

Solutions are at the end of this file.

Multistep Word Problems

The *Student Text* includes some fairly simple two step word problems. Some students may be ready for more challenging problems. Here are a few to try, along with some tips for solving this kind of problem. You may want to read and discuss these with your student as you work out the solutions together. Again, the purpose is to stretch, not to frustrate. If you do not think the student is ready, you may want to come back to these later.

There are more multistep word problems in Lessons 21 and 27 of the *Teacher Manual*. The answers are at the end of the solutions at the back of this book.

- 1) David has a rectangular garden that measures 11 feet by 13 feet. He wants to plant peas in his garden. Dad said that one seed packet will be enough to fill a space 10 feet on a side. Will David's garden have enough space to plant 2 seed packets?

Although the problem asks only one question, there are other questions that must be answered first. The key to solving this is determining what the unstated questions are. Since the final question is really asking for a comparison of the available area to the needed area, the two unstated questions are: "What is the area of David's garden?" and, "What is the area needed for two seed packets?"

You might make a list of steps something like this:

- 1) area of garden in square feet?
- 2) area needed for one seed packet?
- 3) area needed for two seed packets?
- 4) compare areas to answer question

- 2) Rachel and Sarah started out to visit Grandma. They drove for 50 miles and stopped to rest before driving for 30 more miles. They decided to go back 10 miles to a restaurant they had seen. After leaving the restaurant, they drove 80 more miles to Grandma's house. How many miles did the girls drive on the way to Grandma's house?

Make a drawing, and this will be easier to solve!

- 3) Rachel and Sarah spent \$8 for gasoline, \$15.65 for their lunch, and \$5 apiece for gifts for Grandma. Grandma gave each of them \$10. If the girls left home with a total of \$50, how much do they have for the return trip?

This is similar to number 1 in that you must answer other questions before you can answer the question in the problem.

Word Problems

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The answers are at the end of the solutions at the back of this book.

- 1) Scott bought three bags of candy with 75 pieces in each one. He plans to divide all the candy evenly among seven friends. How many pieces of candy will Scott have left for himself?
- 2) Anne earned \$3 an hour baby-sitting, and \$4 an hour working in the garden. Last week she did baby-sitting for 5 hours and garden work for 3 hours. How much more money does she need to buy a game that costs \$35?
- 3) Paige had a nature collection. She had 25 acorns, 16 dried seed pods, and 8 feathers. She divided the acorns into 5 equal groups, the seed pods into 4 equal groups and the feathers into 2 equal groups. She gave her mother one group of each kind. How many separate items did her mother get?

Use after *Delta* Lesson 27

- 1) 65 bags of nuts are to be divided among 13 students. Each bag contains 15 nuts. How many nuts will each student receive?
- 2) Shane is playing a board game. For his first turn he moved ahead 3 spaces, for the second, 5 spaces and for the third, 1 space. For his next turn he had to go back 6 spaces. After that he got a card that said he could move two times the biggest forward move he had done so far. Now how many spaces from the beginning is Shane's game piece?
- 3) The volume of a rectangular box is 330 square inches. The length on one side of the top is 11 inches, and the height of the box is 3 inches. What is the area of the top of the box? (A drawing may help you with this one.)
- 4) Tom divided \$360 among his six children for them to use for Christmas gifts. His daughter Kate added \$20 to her portion, then used the money to buy 16 gifts that each cost the same amount. What was the price of each of Kate's gifts?

- 1) Tom planted vegetables in a rectangular garden that was 25 feet long and 15 feet wide. He used $\frac{1}{3}$ of the area for corn and $\frac{1}{5}$ of it for peas. How many square feet are left for other vegetables?

Although the problem asks only one question, there are other questions that must be answered first. The key to solving this is determining what the unstated questions are. Since the final question is asking for the left over area, the unstated questions are: "What is the total area of Tom's garden?" and, "What is the area used for each of the vegetables mentioned?"

