



وزارة التربية والتعليم
MINISTRY OF EDUCATION

أسئلة مراجعة لمادة رياضيات

الصف السادس ريفيل

الفصل الدراسي الاول

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مدرسة العدل ح 2

أ/ احمد الجبعي

Start your
day with
math!



Question 1: Show the ratio relationship between two quantities using different representations (Page 11)

1 to 6

1. In Suri's coin purse, she has 6 dimes and 4 quarters. Martha has 5 dimes and 3 quarters. Suri thinks that the ratio of dimes to quarters in both purses is the same because they each have 2 more quarters than dimes. Is the same ratio of dimes to quarters maintained? Justify your response.

Suri's $\frac{6}{4}$

Martha $\frac{5}{3}$

~~$\frac{6}{4} = \frac{5}{3}$~~

$6 \times 3 = 4 \times 5$
 $18 \neq 20$

not the same ratio.

2. In a trivia game, Levi answered 8 questions correctly out of 10 turns in the game. He then answered the next three questions correctly. He reasoned that because he added 3 to both the total questions and his correct responses, that the ratio of correct answers to total questions remained the same. Is he correct? Justify your response.

original $\frac{8}{10}$

New = $\frac{8+3}{10+3} = \frac{11}{13}$

~~$\frac{8}{10} = \frac{11}{13}$~~

not the same ratio.

$11 \times 10 = 13 \times 8$
 $110 \neq 104$

$\begin{array}{r} 2 \\ 13 \\ \times 8 \\ \hline 104 \end{array}$

3. Riley needs to make fruit punch for the family reunion. One batch of punch has the ingredients shown. If the punch bowl holds 27 cups, how many cups of orange juice will she need to keep the ratio in a full punch bowl the same? (Example 2)

Item	Cups
Cranberry Juice	4
Lemon Lime Soda	1
Orange Juice	2
Pineapple Juice	2

$4 \times 3 = 12$

$1 \times 3 = 3$

$2 \times 3 = 6$

$2 \times 3 = 6$

$9 \times 3 = 27$

she need 6 cups of orange Juice.

4. A small fruit basket contains the fruits shown. A large basket has the same ratio of fruits as the small basket. If the large basket has 42 total pieces of fruit, how many are pears? (Example 2)

Type of Fruit Amount	
Apple	6
Orange	5
Pear	3

$$6 \times 3 = 18$$

$$5 \times 3 = 15$$

$$3 \times 3 = 9 \rightarrow$$

$$18 + 15 + 9 = 42$$

In large basket

✓ 9 pieces of pear

$$\begin{array}{r} 14 \\ \times 3 \\ \hline 42 \\ \checkmark \end{array}$$

إذا ضرب كل نوع من الفواكه في 3

5. Mrs. Santiago is buying doughnuts for her office. Each box contains 6 glazed, 4 cream filled, and 2 chocolate flavored doughnuts. If there were 20 total cream filled doughnuts, how many chocolate doughnuts did she buy? (Example 3)

$$\text{cream: } 4 \times 5 = 20$$

$$\text{chocolate: } 2 \times 5 = 10 \text{ chocolate doughnuts}$$

6. A small batch of trail mix contains 2 cups of raisins, 2 cups of peanuts, 1 cup of sunflower seeds, and 1 cup of chocolate coated candies. A large batch has the same ratio of ingredients as a small batch. If the large batch has 8 cups of peanuts, how many cups of sunflower seeds are in a large batch? (Example 3) **4 cups**

$$\frac{\text{peanuts}}{\text{sunflower}} : \frac{2}{1} \xrightarrow{\times 4} \frac{8}{4}$$

∴ 4 cups of sunflower seeds

**Question 2: Represent a collection of
equivalent ratios (page 15-18)**

Example:

To make yellow icing, Amida mixes 6 drops of yellow food coloring with 2 cups of white icing.

How many drops of yellow food coloring should Amida mix with 8 cups of white icing to get the same shade of yellow?

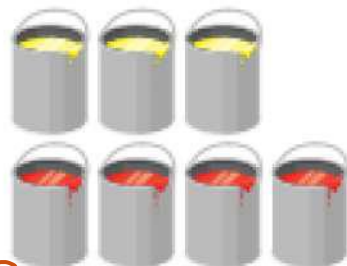
drops of yellow	6	24?
cups of white icing	2	8

$$6 \times 4 = 24$$

he want 24 drops of yellow.

Example:

Akeno mixes three sample containers of yellow paint with four sample containers of red paint to create his favorite shade of orange paint. His little sister Aiko wants to create the same shade of orange paint, but she only has two sample containers of red paint.



Yellow	3	1.5
Red	4	2

$$3 \div 2 = 1.5$$

she need 1.5 sample containers of yellow
to mixed with 2 red.

Example:

The ingredients needed to make 24 biscuits are shown in the table.

If Portia wants to only make 18 biscuits, how many cups of flour does she need?

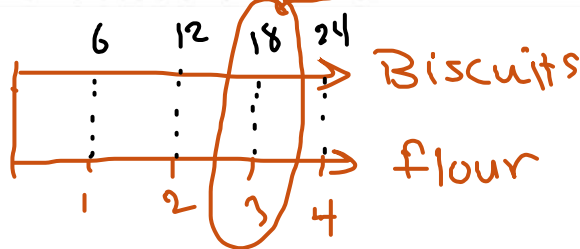
Use a double number line to solve this problem. A double number line consists of two number lines, in which the coordinated quantities are equivalent ratios.

Step 1 Draw a double number line.

Homemade Biscuits	
4 c flour	
8 tsp baking powder	
2 tbsp sugar	
1 tsp salt	
1 c shortening	
2 large eggs	
2 c milk	

$$\frac{24 \text{ Biscuits}}{4 \text{ flour}} \div 4$$

$$\frac{6 \text{ Biscuits}}{1 \text{ flour}}$$



هنا كل 6 بسكويت
تحتاج 1 كوب من الطحين

She need 3 cups of flour to make 18 Biscuits.

Example:

Natasha made raspberry punch for a party by mixing 9 fluid ounces of fruit punch, 3 liters of soda, and 6 scoops of raspberry ice cream. Halfway through the party, the punch bowl was empty.

If Natasha only has 6 fluid ounces of fruit punch left, how much ice cream does she need to make another batch of punch?

fruit punch	9	3	6
ice cream	6	2	(4)

$\div 3$ $\times 2$
 $\div 3$ $\times 2$

$2 \times 2 = 4$

she need (4) icecream

Question 3: Solve real-world problems involving ratio relationships by using bar diagrams, double number lines and equivalent ratios (page 45)

1 to 8

1. A survey showed that 4 out of 5 students own a bicycle. Based on this result, how many of the 800 students in a school own a bicycle?

$$\frac{4}{5} = \frac{\boxed{640}}{800}$$

$\times 160$

$$\begin{array}{r} 2 \\ 160 \\ \times 4 \\ \hline 640 \end{array}$$

$\therefore 640$ student's own bicycle.

2. A survey of Mr. Thorne's class shows that 5 out of 8 students will buy lunch today. Based on this result, how many of the 720 students in the school will buy today?

$$\frac{5}{8}$$

$$\frac{5}{8} = \frac{\boxed{450}}{720}$$

$\times 90$

$$\begin{array}{r} 90 \\ \times 5 \\ \hline 450 \end{array}$$

$\therefore 450$ students buy lunch.

3. The ratio of the number of baskets made by Tony to the number of baskets made by Colin is 2 to 3. Tony made 10 baskets. How many baskets did Colin make?

$$\frac{\text{Tony}}{\text{Colin}} \Rightarrow \frac{2}{3} = \frac{10}{\boxed{15}} \text{ baskets}$$

$\times 5$

✓ Colin will make 15 baskets $3 \times 5 = 15$

4. In the school choir, there is 1 boy for every 4 girls. There are a total of 11 boys. How many girls are in the choir?

$$\frac{\text{Boy}}{\text{Girls}} \Rightarrow \frac{1}{4} = \frac{11}{\boxed{44}} \text{ Girls.}$$

$\times 11$

5. Liberty Middle School has 600 students. In Anna's class, 3 out of 8 students walk to school. How many students at the school can be expected to walk to school?

$$\frac{3}{8} = \frac{x}{600}$$

$$8x = 1800$$

$$\frac{8x}{8} = \frac{1800}{8}$$

$$x = \frac{1800 \div 2}{8 \div 2} = \frac{900 \div 2}{4 \div 2} = \frac{450}{2}$$

$$\frac{450 \div 2}{2 \div 2} = \frac{225}{1} = \boxed{225} \text{ students}$$

6. Pine Hill Middle School has 300 students. In Zoey's class, 2 out of 5 students belong to a club. How many students at the school would you expect belong to a club?

$$\frac{2}{5} = \frac{120}{300}$$

$$2 \times 60 = 120$$

.. 120 student's expect belong to club.

