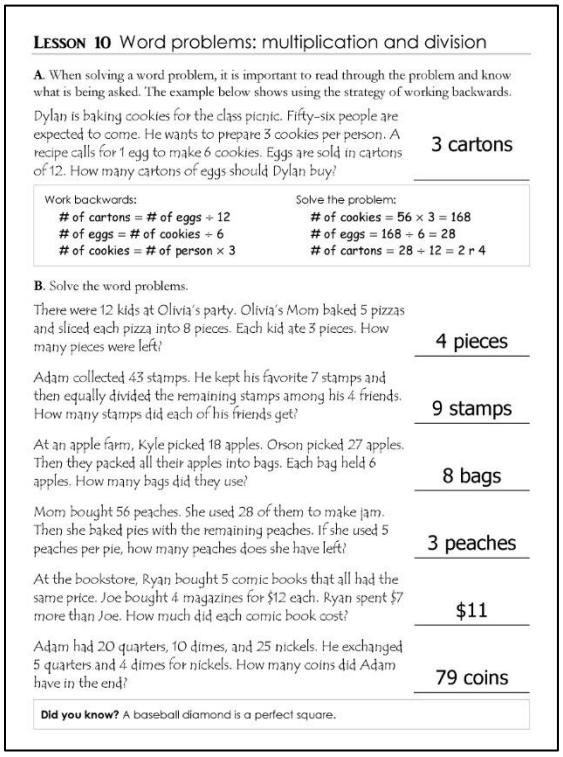
Lesson 25



LESSON 10 Word problems: multiplication and division

A. When solving a word problem, it is important to read through the problem and know what is being asked. The example below shows using the strategy of working backwards.

Dylan is baking cookies for the class picnic. Fifty-six people are expected to come. He wants to prepare 3 cookies per person. A recipe calls for 1 egg to make 6 cookies. Eggs are sold in cartons of 12. How many cartons of eggs should Dylan buy? **3 cartons**

Work backwards:
# of cartons = # of eggs ÷ 12
# of eggs = # of cookies ÷ 6
# of cookies = # of person × 3

Solve the problem:
# of cookies = 56 × 3 = 168
# of eggs = 168 ÷ 6 = 28
# of cartons = 28 ÷ 12 = 2 r 4

B. Solve the word problems.

There were 12 kids at Olivia's party. Olivia's Mom baked 5 pizzas and sliced each pizza into 8 pieces. Each kid ate 3 pieces. How many pieces were left? **4 pieces**

Adam collected 43 stamps. He kept his favorite 7 stamps and then equally divided the remaining stamps among his 4 friends. How many stamps did each of his friends get? **9 stamps**

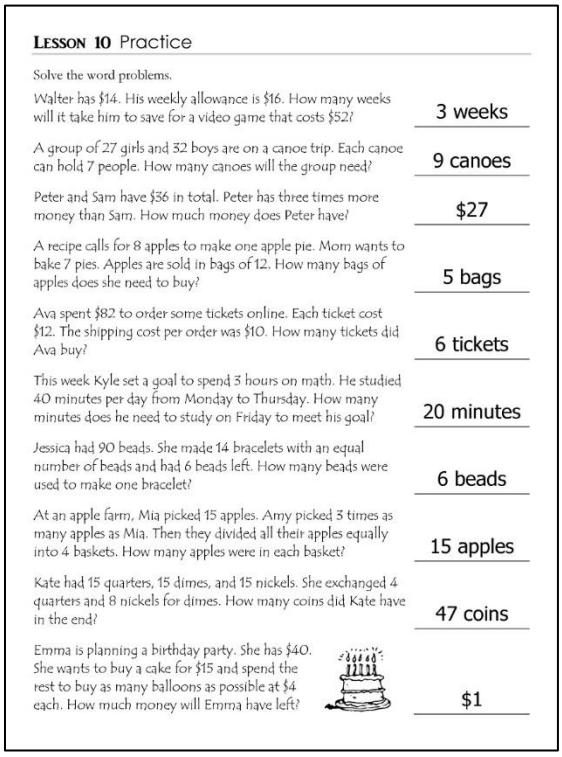
At an apple farm, Kyle picked 18 apples. Orson picked 27 apples. Then they packed all their apples into bags. Each bag held 6 apples. How many bags did they use? **8 bags**

Mom bought 56 peaches. She used 28 of them to make jam. Then she baked pies with the remaining peaches. If she used 5 peaches per pie, how many peaches does she have left? **3 peaches**

At the bookstore, Ryan bought 5 comic books that all had the same price. Joe bought 4 magazines for $12 each. Ryan spent $7 more than Joe. How much did each comic book cost? **$11**

Adam had 20 quarters, 10 dimes, and 25 nickels. He exchanged 5 quarters and 4 dimes for nickels. How many coins did Adam have in the end? **79 coins**

Did you know? A baseball diamond is a perfect square.