You might make a list of questions something like this:

- 1) area of garden in square feet?
- 2) area used for corn?
- 3) area used for peas?
- 4) total area used for peas and corn?
- 5) leftover area?

- 2) Sarah signed $\frac{1}{2}$ of the Christmas cards, and Richard signed $\frac{3}{8}$ of them. If there are 32 cards in all, how many are left to be signed?

- 3) Jim wishes to buy 3 gifts that cost 15 dollars, 9 dollars, and 12 dollars. He has $\frac{1}{4}$ of the money he needs. How much more money must he earn in order to buy the gifts?

- 1) Jennifer had \$30 to spend on herself. She spent $\frac{1}{5}$ of the money on a sandwich, $\frac{1}{6}$ for a ticket to a museum, and $\frac{1}{2}$ of it on a book. How much money does Jennifer have left over?

- 2) Mark drove for $\frac{1}{2}$ of the trip, and Justin drove for $\frac{1}{4}$ of the trip. Gina and Kaitlyn divided the rest of the driving evenly between them. If the entire trip was 128 miles, how many miles did Kaitlyn drive?

- 3) Two pie pans of the same size remain on the counter. One pan has $\frac{1}{2}$ of a pie, and the other has $\frac{3}{4}$ of a pie left in it. Mom wishes to divide all the pie into pieces that are each $\frac{1}{8}$ of a pie. How many pieces of pie will she have when she is finished?

1) A rectangular field is 63 yards long and 21 yards wide. A fence is needed for the perimeter of the field. Fencing is also needed to divide the field into three square sections. How many feet of fencing are needed? (It is a good idea to make a drawing for this one.)

2) One half of the people at the game wore the team colors. Two thirds of those people wore team hats as well. One fourth of those with team colors and team hats had banners to wave. Twenty five people had team colors and banners, but no hats. One hundred people had only banners. If there were 1824 people at the game, how many had banners?

3) A cube shaped pool is half full of water. If the water is 36 inches deep, how much would the water in the pool weigh if the pool were filled to the brim? (1 cubic foot weighs 56 pounds)

1) Mom mixed $2\frac{1}{2}$ pounds of apples, $1\frac{1}{8}$ pounds of grapes and $1\frac{1}{4}$ pounds of pears for a salad. After setting aside $1\frac{1}{2}$ pounds of salad for today, she divided the rest of the salad equally into 3 containers. What is the weight of the salad in one container?

2) Peter wants to put 5 fish in his aquarium. Three of the fish need $\frac{1}{4}$ of a cubic foot of water apiece, and two of them need $\frac{1}{3}$ of a cubic foot of water. The dimensions of Peter's aquarium are $1' \times 1' \times 2'$. Does he have room to add another fish that needs $\frac{2}{3}$ of a cubic foot of water? Assume that the aquarium is filled to the top.

3) Debbie had $5\frac{1}{2}$ yards of ribbon. She cut it into pieces that were each $1\frac{1}{2}$ yard long. How many inches long is the leftover piece? Note that the fraction that indicates the leftover piece is a fraction of a piece, not a fraction of the original amount.

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- 1) Jill bought items costing \$3.45, \$1.99, \$6.59, and \$12.98. She used a coupon worth \$2.50. If Jill had \$50.00 when she went into the store, how much did she have when she left?

Although the problem asks only one question, there are other questions that must be answered first. The key to solving this is determining what the unstated questions are. Since the final question is asking for the left over money, the unstated questions are: “What is the total of Jill’s purchases?” and, “What was the total bill after using the coupon?”

You might make a list of questions something like this:

- 1) total of purchases?
- 2) total bill after subtracting coupon?
- 3) leftover money?

2) Luke and Seth started out to visit Uncle Arnie. After driving 50 miles, they saw a restaurant, and Luke wanted to stop for lunch. Seth wanted to look for something better, so they drove on for 8 miles before giving up and going back to the restaurant. After eating they traveled on for 26 more miles from the restaurant. Seth saw a sign for a classic car museum, which they decided to visit. The museum was 6 miles from their route. After returning to the main road, they drove for another 40 miles and arrived at Uncle Arnie’s house. How many miles is it from Luke and Seth’s house to Uncle Arnie’s house? How many miles did they drive on the way there?