7. In a survey, the ratio of students who prefer popcorn to potato chips is 3 to 4. If the number of students surveyed who prefer popcorn is 360, how many preferred potato chips?

$$\frac{\text{Popcorn}}{\text{Potato}} \Rightarrow \frac{3}{4} = \frac{360}{x}$$

$$\begin{array}{r} 120 \\ \times 4 \\ \hline 480 \end{array}$$

∴ $\boxed{480}$ student's prefer potato

8. Open Response In a neighborhood, the ratio of houses with swing sets to houses without swing sets is 3 to 5. If the number of houses with swing sets is 270, how many houses do not have swing sets?

$$\frac{\text{with swing}}{\text{without swing}} \Rightarrow \frac{3}{5} = \frac{270}{x}$$

$$\begin{array}{r} 90 \\ \times 5 \\ \hline 450 \end{array}$$

450 houses without swing

Question 4: Use ratio reasoning to convert between customary units of measurement (page 55)

1 to 10

$$1 \text{ quart} = 2 \times 2 \times 8 = 32 \text{ fl. oz}$$

1. Mrs. Menary made $4\frac{1}{2}$ quarts of lemonade for a school party. How many fluid ounces of lemonade did she make?

$$\therefore 4.5 \text{ quarts} = 4.5 \times 32 \text{ fl. oz}$$

$$\therefore 4.5 \text{ quarts} = 144 \text{ fl. oz} \quad \checkmark$$

$$\begin{array}{r} 1 \\ + \\ \times 45 \\ \hline 32 \\ \hline 190 \\ 1350 \\ \hline 1440 \end{array}$$

2. A class walked 2.5 miles for a walk-a-thon. How many yards did the class walk?

$$1 \text{ mile} = 5280 \text{ ft}$$

$$1 \text{ yard} = 3 \text{ feet}$$

$$\therefore 1 \text{ mile} = \frac{5280}{3} = 1760 \text{ yards}$$

$$\therefore 2.5 \text{ miles} = 1760 \times 2.5 = 4400 \text{ yard}$$

3. The Martinez family has $\frac{3}{4}$ gallon of orange juice in the refrigerator. How many cups of orange juice are in the refrigerator?

$$1 \text{ gallon} = 4 \times 2 \times 2 = 16 \text{ cups}$$

$$\therefore \frac{3}{4} \text{ gallon} = \frac{3}{4} \times 16 = 3 \times 4 = 12 \text{ cups} \quad \checkmark$$

4. A grand piano can weigh $\frac{1}{2}$ ton. How many ounces can a grand piano weigh?

$$1 \text{ ton} = 2000 \times 16 = 32000 \text{ oz}$$

$$\therefore \frac{1}{2} \text{ ton} = \frac{1}{2} \times 32000 = 16000 \text{ (oz)}.$$

5. A female hippopotamus can weigh 48,000 ounces. How many tons can a female hippopotamus weigh?

$$48000 \div 32000 = 1.5$$

$$\therefore 48000(oz) = 1.5 \text{ tons}$$

6. At soccer practice, Tracey's best kick traveled a distance of 1,200 inches. For how many yards did she kick the ball?

$$1 \text{ yard} = 36 \text{ in}$$

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

$$1 \text{ yard} = 3 \text{ ft}$$

$$\therefore \frac{1200}{36} = 33.3 \text{ yard}$$

$$1 \text{ yard} = 3 \times 12 = 36 \text{ in}$$

7. An elephant can drink up to 6,400 fluid ounces of water a day. How many gallons of water can an elephant drink per day?

هذا قسمه

$$\frac{6400 \text{ fl. oz}}{(8 \times 2 \times 2 \times 4)}$$

$$= \frac{6400}{128} = 50 \text{ gallon}$$

8. A recipe for ice cream calls for 56 fluid ounces of milk. How many pints of milk are there in the recipe?

$$\text{Answer is } 3.5 \text{ pints}$$

حاون حل هذا السؤال لوصفك

9. One quart of strawberries weighs about 2 pounds. About how many quarts of strawberries would weigh $\frac{1}{4}$ ton?

Answer is 250

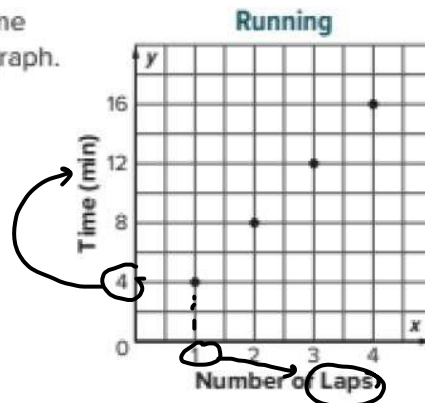
10. **Open Response** A mini fruit juice box contains 4 fluid ounces of juice. You need $2\frac{1}{2}$ quarts of fruit juice. How many mini fruit juice boxes will you need?

Answer is 20 mini fruit juice

Question 5: Graph ratio relationship on the
coordinate plane (page 28)
4 to 8

4. **Multiselect** Lacy is running laps around the track. The time in minutes and the number of laps ran are shown in the graph. Which of the following is true about the ratio relationship shown in the graph?

- ☒ Every 4 minutes, Lacy ran 1 lap.
☒ Lacy ran 8 laps in 2 minutes.
☒ It took Lacy 1 minute to run 4 laps.
☒ In 16 minutes, Lacy completed 4 laps.
☒ Based on the relationship, it would take Lacy 20 minutes to complete 5 laps.



1 laps $\rightarrow$ 4 min

$$5 \times 4 = 20 \quad \checkmark$$

5. **MP Identify Structure** There are 4 quarters for every one dollar and 10 dimes for every dollar. Without graphing, would the ratio of quarters to dollars or dimes to dollars appear to have a steeper line? Explain your reasoning.

$$\therefore 10 > 4$$

$\therefore$ Dimes to \$ have

steeper line.

"دولار إلى ديس" (دولار إلى ديس) steeper, ratio 10

* Quarters to dollar

$$4q = \$1$$

$$\therefore \text{ratio} = \frac{4}{1} = 4$$

* Dimes to \$

$$10 \text{ dimes} = \$1$$

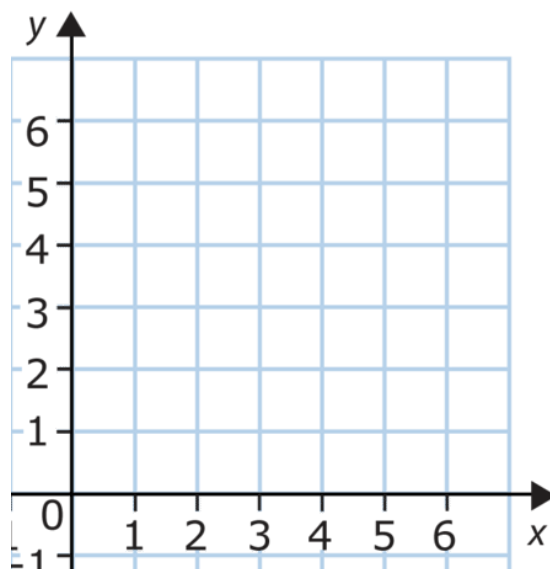
$$\text{Ratio} = \frac{10}{1} = 10$$

6. What are the advantages of graphing when solving problems that involve ratios?

7. **MP Reason Abstractly** The table gives the number of beads needed to make bracelets of certain lengths. Suppose you graph the ordered pairs (bracelet length, number of beads) on the coordinate plane. Would the point (10.5, 42) make sense in this context? Explain.

Bracelet Length (in.)	7	8	9	10		
Number of Beads	28	32	36	40		

8. **Multiple Relationships** For every second, the average green sea turtle can swim 9 meters. Represent how far a green sea turtle can swim in 1, 2, 3 and 4 seconds in a table. Then graph the points on a coordinate plane.