LESSON 10 Practice

Solve the word problems.

Walter has $14. His weekly allowance is $16. How many weeks will it take him to save for a video game that costs $52? **3 weeks**

A group of 27 girls and 32 boys are on a canoe trip. Each canoe can hold 7 people. How many canoes will the group need? **9 canoes**

Peter and Sam have $36 in total. Peter has three times more money than Sam. How much money does Peter have? **$27**

A recipe calls for 8 apples to make one apple pie. Mom wants to bake 7 pies. Apples are sold in bags of 12. How many bags of apples does she need to buy? **5 bags**

Ava spent $82 to order some tickets online. Each ticket cost $12. The shipping cost per order was $10. How many tickets did Ava buy? **6 tickets**

This week Kyle set a goal to spend 3 hours on math. He studied 40 minutes per day from Monday to Thursday. How many minutes does he need to study on Friday to meet his goal? **20 minutes**

Jessica had 90 beads. She made 14 bracelets with an equal number of beads and had 6 beads left. How many beads were used to make one bracelet? **6 beads**

At an apple farm, Mia picked 15 apples. Amy picked 3 times as many apples as Mia. Then they divided all their apples equally into 4 baskets. How many apples were in each basket? **15 apples**

Kate had 15 quarters, 15 dimes, and 15 nickels. She exchanged 4 quarters and 8 nickels for dimes. How many coins did Kate have in the end? **47 coins**

Emma is planning a birthday party. She has $40. She wants to buy a cake for $15 and spend the rest to buy as many balloons as possible at $4 each. How much money will Emma have left? **$1**

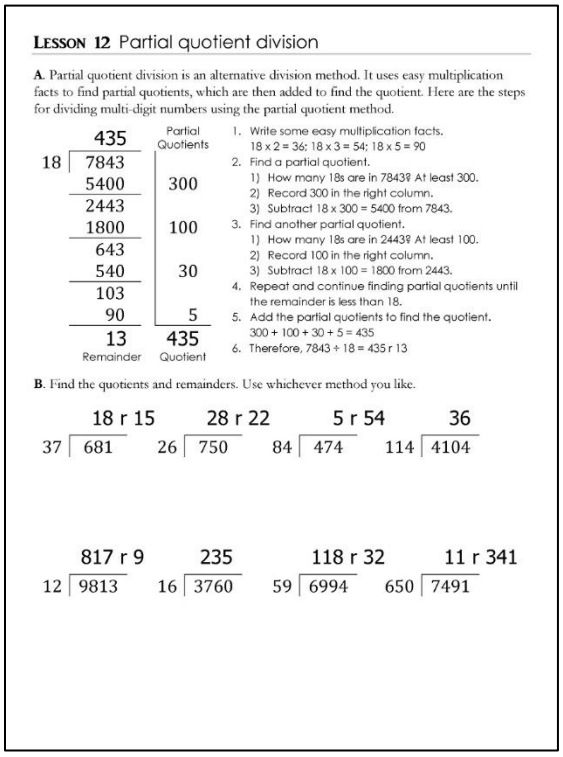
This page is on word problems. They will be using multiplication, division, addition, and subtraction. They will need to take multiple steps to find the answer to the question. They could use their word problem strategies like drawing a picture or using smaller numbers to figure out what to do. However, they should start by asking what they need to know to answer the question. That will help them figure out the first step. They will definitely need to work on scratch paper for today.

Here are the first two worked out.

Question: How many pieces left?
Need to know: how many pieces all together and how many were eaten
# of pieces: 5 x 8 = 40
eaten: 12 x 3 = 36
left 40 – 36 = 4 pieces

Question: How many stamps each?
Need to know: how many stamps all together, how many friends
# of stamps: 43 – 7 = 36
# of friends: 4
each: 36/4 = 9 stamps