The key to solving this is a careful drawing. It does not have to be to scale, but should include all the parts of the journey.

- 3) Last week we got 3.5 inches of snow. Six-tenths of an inch melted before another storm added 8.3 inches. Since then we have lost 4.2 inches to melting or evaporation. How many inches of snow are left on the ground?

1) Naomi was ordering yarn from a discount web site. If she ordered more than \$50 worth of yarn labeled “discountable”, she could take an extra 10% from the price of that yarn. Only some of the yarn she ordered was eligible for the discount. Here is what Naomi ordered:

| | |
|------------------------------|--------------------|
| 2 skeins at \$2.50 per skein | (not discountable) |
| 8 skeins at \$8.40 per skein | (discountable) |
| 7 skeins at \$5.99 per skein | (discountable) |

Tax is 5% and shipping is 8%. How much did Naomi pay for her yarn?

2) After Naomi received her order, she found that she could make a scarf from one skein of the yarn that cost \$5.99 a skein. After taking into account the discount, taxes, and shipping for the yarn, how much would it cost to make five scarves?

3) Naomi made a scarf for her brother using the yarn that cost \$2.50 per skein. He offered to pay Naomi for the yarn she used. If she used 1.5 skeins of yarn to make the scarf, what was the total cost of the yarn?

1) The boys ordered several pizzas for the weekend. When the first evening was over, the following amounts of pizza were left over: $\frac{1}{4}$ of the pepperoni pizza, $\frac{1}{2}$ of the cheese pizza, $\frac{3}{4}$ of the mushroom pizza and $\frac{1}{4}$ of the supreme pizza. The next morning, each boy ate the equivalent of $\frac{1}{4}$ of a pizza for breakfast. If that finished the pizza, how many boys were there?

2) Dan read that an average snowfall of 10 inches yields 1 inch of water when melted. Very wet snow will measure 5 inches for one inch of water, and very dry snow may measure 20 inches for an inch of water. He made measurements for a storm that started with 5.3 inches of average snowfall. The precipitation changed to wet snow and dropped another 4.1 inches. The weather continued to warm up, and the storm finished with 1.5 inches of rain. What was the actual amount of water that fell during the storm? Round your answer to tenths.

3) Jim bought edging to go around a circular garden with a radius of 3 feet. Later he decided to double the diameter of the garden. How many more feet of edging must he buy?

4) One packet of flower seeds was enough to just fill the area of the smaller garden in #3. How many packets of seed are needed for the larger garden? Round each answer to the nearest square foot before continuing.

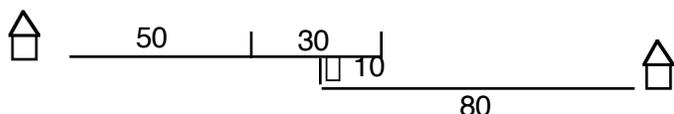
- 1) Emily cut two circles from a sheet of colored paper measuring 8" by 12". One circle had a radius of 3 inches and the other had a radius of 2.5 inches. How many square inches of paper are left over? Is it possible to cut another circle with a 3 inch radius from the paper?

- 2) Tom wants to buy items costing \$25.35, \$50.69, and \$85.96. He earns \$6.50 an hour doing odd jobs. If ten percent of his income is put aside for other purposes, how many hours must he work to earn the money he needs for his purchases? Round your answer to the nearest whole hour.

- 3) Three tenths of the wooden toys were painted blue and one fourth of them were painted green. Half of the remaining toys were painted red and half were painted yellow. If 300 toys are blue, how many are there of each of the other colors?