Question 6: Use ratio and rate reasoning

to find a unit rate: (page 63)

1 to 8

$$6 \text{ km} = 6000 \text{ m}$$

1. A hippopotamus can run 6 kilometers in 15 minutes. At this rate, how far can the hippopotamus run in 1 minute? (Example 1)

$$\frac{\text{Distance}}{\text{Time}} \Rightarrow \frac{6 \text{ km} \div 15}{15 \text{ min} \div 15}$$

$$\therefore \frac{6000 \text{ m} \div 15}{15 \div 15} = \frac{400 \text{ m}}{1 \text{ min}} \text{ or } \frac{0.4 \text{ km}}{1 \text{ min}}$$

2. Imena earned \$261 last week. If she worked 18 hours and earned the same amount each hour, how much was she paid per hour? (Example 1)

$$\therefore \frac{\$ 261}{18 \text{ h}} = \$ 14.5$$

$$\frac{\$ 261 \div 18}{18 \text{ h} \div 18}$$

$$\begin{array}{r} 14.5 \\ 18 \overline{) 261.0} \\ \underline{18} \\ 781 \\ \underline{72} \\ 90 \\ \underline{90} \\ 00 \end{array}$$

3. A cat's heart beats approximately 45 times in 15 seconds. At this rate how many times does the cat's heart beat per second? (Example 1)

$$\frac{45 \text{ times} \div 15}{15 \text{ sec} \div 15} = \frac{3 \text{ times}}{1 \text{ second}}$$

4. Mr. Farley used 4 pounds of hamburger to make 10 hamburger patties of the same size. How many pounds of hamburger did he use per patty? (Example 1)

$$\frac{4 \text{ pound} \div 10}{10 \text{ h. patties} \div 10} = \frac{0.4 \text{ pound}}{1 \text{ patty}}$$

5. At the school festival, Heather can buy 25 game tickets for \$10, or she can pay \$0.50 per game ticket. Which option has the lesser price per ticket? (Example 2)

option 1

$$\frac{\$10 \div 25}{25 \text{ games} \div 25} = \frac{\$0.4}{1 \text{ game}}$$

option 2

$$\frac{\$0.5}{1 \text{ game}}$$

$\therefore$ option 1 has the lesser price $0.4 < 0.5$

6. At a toy store, Colton can buy a package of 6 mini footballs for \$7.50, or a package of 8 mini footballs for \$9.60. Which option has the lesser price per mini football? (Example 2)

option 2

$$\frac{\$7.50 \div 6}{6 \text{ mini f.} \div 6} = \frac{\$1.25}{1 \text{ mini football}} \left\{ \frac{\$9.60 \div 8}{8 \div 8} = \frac{\$1.2}{1 \text{ mini f.}} \right.$$

option 2 < option 1 $\therefore$ option 2 has lesser price.

7. The table shows the options Zoe's mother has for buying tickets to an adventure day camp for Zoe and 5 of her friends. Which option has the lesser cost per student ticket? (Example 2)

option 1

$$\frac{\$126}{6} = \frac{\$21}{1 \text{ student}}$$

Adventure Camp Tickets	
Option	Cost (\$)
6-pack of Student Tickets	126.00
Individual Student Ticket	21.50

option 2

$$\frac{\$21.5}{1 \text{ students}}$$

$$\$21 < \$21.5$$

∴ option 1 lesser cost per student.

8. Multiple Choice Which of the following offers the least price per ounce of shampoo? down

a) 6\$ for 8 ounces of shampoo.

b) 8\$ for 12 ounces of shampoo.

☒ c) 4\$ for 12 ounces of shampoo

d) 6\$ for 10 ounces of shampoo

a) $\frac{6\$}{8 \div 8} = \frac{\$0.75}{1 \text{ oz.}}$

b) $\frac{\$8}{12} = \frac{\$0.66}{1 \text{ oz.}}$

c) $\frac{\$4}{12} = \frac{\$0.33}{1 \text{ oz.}}$

d) $\frac{\$6}{10} = \frac{\$0.6}{1 \text{ oz.}}$

0.33 → أقل سعر

Question 7: Solve real-world problems involving ratio relationships by using bar diagrams, double number lines and equivalent ratios (page 71)

1 to 6

1. Mr. Anderson is ordering pizzas for a class pizza party. Pizza Place has a special where he can buy 3 large pizzas for \$18.75. At Mario's Pizzeria, he can buy 4 large pizzas for \$22. If he needs to buy 12 pizzas, how much will he save if he buys the pizzas from Mario's Pizzeria instead of Pizza Place?

(Example 1)

→ Mario's pizzeria

$$\begin{array}{r} 4 \xrightarrow{\times 3} 12 \\ \$22 = \boxed{\$66} \end{array}$$

pizza place

$$\begin{array}{r} 3 \xrightarrow{\times 4} 12 \\ 18.75 = \boxed{75} \end{array}$$

$$\begin{array}{r} 18.75 \\ \times 4 \\ \hline 75.00 \end{array}$$

$$\begin{array}{r} 75 \\ -66 \\ \hline 9 \end{array}$$

He will save \$9.

2. Skylar and Rodrigo each recorded how far they traveled while skateboarding. Skylar traveled 65 feet in 5 seconds and Rodrigo traveled 108 feet in 8 seconds. How much farther did Rodrigo travel per second than Skylar? (Example 1)

Skylar

$$\frac{65 \text{ feet} \div 5}{5 \text{ second} \div 5} = \frac{13 \text{ feet}}{1 \text{ second}}$$

Rodrigo

$$\frac{108 \text{ feet} \div 8}{8 \text{ sec.} \div 8} = \frac{13.5}{1}$$

$$\begin{array}{r} 13.5 \\ 8 \overline{) 108.0} \\ \underline{6} \\ 28 \\ \underline{24} \\ 40 \\ \underline{40} \\ 00 \end{array}$$

⇒ Rodrigo travelled more by $13.5 - 13 = \boxed{0.5 \text{ feet/second}}$

3. Melissa is buying party favors to make gift bags. Supplies LTD sells a 5-pack of favors for \$11.25 and Parties and More sells a 3-pack of favors for \$8.25. At these rates, how much will she save if she buys 15 favors from Supplies LTD than Parties and More?

$$\begin{array}{r} \text{LTD} \\ \underline{\$ 11.25} \end{array} \xrightarrow{\times 3} \underline{\$ 33.75}$$

5 pack 15 pack

$\xrightarrow{\times 3}$

(Example 1)

parties and more

$$\begin{array}{r} 8.25 \\ \underline{} \\ 3 \text{ pack} \end{array} \xrightarrow{\times 5} \underline{\$ 41.25}$$

$\xrightarrow{\times 5} 15$

$$\begin{array}{r} 1 \quad 2 \\ 8.25 \\ \times \quad 5 \\ \hline 41.25 \end{array}$$

$$\begin{array}{r} 3 \quad 10 \quad 12 \\ 41.25 \\ - 33.75 \\ \hline 7.50 \end{array}$$

She will save \$7.50 if buys from supplies LTD

4. Tara can type 180 words in 4 minutes. At this rate, how many words can she type in 10 minutes? (Example 2)

word
min $\rightarrow$

$$\frac{180 \div 2}{4 \div 2} = \frac{90}{2} \xrightarrow{\times 5} \underline{450}$$

$\xrightarrow{\times 5} 10$

she can type 450 words in 10 minutes.

5. A bakery makes 260 donuts in 4 hours. At this rate, how many donuts can they make in 6 hours? (Example 2)

$$\frac{260 \text{ donuts} \div 2}{4 \text{ hours} \div 2} = \frac{130}{2} \xrightarrow{\times 3} \underline{390}$$

$\xrightarrow{\times 3} 6$

$$\begin{array}{r} 130 \\ \times 3 \\ \hline 390 \end{array}$$

Can make 390 donuts in 6 hours.

6. **Open Response** While jumping rope, Juan jumped 24 times in 30 seconds. At this rate, how many times will he jump in 50 seconds?

$$\frac{24 \text{ times} \div 3}{30 \text{ seconds} \div 3} = \frac{8}{10} \xrightarrow{\times 5} \underline{40 \text{ times}}$$

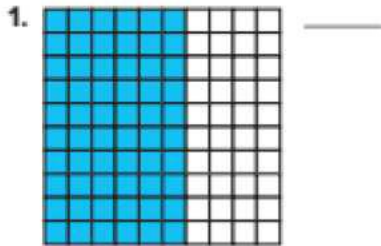
$\xrightarrow{\times 5} 50$

second.

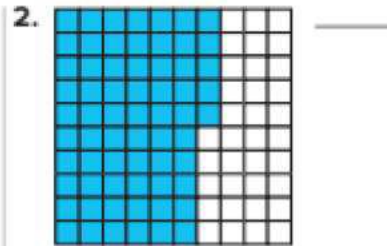
he jump 40 times in 50 second.