Lesson 27



LESSON 12 Partial quotient division

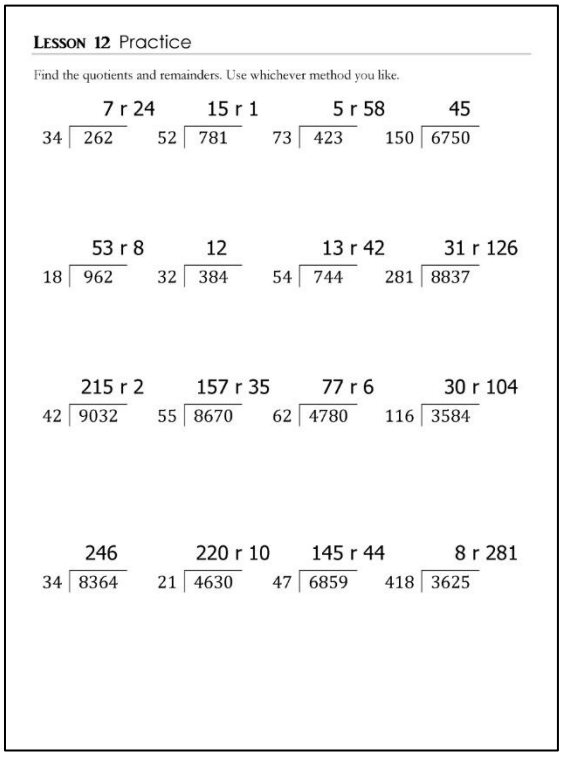
A. Partial quotient division is an alternative division method. It uses easy multiplication facts to find partial quotients, which are then added to find the quotient. Here are the steps for dividing multi-digit numbers using the partial quotient method.

		Partial Quotients
18	7843	
	5400	300
	2443	
	1800	100
	643	
	540	30
	103	
	90	5
Remainder	13	435 Quotient

1. Write some easy multiplication facts.
   18 x 2 = 36; 18 x 3 = 54; 18 x 5 = 90
2. Find a partial quotient.
   1) How many 18s are in 7843? At least 300.
   2) Record 300 in the right column.
   3) Subtract 18 x 300 = 5400 from 7843.
3. Find another partial quotient.
   1) How many 18s are in 2443? At least 100.
   2) Record 100 in the right column.
   3) Subtract 18 x 100 = 1800 from 2443.
4. Repeat and continue finding partial quotients until the remainder is less than 18.
5. Add the partial quotients to find the quotient.
   300 + 100 + 30 + 5 = 435
6. Therefore, 7843 ÷ 18 = 435 r 13

B. Find the quotients and remainders. Use whichever method you like.

18 r 15	28 r 22	5 r 54	36
37 ⟌ 681	26 ⟌ 750	84 ⟌ 474	114 ⟌ 4104
817 r 9	235	118 r 32	11 r 341
12 ⟌ 9813	16 ⟌ 3760	59 ⟌ 6994	650 ⟌ 7491



LESSON 12 Practice

Find the quotients and remainders. Use whichever method you like.

7 r 24	15 r 1	5 r 58	45
34 ⟌ 262	52 ⟌ 781	73 ⟌ 423	150 ⟌ 6750
53 r 8	12	13 r 42	31 r 126
18 ⟌ 962	32 ⟌ 384	54 ⟌ 744	281 ⟌ 8837
215 r 2	157 r 35	77 r 6	30 r 104
42 ⟌ 9032	55 ⟌ 8670	62 ⟌ 4780	116 ⟌ 3584
246	220 r 10	145 r 44	8 r 281
34 ⟌ 8364	21 ⟌ 4630	47 ⟌ 6859	418 ⟌ 3625

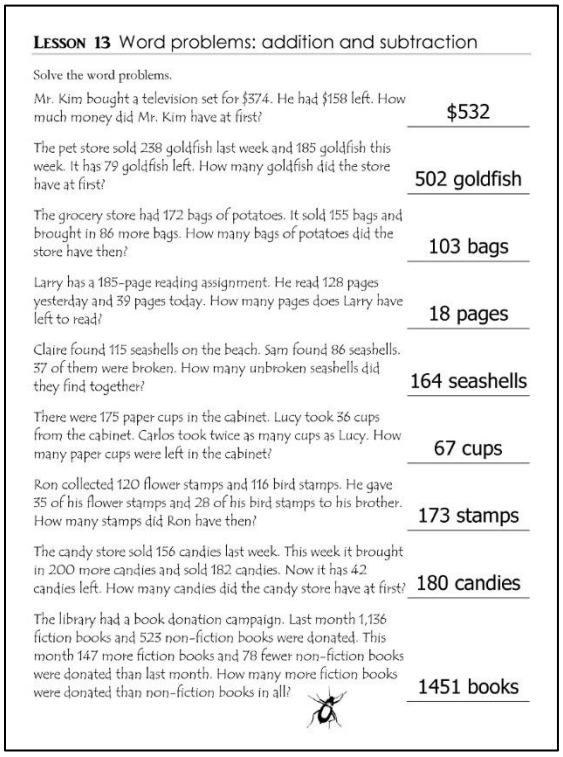
Your child should take the time to look through the example and use the directions to follow along.