Lesson 15

- 1) area of garden is $11 \times 13 = 143$ sq. ft.
 $10 \times 10 = 100$ sq. ft. needed for one packet
 $2 \times 100 = 200$ sq. ft. needed for 2 packets
 $200 > 143$, so garden does not have enough space.
- 2) Use a drawing to show the girls' travels. The distances don't have to be exact.



$50 + 30 = 80$ to turn around
 $80 + 10 = 90$ backtrack to restaurant
 $90 + 80 = 170$ miles is total distance driven

- 3) $\$50 + \$20 = \$70$ what they left with
 plus $\$10$ to each
 $\$8 + \$15.65 + \$10 = \33.65 what they spent
 (gifts are $\$5 + \5)
 $\$70 - \$33.65 = \$36.35$ left

Lesson 21

- 1) $3 \times 75 = 225$ pieces of candy
 $225 \div 7 = 32$ R 1
 Scott will have one piece left
- 2) $5 \times \$3 = \15 for baby-sitting
 $3 \times \$4 = \12 for garden work
 $\$15 + \$12 = \$27$ she has
 $\$35 - \$27 = \$8$ more needed to buy the game
- 3) $25 \div 5 = 5$ acorns in a group
 $16 \div 4 = 4$ seed pods in a group
 $8 \div 2 = 4$ feathers in a group
 $5 + 4 + 4 = 13$ items given to Mom

Lesson 27

- 1) $65 \div 13 = 5$ bags per student
 $5 \times 15 = 75$ nuts per student
- 2) You may want to draw this one.
 biggest move is 5, so two times
 biggest move is 10.
 $3 + 5 + 1 = 9$
 $9 - 6 = 3$
 $3 + 10 = 13$, so he is 13 spaces from the beginning.
- 3) $3 \times 11 = 33$
 $V = 33 \times$ missing measure
 V is 330
 $330 \div 33 = 10$ which is the missing measure of the side of the box top
 $10 \times 11 = 110$ sq. ft. which is area of the top of the box.
- 4) $\$360 \div 6 = \60 for each child
 $\$60 + \$20 = \$80$ Kate's money
 $\$80 \div 16 = \5 cost of each gift

Lesson 6

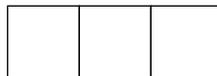
- 1) area of garden is $25 \times 15 = 375$ sq. ft.
 $\frac{1}{3} \times 375 = 125$ sq. ft. for corn
 $\frac{1}{5} \times 375 = 75$ sq. ft. for peas
 $125 + 75 = 200$ sq. ft. used
 $375 - 200 = 175$ sq. ft. left over
- 2) $\frac{1}{2} \times 32 = 16$ Sarah signed
 $\frac{3}{8} \times 32 = 12$ Richard signed
 $16 + 12 = 28$ are signed
 $32 - 28 = 4$ cards left to be signed
- 3) $\$15 + \$9 + \$12 = \36 needed
 $\frac{1}{4} \times \$36 = \9 on hand
 $\$36 - \$9 = \$27$ to earn

Lesson 12

- 1) $\frac{1}{5} \times \$30 = \6 for sandwich
 $\frac{1}{6} \times \$30 = \5 for museum
 $\frac{1}{2} \times \$30 = \15 for book
 $\$6 + \$5 + \$15 = \26 spent
 $\$30 - \$26 = \$4$ left over
- 2) $\frac{1}{2} \times 128 = 64$ miles Mark drove
 $\frac{1}{4} \times 128 = 32$ miles Justin drove
 $64 + 32 = 96$ miles driven
 $128 - 96 = 32$ miles left
 $32 \div 2 = 16$ miles driven by Kaitlyn
- 3) $\frac{1}{2} + \frac{3}{4} = \frac{2}{4} + \frac{3}{4} = \frac{5}{4}$ pie
 $\frac{5}{4} \div \frac{1}{8} = \frac{40}{32} \div \frac{4}{32} =$
 $40 \div 4 = 10$ pieces of pie