Question 8: Model percent using 10 x 10
grids and bar diagrams: (page 83)
1 to 8

For Exercises 1 and 2, identify the percent represented by each 10 × 10 grid. (Example 1)



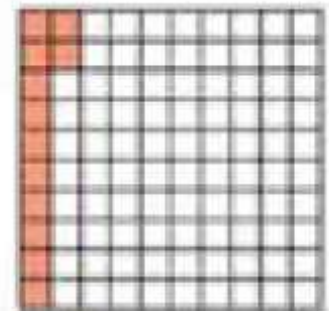
60 %



65 %

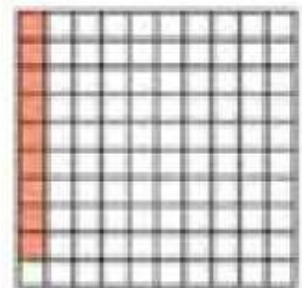
3. In a school survey, 12% of the students surveyed said they like camping. Shade the 10 × 10 grid to model 12%. (Example 2)

لون 12 المربع

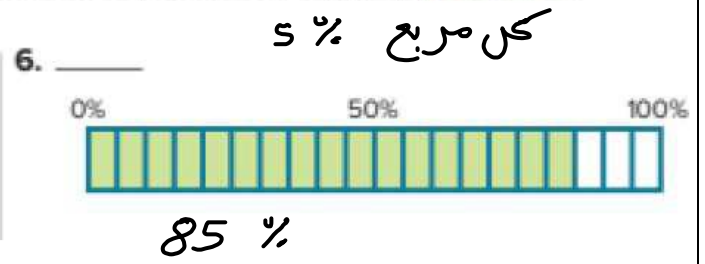
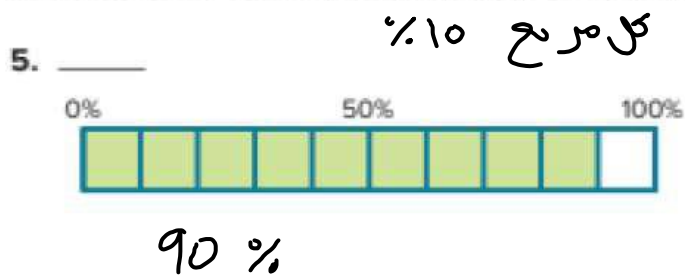


4. Of the students in the lunch line, 9% said they were buying strawberry milk. Shade the 10 × 10 grid to model 9%. (Example 2)

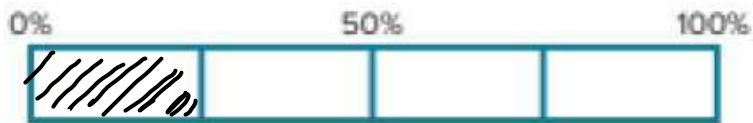
لون 9 مربعات



For Exercises 5 and 6, identify the percent represented by each bar diagram. (Example 3)



7. Shade the bar diagram to model 25%.
(Example 4)

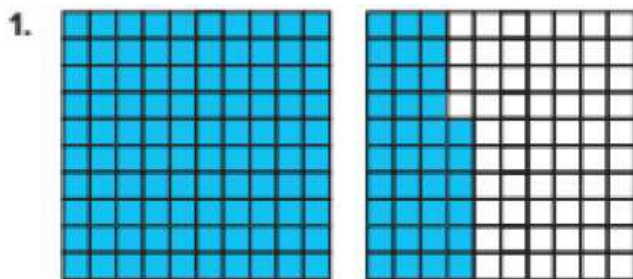


8. Open Response How can you use a bar diagram to model 45%? → ٩ مربعات



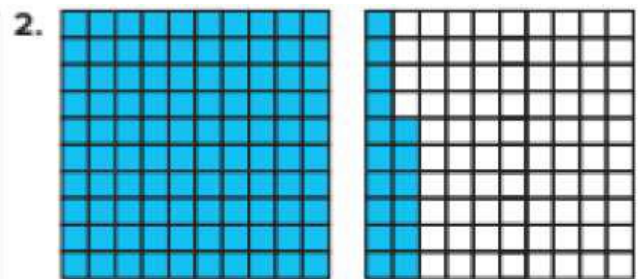
Question 9: Use 10 x 10 grids and bar diagrams to represent percent greater than 100% or less than 1% (page 91)

1 to 4



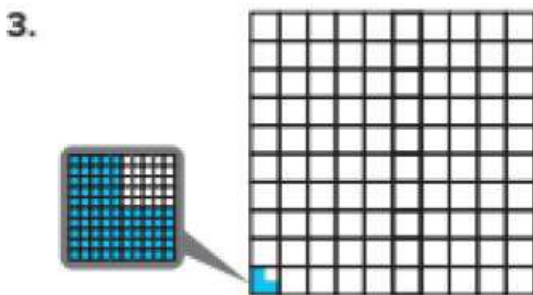
100% + 36%

136%

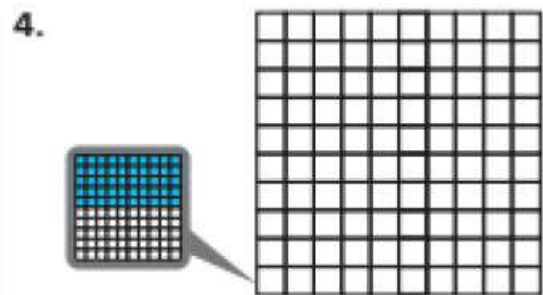


100% + 16%

116%



0.75%



0.50%

Question 10: Relate fractions, decimals and percent by using place-value reasoning and understanding a percent as a ratio that compares a number to 100 (page 101)

1. 45% → $\boxed{0.45}$ decimal.

→ $\frac{45 \div 5}{100 \div 5} = \boxed{\frac{9}{20}}$ → fraction.

2. 72% → $\boxed{0.72}$ decimal.

→ $\frac{72 \div 2}{100 \div 2} = \frac{36 \div 2}{50 \div 2} = \boxed{\frac{18}{25}}$ → fraction

3. 80% ⇒ $\boxed{0.80 \text{ or } 0.8}$ → decimal.

→ $\frac{80 \div 2}{100 \div 2} = \boxed{\frac{4}{5}}$ → fraction

4. 6%

→ $\boxed{0.06}$ → decimal

→ $\frac{6 \div 2}{100 \div 2} = \boxed{\frac{3}{50}}$ → fraction

Question 11: Relate fractions, decimals and percent by using place-value reasoning and understanding a percent as a ratio as number to 100 (page 101)

$$4. \frac{3}{20} \times \frac{5}{5} = \frac{15}{100} = \boxed{15\%} \rightarrow \text{percent.}$$

$$= \boxed{0.15} \rightarrow \text{decimal.}$$

$$5. \frac{7\frac{3}{4}}{1} = \frac{7 \times 25}{4 \times 25} = \frac{175}{100} = \boxed{175\%} \rightarrow \text{percent.}$$

$$= \boxed{1.75} \rightarrow \text{decimal}$$

$$6. \frac{5}{8} \times \frac{125}{125} = \frac{625}{1000} = \boxed{0.625} \rightarrow \text{decimal}$$

$$\rightarrow \boxed{62.5\%} \rightarrow \text{percent.}$$

$$\begin{array}{r} .2 \\ 125 \\ \times \quad 5 \\ \hline 625 \end{array}$$

Question 12: Find a percent of a number by reasoning about percent as a rate per 100 and by using bar diagrams, ratio tables, equivalent ratios (page 105-109)

Example:

The graph shows the types of snacks that students at York Middle School bring with them to school. Suppose there are 300 students at the school.

How many of them bring cheese for a snack?

