Section 3

Suggestions for helping your child find the answers

Grade 4, Worksheet I

1. **Answer: 72; 70; 66; 67. The repeating pattern is subtracting 4, adding 1.** This pattern has 2 operations, subtract and add. If your child is having difficulty seeing the pattern, encourage the child to figure out what happens from one number to the next, writing the thoughts below each set of numbers. The pattern will then become obvious.

88, 84, 85, 81, 82, 78, 79, 75, 76, **72**, 73, 69, **70**, **66**, **67**, 63, 64

-4 +1 -4 +1 -4 and so on…

2. **Answer: B $1,250.** How much profit has been made is the question at hand. Encourage the child to solve this problem in her or his own way. The child may begin this problem by multiplying 300 × $5, or he or she may realize that 100 × $5 is $500, so 300 × $5 would be 3 times that much, or $1500. That's how much has been spent.

But the school have made 250 × $11. The child may know that 100 × $11 is $1100, so 200 × $11 is twice that amount or $2200. Then 50 × $11 is half of $1100, or $550. So that's added to $2200 to get $2750 brought in. Their profit is then $2750 - $1500, or $1250.

3**. Answer: 32 kids.** The challenge with this problem is that it involves two multiplication steps. 4 cups to a quart and 4 quarts to a gallon means there are 4 × 4 or 16 cups in a gallon. So two gallons would have 2 × 16 cups, or 32 cups. The child might draw a picture of 4 cups "inside" a quart container, then 4 of those quarts "inside" a gallon, and then two gallons like that.

4. **Answer: $432. The explanation should show an understanding of the process they used to find their solution. A diagram may be a part of the explanation, but encourage your child to translate the picture into words.** This is a two-step problem that may be solved in different ways. Most children will multiply the number of lawns mowed by the money made for each lawn because 9 × 4 is a basic fact they may be comfortable with. The challenge comes when they need to multiply 36 by 12. If your child has difficulty with this, have her or him try breaking the 12 apart into 10 and 2. It might be easier to find 36 × 10 and 36 × 2, and then add the products together. Breaking 36 apart into 30 and 6 gives the child another number that is a multiple of ten (30) to work with. Or, the child might simply add 36 twelve times.

Grouping numbers is another strategy children use. They might draw a diagram or picture matching the lawns, money, and weeks in different combinations. Drawing a diagram always helps a child visualize the problem, making it easier to solve and explain.

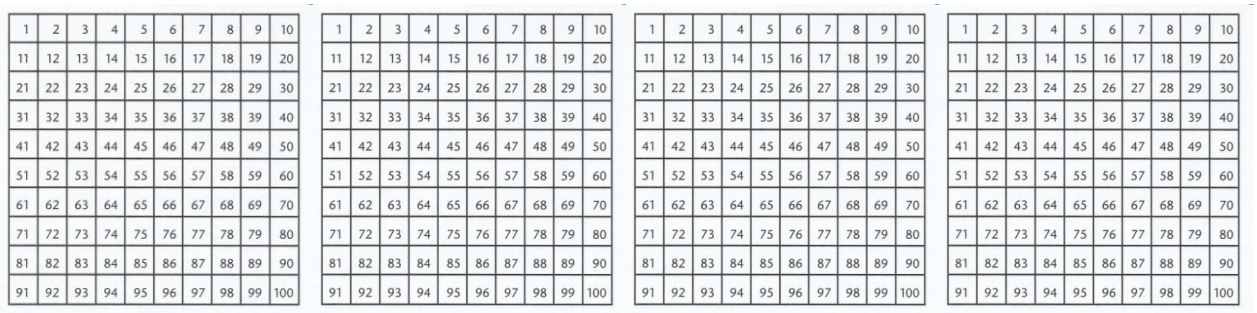
5. **Answer: 0.5 or 0.50 or 0.5 and any amount of zeros. (Note: it's not necessary for your child to put a zero before the decimal point.)** See if your child draws a picture to solve the problem. If he or she is having difficulty, encourage your child to draw a picture of a square

cake and then draw 9 lines to separate the cake into *tenths*. Shading in ½ the cake will be 5 of those tenths, or 5/10, or 0.5.

