the same number.

I Can Statements:

1. I can recognize equivalent fractions.
2. I can create equivalent fractions.
3. I can explain why the fractions are equivalent by using a model.

Unit 5 - Task #6

Jason ran $\frac{4}{12}$ of the way around the track.

Write three equivalent fractions for his distance.

$\frac{4}{12} = \frac{2}{6} = \frac{1}{3}$

Explain your method for finding the equivalent fractions.

I simplified $\frac{4}{12}$ by dividing both the numerator and the denominator by the same number. For example, $\frac{4}{12} \div \frac{2}{2} = \frac{2}{6}$ and then I simplified $\frac{2}{6}$ by dividing it by $\frac{2}{2}$ $\left(\frac{2}{6} \div \frac{2}{2}\right) = \frac{1}{3}$.

Extension:

Julianne used multiplication and division to create two equivalent fractions for $\frac{6}{8}$. What two equivalent fractions could she have created using multiplication and division?

$\frac{6}{8} \times \frac{2}{2} = \frac{12}{16}$

$\frac{6}{8} \div \frac{2}{2} = \frac{3}{4}$

I Can Statements:

1. I can create equivalent fractions.
2. I can explain why the fractions are equivalent by using a model.

Unit 5 - Task #7

Part 1:

1. Work in pairs.

2. Combine your fractional pieces.

3. Use your fractional pieces to write three fractions between 1 and 2 on the index cards. Also, write the fractions below.

4. Explain your method for identifying fractions between 1 and 2.

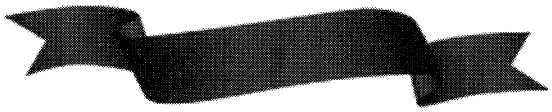
I Can Statements:

1. I can identify fractions greater than one.
2. I can recognize equivalent fractions.

Unit 5 - Task #7

Part 2:

Mary bought $1\frac{2}{3}$ yards of ribbon to make bows. Each bow takes $\frac{1}{3}$ yard of ribbon. How many bows can she make? Explain your reasoning.



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

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

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

Mary can make 5 bows from the ribbon. Since 1 is equivalent to $\frac{3}{3}$ $(\frac{1}{3} + \frac{1}{3} + \frac{1}{3})$, she can make 3 bows from the yard and then 2 more from the $\frac{2}{3}$ $(\frac{1}{3} + \frac{1}{3})$.

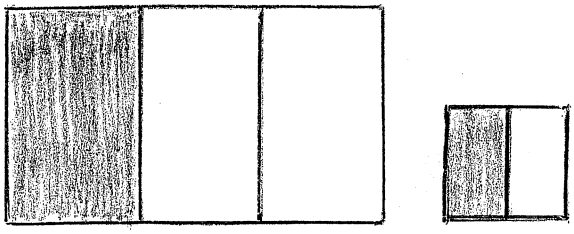
I Can Statements:

1. I can identify fractions greater than one.

Unit 5 - Task #8

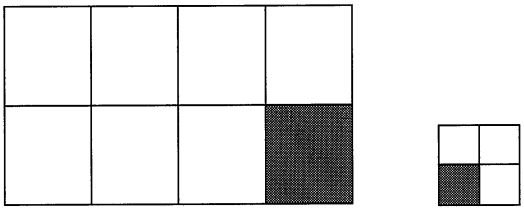
Mark is offered the choice of a third of a pizza or a half of a pizza. Because he is hungry and likes pizza, he chooses the half. His friend, Jane, gets a third of a pizza but ends up with more than Mark. How can that be?

It is possible if the pizzas are not the same size. Perhaps Mark's pizza was a personal size, but Jane's could have been a medium or large size pizza. You cannot compare the fractions because they do not represent the same whole.



Extension:

Kevin drew the picture below. He said, "This shows that $\frac{1}{8}$ is greater than $\frac{1}{4}$."



What is his mistake? Draw a picture to justify your answer.

Kevin's mistake is that he drew 2 different-sized pictures. In order to compare fractions, they need to represent the same whole.

I Can Statements:

1. I can compare fractions by reasoning about their size.

Unit 5 - Task #9

Which fraction in each pair is greater? Use symbols >, =, or < to record the comparison. Explain your reasoning. Try to do it without using drawings or models.

(a.) $\frac{4}{5}$ ⓞ $\frac{4}{9}$ $\frac{4}{5}$ is almost 1 whole and $\frac{4}{9}$ is close to $\frac{1}{2}$.

(b.) $\frac{4}{7}$ ⓞ $\frac{5}{7}$ Since the denominators are the same, you need to compare the numerators; $4 < 5$.

(c.) $\frac{5}{3}$ ⓞ $\frac{5}{8}$ $\frac{5}{3}$ is the same as $1\frac{2}{3}$ so it is more than 1 whole. $\frac{5}{8}$ is closer to $\frac{1}{2}$.

(d.) $\frac{3}{5}$ ⓞ $\frac{3}{7}$ The numerators are the same so you need to compare the denominators. Fifths are larger than sevenths.

(e.) $\frac{5}{8}$ ⓞ $\frac{1}{6}$ $\frac{5}{8}$ is close to $\frac{1}{2}$, but $\frac{1}{6}$ is closer to 0.

(f.) $\frac{3}{8}$ ⓞ $\frac{4}{7}$ $\frac{3}{8}$ is less than $\frac{1}{2}$, but $\frac{4}{7}$ is greater than $\frac{1}{2}$.