This is another way to look at long division. With this method, they don't have to figure out the highest possible number of times that a number goes into something. In the example, 18 goes into 78 four times, but at first they just use 3 times. They subtract that off and see that it can go in another time.

Here's another way to write the same method.

Groups	Totals
	7843
300	5400 (18 x 300)
	2443
100	1800 (18 x 100)
	643
30	540 (18 x 30)
	103
5	90 (5 x 18)
435	13

Lesson 28



LESSON 13 Word problems: addition and subtraction

Solve the word problems.

Mr. Kim bought a television set for $374. He had $158 left. How much money did Mr. Kim have at first? $532

The pet store sold 238 goldfish last week and 185 goldfish this week. It has 79 goldfish left. How many goldfish did the store have at first? 502 goldfish

The grocery store had 172 bags of potatoes. It sold 155 bags and brought in 86 more bags. How many bags of potatoes did the store have then? 103 bags

Larry has a 185-page reading assignment. He read 128 pages yesterday and 39 pages today. How many pages does Larry have left to read? 18 pages

Claire found 115 seashells on the beach. Sam found 86 seashells. 37 of them were broken. How many unbroken seashells did they find together? 164 seashells

There were 175 paper cups in the cabinet. Lucy took 36 cups from the cabinet. Carlos took twice as many cups as Lucy. How many paper cups were left in the cabinet? 67 cups

Ron collected 120 flower stamps and 116 bird stamps. He gave 35 of his flower stamps and 28 of his bird stamps to his brother. How many stamps did Ron have then? 173 stamps

The candy store sold 156 candies last week. This week it brought in 200 more candies and sold 182 candies. Now it has 42 candies left. How many candies did the candy store have at first? 180 candies

The library had a book donation campaign. Last month 1,136 fiction books and 523 non-fiction books were donated. This month 147 more fiction books and 78 fewer non-fiction books were donated than last month. How many more fiction books were donated than non-fiction books in all? 1451 books

LESSON 13 Practice

Solve the word problems.

Brian has 55 baseball cards. Matt has 48 more baseball cards than Brian. How many baseball cards does Matt have? 103 cards

Ryan had 33 dimes. His mom gave him some more dimes. Now he has 50 dimes. How many dimes did Ryan get from his mom? 17 dimes

Heather had 72 cents. She spent 44 cents on candies and 15 cents on cookies. How much money does Heather have left? 13 cents

Sam has $25. Clara has $16 more than Sam. Matt has $8 less than Sam. How much money do they have in all? $83

Ron wants to buy three books that cost $18, $13, and $16 each. He has saved $12 so far. How much more money does Ron need to buy all three books? $35

Jack solved 32 multiplication problems and 20 division problems. He got 5 multiplication problems and 4 division problems wrong. How many problems did he get correct in all? 43 problems

Julio saved $20 in May. He saved $18 in June and $15 in July. Then Julio spent $28 during summer vacation. How much money does Julio have left? $25

Jessica has 36 red beads, 65 blue beads, and 42 green beads. She needs 9 beads from each color to make a necklace. How many beads will Jessica have left after making 2 necklaces? 89 beads

This year Mia planted 35 roses. Her sister Heather planted 20 more roses than Mia. Half the roses have bloomed so far. How many roses have not bloomed yet? 45 roses

Our homeschool group included 12 high school students, 27 middle school students, 23 elementary students, 44 parents, and 18 kids in the nursery. How many people were in our homeschool group in all? 124 people

This is a page of word problems. They can use word problem strategies like drawing pictures or using smaller numbers. They will need to use scratch paper for today. Here are the first couple of problems worked out and the set up for several others.

$374 + $158 = $532
They could think of this with smaller numbers to figure out what to do. He bought something for $3 and still had $1 leftover. How much did he have at first? $4 (3+1)

238 + 185 + 79 = 502 goldfish
This is another one that using smaller numbers would help. They sold 2 then 1 and had 1 leftover. How many did they have at first? 2 + 1 + 1. They need to add.