6. **Answer: Angle A= 90°. Angles B and C would be less than 90°, probably around 45°.** Angle A is a right angle and all right angles are 90°. You can tell it is a right angle by placing the corner of a standard piece of paper up to the corner of the angle you are trying to measure and the lines match up to the edges of the paper. The child can then use the same corner to tell the other angles are less than that, and probably only about half as big as the right angle.

7. **Answer: First—Lee; Second—Joey; Third—Kristen.** If this is the first time your child is exposed to decimals as time, tell them to think of it as money. You may ask, "Who has the least amount?" "Who has the most?" "In a race, would you want to finish in less or more time?" If the child is still having difficulty, try acting it out by using a stopwatch.

You can also use 4 hundreds charts like the ones below, representing each time on it. The whole square represents 1 minute, and since it's divided into 100 small squares, each of those is one *hundredth* minute. So shade in the right number for each child's time—the one with the fewest shaded squares is the winner.

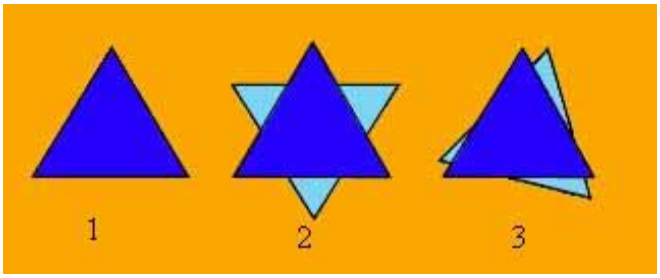


8. **Answer: 45 ÷ 5 = 9, or an equivalent statement.** Let your child solve this in her or his own way. Drawing a diagram of the flower beds and placing the flowers in the beds may help to visualize the problem. However, in the end, the child should write 45 ÷ 5 = 9, or an equivalent statement such as 5 × 9 = 45. In fourth grade, students will be expected to remember that fact—and the others like it—and use them fluently.

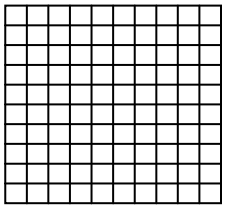
Suggestions for helping your child find the answers

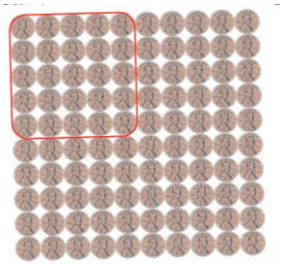
Grade 4, Worksheet II

1. **Answer: The starfish and flower have rotational symmetry and line symmetry. The butterfly and owl have line symmetry.** *Line symmetry* is when one half of an object is the mirror image of the other half. When an object has *line symmetry* you can draw a line down the center and both sides are exactly the same. An object with *rotational symmetry* occurs when an object has a center point and as you rotate it around, less than 360 degrees, it matches itself. The triangle below has rotational symmetry because it matched itself three times as it is turned 360 degrees. Encourage your child to find other examples of symmetry, both *line* and *rotational*, in the world.



2. **Answer: four-hundred thirty-three and thirty-eight hundredths.** Encourage your child to use the diagram that is provided with the problem which will help them see place value with decimals. You may also use the hundreds chart below to explain *hundredths* to the child by shading in 38 out of the hundred squares to represent thirty-eight *hundredths*. You could also relate this amount to $433.38 in which the "433" shows 433 dollars, and the ".38" shows 38 cents, which is 38/100 of a dollar. (The pennies circled in red below show 25/100 of a dollar.)





3. **Answer: B.** In this problem, the words match the equation. The variable *b* would be the number of bags, which is the unknown. Your child might have difficulty understanding this concept, but you can relate it to letting symbols stand for other things we don't know. For example, if this child is 2 years older than a sister, let *a* stand for this child's age and the sister's age is $a - 2$, always and forever, no matter what age this child becomes.