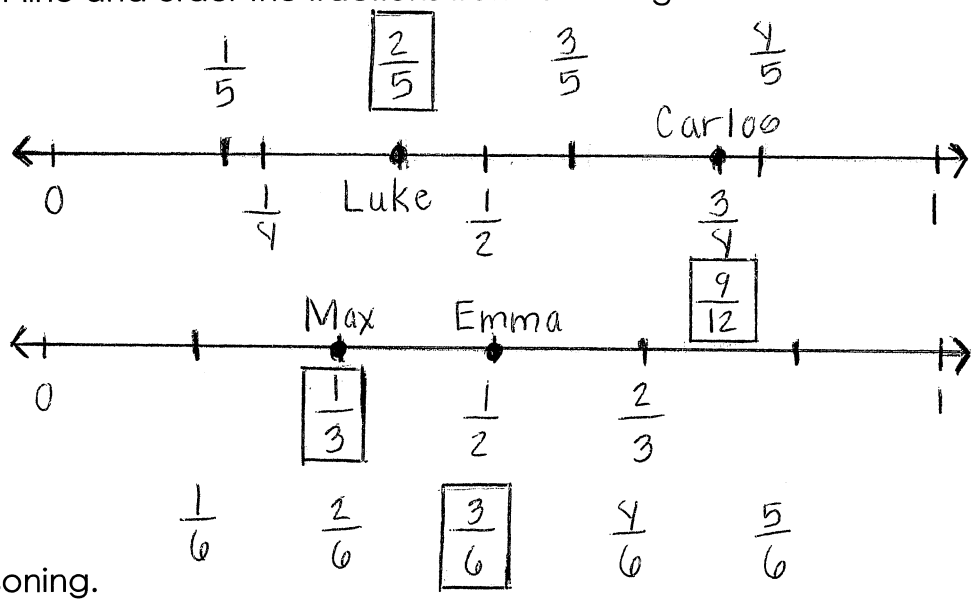
I Can Statements:

1. I can compare fractions.
2. I can record the results of fraction comparison with symbols.

Unit 5 - Task #10

Max lives $\frac{1}{3}$ of a mile from school, Carlos lives $\frac{9}{12}$ of a mile from school, Luke lives $\frac{2}{5}$ and Emma lives $\frac{3}{6}$ of a mile from school.

Create a number line and order the fractions from least to greatest in distance.



Explain your reasoning.

$\frac{1}{3}, \frac{2}{5}, \frac{3}{6}, \frac{9}{12}$

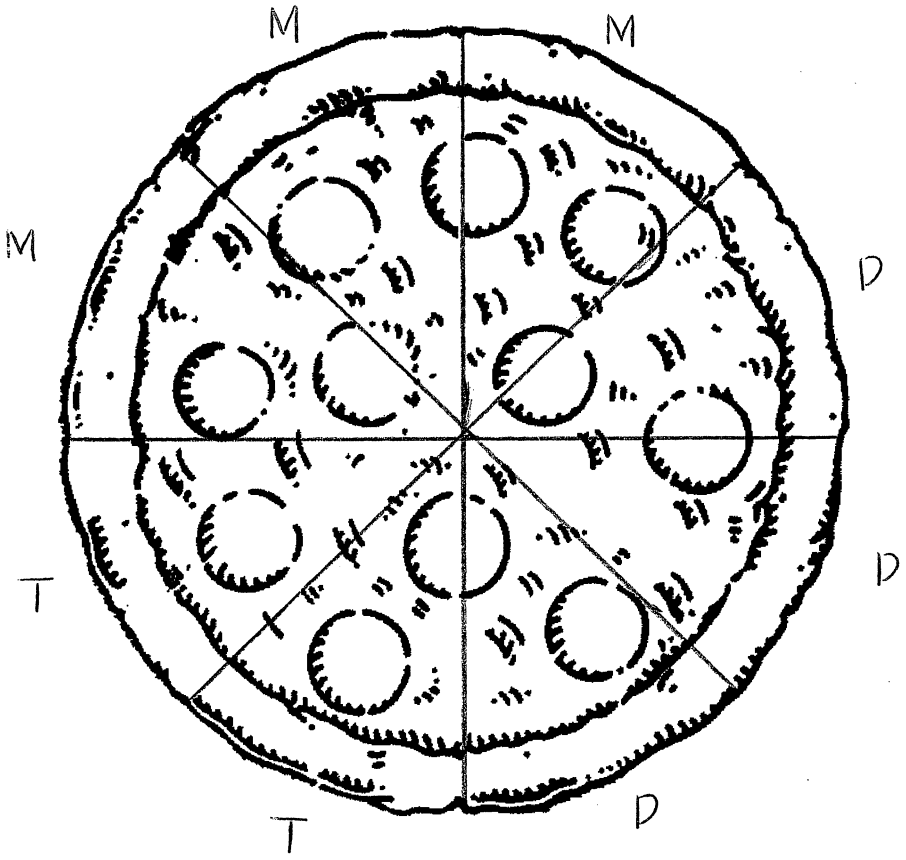
Max lives the closest to the school because he is only $\frac{1}{3}$ mile away. Luke is $\frac{2}{5}$ mile away and Emma is $\frac{3}{6}$ mile away which is equivalent to $\frac{1}{2}$ mile. Carlos lives the furthest from school. He lives $\frac{9}{12}$ mile away which is equivalent to $\frac{3}{4}$ mile. I compared the fractions by partitioning the number lines into thirds, fourths, fifths, and sixths.

I Can Statements:

1. I can compare fractions.
2. I can justify my comparison of fractions by using a model.

Unit 5 - Task #11

It's pizza night at the Smith household and everyone is hungry. Mom cuts herself $\frac{3}{8}$ of the pizza, Dad eats $\frac{2}{8}$ of the pizza and goes back for another $\frac{1}{8}$. How much pizza is left for hungry little Timmy? Use the pizza model to explain your reasoning.



