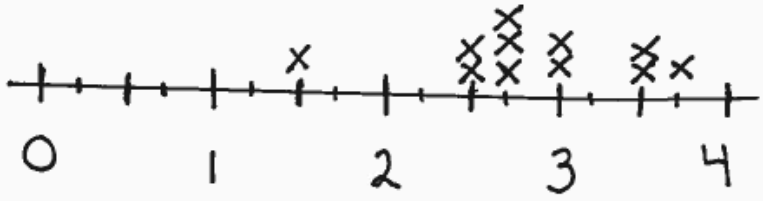
Name _____ Date _____

1. Draw a line plot for the following data measured in inches:

$1\frac{1}{2}, 2\frac{3}{4}, 3, 2\frac{3}{4}, 2\frac{1}{2}, 2\frac{3}{4}, 3\frac{3}{4}, 3, 3\frac{1}{2}, 2\frac{1}{2}, 3\frac{1}{2}$

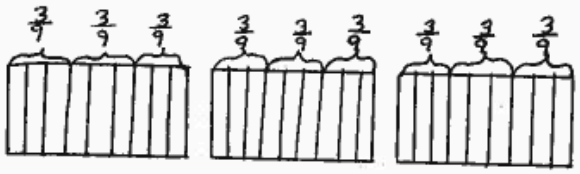


2. Explain how you decided to divide your wholes into fractional parts and how you decided where your number scale should begin and end.

Name _____ Date _____

1. Draw a picture that shows the division expression. Then, write an equation and solve.

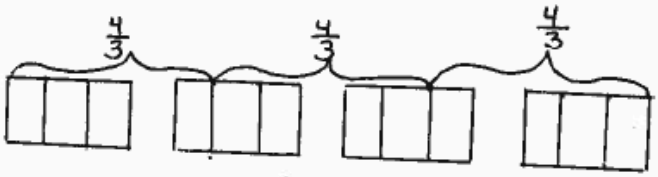
a. $3 \div 9$



$\frac{3}{1} \div \frac{9}{1} = \frac{3}{1} \times \frac{1}{9} = \frac{3}{9}$

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

b. $4 \div 3$



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

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

2. Fill in the blanks to make true number sentences.

a. $21 \div 8 = \frac{21}{8}$

b. $\frac{7}{4} = 7 \div 4$

c. $4 \div 9 = \frac{4}{9}$

d. $1\frac{2}{7} = 9 \div 7$

$1\frac{2}{7} = \frac{9}{7}$

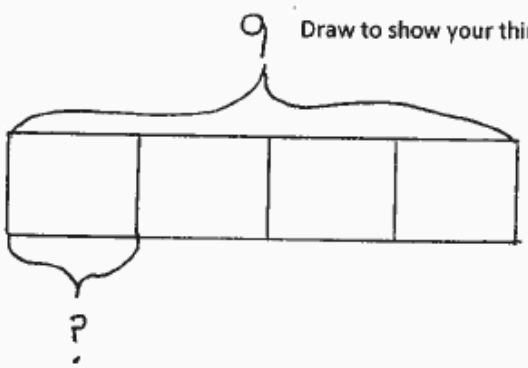
Name _____ Date _____

A baker made 9 cupcakes, each a different type. Four people want to share them equally. How many cupcakes will each person get?

Fill in the chart to show how to solve the problem.

Division Expression	Unit Forms	Fractions and Mixed numbers	Standard Algorithm
$9 \div 4$	36 fourths $\div 4 =$ 9 fourths	$\frac{9}{4}$	$4\overline{)9}$ $2\frac{1}{4}$, -8, 1 $4 \times 2\frac{1}{4} =$ $2\frac{1}{4}+2\frac{1}{4}+2\frac{1}{4}+2\frac{1}{4} =$ $8\frac{4}{4}=9$

Draw to show your thinking:

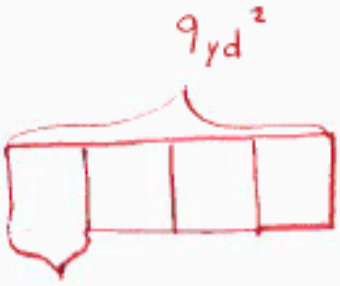


$$9 \div 4 = \frac{9}{1} \div \frac{4}{1} = \frac{9}{1} \times \frac{1}{4} = \frac{9}{4}$$

$$\frac{9}{4} = 2\frac{1}{4}$$

Name _____ Date _____

Matthew and his 3 siblings are weeding a flower bed with an area of 9 square yards. If they share the job equally, how many square yards of the flower bed will each child need to weed? Use a tape diagram to show your thinking.