First, identify the part, the whole, and the percent. The part is unknown. The whole is 300. The percent is 15%.



$$\cancel{300} \times \frac{15}{\cancel{100}} = 3 \times 15 = 45 \text{ students}$$

1. The graph shows the career interests of the students at Linda's school. Suppose there are 400 students at the school. How many of them want to be an athlete? (Example 1)



$$\cancel{400} \times \frac{12}{\cancel{100}}$$

$$4 \times 12 = 48 \text{ students.}$$

2. The graph shows the favorite activities of campers at a summer camp. Suppose there are 300 campers at the camp. How many campers favor fishing? (Example 1)

Favorite Camp Activities



$$300 \times \frac{14}{100} = 3 \times 14$$

42 campers

Use any method to find the percent of each number. (Examples 2–4)

3. 15% of 240 = _____

$$\frac{15}{100} \times 240$$

$$= \frac{360}{10}$$

$$= \boxed{36}$$

$$\begin{array}{r} 15 \\ \times 24 \\ \hline 60 \\ + 300 \\ \hline 360 \end{array}$$

4. 65% of 180 = _____

$$\frac{65}{100} \times 180$$

$$= \frac{1170}{10}$$

$$= \boxed{117}$$

$$\begin{array}{r} 65 \\ \times 18 \\ \hline 520 \\ + 650 \\ \hline 1170 \end{array}$$

5. 250% of 82 = _____

9. **Open Response** Kenzie is putting the family vacation videos onto a flash drive. The flash drive can hold 200 minutes of video. Kenzie has used 45% of the memory space already. How many minutes of the flash drive has she already used?

$$200 \times \frac{45}{100}$$

$$2 \times 45 = 90 \text{ minutes}$$

Question 13: Estimate the percent of a number by using benchmark percents and rounding: (Page 119)

7. Emilia and her three sisters went out to dinner. The total cost of their dinner was \$38.75. They want to leave a tip that is 23% of the total bill. About how much of a tip should they leave? قَرِّبْ

$$\begin{aligned} & \$38.75 \text{ of } 23\% \\ \approx & \$40 \times \frac{20}{100} = 4 \times 2 = 8 \$ \end{aligned}$$

8. Karl earned \$188 last month doing chores after school. If 68% of the money he earned was from doing yard work, about how much did Karl earn doing yard work?

$$\begin{aligned} & 188 \text{ of } 68\% \\ \approx & 200 \times \frac{70}{100} = 2 \times 70 = \$140 \end{aligned}$$

9. The concession stand at a football game served 288 customers. Of those customers, about 77% bought a hot dog. About how many customers bought a hot dog?

$$288 \text{ of } 77\%$$

$$\approx 300 \times \frac{80}{100}$$

$$3 \times 80 = \boxed{\$240}$$

10. In a recent season, the Chicago Cubs won 64% of the 161 regular season games they played. About how many games did they win?

$$161 \text{ of } 64\%$$

$$\approx 160 \times \frac{60}{100} = 16 \times 6 = \boxed{96}$$

$$\begin{array}{r} 3 \\ \times 16 \\ 6 \\ \hline 96 \end{array}$$

11. The table shows how the 515 students at West Middle School get to school. About how many of the students walk to school?

Method	Percent of Students
Bus	53%
Car	21%
Walk	26%

515 of 26%

$$\approx 500 \times \frac{25}{100} = 5 \times 25 = 125 \text{ students}$$

12. **Open Response** Carolyn's homeroom sold 207 magazine subscriptions. Of the magazine subscriptions sold, 28% were for fashion magazines. About how many fashion magazine subscriptions were sold?

207 of 28%

$$\approx 200 \times \frac{30}{100} = 2 \times 30 = 60 \text{ magazine}$$

Question 14: Find the whole, given the part and the percent by using bar diagrams, ratio tables, double number lines, and equivalent ratios (page:127)

1. Yolanda's club requires that 80% of the members be present for any vote. If at least 20 members must be present to have a vote, how many members does the club currently have?

$$x \times 80\% = 20$$

$$x \times \frac{80}{100} = 20$$

$$x = \frac{20 \times 100}{80} = \frac{200}{8} = \boxed{25 \text{ members}}$$

2. Action movies make up 25% of Sara's DVD collection. If she has 16 action DVDs, how many DVDs does Sara have in her collection?

$$\text{DVD} = 16 \times \frac{100}{25} \rightarrow \begin{matrix} \text{مقلوب} \\ 25\% \end{matrix}$$

$$= 16 \times 4 = \underline{\underline{64 \text{ DVD sara have.}}}$$

يمكن الحل مباشرة

3. Marcus saved \$10 because he bought a baseball glove that was on sale for 40% off. What was the original price of the baseball glove?

$$\text{original price} \times 40\% = 10 \quad 40\% \text{ مئول}$$

$$\text{original price} = 10 \times \frac{100}{40} \nearrow$$

$$\frac{100}{4} = \$25 \checkmark$$

4. Of the students in the marching band, 55% plan to go to the school dance. If there are 110 students in the marching band that are going to the dance, how many students are in the marching band?

$$\text{students} = \frac{2}{110} \times \frac{100}{55} = 2 \times 100 = 200 \text{ student-}$$

5. Melcher used 24% of the memory card on his digital camera while taking pictures at a family reunion. If Melcher took 96 pictures at the family reunion, how many pictures can the memory card hold?

$$x = 96 \div 24 = 4 \quad \frac{100}{24} \div 24 = 1 \quad 4 \times 100 = 400 \text{ picture}$$

6. Mallorie has \$12 in her wallet. If this is 20% of her monthly allowance, what is her monthly allowance?

$$x = 12 \times \frac{100}{20} = \frac{1200}{20} = \$60$$

20% مقلوب

Question 15: Solve problems by using the standard algorithms for addition, subtraction, multiplication, and division to compute with multi-digit decimals (page:153)

1. $34.672 + 15.31 =$

$$\begin{array}{r} 34.672 \\ + 15.310 \\ \hline 49.982 \end{array}$$

2. $152.875 + 35.4 =$

$$\begin{array}{r} 152.875 \\ + 35.400 \\ \hline 188.275 \end{array}$$

3. $139.65 - 59.623 =$

$$\begin{array}{r} 139.650 \\ - 59.623 \\ \hline 80.027 \end{array}$$

4. $352.37 - 231.975 =$

$$\begin{array}{r} 352.370 \\ - 231.975 \\ \hline 120.395 \end{array}$$

Question 16: Solve problems by using the standard algorithms for addition, subtraction, multiplication, and division to compute with multi-digit decimals (page:153)

$$3 \text{ dp} \quad 2 \text{ dp} = 5 \text{ dp}$$

$$5. 0.025 \times 1.24 =$$

$$= 0.03100$$

5 dp

$$\begin{array}{r} 124 \\ \times 125 \\ \hline 1620 \\ 2480 \\ \hline 3100 \end{array}$$

$$2 \text{ dp} + 3 \text{ dp} = 5 \text{ dp}$$

$$6. 17.15 \times 1.062 =$$

$$= 18.21330$$

5 dp

15 رقم به نقطه اعشاریة

$$\begin{array}{r} 1062 \\ \times 1715 \\ \hline \textcircled{1}5310 \\ \textcircled{1}10620 \\ 743400 \\ 1062000 \\ \hline 18.21330 \end{array}$$

Question 17: Use the standard algorithm to divide multi-digit numbers when solving problems (page: 141)

1. $52,080 \div 15 =$

$15 \times 2 = 30$

$15 \times 3 = 45$

$15 \times 4 = 60$

$15 \times 7 = 105$

$$\begin{array}{r}
 3472 \\
 15 \overline{) 52080} \\
 \underline{45} \\
 70 \\
 \underline{- 60} \\
 108 \\
 \underline{- 105} \\
 30 \\
 \underline{- 30} \\
 00
 \end{array}$$

2. $38,480 \div 26 =$

$26 \times 1 = 26$

$26 \times 4 = 104$

$26 \times 8 = 208$

$$\begin{array}{r}
 1480 \\
 26 \overline{) 38480} \\
 \underline{- 26} \\
 124 \\
 \underline{- 104} \\
 208 \\
 \underline{- 208} \\
 000
 \end{array}$$

$$3. 648 \div 18 =$$

$$3 \times 18 = 54$$

$$6 \times 18 = 108.$$

$$\begin{array}{r} 36 \\ 18 \overline{) 648} \\ \underline{- 54} \\ 108 \\ \underline{- 108} \\ 000 \end{array}$$

$$4. 3,409 \div 14 =$$

$$1 \times 14 = 14$$

$$2 \times 14 = 28$$

$$4 \times 14 = 56$$

$$3 \times 14 = 42$$

$$\begin{array}{r} 243.5 \\ 14 \overline{) 3409.0} \\ \underline{28} \\ 60 \\ \underline{- 56} \\ 49 \\ \underline{42} \\ 70 \\ \underline{70} \\ 00 \end{array}$$

$$5. 8,890 \div 40 =$$

$$\begin{array}{r} 222 \text{ R } 10 \\ 40 \overline{) 8890} \\ \underline{- 80} \downarrow \\ 89 \downarrow \\ \underline{80} \\ 90 \\ \underline{- 80} \\ 10 \end{array}$$

$$6. 3,120 \div 64 =$$

$$64 \times 4 = 256$$

$$64 \times 5 = 320$$

$$64 \times 8 = 512$$

-

$$\begin{array}{r} 48 \text{ R } 48 \\ 64 \overline{) 3120} \\ \underline{256} \downarrow \\ 0560 \\ \underline{512} \\ 048 \end{array}$$