Mom eats $\frac{3}{8}$ of the pizza. Dad eats $\frac{2}{8} + \frac{1}{8}$ so he also eats a total of $\frac{3}{8}$. Therefore, $\frac{2}{8}$ of the pizza is left for Timmy.

I Can Statements:

1. I can solve word problems involving fractions.
2. I can use models to represent the word problem.

Unit 5 - Task #12

Mr. Thomson's class had a garden. The plot was divided into 12 sections. Look at the data table below.

Class Garden Plot	
Crop	**Number of Sections**
Strawberries	1
Hot Peppers	2
Corn	2
Tomatoes	4
Flowers	the rest

$\frac{1}{12}$

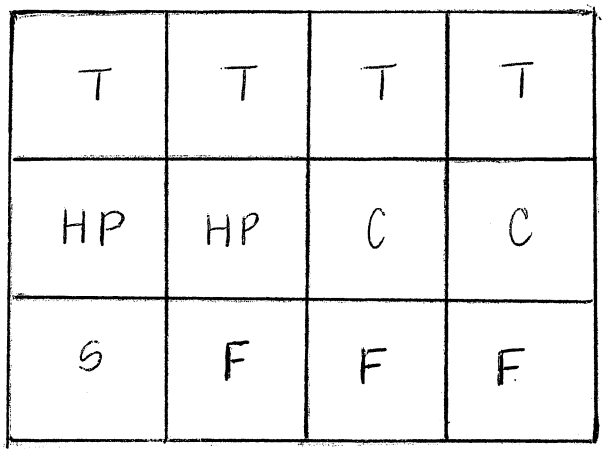
$\frac{2}{12} = \frac{1}{6}$

$\frac{2}{12} = \frac{1}{6}$

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

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

What fraction of the plot represents flowers? Explain your reasoning.



Flowers were planted in $\frac{3}{12}$ of the garden. This is equivalent to $\frac{1}{4}$. When I added the fractions, the number of sections was equal to $\frac{9}{12}$. Therefore, the remaining sections were equal to $\frac{3}{12}$ or $\frac{1}{4}$ of Mr. Thomson's garden.

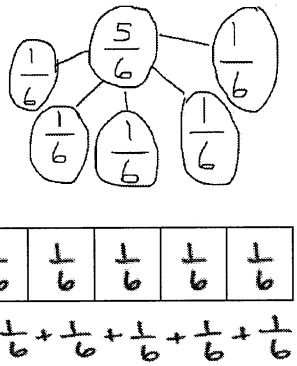
I Can Statements:

1. I can solve word problems involving fractions.
2. I can use models to represent the word problem.

Unit 5 - Task #13

Lina decomposed $\frac{5}{6}$ into $\frac{1}{6}+\frac{1}{6}+\frac{1}{6}+\frac{1}{6}+\frac{1}{6}$.

Lina's Work:



Her friend said that $\frac{5}{6}$ can also be decomposed another way. What is another way to decompose $\frac{5}{6}$? Is there more than one way? Explain your reasoning.

$\frac{5}{6}$ can be decomposed into $\frac{3}{6}+\frac{2}{6}=\frac{5}{6}$. It can also be decomposed into $\frac{4}{6}+\frac{1}{6}=\frac{5}{6}$. Decomposing fractions is like decomposing whole numbers. However, the denominator stays the same.

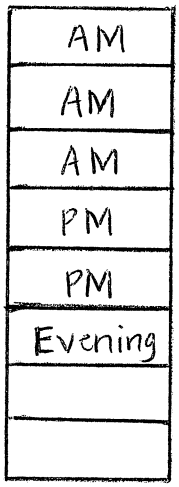
I Can Statements:

1. I can decompose a fraction.
2. I can justify my decomposition of a fraction.

Unit 5 - Task #14

Krista drank $\frac{3}{8}$ of the water in her water bottle in the morning, $\frac{2}{8}$ in the afternoon, and $\frac{1}{8}$ in the evening. Krista drew a picture and used an equation to figure out the fraction of the water that was left at the end of the day.

What picture and equation do you think Krista used to determine the fraction of the water that was left over? Explain your thinking.



AM = $\frac{3}{8}$

PM = $\frac{2}{8}$

Evening = $\frac{1}{8}$

Left over = $\frac{2}{8} = \frac{1}{4}$

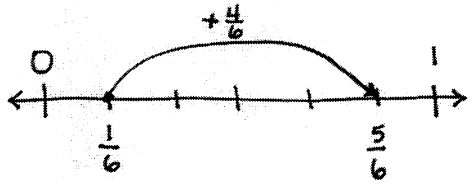
Krista had $\frac{1}{4}$ of the water in her bottle left over. I know this because I added the fractions together to determine that she drank $\frac{6}{8}$ or $\frac{3}{4}$ of the water. She had $\frac{2}{8}$ left which is equivalent to $\frac{1}{4}$.

I Can Statements:

1. I can solve word problems involving fractions.
2. I can use models to represent the word problem.

Unit 5 - Task #15

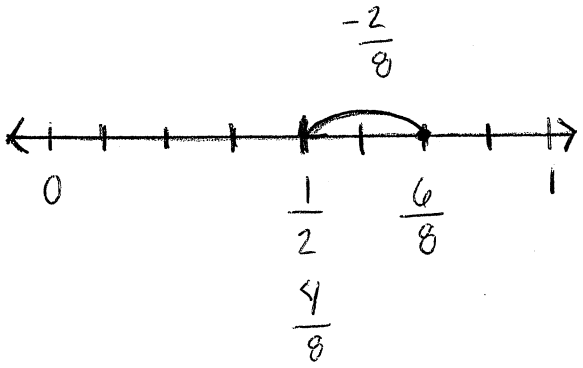
1. Sam created a number line to solve $\frac{1}{6} + \frac{4}{6}$. Look at Sam's number line below. Explain how he used the number line to solve the problem.