4 units = 9 yds

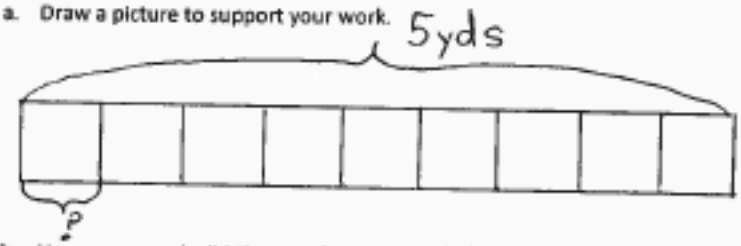
1 unit = 9 ÷ 4 =

$\frac{9}{4} = 2\frac{1}{4}$ yd each

Name _____ Date _____

A grasshopper covered a distance of 5 yards in 9 equal hops. How many yards did the grasshopper travel on each hop?

a. Draw a picture to support your work.



9 units = 5 yds

1 unit = $5 \div 9 = \frac{5}{9}$ yd

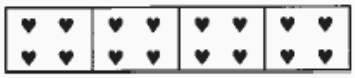
b. How many yards did the grasshopper travel after hopping twice?

$\frac{5}{9} + \frac{5}{9} = \frac{10}{9} = 1\frac{1}{9}$ yd in 2 days

$$\begin{array}{r} 1\frac{1}{9} \\ 9\overline{)10} \\ -9 \\ \hline 1 \end{array}$$

Name _____ Date _____

1. Find the value of each of the following.

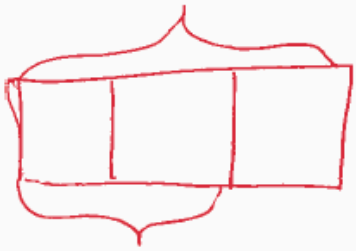


a. $\frac{1}{4}$ of 16 = 4

b. $\frac{3}{4}$ of 16 = 12

2. Out of 18 cookies, $\frac{2}{3}$ are chocolate chip. How many of the cookies are chocolate chip?

18 cookies



3 units = 18

1 unit = $\frac{18}{3}$ = 6

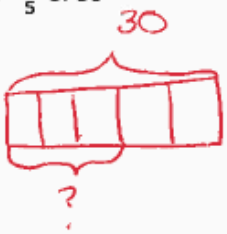
2 units = 12

12 cookies are Chocolate chip

Name _____ Date _____

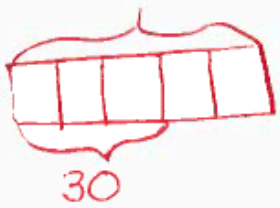
Solve using a tape diagram.

a. $\frac{3}{5}$ of 30



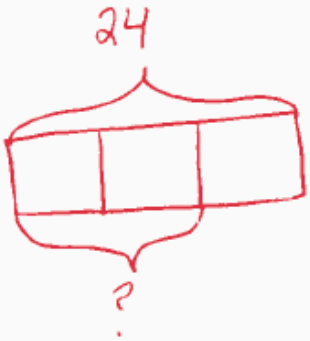
5 units = 30
1 unit = $\frac{30}{5}$ = 6
3 × 6 = 18

b. $\frac{3}{5}$ of a number is 30. What's the number?



3 units = 30
1 unit = $\frac{30}{3}$ = 10
5 × 10 = 50

c. Mrs. Johnson baked 2 dozen cookies. Two-thirds of the cookies were oatmeal. How many oatmeal cookies did Mrs. Johnson bake?



3 units = 24
1 unit = $\frac{24}{3}$ = 8
2 units = 16 cookies

Name _____ Date _____

Solve each problem in two different ways as modeled in the example.

Example: $\frac{2}{3} \times 6 = \frac{2 \times 6}{3} = \frac{12}{3} = 4$

$\frac{2}{3} \times 6 = \frac{2 \times 6^{2}}{3_{1}} = 4$

a. $\frac{2}{3} \times 15 =$

$\frac{2 \times 15}{3} = \frac{{}^{1}30}{3_{1}} = \frac{10}{1} = 10$

$\frac{2}{3} \times 15 =$

$\frac{2 \times 15^{5}}{3_{1}} = \frac{10}{1} = 10$

b. $\frac{5}{4} \times 12 =$

$\frac{5 \times 12}{4} = \frac{60}{4} = 15$

$\frac{5 \times 12^{3}}{4_{1}} = \frac{15}{1} = 15$

$$\begin{array}{r} 15 \\ 4\overline{)60} \\ -4\downarrow \\ \hline 20 \end{array}$$

Name _____ Date _____

1. Express 36 minutes as a fraction of an hour: 36 minutes = $\frac{3}{5}$ hour

$\frac{36}{60} \div \frac{6}{6} = \frac{6}{10} = \frac{3}{5}$ or $\frac{36}{60} \div \frac{12}{12} = \frac{3}{5}$