4. Answer: a. 1050; b. 2550; c. 4500 This problem is ripe for introducing how to multiply parts of a number and pull the parts together to get a final answer, which is what happens in our multiplication algorithm. The child can find the answer to (a) by either adding 150 seven times, or if the child knows how to multiply, by doing 150 × 7. He or she might even do the latter by finding 100 × 7 = 700, then 50 × 7 is half of that, or 750, and the sum of those is 1050.

To get the answer to (b), the child can again add 150 seventeen times, or multiply 150 × 17. He or she already has 150 × 7, so you might encourage the child to do 150 × 10 to get 1500, and add that to 1050. If the child uses the standard algorithm, these numbers are what will be obtained anyway. For (c), 150 × 30 can be obtained in ways similar to the above.

5**. Answer: 2/3 = 4/6 = 6/9.** Have the child shade in the parts of each pan to discover that the same amount has been shaded in each pan. If not, have the child take tracing paper and trace over the shaded amount in the first pan, 2/3, and put it on top of 4/6 and then 6/9.

6. **Answer: 12 cm^2.** The base and the height of the picture are given. Your child might know to multiply the base times the height to get the area of the picture. If the child doesn't know this, take a centimeter ruler and mark off 3 centimeters on the bottom and 4 up the side, and draw in the square centimeters (see below). First have the child count the squares—that's the area—and then encourage them to look at 4 rows with 3 in each row, and use *repeated addition* or *multiplication*—a shortcut to repeated addition—to find the answer.

7. **Answer: Equation: $x + x + x = 60$, or $3x = 60$; Solution: $x = 20$ grams** The picture shows a balance scale that commonly represents an equation. The left pan has 3 cans on it, labeled *x*, and the right pan has 6 strawberries, each weighing 10 grams. So the equation is $x + x + x = 60$ or $3x = 60$. If the child has trouble understanding this, have them take 3 identical cans from your kitchen and say that all 3 cans cost 60 cents, and use 6 dimes. Then have the child match up the cans with dimes so each can matches the same number of dimes, 2. Tell the child that's what you're doing when you solve an equation—simply finding out how much of something one unknown is worth.

Suggestions for helping your child find the answers

Grade 4, Worksheet III

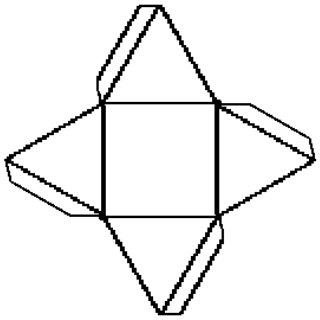
1. **Answer: A. 0.5 B. 0.25 C. 0.75.** Your child might not have encountered decimals in school yet. You might display a hundreds chart like the one below, and pretend it is a candy bar.

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

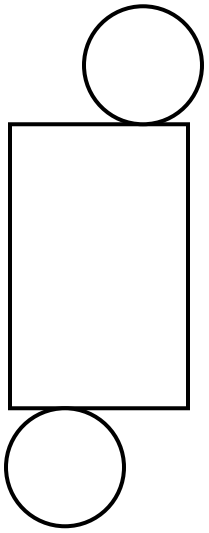
Have the child shade in the first 25 squares and write 0.25 to show that part of the candy bar. Then have the child decide what *fraction* of the candy bar is shaded. It's ¼ since four pieces that size make up 1 whole.

Go through a similar explanation of 0.5, which would be the first 50 squares, and matches ½. Then a similar activity for 0.75, which matches ¾.