7. $6,750 \div 240 =$

$$240 \times 2 = 480$$

$$240 \times 8 = 1920$$

$$\begin{array}{r} 28 \text{ R } 30 \\ 240 \overline{) 6750} \\ \underline{- 480} \\ 1950 \\ \underline{- 1920} \\ 30 \end{array}$$

8. $4,415 \div 800 =$

$$800 \times 5 = 4000$$

$$\begin{array}{r} 5 \text{ R } 415 \\ 800 \overline{) 4415} \\ \underline{- 4000} \\ 415 \end{array}$$

Question 18: Apply prior knowledge about multiplication, division, and operations on multi-digit numbers to divide whole numbers by fractions (page:165)

$$6.3 \div \frac{1}{4} =$$

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

$$7.4 \div \frac{2}{5} =$$

$$\frac{4}{1} \times \frac{5}{2} = \frac{20}{2} = \textcircled{10}$$

$$8.6 \div \frac{2}{3} =$$

$$\frac{6}{1} \times \frac{3}{2} = \frac{18}{2} = \textcircled{9} \checkmark$$

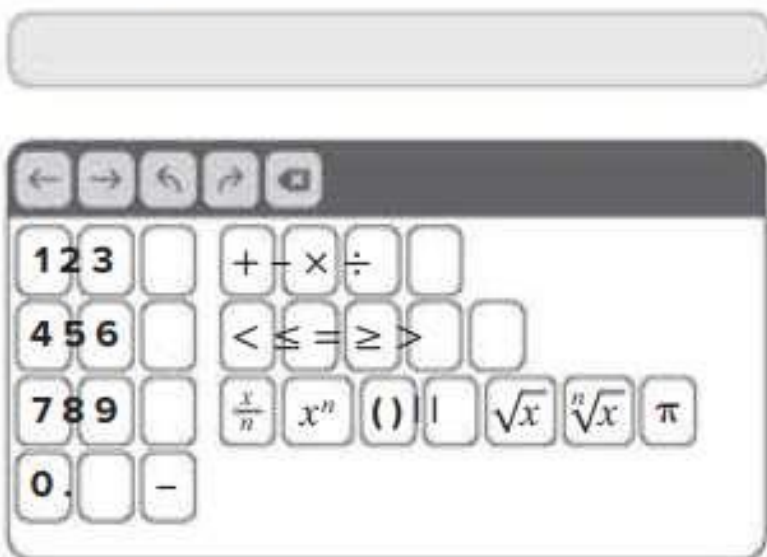
9. Marie is making scarves. She has 7 yards of fabric and each scarf needs $\frac{5}{8}$ yard of fabric. Find $7 \div \frac{5}{8}$. Then interpret the quotient.

$$\frac{7}{1} \times \frac{8}{5} = \frac{56}{5} = \frac{55+1}{5} = 11 \frac{1}{5} \checkmark$$

10. Roberto is at a tennis day camp. The coach has set aside 2 hours to play mini matches that last $\frac{3}{5}$ hour. Find $2 \div \frac{3}{5}$. Then interpret the quotient.

$$\frac{2}{1} \times \frac{5}{3} = \frac{10}{3} \Rightarrow \frac{9+1}{3} = 3 \frac{1}{3}$$

11. Equation Editor What is the value of $15 \div \frac{5}{9}$?



$$\frac{15}{1} \times \frac{9}{5 \div 5 = 1}$$

$$3 \times 9 = 27 \checkmark$$

Question 19: Apply prior knowledge about multiplication and division with whole numbers and the division of whole numbers by fractions to divide fractions by fractions (page:175)

1. $\frac{5}{6} \div \frac{5}{12} =$

$$1. \frac{\cancel{5}^{\div 5}}{6} \times \frac{12}{\cancel{5}_{\div 5}} = \frac{12}{6} = \boxed{2}$$

2. $\frac{1}{3} \div \frac{1}{9} =$

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

3. $\frac{3}{7} \div \frac{1}{14} =$

$$1. \frac{\cancel{7}^{\div 7}}{3} \times \frac{\cancel{14}^{\div 7}_2}{1}$$

$$3 \times 2 = \textcircled{6}$$

4. Romeo had $\frac{3}{4}$ pound of fudge left. He divided the remaining fudge into $\frac{5}{16}$ -pound bags. Write and solve an equation that models the situation. Then interpret the quotient.

$$\frac{3}{4} \div \frac{5}{16} \Rightarrow \frac{3}{\cancel{4 \div 4}^1} \times \frac{\cancel{16 \div 4}^4}{5} = \frac{3 \times 4}{5} = \frac{12}{5} = 2\frac{2}{5}$$

5. Chelsea has $\frac{7}{8}$ pound of butter to make icing. Each batch of icing needs $\frac{1}{4}$ pound of butter. Write and solve an equation that models the situation. Then interpret the quotient.

$$\frac{7}{8} \div \frac{1}{4} \Rightarrow \frac{7}{\cancel{8 \div 4}^2} \times \frac{\cancel{4 \div 4}^1}{1} = \frac{7}{2} = 3\frac{1}{2}$$

6. Write a story context for $\frac{5}{6} \div \frac{1}{6}$. Then find the quotient.

$$\frac{\cancel{5}}{\cancel{6}} \times \frac{\cancel{6}}{1} = \frac{5}{1} = 5$$

7. **Equation Editor** What is the value of the expression $\frac{2}{5} \div \frac{1}{6}$?

$$\frac{2}{5} \times \frac{6}{1} = \frac{12}{5} = 2 \frac{2}{5}$$

**Question 20: Apply prior knowledge about division
and reciprocals to divide fractions by whole and
mixed numbers. (page:185)**

1. The drama teacher is making bandanas for costumes. She is cutting $\frac{1}{2}$ yard of fabric into 6 bandanas of the same size. Write and solve an equation to find how much fabric there will be for each bandana.

$$\frac{1}{2} \div 6 \Rightarrow \frac{1}{2} \div \frac{1}{6} = \left(\frac{1}{12} \right) \rightarrow \text{each bandana}$$

2. A landscape designer has $\frac{4}{5}$ ton of mulch to $\div$ divide equally among 8 customers. Write and solve an equation to find how much mulch each customer will receive.

$$\frac{4}{5} \div \frac{8}{1} \Rightarrow \frac{4}{5} \times \frac{1}{8} = \frac{4 \div 4}{20 \div 4} = \left(\frac{1}{10} \right)$$

each customer get $\frac{1}{10}$ ton.

$$3. 2\frac{4}{5} \div 4 =$$

$$\frac{10+4}{5} \div \frac{4}{1} \Rightarrow \frac{14}{5} \div \frac{4}{1}$$

$$\cancel{7} \frac{\cancel{14} \div 2}{5} \times \frac{1}{\cancel{4} \div 2} = \left(\frac{7}{10} \right)$$

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

$$\frac{18+2}{3} \div \frac{8}{1} \Rightarrow \frac{20}{3} \div \frac{8}{1}$$

$$\frac{20 \div 4}{3} \times \frac{1}{8 \div 4} \Rightarrow \frac{5}{3} \times \frac{1}{2} = \left(\frac{5}{6} \right)$$

$$5. 4\frac{2}{3} \div 6 =$$

$$\frac{14 \div 2}{3} \times \frac{1}{6 \div 2} \Rightarrow \frac{7}{3} \times \frac{1}{3} = \left(\frac{7}{9} \right)$$

$$6. 3\frac{+3}{\times 5} \div 1\frac{+1}{\times 2} =$$

$$\frac{18}{5} \div \frac{3}{2} \Rightarrow \frac{18 \div 3}{5} \times \frac{2}{3 \div 3} \Rightarrow \frac{6}{5} \times \frac{2}{1} = \frac{12}{5} = \left(2 \frac{2}{5}\right)$$

$$7. 3\frac{+3}{\times 4} \div 1\frac{+2}{\times 3} =$$

$$\frac{15}{4} \div \frac{5}{3} \Rightarrow \frac{15 \div 3}{4} \times \frac{3}{5 \div 5} = \frac{3}{4} \times \frac{3}{1} = \frac{9}{4} = \left(2 \frac{1}{4}\right)$$

$$8. 4\frac{+1}{\times 2} \div 2\frac{+7}{\times 10} =$$

$$\frac{9}{2} \div \frac{27}{10} \Rightarrow \frac{9 \div 9}{2} \times \frac{10 \div 2}{27 \div 9} = \frac{1}{2} \times \frac{5}{3} = \frac{5}{6}$$

Free response questions (FRQ)

الأسئلة المقالية (الكتابية)



ملاحظة: يجب على الطالب التدرب جيداً على طريقة الحل وكتابة جميع خطوات الحل في الجزء الكتابي.