2. Solve.

a. $\frac{2}{3}$ feet = 8 inches b. $\frac{2}{5}$ m = 40 cm c. $\frac{5}{6}$ year = 10 months

$\frac{2}{3}$ ft $= \frac{2}{3} \times 1$ ft
$= \frac{2}{3} \times 12$ inches
$= \frac{2}{3} \times \frac{12}{1} = \frac{24}{3} = 8$

$\frac{2}{5}$ m $= \frac{2}{5} \times 1$ m
$= \frac{2}{5} \times 100$ cm
$= \frac{200}{5}$ cm
$= 40$ cm

$\frac{5}{6}$ yr $= \frac{5}{6} \times 1$ yr
$= \frac{5}{6} \times 12$ months
$= \frac{60}{6}$ months
$= 10$ months

Name _____ Date _____

1. Rewrite these expressions using words.

a. $\frac{3}{4} \times \left(2\frac{2}{5} - \frac{5}{6}\right)$

Answers will vary

Example:

$\frac{3}{4}$ times the difference between $2\frac{2}{5}$ and $\frac{5}{6}$

b. $2\frac{1}{4} + \frac{8}{3}$

The sum of $2\frac{1}{4}$ and $\frac{8}{3}$

2. Write an expression, and then solve.

Three less than one-fourth of the product of eight thirds and nine

$\frac{1}{4}$ of $(\frac{8}{3} \times 9) - 3 =$

$\frac{1}{4} \times (\frac{8}{3} \times \frac{9}{1}) - 3 =$

$\frac{1}{4} \times 24 - 3 =$

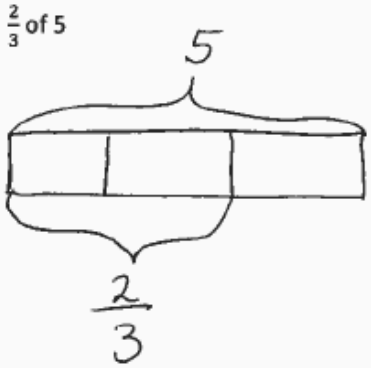
$\frac{1}{4} \times \frac{24}{1} - 3 =$

$6 - 3 = 3$

Name _____ Date _____

Use a tape diagram to solve.

$\frac{2}{3}$ of 5



3 units = 5

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

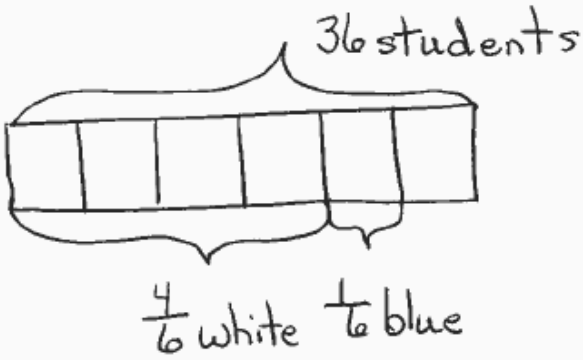
2 units = $1\frac{2}{3} + 1\frac{2}{3} = 2\frac{4}{3} = 3\frac{1}{3}$

Name _____ Date _____

In a classroom, $\frac{1}{6}$ of the students are wearing blue shirts, and $\frac{2}{3}$ are wearing white shirts. There are 36 students in the class. How many students are wearing a shirt other than blue or white?

$\frac{2}{3} \times \frac{2}{2} = \frac{4}{6}$ white

$\frac{1}{6}$ blue



6 units = 36 students

1 unit = $\frac{36}{6}$ = 6 students

4 units x 6 students = 24 students wearing white

1 unit x 6 students = 6 students wearing blue

6 students wearing another color shirt

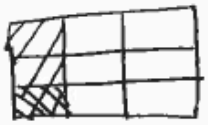
24 + 6 = 30

36 - 30 = 6

Name _____ Date _____

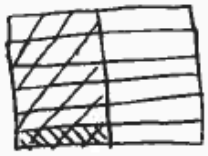
1. Solve. Draw a rectangular fraction model, and write a number sentence to show your thinking.

$\frac{1}{3} \times \frac{1}{3} = \frac{1}{9}$



$\frac{1}{3}$ of $\frac{1}{3} = \frac{1}{9}$

2. Ms. Sheppard cuts $\frac{1}{2}$ of a piece of construction paper. She uses $\frac{1}{6}$ of the piece to make a flower. What fraction of the sheet of paper does she use to make the flower?