Lesson 18

- 1) $63 + 21 + 63 + 21 = 168$ yds. for outside of field.
 $21 + 21 = 42$ yds. for dividing sections
 $168 + 42 = 210$ yds. of fencing
 $210 \times 3 = 630$ ft. of fencing
- 2) $\frac{1}{2} \times 1824 = 912$ with team colors
 $\frac{2}{3} \times 912 = 608$ with hats and colors
 $\frac{1}{4} \times 608 = 152$ with hats, colors, and banners
 $152 + 100 + 25 = 277$ with banners
- 3) $36'' \div 3 = 3$ ft.
 $2 \times 3 = 6$ ft. to brim, so cube is 6 ft. on a side
 $6 \times 6 \times 6 = 216$ cu. ft. volume
 $216 \times 56 = 12,096$ pounds of water



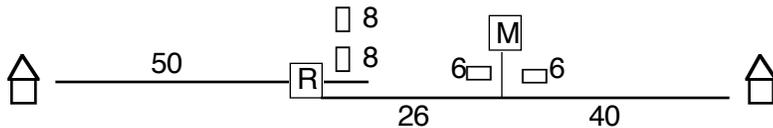
Lesson 24

- 1) $2 \frac{1}{2} + 1 \frac{1}{8} + 1 \frac{1}{4} = 4 \frac{7}{8}$ pounds of salad
 $4 \frac{7}{8} - 1 \frac{1}{2} = 3 \frac{3}{8}$ pounds left
 $3 \frac{3}{8} \div 3 = \frac{27}{8} \div \frac{3}{1} = \frac{27}{8} \times \frac{1}{3} =$
 $\frac{9}{8} = 1 \frac{1}{8}$ lb. in a container
- 2) $1 \times 1 \times 2 = 2$ cu. ft. in aquarium
 $3 \times \frac{1}{4} = \frac{3}{4}$ cu. ft. for one kind of fish
 $2 \times \frac{1}{3} = \frac{2}{3}$ cu. ft. for other kind of fish
 $\frac{3}{4} + \frac{2}{3} = 1 \frac{5}{12}$ cu. ft. for both kinds
 $2 - 1 \frac{5}{12} = \frac{7}{12}$ cu. ft.
 $\frac{2}{3} = \frac{8}{12}$, so there is not room for extra fish
- 3) $5 \frac{1}{2} \div 1 \frac{1}{2} = \frac{11}{2} \times \frac{2}{3} = \frac{22}{6} =$
 $3 \frac{4}{6} = 3 \frac{2}{3}$ pieces
 $1 \frac{1}{2}$ yds. \times 36 in. = 54 in. length of one piece
 $\frac{2}{3} \times 54 = 36$ in. length of left over piece

Lesson 6

- 1) $\$3.45 + \$1.99 + \$6.59 + \$12.98 = \$25.01$
 $\$25.01 - \$2.50 = \$22.51$
 $\$50.00 - \$22.51 = \underline{\$27.49}$ is money left

- 2) Use a drawing to show their travels.
 The distances don't have to be to scale.



$$50 + 26 + 40 = \underline{116 \text{ miles}}$$
 from house to house

$$50 + 8 + 8 = 66 \text{ miles past restaurant and back}$$

$$66 + 26 = 92 \text{ miles to museum turnoff}$$

$$92 + 6 + 6 = 104 \text{ miles back to main route}$$

$$104 + 40 = \underline{144 \text{ miles}}$$
 total driven

- 3) $3.5 - .6 = 2.9$ "
 $2.9 + 8.3 = 11.2$ "
 $11.2 - 4.2 = \underline{7"}$ remaining

Lesson 12

- 1) $8 \times \$8.40 = \67.20 (All money is rounded to hundredths at each step.)
 $7 \times \$5.99 = \41.93
 $\$67.20 + \$41.93 = \$109.13$ discountable
 $\$109.13 \times .10 = \10.91 (rounded)
 $\$109.13 - \$10.91 = \$98.22$ for discounted yarn
 $2 \times \$2.50 = \5.00 for un-discounted
 $\$98.22 + \$5.00 = \$103.22$ cost of yarn
 $\$103.22 \times 1.13 = \underline{\$116.64}$ with tax and shipping
 (5% + 8% = 13%)
- 2) $\$5.99 \times 5 = \29.95
 $.10 \times \$29.95 = 2.995$ rounds to \$3.00
 $\$29.95 - \$3.00 = \$26.95$ discounted price
 $\$26.95 \times 1.13 = \underline{\$30.45}$ with tax and shipping

You could also figure the total cost of one skein and multiply by 5. Rounding may give a slightly different answer.