172 – 155 + 86 bags

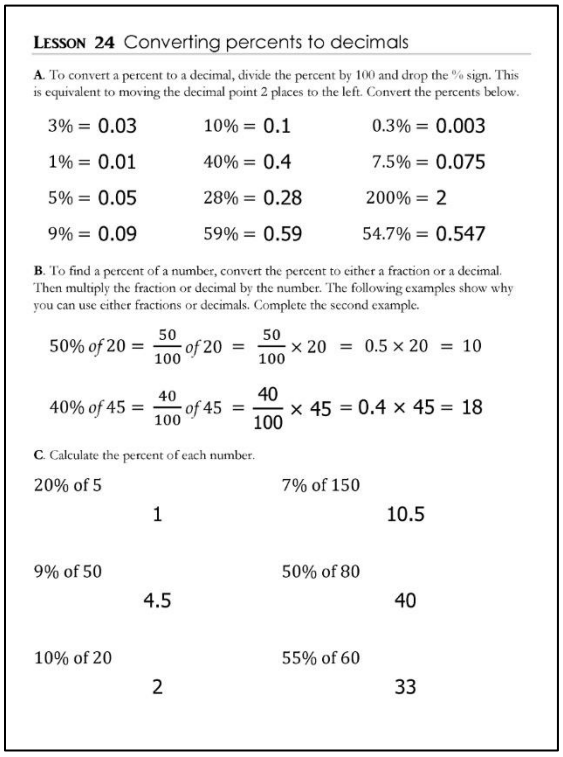
185 – 128 – 39 pages

115 + 86 – 37 seashells

175 – 36 – (2 x 36) cups

120 + 116 – 35 – 28 = 236 – 63 stamps

Lesson 112



LESSON 24 Converting percents to decimals

A. To convert a percent to a decimal, divide the percent by 100 and drop the % sign. This is equivalent to moving the decimal point 2 places to the left. Convert the percents below.

3% = 0.03	10% = 0.1	0.3% = 0.003
1% = 0.01	40% = 0.4	7.5% = 0.075
5% = 0.05	28% = 0.28	200% = 2
9% = 0.09	59% = 0.59	54.7% = 0.547

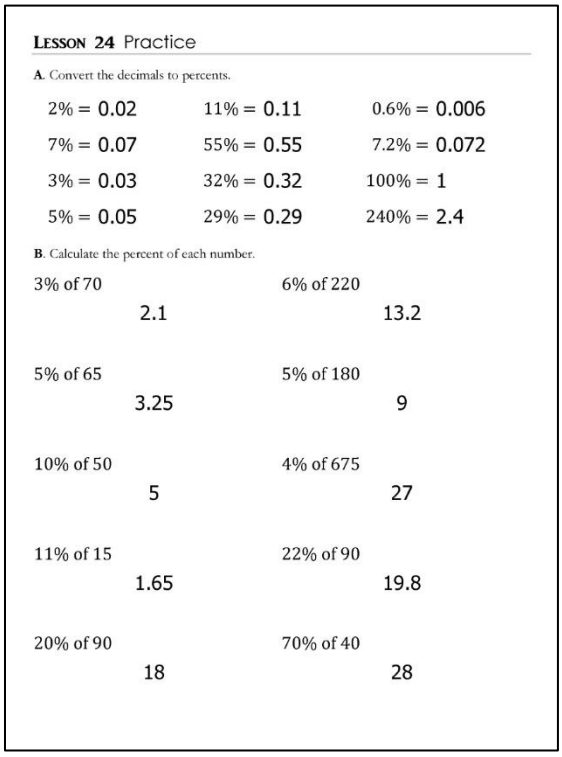
B. To find a percent of a number, convert the percent to either a fraction or a decimal. Then multiply the fraction or decimal by the number. The following examples show why you can use either fractions or decimals. Complete the second example.

$$50\% \text{ of } 20 = \frac{50}{100} \text{ of } 20 = \frac{50}{100} \times 20 = 0.5 \times 20 = 10$$

$$40\% \text{ of } 45 = \frac{40}{100} \text{ of } 45 = \frac{40}{100} \times 45 = 0.4 \times 45 = 18$$

C. Calculate the percent of each number.

20% of 5	7% of 150
1	10.5
9% of 50	50% of 80
4.5	40
10% of 20	55% of 60
2	33



LESSON 24 Practice

A. Convert the decimals to percents.

2% = 0.02	11% = 0.11	0.6% = 0.006
7% = 0.07	55% = 0.55	7.2% = 0.072
3% = 0.03	32% = 0.32	100% = 1
5% = 0.05	29% = 0.29	240% = 2.4

B. Calculate the percent of each number.

3% of 70	6% of 220
2.1	13.2
5% of 65	5% of 180
3.25	9
10% of 50	4% of 675
5	27
11% of 15	22% of 90
1.65	19.8
20% of 90	70% of 40
18	28

Today they are moving in the opposite direction and converting from percents to decimals.

The decimal point will be moving in the opposite direction. It will move two places to the left. Here are some examples.