$\frac{1}{2}$ of paper is flower

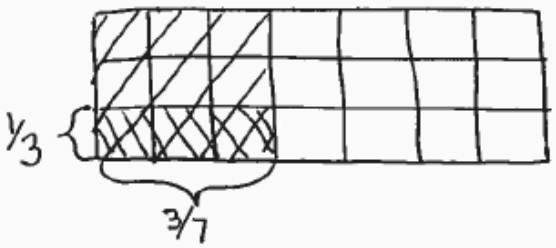
$\frac{1}{6} \times \frac{1}{2} = \frac{1}{12}$

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

Name _____ Date _____

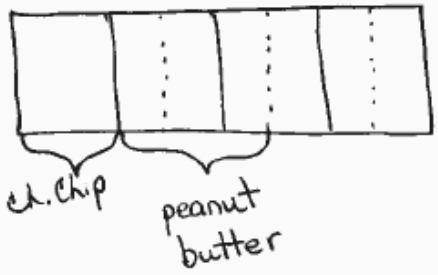
1. Solve. Draw a rectangular fraction model to explain your thinking. Then, write a number sentence.

$\frac{1}{3}$ of $\frac{3}{7}$ =



$\frac{1}{3} \times \frac{3}{7} = \frac{3}{21} = \frac{1}{7}$

2. In a cookie jar, $\frac{1}{4}$ of the cookies are chocolate chip, and $\frac{1}{2}$ of the rest are peanut butter. What fraction of all the cookies is peanut butter?



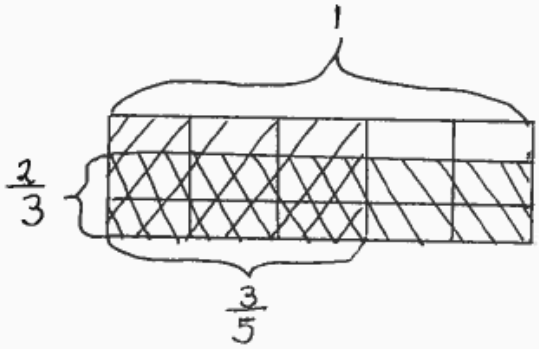
$\frac{3}{8}$ of all cookies are peanut butter

$\frac{1}{2}$ of $\frac{3}{4} = \frac{3}{8}$

Name _____ Date _____

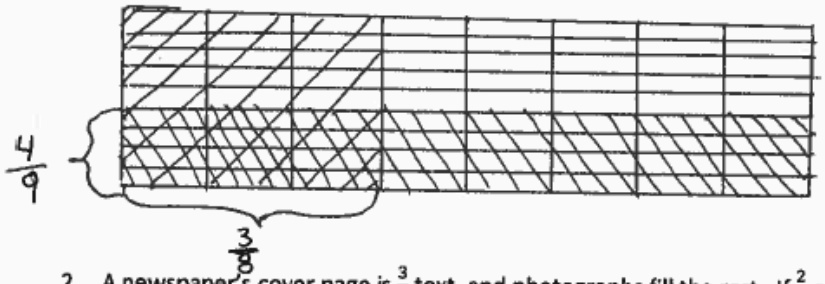
1. Solve. Draw a rectangular fraction model to explain your thinking. Then, write a multiplication sentence.

a. $\frac{2}{3}$ of $\frac{3}{5}$ =



$\frac{2}{3} \times \frac{3}{5} = \frac{2}{5}$

b. $\frac{4}{9} \times \frac{3}{8}$ =



$\frac{4}{9} \times \frac{3}{8} = \frac{1}{6}$

2. A newspaper's cover page is $\frac{3}{8}$ text, and photographs fill the rest. If $\frac{2}{5}$ of the text is an article about endangered species, what fraction of the cover page is the article about endangered species?

$\frac{2}{5}$ of $\frac{3}{8}$ =

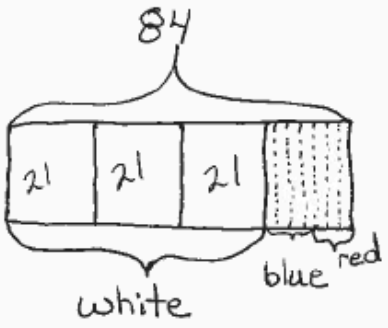
$\frac{2}{5} \times \frac{3}{8} = \frac{6}{40}$

$\frac{6}{40} \left(\frac{\div 2}{\div 2}\right) = \frac{3}{20}$ of the cover page is about endangered species

Name _____ Date _____

Solve and show your thinking with a tape diagram.

Three-quarters of the boats in the marina are white, $\frac{4}{7}$ of the remaining boats are blue, and the rest are red. If there are 9 red boats, how many boats are in the marina?