متمنياً للجميع النجاح والتوفيق



**Question 21: Represent a collection of
equivalent ratios (page:15,16,17)**

Example:

To make yellow icing, Amida mixes 6 drops of yellow food coloring with 2 cups of white icing.

How many drops of yellow food coloring should Amida mix with 8 cups of white icing to get the same shade of yellow?

drops of yellow	6	24?
white icing	2	8

$\times 4$

$\times 4$

$$6 \times 4 = 24$$

She want 24 drops of yellow

Example:



Akeno mixes three sample containers of yellow paint with four sample containers of red paint to create his favorite shade of orange paint. His little sister Aiko wants to create the same shade of orange paint, but she only has two sample containers of red paint.



What should Aiko do to create the same shade of orange paint?

yellow paint	3	1.5 ?
Red paint	4	2

$$3 \div 2 = 1.5$$

Aiko want 1.5 containers of yellow with 2 containers of red paint

Example:

Natasha made raspberry punch for a party by mixing 9 fluid ounces of fruit punch, 3 liters of soda, and 6 scoops of raspberry ice cream. Halfway through the party, the punch bowl was empty.

If Natasha only has 6 fluid ounces of fruit punch left, how much ice cream does she need to make another batch of punch?

fruit punch	9	3	6
ice cream	6	2	4

Ratio 6:4

⇒ Natasha should mix 4 scoops of ice cream with 6 scoops of fruit punch.

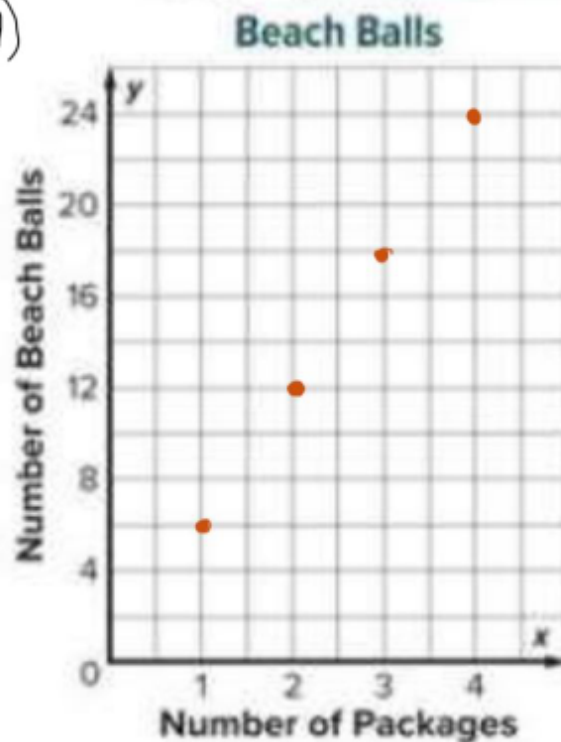
Question 22: Graph a ratio relationship on the coordinate plane (page: 27,28)

1. Lulah is buying beach balls for her beach themed party. Each package contains 6 beach balls. Generate the set of ordered pairs for the ratio relationship between the number of beach balls y and the number of packages x for a total of 1, 2, 3, and 4 packages. Then graph the relationship on the coordinate plane and describe the pattern in the graph. (Examples 1 and 2)

Packages	Beach balls
1	6
2	12
3	18
4	24

$(1, 6)$ $(2, 12)$ $(3, 18)$ $(4, 24)$

The number of beach balls increases by 6 as the number of packages increase by 1



2. A sloth travels about 7 feet every minute.

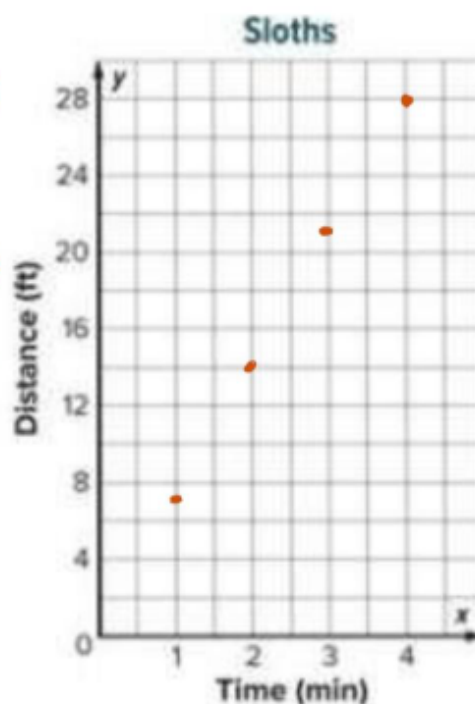
Generate the set of ordered pairs for the ratio relationship between the total distance traveled y and the number of minutes x for a total of 1, 2, 3, and 4 minutes. Then graph the relationship on the coordinate plane and describe the pattern in the graph.

(Examples 1 and 2)

Time (min)	Distance (feet)
1	7
2	14
3	21
4	28

$(1, 7)$ $(2, 14)$ $(3, 21)$ $(4, 28)$

The distance travelled increases by 7 feet as the number of minutes increase by 1 minute.

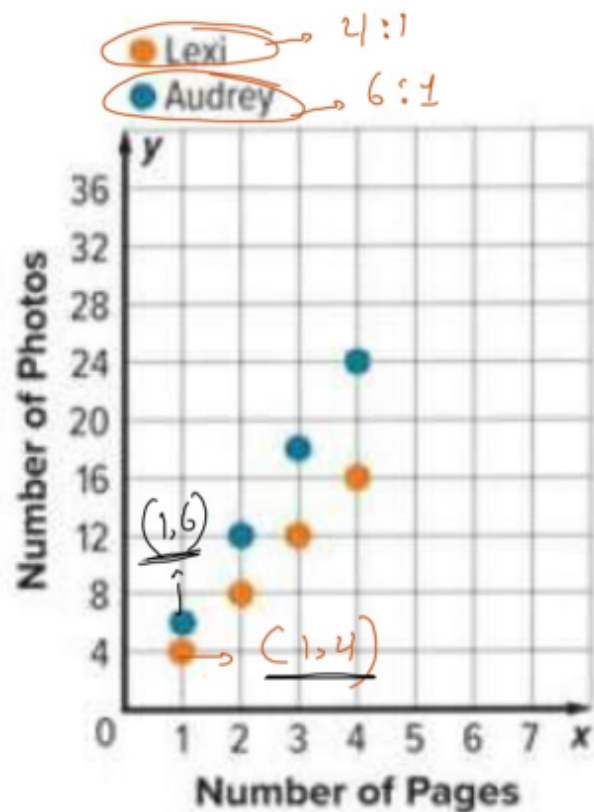


3. Two friends are making scrapbooks. The number of photos Lexi and Audrey place on each page of their scrapbooks is shown in the graph. Describe the ratio relationship for each person.

The ratio of photos to pages

for Lexi's is $4:1$, But
the ratio of photos to pages
for Audrey is $6:1$

$\therefore$ Audrey uses more
photos per page than Lexi
 $\text{Audrey} > \text{Lexi}$.