Sam started at $\frac{1}{6}$ and made a jump of $\frac{4}{6}$ to get to $\frac{5}{6}$.

2. How can you use a number line to solve a subtraction problem? Try to solve $\frac{6}{8} - \frac{2}{8}$ using a number line.

You can use a number line to subtract fractions by counting backwards or counting up. $\frac{6}{8} - \frac{2}{8} = \frac{4}{8} = \frac{1}{2}$

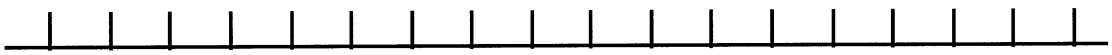


I Can Statements:

1. I can understand addition of fractions.
2. I can understand subtraction of fractions.

Unit 5 - Task #16

Our Classroom Line Plot: Answers will vary.



1. Which data value(s) occurred most often?

2. Which data value(s) occurred least often?

3. How many pencils are longer than $\frac{1}{2}$ of a foot?

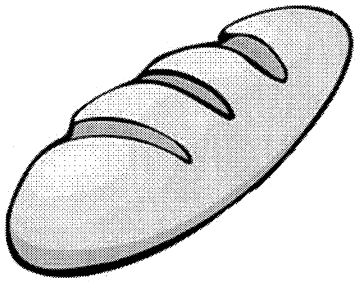
4. What is the difference between the largest value and the least value?

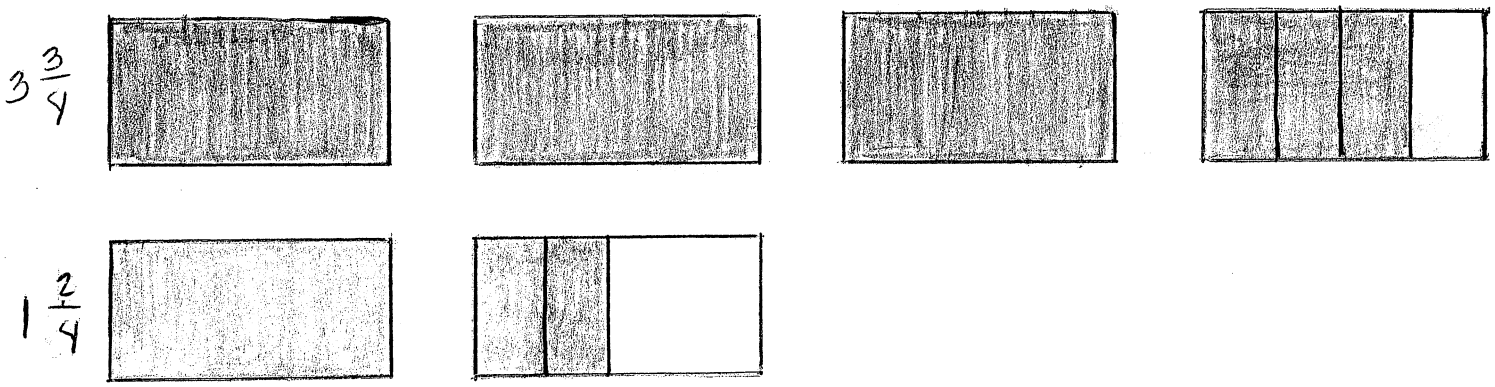
I Can Statements:

1. I can show the measurement data by making a graph.
2. I can solve problems involving fractions by using information from a graph.

Unit 5 - Task #17

Tory is cutting bread loaves into fourths. She needs to wrap up $3\frac{3}{4}$ loaves to take to a potluck supper and $1\frac{2}{4}$ loaves for a bake sale. How many loaves does Tory need to wrap in all for the potluck supper and the bake sale? Draw a picture to represent the problem.





$3\frac{3}{4} + 1\frac{2}{4} = 4\frac{5}{4}$

$4\frac{5}{4} = 4 + \frac{4}{4} + \frac{1}{4} = 5\frac{1}{4}$

Tony needs to wrap up a total of $5\frac{1}{4}$ loaves of bread for the potluck and bake sale.

I Can Statements:

1. I can solve word problems involving fractions.

Unit 5 - Task #18

Maria and Paul both solved $1\frac{3}{4} + 1\frac{1}{4}$. Look at their strategies below.

Maria's Strategy	Paul's Strategy
$1\frac{3}{4} + 1\frac{1}{4}$	$1\frac{3}{4} + 1\frac{1}{4}$
$1\frac{3}{4} + 1\frac{1}{4} = 1 + \frac{3}{4} + 1 + \frac{1}{4}$	$1\frac{3}{4} = 1 + \frac{3}{4}$ which means $\frac{4}{4} + \frac{3}{4}$ is $\frac{7}{4}$
So $1 + 1 + \frac{3}{4} + \frac{1}{4} = 2 + \frac{4}{4}$	$1\frac{1}{4} = 1 + \frac{1}{4}$, which means $\frac{4}{4} + \frac{1}{4}$ is $\frac{5}{4}$
$2 + 1 = 3$	$\frac{7}{4} + \frac{5}{4} = \frac{12}{4}$
	$\frac{12}{4} = 3$

How are their strategies the same? How are they different? Explain why Maria and Paul are both correct.