3 sections = 9 red boats

1 section = 3

4 sections = 4 x 3 = 12 blue boats

9 + 12 = 21 sections in 1/3 total

21 x 4 = 84 boats total

Name _____ Date _____

1. Multiply and model. Rewrite the expression as a number sentence with decimal factors.

$\frac{1}{10} \times 1.2$

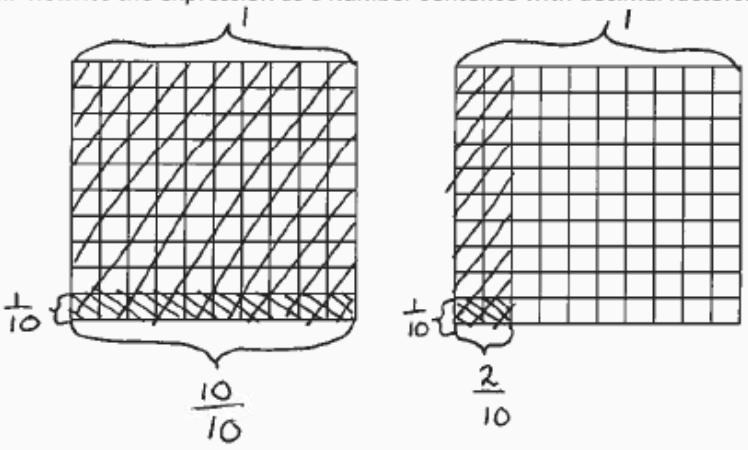
$= \frac{1}{10} \times \frac{12}{10}$

$= \frac{12}{100}$

$.1 \times 1.2$

$= .12$

$1.2 \times .1 = .12$



2. Multiply.

a. $1.5 \times 3 = 4.5$

$1.5 \times 3 = 4.5$

b. $1.5 \times 0.3 = .45$

$1.5 \times .3 = .45$

c. $0.15 \times 0.3 = .045$

$.15 \times .3 = .045$

Name _____ Date _____

Multiply. Do at least one problem using unit form and at least one problem using fraction form.

a. $3.2 \times 1.4 = 4.48$

$\frac{32}{10} \times \frac{14}{10} =$

$\frac{32 \times 14}{100} =$

$\frac{448}{100} = 4.48$

or

32 tenths
× 14 tenths
128
+320
448 hundredths

b. $1.6 \times 0.7 = 1.12$

$\frac{16}{10} \times \frac{7}{10} =$

$\frac{16 \times 7}{100} =$

$\frac{112}{100} = 1.12$

or

416 tenths
× 7 tenths
112 hundredths

c. $2.02 \times 4.2 = 8.484$

$\frac{202}{100} \times \frac{42}{10} =$

$\frac{202 \times 42}{1000} =$

$\frac{8484}{1000} =$

8.484

202 hundredths
× 42 tenths
404
+8080
8484 thousandths

d. $2.2 \times 0.42 = .924$

$= \frac{22}{10} \times \frac{42}{100}$

$= \frac{22 \times 42}{1000}$

$= \frac{924}{1000}$

$= .924$

or

22 tenths
× 42 hundredths
44
+880
924 thousandths

Name _____ Date _____

Convert. Express your answer as a mixed number, if possible.

a. 5 in = $\frac{5}{12}$ ft

$5\text{in} = 5 \times 1\text{in}$

$= 5 \times \frac{1}{12}\text{ ft}$

$= \frac{5}{12}\text{ ft}$

b. 13 in = $1\frac{1}{12}$ ft

$13\text{ in} = 13 \times 1\text{in}$

$= 13 \times \frac{1}{12}\text{ ft}$

$= \frac{13}{12}\text{ ft}$

$= 1\frac{1}{12}\text{ ft}$

c. 9 oz = $\frac{9}{16}$ lb

$9\text{oz} = 9 \times 1\text{oz}$

$= 9 \times \frac{1}{16}\text{ lb}$

$= \frac{9}{16}\text{ lb}$

d. 18 oz = $1\frac{1}{8}$ lb

$18\text{oz} = 18 \times 1\text{oz}$

$= 18 \times \frac{1}{16}\text{ lb}$

$= \frac{18}{16}\text{ lb}$

$= 1\frac{2}{16} = 1\frac{1}{8}\text{ lb}$

Name _____ Date _____

Convert. Express your answer as a mixed number.