30% becomes 0.30 or 0.3

2% becomes 0.02

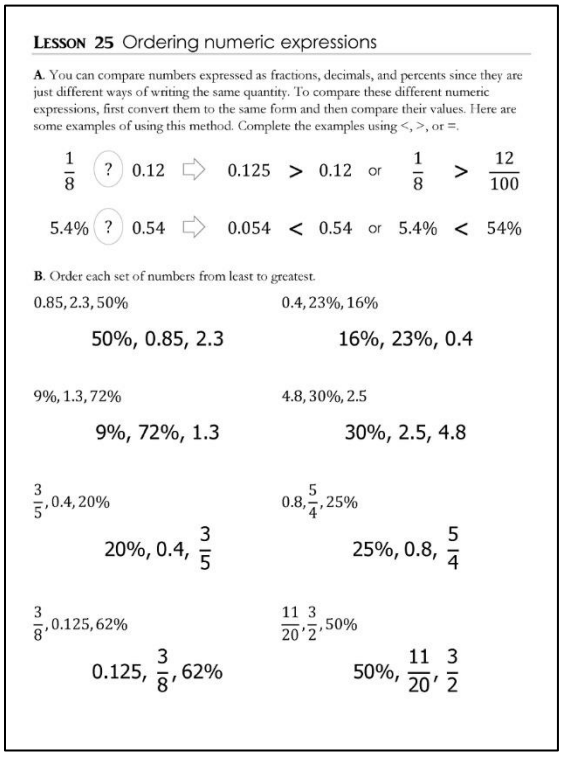
683% becomes 6.83

They are going to be multiplying by percents as well, which just means multiplying by a decimal. The examples show that you can multiply by a fraction as well, but I think it's much simpler to multiply by the decimal.

25% of 10 is 0.25 x 10 = 2.5

"Of" is always a clue word that you need to multiply.

Lesson 114



LESSON 25 Ordering numeric expressions

A. You can compare numbers expressed as fractions, decimals, and percents since they are just different ways of writing the same quantity. To compare these different numeric expressions, first convert them to the same form and then compare their values. Here are some examples of using this method. Complete the examples using <, >, or =.

$\frac{1}{8}$? 0.12 ⇨ 0.125 > 0.12 or $\frac{1}{8} > \frac{12}{100}$

5.4% ? 0.54 ⇨ 0.054 < 0.54 or 5.4% < 54%

B. Order each set of numbers from least to greatest.

0.85, 2.3, 50%

50%, 0.85, 2.3

0.4, 23%, 16%

16%, 23%, 0.4

9%, 1.3, 72%

9%, 72%, 1.3

4.8, 30%, 2.5

30%, 2.5, 4.8

$\frac{3}{5}$, 0.4, 20%

20%, 0.4, $\frac{3}{5}$

0.8, $\frac{5}{4}$, 25%

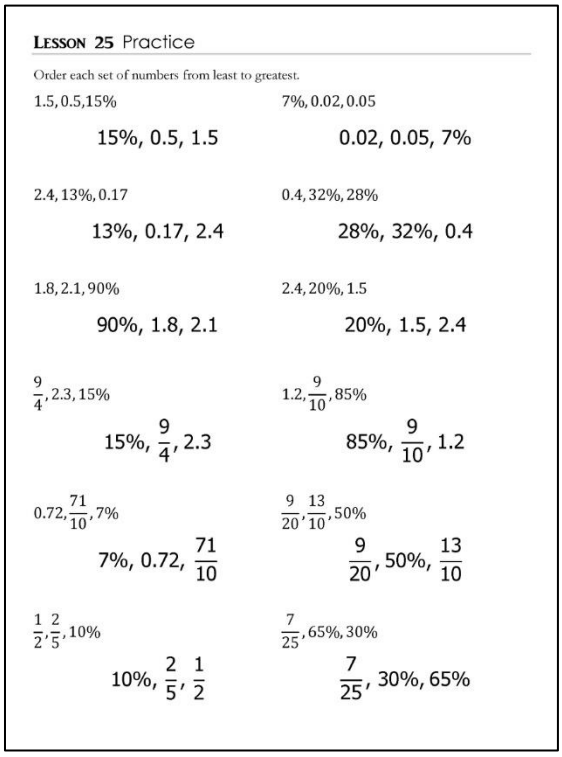
25%, 0.8, $\frac{5}{4}$

$\frac{3}{8}$, 0.125, 62%

0.125, $\frac{3}{8}$, 62%

$\frac{11}{20}, \frac{3}{2}$, 50%

50%, $\frac{11}{20}, \frac{3}{2}$



LESSON 25 Practice

Order each set of numbers from least to greatest.