Their strategies are the same because both Maria and Paul decomposed their mixed numbers. However, they are different because of the way they decomposed the numbers. Maria decomposed her mixed numbers into whole numbers and fractions. Paul decomposed his numbers into equivalent fractions (e.g. $1 = \frac{4}{4}$). When he added the fractions, he got improper fractions. They are both correct because they used each strategy properly to solve the problem.

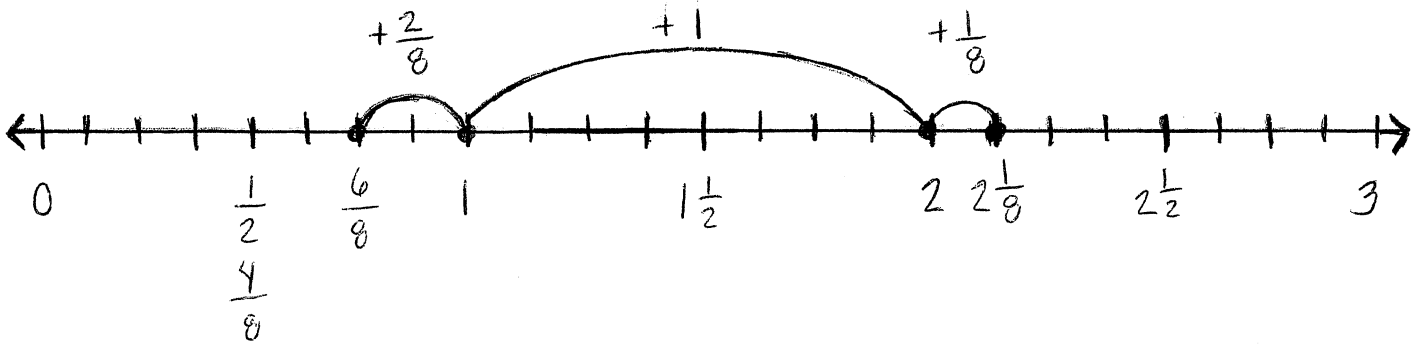
I Can Statements:

1. I can add mixed numbers.

Unit 5 - Task #19

Evan is walking $2\frac{1}{8}$ miles to his aunt's house. He has already walked $\frac{6}{8}$ of a mile. How much farther does he have to go?

Solve in any way you choose. If needed, use your fractional pieces or create a drawing to help solve the problem. Record your solution and explanation.



$\frac{2}{8} + 1 + \frac{1}{8} = 1\frac{3}{8}$

OR

$\frac{2}{8} + \frac{8}{8} + \frac{1}{8} = \frac{11}{8}$

$\frac{11}{8} = 1\frac{3}{8}$

Since Evan has already walked $\frac{6}{8}$ mile to his aunt's house, he needs to walk another $1\frac{3}{8}$ miles.

$\frac{6}{8} + 1\frac{3}{8} = 1\frac{9}{8}$

$1\frac{9}{8} = 2\frac{1}{8}$

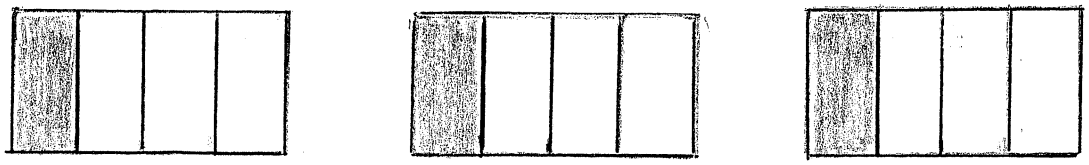
I Can Statements:

1. I can solve word problems involving fractions.

Unit 5 - Task #20

Kalil and Mara were working on their math homework. Kalil had written a description of $\frac{3}{4}$ as $\frac{1}{4} + \frac{1}{4} + \frac{1}{4}$. Mara looked at it and said, "I think you could use multiplication there. Remember how we learned that 2 + 2 + 2 = 3 x 2. Wouldn't it make sense that $\frac{1}{4} + \frac{1}{4} + \frac{1}{4} = 3 \times \frac{1}{4}$?"

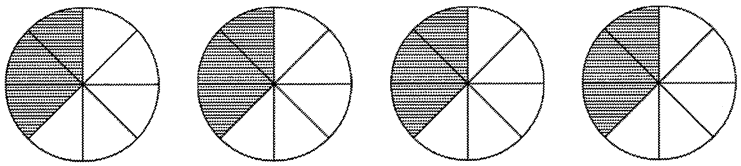
What do you think about Mara's observation? Use drawings and paper strips to explain your thinking.



Mara's observation is correct. Kalil can multiply $3 \times \frac{1}{4}$.

Extension:
What addition and multiplication sentence matches the models below?

1.

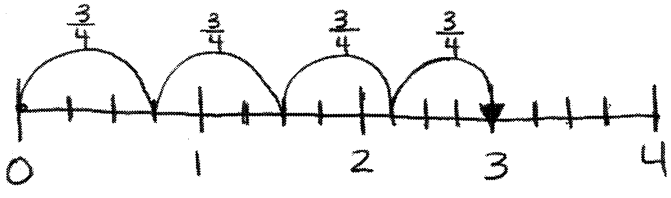


$\frac{3}{8} + \frac{3}{8} + \frac{3}{8} + \frac{3}{8}$ OR $4 \times \frac{3}{8}$

Answer:

$\frac{12}{8} = 1\frac{4}{8} = 1\frac{1}{2}$

2.