a. $2\frac{1}{6}$ ft = 26 in

$2\frac{1}{6}$ ft = $2\frac{1}{6} \times 1$ ft

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

$= \frac{13}{\cancel{6}_1} \times \frac{\cancel{12}^2}{1}$ in

$= 26$ in

b. $3\frac{3}{4}$ ft = $1\frac{1}{4}$ yd

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

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

$= \frac{\cancel{15}^5}{4} \times \frac{1}{\cancel{3}_1}$ yd

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

c. $2\frac{1}{2}$ c = $1\frac{1}{4}$ pt

$2\frac{1}{2}$ c = $2\frac{1}{2} \times 1$ c

$= 2\frac{1}{2} \times \frac{1}{2}$ pt

$= \frac{5}{2} \times \frac{1}{2}$ pt

$= \frac{5}{4}$ pt

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

d. $3\frac{2}{3}$ years = 44 months

$3\frac{2}{3}$ yrs = $3\frac{2}{3} \times 1$ yr

$= 3\frac{2}{3} \times 12$ months

$= \frac{11}{\cancel{3}_1} \times \frac{\cancel{12}^4}{1}$ months

$= \frac{44}{1}$ months

$= 44$ months

Name _____ Date _____

1. Fill in the blanks to make the equation true.

$\frac{9}{4} \times 1 = \frac{9}{4} \times \frac{5}{5} = \frac{45}{20}$

2. Express the fractions as equivalent decimals.

a. $\frac{1}{4} = \frac{1}{4} \times \frac{25}{25} = \frac{25}{100} = .25$

b. $\frac{2}{5} = \frac{2}{5} \times \frac{20}{20} = \frac{40}{100} = .40$

c. $\frac{3}{25} = \frac{3}{25} \times \frac{4}{4} = \frac{12}{100} = .12$

d. $\frac{5}{20} = \frac{5}{20} \times \frac{5}{5} = \frac{25}{100} = .25$

Name _____ Date _____

Fill in the blank to make the number sentences true. Explain how you know.

a. $\frac{\quad}{3} \times 11 > 11$

(any number greater than 3)

b. $5 \times \frac{\quad}{8} < 5$

(any number Less than 8)

c. $6 \times \frac{2}{\quad} = 6$

2

Name _____ Date _____

1. Fill in the blank using one of the following scaling factors to make each number sentence true.

1.009	1.00	0.898

a. $3.06 \times \underline{0.898} < 3.06$ b. $5.2 \times \underline{1.00} = 5.2$ c. $\underline{1.009} \times 0.89 > 0.89$

2. Will the product of 22.65×0.999 be greater than or less than 22.65? Without calculating, explain how you know.

The product of 22.65 x 0.999 will be slightly Less than 22.65 because the scaling factor is a little less than 1.

Name _____ Date _____

1. An artist builds a sculpture out of metal and wood that weighs 14.9 kilograms. $\frac{3}{4}$ of this weight is metal, and the rest is wood. How much does the wood part of the sculpture weigh?

$\frac{3}{4}$ of 14.9 =

.75 x 14.9 = 11.175 is metal

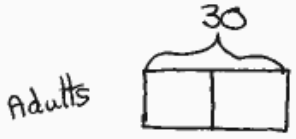
$$\begin{array}{r} .75 \\ 4\overline{)3.00} \\ -28\downarrow \\ \hline 20 \\ -20 \\ \hline \end{array}$$

$$\begin{array}{r} {}^{2}14.9 \\ \times .7\not{5} \\ \hline 745 \\ +10430 \\ \hline 11.175 \end{array}$$

$$\begin{array}{r} 14.900 \\ -11.175 \\ \hline 3.725 \end{array}$$

3.725 kg are wood

2. On a boat tour, there are half as many children as there are adults. There are 30 people on the tour. How many children are there?



3 units = 30

1 unit = $\frac{30}{3}$ = 10

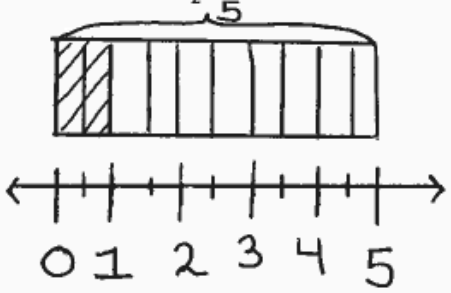
children 

There are 10 children on the tour.

Name _____ Date _____

1. Draw a tape diagram and a number line to solve. Fill in the blanks that follow.

a. $5 \div \frac{1}{2} =$ 10

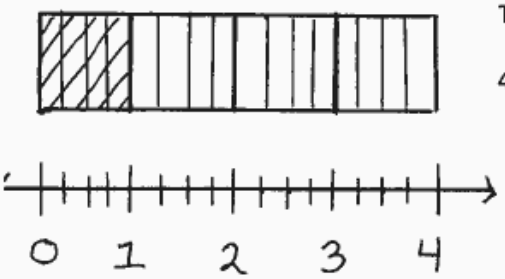


There are 2 halves in 1 whole.

There are 10 halves in 5 wholes.

5 is $\frac{1}{2}$ of what number? 10

b. $4 \div \frac{1}{4} =$ 16



There are 4 fourths in 1 whole.

There are 16 fourths in 4 wholes.