- 3) $\$2.50 \times 1.13 = 2.83$ for one skein (rounded)
 $\$2.83 \times 1.5 = \underline{\$4.25}$ (rounded)

You could have found the basic cost of 1.5 skeins first, and then figured tax and shipping. Your answer may be slightly different because of rounding.

Lesson 18

- 1) $1/4 + 1/2 + 3/4 + 1/4 =$
 $1/4 + 2/4 + 3/4 + 1/4 = 7/4$ or 1 $3/4$ pizza left over
 $7/4 \div 1/4 = 7/4 \times 4/1 = \underline{7 \text{ boys}}$
- 2) $5.3 \div 10 = .53$ " water from average snow
 $4.1 \div 5 = .82$ " water from wet snow

If you are unsure whether to multiply or divide, check your answer to see if it makes sense. The actual snowfall in each case was less than what was needed to make an inch of water, so division yields a sensible answer.

$$.53 + .82 + 1.5 = 2.85 \text{'' rounds to } \underline{2.9 \text{'' of water}}$$

- 3) $(2)3.14 \times 3 = 18.84'$ circumference of small garden
 $2 \times 3 = 6'$ diameter of small garden
 $3.14 \times 12 = 37.68'$ circumference of garden with
 doubled diameter
 $37.68 - 18.84 = \underline{18.84' \text{ additional edging needed}}$

In real life this would probably be rounded to 19 or 20 feet.

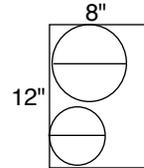
- 4) $3.14 \times 3^2 = 28.26$ sq. ft. area of small garden
 28 sq. ft. rounded
 $3.14 \times 6^2 = 113.04$ sq. ft. area of large garden
 113 sq. ft. rounded
 $113 \div 28 = 4.04$ or 4 seed packets (rounded)

When you have learned how to divide a decimal by a decimal, try this again using the un-rounded areas.

Lesson 24

- 1) $8 \times 12 = 96$ sq. in. area of paper
 $3.14(3)^2 = 28.26$ sq. in. area of one circle
 $3.14(2.5)^2 = 19.625$ or 19.63 sq. in. rounded
 area of other circle
 $28.26 + 19.63 = 47.89$ sq. in. used for circles
 $96 - 47.89 = \underline{48.11}$ sq. in. left over

Look at the drawing to see why it is not possible to cut another circle with a 3" radius, even though there seems to be enough area. One circle has a diameter of 6", which leaves 2" distance to the edge of the paper. The other circle has a diameter of 5", which leaves a 3" distance to the edge of the paper. Neither space is enough for another circle with a 3" radius (6" diameter).



- 2) $\$6.50 \times .10 = \$.65$ is 10% of his hourly income
 $\$6.50 - .65 = \5.85 hourly amount available to spend
 $\$25.35 + \$50.69 + \$85.96 = \162 total needed
 $\$162 \div \$5.85 = 27.69\dots$ rounds to 28 hours
- 3) $.3 \times T = 300$ blue toys
 $T = 300 \div .3$
 $T = 1000$ toys in all
 $1/4 \times 1000 = \underline{250}$ green toys
 $300 + 250 = 550$ blue or green toys
 $1000 - 550 = 450$ remaining toys
 $1/2 \times 450 = \underline{225}$ red toys
 $1/2 \times 450 = \underline{225}$ yellow toys

You could use decimals or fractions for this problem.