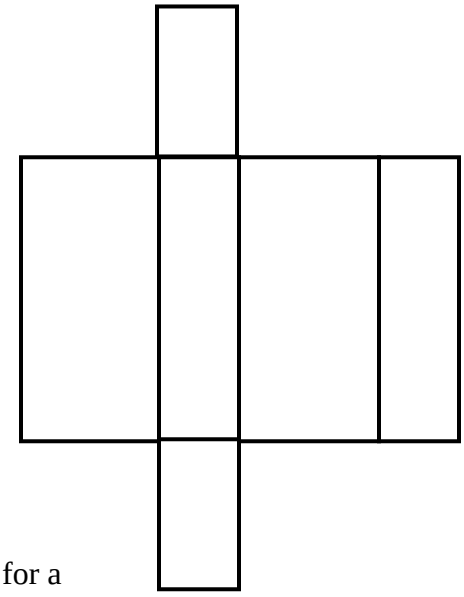
2. **Answer: the pyramid.** Explain that a net is a two dimension figure that, when cut out and folded up, makes a 3-dimensional shape. Each flat part is called a "face". Cut out the nets below and fold each one to match the sides, creating the three-dimensional shapes. (The net for a pyramid has tabs for gluing the faces together.)



Net for a pyramid.



Net for a cylinder.



Net for a rectangular prism (box).

3. **Answer: 5, 10, 15, 20, 25, 30, 35; 50** Encourage your child to think about counting by 5s and what that means. Because the question states the first seven multiples of 5, the child starts at 0 on the number line and then counts up from there by 5s. He or she can keep going till the 10^{th} multiply of five has been found also. Hint: counting nickels or 5-minute increments on a clock might be worthwhile to your child, to show a real-world connection.

4. **Answer: 7.** This problem can be solved in various ways. One suggestion is for the child to draw a diagram of the candy bars and group them for each neighbor. This method will help to visualize the problem.

5. **Answer: a. ruler/meter stick/tape measure/yardstick b. feet.** Some form of a ruler would be the tool used for measuring height. This is a measurement of feet or meters (metric). Your child should start to become familiar with both systems and learn the appropriate time to use each.

6. **Answer: B: ¼.** Have your child look at the answer choices and rule out the ones that do not work as an equivalent fraction for 3/12. You might use a strip of paper made for the months of the year, each month being 1/12 of a year. Then 3/12 would be 3 months shaded in. Fold the strip into fourths and your child can see that same amount is ¼ of the strip. Show the child that ¾ of the strip is too much, and 12/3 means you could divide the strip into 3rds, and take 12 of those. That would be way too much. Other ways to easily show twelfths are with an egg carton, a clock face, and a ruler as each of these comes "naturally" divided into twelfths.

7. **Answer: Expression: $A + A + A + A + C + C + C + C + C$, or $4 \times A + 5 \times C$; $43.** Some children are not familiar with the word "expression." Help your child understand that an expression has operation signs (+, –, ×, ÷), but no equal sign (=). The expression might be written simply with addition signs, as in $A + A + A + A + C + C + C + C + C$. The way $4 \times A + 5 \times C$ is written means the number of adult tickets A is multiplied by the cost of each ticket; the number of child tickets C is multiplied by the cost of each ticket; the two amounts are then added. Let the child use play money and count out the amount spent for each ticket. He or she might want to put the money for the adult's tickets separate from the money for the children's tickets.

8. **Answer: 0.25.** This problem can be related back to problem 1 on this worksheet. Tell your child to think of the hundreds chart as one whole. Then have the child explain to you how many boxes it is broken up into. Then ask," How many are shaded in?" So that's 25 out of a hundred or 25 *hundredths*, which is written 0.25.