4 is $\frac{1}{4}$ of what number? 16

2. Ms. Leverenz is doing an art project with her class. She has a 3 foot piece of ribbon. If she gives each student an eighth of a foot of ribbon, will she have enough for her class of 22 students?

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

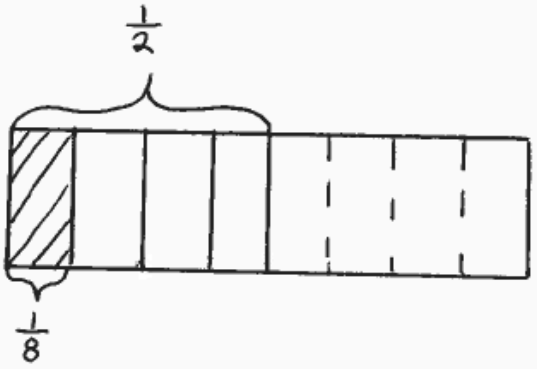
$\frac{3}{1} \times \frac{8}{1} = \frac{24}{1} = 24$

Yes, she will have enough for 22 students.

Name _____ Date _____

1. Solve. Support at least one of your answers with a model or tape diagram.

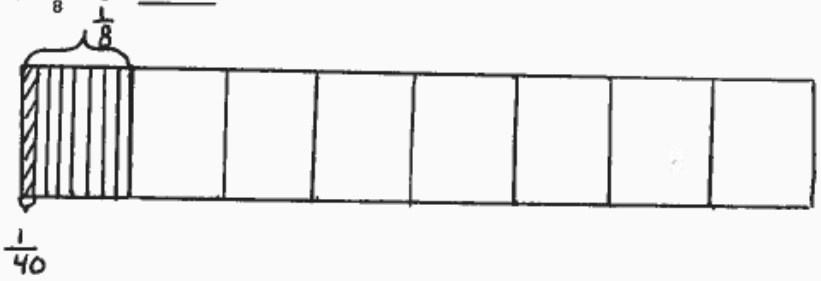
a. $\frac{1}{2} \div 4 =$ _____



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

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

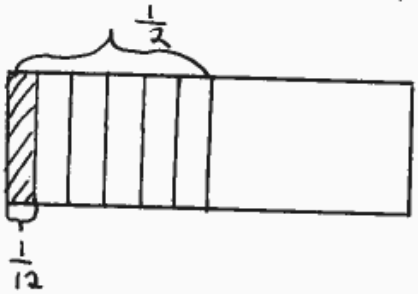
b. $\frac{1}{8} \div 5 =$ _____



$\frac{1}{8} \div \frac{5}{1} =$

$\frac{1}{8} \times \frac{1}{5} = \frac{1}{40}$

2. Larry spends half of his workday teaching piano lessons. If he sees 6 students, each for the same amount of time, what fraction of his workday is spent with each student?

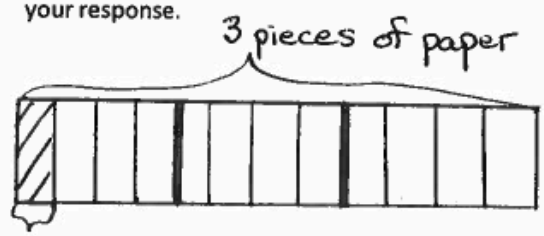


$\frac{1}{2} \div \frac{6}{1} =$

$\frac{1}{2} \times \frac{1}{6} = \frac{1}{12}$ of his workday

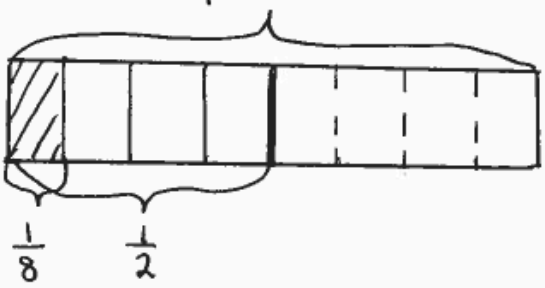
Name _____ Date _____

1. Kevin divides 3 pieces of paper into fourths. How many fourths does he have? Draw a picture to support your response.



Kevin has 12 fourths in 3 pieces of paper

2. Sybil has $\frac{1}{2}$ of a pizza left over. She wants to share the pizza with 3 of her friends. What fraction of the original pizza will Sybil and her 3 friends each receive? Draw a picture to support your response.