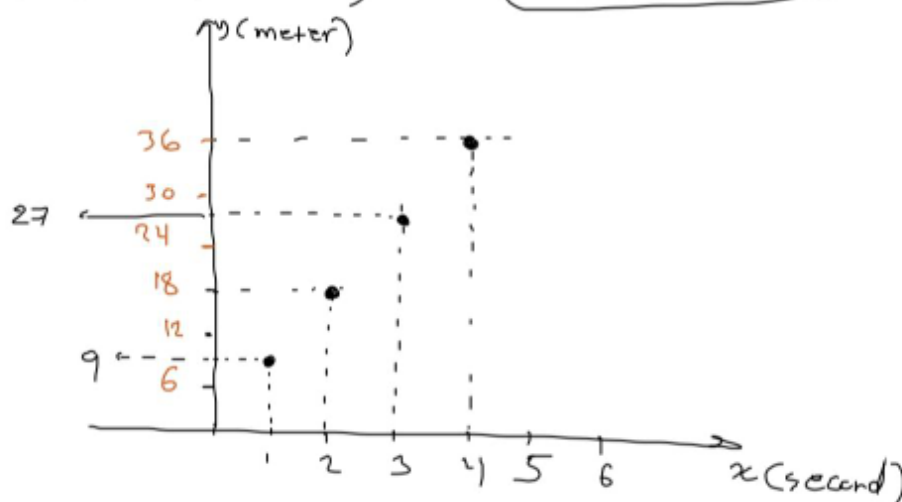
7. **MP Reason Abstractly** The table gives the number of beads needed to make bracelets of certain lengths. Suppose you graph the ordered pairs (bracelet length, number of beads) on the coordinate plane. Would the point (10.5, 42) make sense in this context? Explain.

Bracelet Length (in.)	7	8	9	10
Number of Beads	28	32	36	40

8. **Multiple Relationships** For every second, the average green sea turtle can swim 9 meters. Represent how far a green sea turtle can swim in 1, 2, 3 and 4 seconds in a table. Then graph the points on a coordinate plane.

$(1, 9) (2, 18) (3, 27) (4, 36)$

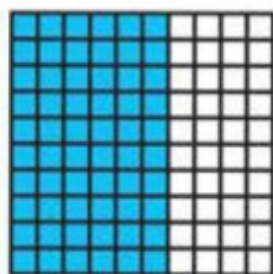
Ratio 9:1



**Question 23: Show a ratio relationship
between two quantities using different
representations (page:83)**

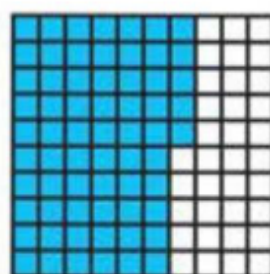
For 1,2 identify the percent represented by each 10×10 grid:

1.



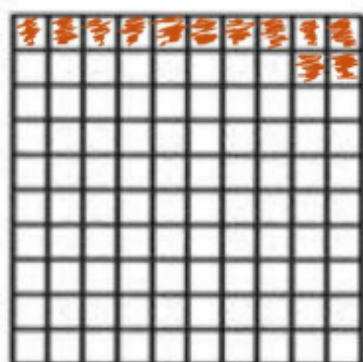
60 %

2.

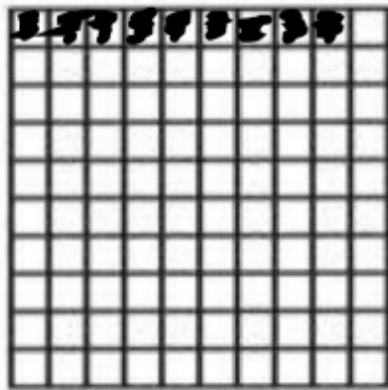


65 %

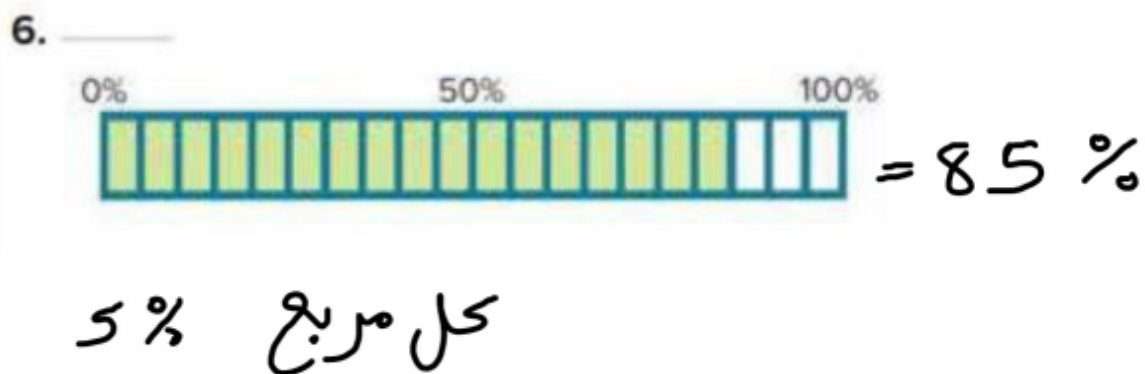
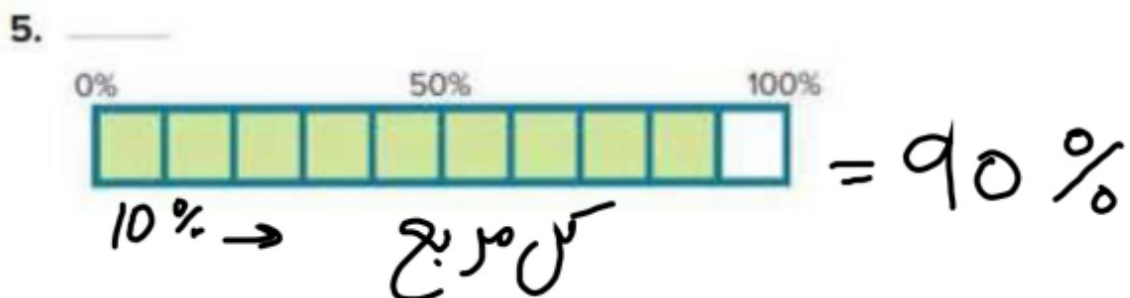
3. In a school survey, 12% of the students surveyed said they like camping. Shade the 10×10 grid to model 12%. (Example 2)



4. Of the students in the lunch line, 9% said they were buying strawberry milk. Shade the 10×10 grid to model 9%. (Example 2)



identify the percent represented by each bar diagram:



Question 24: Find the whole, given the part and the percent by using bar diagrams, ratio tables, double number lines, and equivalent ratios (page 127,128)

8. Open Response The number of sixth grade students accounts for 35% of the total number of students enrolled in middle school. There are 245 sixth grade students. How many students are enrolled in the middle school?

$$35\% \text{ of the total} = 245$$

$$\therefore \frac{35 \div 5 = 7}{100 \div 5 = 20} = \frac{245}{\boxed{x}}$$

$$\therefore \frac{7}{20} = \frac{245}{x}$$

$$\frac{7x}{7} = \frac{4900}{7}$$

$$\boxed{x = 700}$$

700 students in the school.

9. Three different options for school lunch were offered on Friday. The table shows the percent of the total lunches sold for each option. If 270 students bought a cheese pizza or a pepperoni pizza, how many lunches were sold on Friday? If each lunch costs \$3.50, how much money will the cafeteria earn from all of the lunches?

Option	Percent
Cheese Pizza	50
Pepperoni Pizza	40
Fried Chicken	10

$$\text{cheese and pepperoni} = \frac{90}{100} = 90\%$$

$$\therefore \frac{90}{100} = \frac{270}{x}$$

$$\therefore \underline{x = 300 \text{ lunches}}$$

$$\text{cafeteria earn } 300 \times 3.5 = \underline{\underline{\$1050}}$$

Question 25: Solve problems by using the standard algorithms for addition, subtraction, multiplication, and division to compute with multi-digit (Page 153)

Find each difference:

3. $139.65 - 59.623 =$

$$\begin{array}{r} 139.65^{\cancel{4}}^{\cancel{10}} \\ - 59.623 \\ \hline 80.027 \end{array}$$

✓

4. $352.37 - 231.975 =$

$$\begin{array}{r} 352.37^{\cancel{1}}^{\cancel{12}}^{\cancel{16}}^{\cancel{10}} \\ - 231.975 \\ \hline 120.395 \end{array}$$

✓

Find each quotient:

$$7. \underbrace{32.674} \div \underbrace{0.016} =$$
$$32674 \div 16$$

$$2042 R2$$
$$\begin{array}{r} 16 \overline{) 32674} \\ \underline{32} \\ 0067 \\ \underline{- 64} \\ 34 \\ \underline{- 32} \\ 2 \end{array}$$

$$8. \underbrace{3.825} \div \underbrace{0.25} =$$

$$382.5 \div 25$$

$$15.3 \checkmark$$
$$\begin{array}{r} 25 \overline{) 382.5} \\ \underline{- 25} \\ 132 \\ \underline{- 125} \\ 75 \\ \underline{- 75} \\ 00 \end{array}$$