$\frac{3}{4} + \frac{3}{4} + \frac{3}{4} + \frac{3}{4}$ OR $4 \times \frac{3}{4}$

Answer:

$\frac{12}{4} = 3$

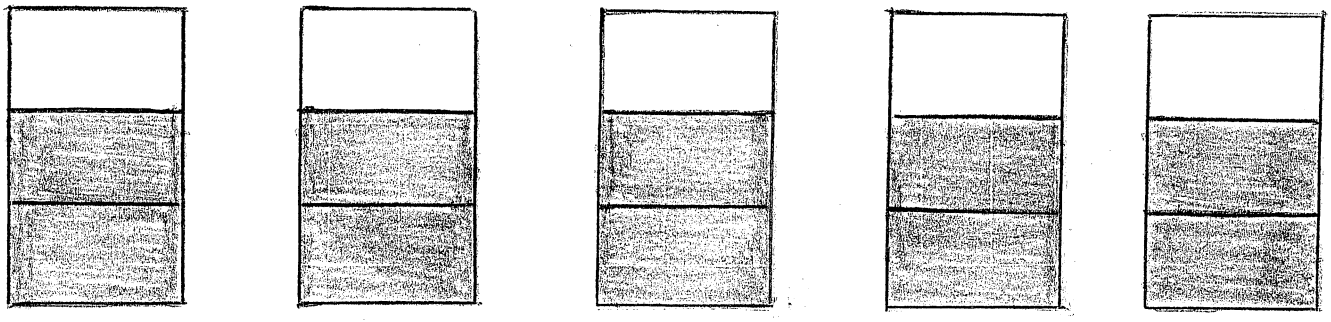
I Can Statements:

1. I can multiply a fraction by a whole number.

Unit 5 - Task #21

Wesley filled 5 glasses with $\frac{2}{3}$ liter of soda in each glass. How much soda did Wesley use?

Solve the problem your way. Explain your method.



$\frac{2}{3} + \frac{2}{3} + \frac{2}{3} + \frac{2}{3} + \frac{2}{3}$ or $5 \times \frac{2}{3} = \frac{10}{3} = 3\frac{1}{3}$

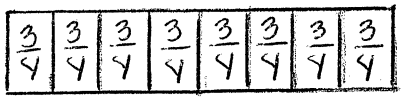
Wesley used a total of $3\frac{1}{3}$ liters of soda.

I Can Statements:

1. I can solve word problems involving fractions.
2. I can use models to represent the word problem.

Unit 5 - Task #22

1. Fill in the missing blanks. Answers for word problems and pictures may vary.

Word Problem	Multiplication Equation	Words	Pictures
A recipe for 1 gallon of fruit punch calls for $\frac{3}{4}$ cup of orange juice. How much orange juice is needed to make 8 gallons of fruit juice?	$8 \times \frac{3}{4}$	8 groups of $\frac{3}{4}$	
	$2 \times \frac{2}{5}$	2 groups of $\frac{2}{5}$	
	$4 \times \frac{5}{6}$	4 groups of $\frac{5}{6}$	
	$5 \times \frac{5}{4}$	5 groups of $\frac{5}{4}$	

2. Try to mentally picture the following problems. Write the product without drawing pictures. Explain a shortcut someone could use to find the answers quickly.

a.) $7 \times \frac{1}{8} = \frac{7}{8}$

b.) $8 \times \frac{2}{11} = \frac{16}{11} = 1\frac{5}{11}$

c.) $7 \times \frac{4}{5} = \frac{28}{5} = 5\frac{3}{5}$

A shortcut would be to multiply the whole number by the numerator and then simplify the fraction.

I Can Statements:

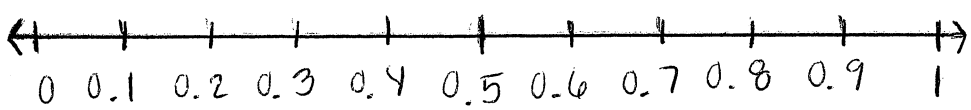
1. I can multiply a fraction by a whole number.

Unit 6 - Task #1

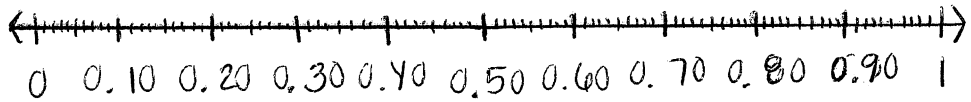
1) Using the 2 sets of decimal fraction cards, create a model for each fraction using a tenths or hundredths square. (see next 2 pages)

2) Create 2 number lines using the decimal fraction cards and the models you created.

tenths



hundredths



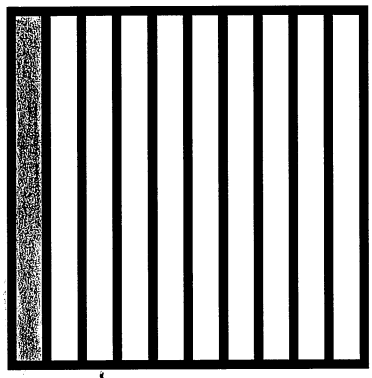
3) What patterns did you see as you completed your number line?

I notice that 0.1 and 0.10 are at the same place on both the number lines. Therefore, they have the same value. This is true for all of the other sets of numbers.