Sybil + 3 friends = 4 people

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

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

Each will receive $\frac{1}{8}$ of the original pizza

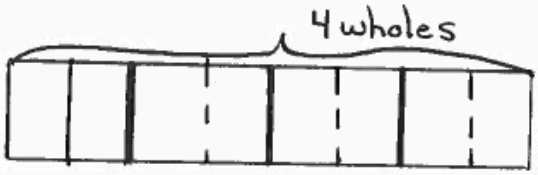
Name _____ Date _____

Create a word problem for the following expressions, and then solve.

a. $4 \div \frac{1}{2}$

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

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

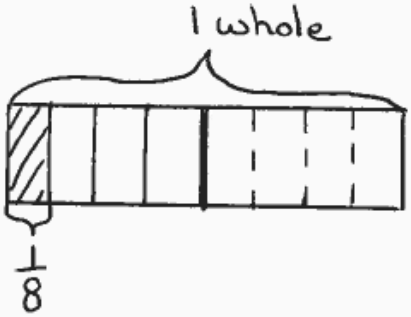


Example Molly bought 4 meters of rope. She cut each meter in half. How many halves did she have after cutting the rope? (8 halves)

b. $\frac{1}{2} \div 4$

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

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



Sophia had $\frac{1}{2}$ pound of candy. She shared this with 3 of her friends. How much candy did each girl get?

$(\frac{1}{8}$ lb)

Name _____ Date _____

1. 8.3 is equal to

83 tenths 8.3 x 10 = 83

830 hundredths 8.3 x 100 = 830

2. 28 is equal to

2,800 hundredths 28 x 100 = 2,800

280 tenths 28 x 10 = 280

3. $15.09 \div 0.01 =$ 1,509

$15.09 \div \frac{1}{100} =$

$15.09 \times \frac{100}{1} = 1,509$

4. $267.4 \div \frac{1}{10} =$ 2,674

$267.4 \div \frac{1}{10} =$

$267.4 \times \frac{10}{1} = 2,674$

5. $632.98 \div \frac{1}{100} =$ 63,298

$632.98 \div \frac{1}{100} =$

$632.98 \times \frac{100}{1} = 63,298$

Name _____ Date _____

Rewrite the division expression as a fraction and divide.

a. $3.2 \div 0.8$

$= \frac{3.2 \times 10}{.8 \times 10}$

$= \frac{32}{8}$

$= 4$

b. $3.2 \div 0.08$

$= \frac{3.2 \times 100}{.08 \times 100}$

$= \frac{320}{8}$

$= 40$

c. $7.2 \div 0.9$

$= \frac{7.2 \times 10}{.9 \times 10}$

$= \frac{72}{9}$

$= 8$

d. $0.72 \div 0.09$

$= \frac{.72 \times 100}{.09 \times 100}$

$= \frac{72}{9}$

$= 8$

Name _____ Date _____

Estimate first, and then solve using the standard algorithm. Show how you rename the divisor as a whole number.

1. $6.39 \div 0.09 \approx 630 \div 9 = 70$

$$\frac{6.39 \times 100}{.09 \times 100}$$

$$= \frac{639}{9}$$

$$= 71$$

```
  71
9|639
 -63↓
   9
  -9
```

2. $82.14 \div 0.6 \approx 8400 \div 60 = 140$

$$= \frac{82.14 \times 100}{.6 \times 100}$$

$$= \frac{8214}{60}$$

$$= 136.9$$

```
  140
60|8400
 -60
  240
 -240↓
    0
```

```
  136.9
60|8214 0
 -60↓
  221
 -180↓
   414
  -360↓
    540
   -540
```

Name _____ Date _____

1. Write an equivalent expression in numerical form.

   A fourth as much as the product of two-thirds and 0.8

Example $\frac{1}{4} \times \left(\frac{2}{3} \times 0.8\right)$

2. Write an equivalent expression in word form.

Examples a. $\frac{3}{8} \times (1 - \frac{1}{3})$

Three eighths times the difference between one and one third

b. $(1 - \frac{1}{3}) \div 2$

Half as much as the difference between one and one third

3. Compare the expressions in 2(a) and 2(b). Without evaluating, determine which expression is greater, and explain how you know.

a. Takes the difference between 1 and $\frac{1}{3}$ and multiplies it by $\frac{3}{8}$ (or $\div 2$)

b. Takes the difference between 1 and $\frac{1}{3}$ and multiplies by $\frac{3}{8}$, which is less than $\frac{4}{8}$, so b. is greater

$(1 - \frac{1}{3}) \div 2 > \frac{3}{8} \times (1 - \frac{1}{3})$

Name _____ Date _____

An entire commercial break is 3.6 minutes.

a. If each commercial takes 0.6 minutes, how many commercials will be played?

$3.6 \div .6$

$= \frac{3.6}{.6}$

$= \frac{36}{6}$

$= 6$

6 commercials will play in 3.6 minutes

b. A different commercial break of the same length plays commercials half as long. How many commercials will play during this break?

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

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

12 commercials will play