1.5, 0.5, 15%

15%, 0.5, 1.5

7%, 0.02, 0.05

0.02, 0.05, 7%

2.4, 13%, 0.17

13%, 0.17, 2.4

0.4, 32%, 28%

28%, 32%, 0.4

1.8, 2.1, 90%

90%, 1.8, 2.1

2.4, 20%, 1.5

20%, 1.5, 2.4

$\frac{9}{4}$, 2.3, 15%

15%, $\frac{9}{4}$, 2.3

1.2, $\frac{9}{10}$, 85%

85%, $\frac{9}{10}$, 1.2

0.72, $\frac{71}{10}$, 7%

7%, 0.72, $\frac{71}{10}$

$\frac{9}{20}, \frac{13}{10}$, 50%

$\frac{9}{20}$, 50%, $\frac{13}{10}$

$\frac{1}{2}, \frac{2}{5}$, 10%

10%, $\frac{2}{5}, \frac{1}{2}$

$\frac{7}{25}$, 65%, 30%

$\frac{7}{25}$, 30%, 65%

They will be working with fractions, decimals, and percents today. They will be ordering numbers, finding which is greater, which is less.

To compare the numbers it's easiest to put them in the same format, to compare fractions to fractions and decimals to decimals, percents to percents.

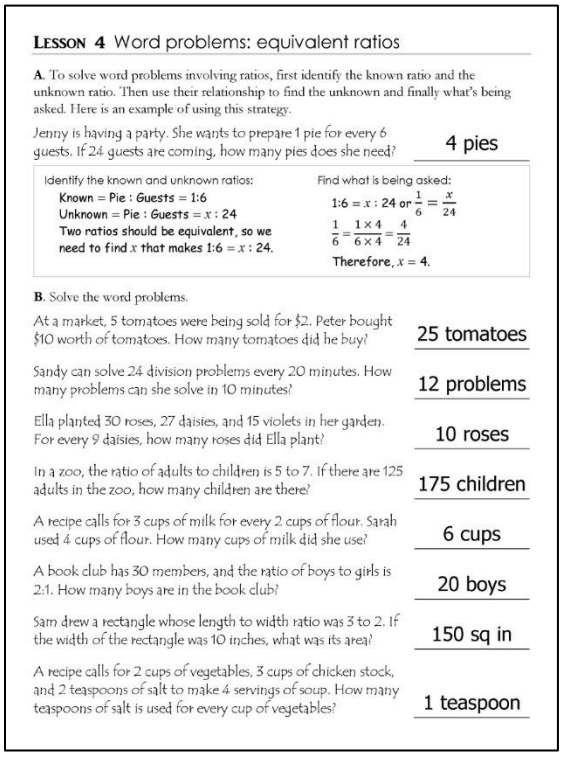
Here's the first from the lesson page.

> 0.85, 2.3, 50% In percents that's 85%, 230%, 50%. Then it's easy to order them.
>
> To find the percent, you move the decimal point over two places to the right.

Here's another example.

> 3/5, 0.4, 20% That's 0.6, 0.4, 0.2 in decimals.
>
> I doubled 3 and 5 to get six tenths. That's easy to write as a decimal. To turn the percent into a decimal, I moved the decimal back over to the left two places.

Lesson 122



LESSON 4 Word problems: equivalent ratios

A. To solve word problems involving ratios, first identify the known ratio and the unknown ratio. Then use their relationship to find the unknown and finally what's being asked. Here is an example of using this strategy.

Jenny is having a party. She wants to prepare 1 pie for every 6 guests. If 24 guests are coming, how many pies does she need? 4 pies

Identify the known and unknown ratios:
Known = Pie : Guests = 1:6
Unknown = Pie : Guests = x : 24
Two ratios should be equivalent, so we need to find x that makes 1:6 = x : 24.

Find what is being asked:
1:6 = x : 24 or $\frac{1}{6} = \frac{x}{24}$
$\frac{1}{6} = \frac{1 \times 4}{6 \times 4} = \frac{4}{24}$
Therefore, $x = 4$.