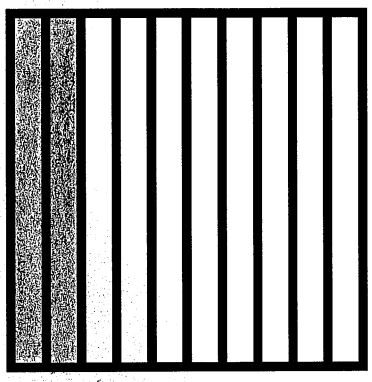
I Can Statements:

1. I can identify patterns in fractions with denominators 10 or 100.

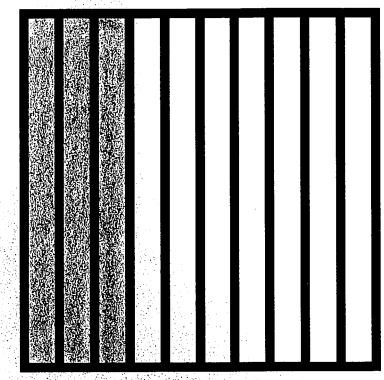
Tenths Grid



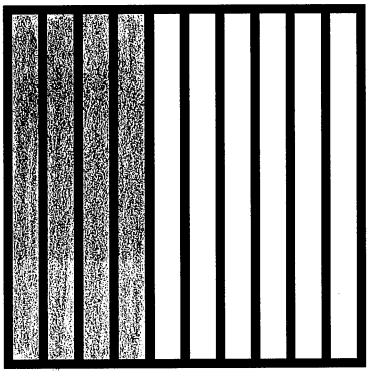
$\frac{1}{10}$ 0.1



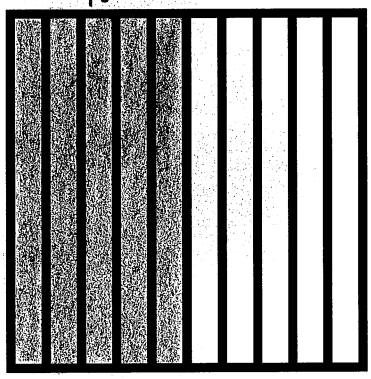
$\frac{2}{10}$ 0.2



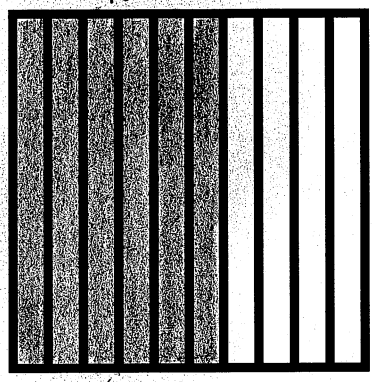
$\frac{3}{10}$ 0.3



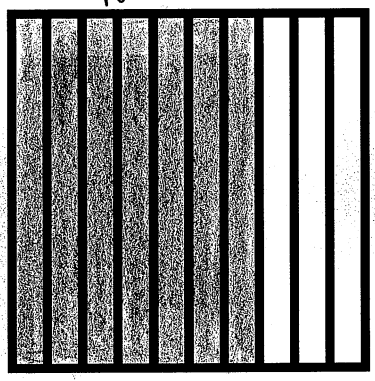
$\frac{4}{10}$ 0.4



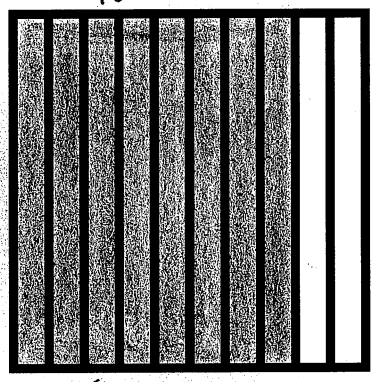
$\frac{5}{10}$ 0.5



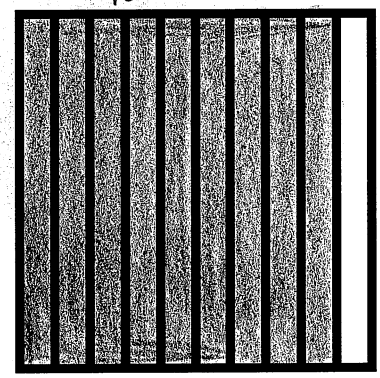
$\frac{6}{10}$ 0.6



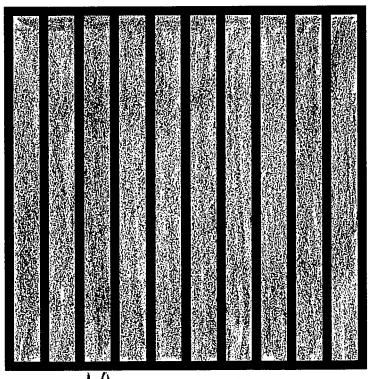
$\frac{7}{10}$ 0.7



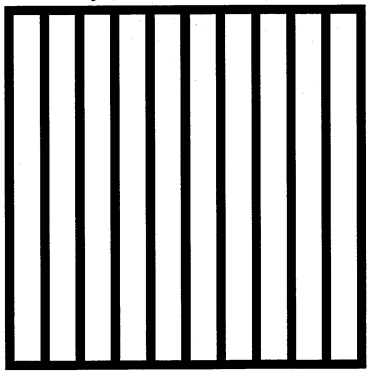
$\frac{8}{10}$ 0.8

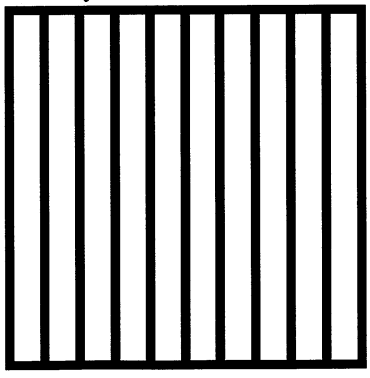