Have the child also think about calling this "2 *tenths* and 5 *hundredths*", because the square has also been broken into tenths by the vertical lines, and two of those are shaded, giving 2 *tenths*. There are 5 small squares left, and those are *hundredths*, so 2 *tenths* and 5 *hundredths* is another name for 25 *hundredths.*

Suggestions for helping your child find the answers

Grade 4, Worksheet IV

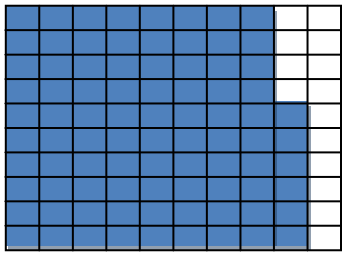
1**. Answer: Yes, he has enough money (unless there a a shipping and handling fee—there should be no tax on internet sales)** Your child should think of $24 as close to $25, a friendly number to use in estimation. Your child can either multiply 5 × $25 = $125, or add $25 five times, or perhaps count by 25s, saying "25, 50, 75, 100, 125."

2. **Answer: 30,000.** Your child can think of 3850 as close to 4,000, and then multiply 5 × 4000 = 20,000, or the child can add five 4,000s and get the same answer. Similarly, 5100 can be rounded to 5000 and 2 × 5000 = 10,000; or add two 5000s to get 10,000. Putting 20,000 and 10,000 together gives the final answer.

3. **Answer: A. Cassie the Cow B. scale C. ounces D. pounds** A cow is the obvious animal that weighs more and students coming into 4th grade should be familiar with the use of a scale to measure weight. Brian the Bee would be measured in ounces because he weighs less than 1 pound. 16 oz = 1 lb. An item whose weight is below 1 lb, such as a bee, will typically be measured in ounces. A cow definitely weighs a lot and would be measured in pounds.

4. **Answer: equation: 72 ÷ 8 = *x* or an equivalent true multiplication or division statement, with or without a variable. 9** If your child doesn't know what "equation" means, have her or him think of it as a number sentence that must be true. In most equations, though, you don't know one of the numbers—that's the math problem—so a variable is used as a placeholder, till you find the number. If the child doesn't know how to start the problem at all, have the child take out 72 cards of some sort, and share them equally between 8 spots on the floor, to represent 8 friends. How many would each friend get?

5. **Answer:**



The names are: **8 *tenths* and 6 *hundredths*** and

86 *hundredths*

Have your child to think of the whole grid as one that's divided into 100 small squares, and 86 are filled in. You might relate this problem back to problem 8 on Worksheet III and remind the child that 8 of the *tenths* columns are shaded, plus 6 small squares, so it can be called 8 *tenths* and 6 *hundredths*. Or 86 of the small squares—*hundredths*—are shaded, so you can also call it 86 *hundredths*.

6. **Answer: A. 8 B. 8 C. 8 × 8 = 64 square inches.** Your child can count the black, white and gray squares, but he or she might prefer to add 8 + 8 + ... + 8 and get 64. Encourage the child to notice that a short cut to repeatedly adding the same number is to multiply, in this case 8

× 8. Also have the child notice that the *area* of a rectangle like this one is always going to be the number of rows by the number of columns.

7. **Answer: 1, 2, 3, 4, 6, 8, 12, 24** This problem is an introduction to *factors* of a number. A *factor* of a number is one that divides into it evenly. In this case, she could give all 24 jelly beans to 1 friend, so 1 and 24 divide 24 evenly and are factors of 24. She could also give 12 jellybeans to 2 friends, or 2 jellybeans to 12 friends, so both 2 and 12 are *factors* of 24. Similarly for 3, 8, 4, and 6.

A more concrete way would be to use 24 of something (pieces of candy, beans, or some sort of manipulative) and divide all of the items until each group is equal. The groups would represent the number of friends.

8. **Answer: 54 times.** Your child might add 4 + 2 + 3 = 9; then, 9 × 6 = 54. Though this is a basic multiplication fact, the most enjoyable way to find the answer is to act it out. You might hear some bongo beats going on, but this is a wonderful way for your child to connect math with music!

9. **Answer: 36 points.** The most direct way to solve this problem is to add 7 + 5 = 12, then multiply 12 × 3 = 36. If your child is having difficulty with this, you might ask for another way to find how much three 12s make. The child might add 12 + 12 + 12 = 36. This is fine, as long as the connection is made that multiplication is a shortcut for repeated addition.