B. Solve the word problems.

At a market, 5 tomatoes were being sold for $2. Peter bought $10 worth of tomatoes. How many tomatoes did he buy? 25 tomatoes

Sandy can solve 24 division problems every 20 minutes. How many problems can she solve in 10 minutes? 12 problems

Ella planted 30 roses, 27 daisies, and 15 violets in her garden. For every 9 daisies, how many roses did Ella plant? 10 roses

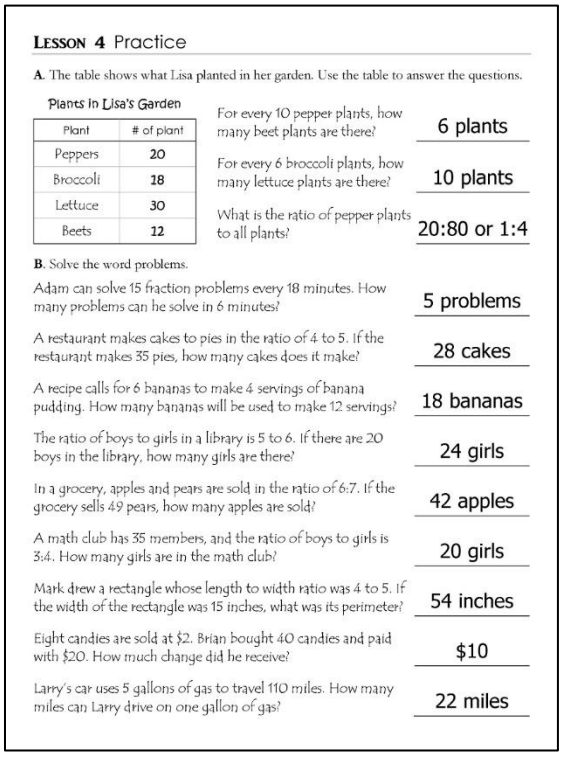
In a zoo, the ratio of adults to children is 5 to 7. If there are 125 adults in the zoo, how many children are there? 175 children

A recipe calls for 3 cups of milk for every 2 cups of flour. Sarah used 4 cups of flour. How many cups of milk did she use? 6 cups

A book club has 30 members, and the ratio of boys to girls is 2:1. How many boys are in the book club? 20 boys

Sam drew a rectangle whose length to width ratio was 3 to 2. If the width of the rectangle was 10 inches, what was its area? 150 sq in

A recipe calls for 2 cups of vegetables, 3 cups of chicken stock, and 2 teaspoons of salt to make 4 servings of soup. How many teaspoons of salt is used for every cup of vegetables? 1 teaspoon



LESSON 4 Practice

A. The table shows what Lisa planted in her garden. Use the table to answer the questions.

Plants in Lisa's Garden

Plant	# of plant
Peppers	20
Broccoli	18
Lettuce	30
Beets	12

For every 10 pepper plants, how many beet plants are there? 6 plants

For every 6 broccoli plants, how many lettuce plants are there? 10 plants

What is the ratio of pepper plants to all plants? 20:80 or 1:4

B. Solve the word problems.

Adam can solve 15 fraction problems every 18 minutes. How many problems can he solve in 6 minutes? 5 problems

A restaurant makes cakes to pies in the ratio of 4 to 5. If the restaurant makes 35 pies, how many cakes does it make? 28 cakes

A recipe calls for 6 bananas to make 4 servings of banana pudding. How many bananas will be used to make 12 servings? 18 bananas

The ratio of boys to girls in a library is 5 to 6. If there are 20 boys in the library, how many girls are there? 24 girls

In a grocery, apples and pears are sold in the ratio of 6:7. If the grocery sells 49 pears, how many apples are sold? 42 apples

A math club has 35 members, and the ratio of boys to girls is 3:4. How many girls are in the math club? 20 girls

Mark drew a rectangle whose length to width ratio was 4 to 5. If the width of the rectangle was 15 inches, what was its perimeter? 54 inches

Eight candies are sold at $2. Brian bought 40 candies and paid with $20. How much change did he receive? $10

Larry's car uses 5 gallons of gas to travel 110 miles. How many miles can Larry drive on one gallon of gas? 22 miles

The example on the page is showing that there is a one pie to six guest ratio, 1:6. There will be 24 guests, so they need to figure out how many pies they will need. This is a typical problem and useful in real life. ☺

The equivalent ratios are 1:6 = x:24. X is the unknown quantity. It just means the number you don't know. I like to use a ?.

$$\frac{1}{6} = \frac{?}{24}$$

In the next lesson they will learn to solve this with cross multiplying. Right now they just need to think about equivalent fractions, equivalent ratios. 24÷6 = 4, so 6 was multiplied by 4 to get to 24. 1 x 4 = 4, so ? = 4 They need to make four pies.

The most important thing in setting up these problems is to make sure they are comparing apples to apples and oranges to oranges, so to speak. The same thing should be on the same side of the colon. In this problem it's #of pies : #of people to #of pies : #of people.

Here's the set up for the first couple word problems.

5:2 = x:10 ? tomatoes

24:20 = x:10 ? problems