$\frac{9}{10}$ 0.9

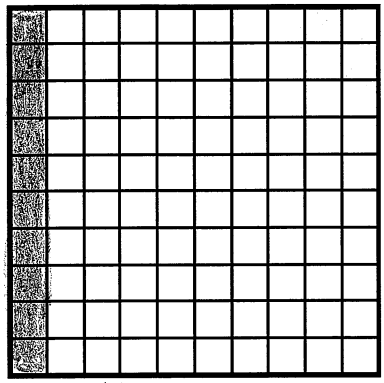


$\frac{10}{10}$ 1.0

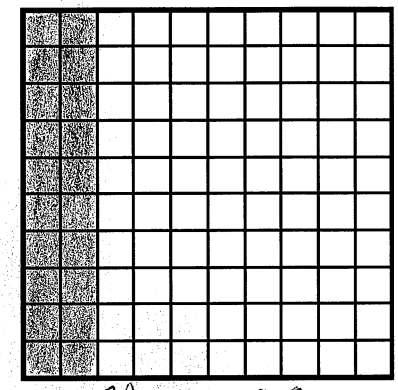




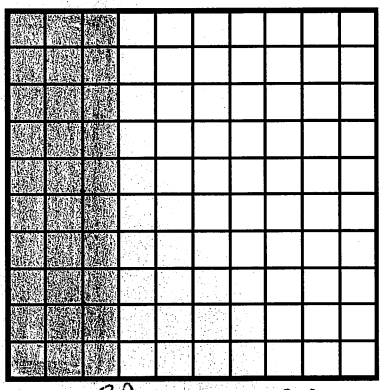
Hundredths Grid



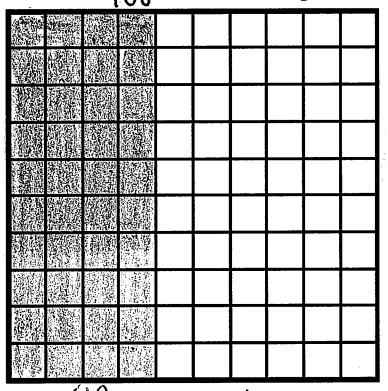
$\frac{10}{100}$ 0.10



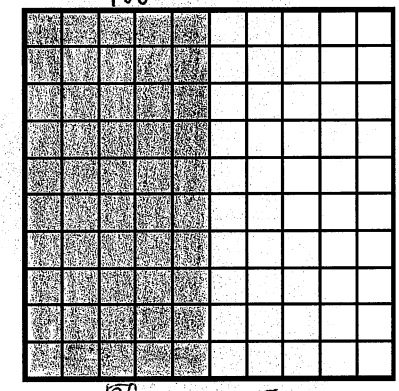
$\frac{20}{100}$ 0.20



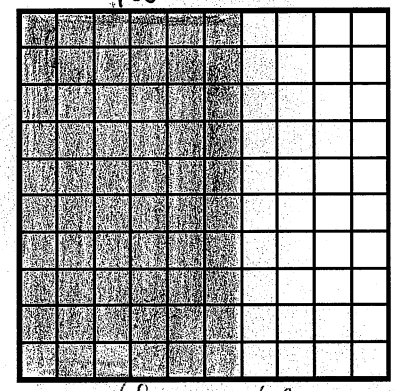
$\frac{30}{100}$ 0.30



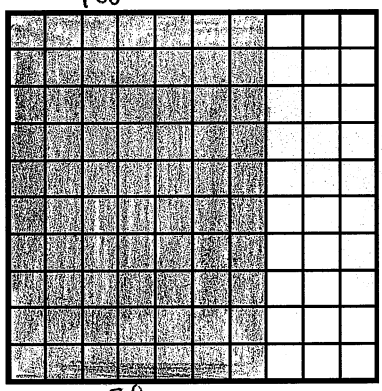
$\frac{40}{100}$ 0.40



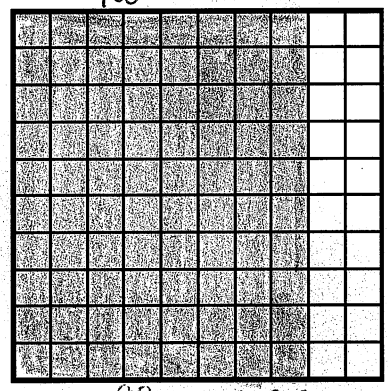
$\frac{50}{100}$ 0.50



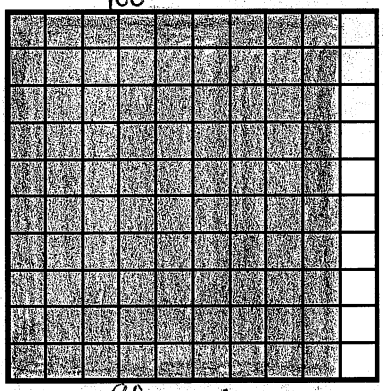
$\frac{60}{100}$ 0.60



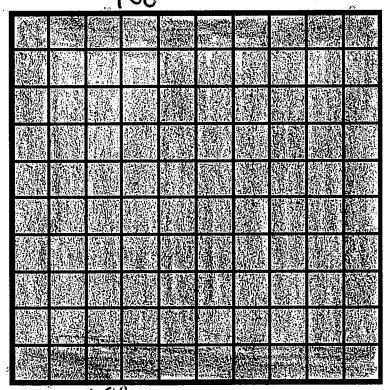
$\frac{70}{100}$ 0.70



$\frac{80}{100}$ 0.80



$\frac{90}{100}$ 0.90



$\frac{100}{100}$ 1.00