Suggestions for helping your child find the answers

Grade 4, Worksheet V

1. **Answer: about 3 liters.** This problem is about estimation in the real world. 4.8 liters is 4 and 8/10 liters, and that's very close to 5 liters. You can have your child talk about how much money $4.80 is, and what it's close to—$5. Likewise, 1.9 liters is very close to 2 liters, and 5 liters – 2 liters is 3 liters.

2. **Answer: 1320 miles. The explanation should show an understanding of the process they used to find their solution. A diagram may be a part of the explanation, but encourage your child to translate the picture into words.** This is a two-step problem and may be solved different ways. Some children find the distance one car travels and then add the three together, or multiply by three. Others may multiply 3 × 4 first, thinking that each trip of the three cars around the track results in 12 miles. They would then multiply 110 × 12, or add 110 twelve times. Whichever way your child chooses to solve the problem, discuss other options to allow the child to see different ways. Drawing the track and cars or even using toy cars sometimes helps children relate to the problem. If your child has difficulty with the explanation, talk about it with her or him first. Once it's verbalized, the child may find it easier to write.

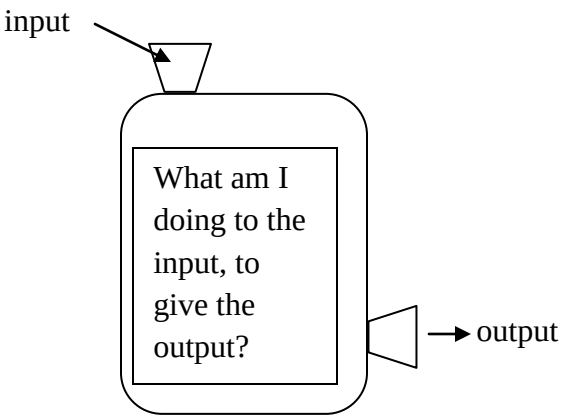
3. **Answer: C ($0.40)** Prompt a discussion about the value of $0.10 equaling 1 dime. Discuss that 1 dime is 1/10 of a dollar since 10 dimes make $1, and so 4 dimes is 4/10 of a dollar. There are two basic ways to show 40 cents: $0.40 or 40¢, **but not** 0.40¢. The latter means 4/10 of one cent or four-tenths of a penny.

4. **Answer:** ***Joe could make a 1 row-by-36 car lot; or a 2 row-by-18 car lot; or a 3 row-by-12 car lot; or a 4 row-by-9 car lot; or a 6 row-by-6 car lot; or a 9 row-by-4 car lot; or a 12 row-by-3 car lot; or an 18 row-by-2 car lot; or a 36 row-by-1 car lot. There are 9 ways all together.*** The purpose of this problem is to find the different combinations of numbers (factors) that make 36. Making a diagram or acting it out with toy cars, or things that represent the cars, will help your child visualize the answers. If the child knows some of the basic facts, start with those and then use other strategies to find the remaining combinations. The key is to count each combination both ways because the parking lot would look different, for example, with 2 rows of 18 cars or 18 rows of 2 cars. If the child writes a list as he or she works, a pattern might be seen as the numbers begin to reverse.

5. **Answer: ¼ of the square should be shaded. A. One-fourth is equal to 25% or 0.25.** If the child shades in one of the four small squares inside the larger one, they will have shaded 25 of the 100 tiny squares that make up the large square. Since there are 100 tiny squares, each is 1/100 of the square, so when ¼ is shaded in and that's 25 tiny squares, another name is 0.25 of the square. 25% is one of the "friendly numbers" for percent, so many children will recognize immediately that this shows ¼ of something. If not, tell them the word "per cent" literally means "per 100", so 25% literally means 25 out of 100.

6. **Answer: a. 21; 27; ? is $x + x + x$ *or* $3x$. b. 7; 9; is $x \div 3$. The relationship between the two tables is that the rules are inverse operations of each other.** To help your child identify this, have her or him look at how the numbers in each table are the same, just in opposite order. To extend this, see if the child can make up other tables with "inverse operations."

If your child is having trouble visualizing this problem, it might help to draw a "function machine" on the paper like the one below, and pretend that he or she is actually putting numbers into and taking numbers out of a machine. The task is to determine what the machine has been set to do to the input number, to find the output number



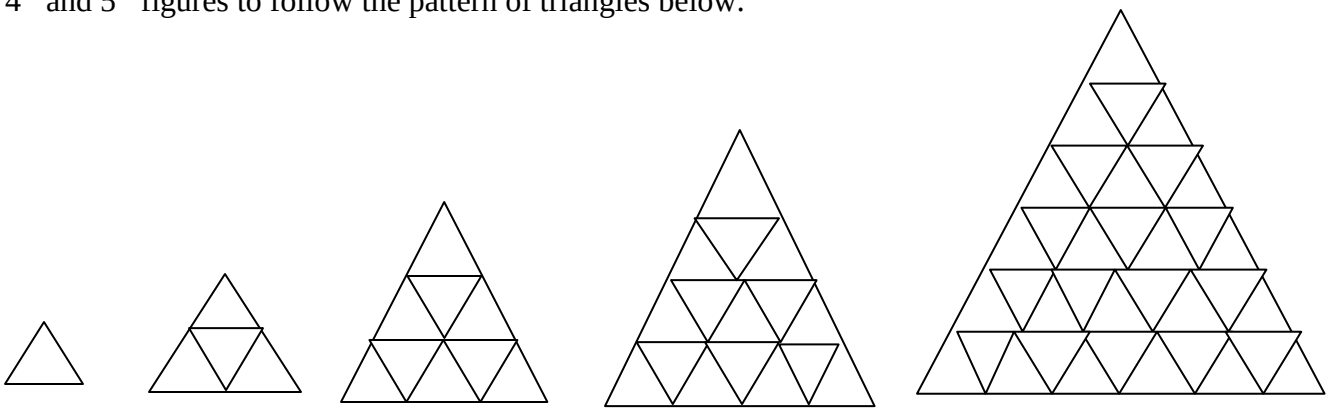
7. **Answer: (150 + 85) × 3 = *t*; *t* = 705 minutes.** To solve this problem, your child needs to find the total minutes Sylvia spends on the Internet each day (150 + 85), and multiply that amount by the number of days each month this event occurs (3). Most children will write the initial equation as 150 + 85 × 3. If they do this, the problem might be solved as 85 × 3 = 255, then add 150, resulting in 405 minutes. This is an incorrect answer, because it is saying that she spends 85 minutes a day, 3 times a month plus an additional 150 minutes on the Internet. Talk with your child and ask what happens "3 times". In order to find the total number of minutes to multiply by three, the 150 and 85 need to be added together first and the parenthesis groups these numbers together for that reason.

8. **Possible Answer: about 800 beats.** The key word in this problem is <u>about</u> how many beats there are in the song. Start out by asking "is 3 minutes 58 seconds closer to 3 minutes or 4 minutes?" You can further the discussion by stating how many seconds are there are in 1 minute. Since 58 seconds is almost 1 minute, add that minute to the 3 minutes stated in the question, which would give 4 minutes. 180 beats per minute is also about 200 beats per minute, so an estimate is "about 200 beats per minute × 4 minutes", or 800 beats. Accept other reasonable answers such as if the child rounded off one of the numbers correctly, but used the other number as it stands.

Suggestions for helping your child find the answers

Grade 4, Worksheet VI

1. **Answer: a. See below**. **b. 36 and 49** The purpose of this problem is for the child to visualize the pattern as a row is added to the bottom of each triangle. Have your child draw the 4^{th} and 5^{th} figures to follow the pattern of triangles below.



For the (b) part of the question, maybe your child will recognize that the first five numbers of triangles are the square numbers—1, 4, 9, 16, and 25—and then predict that the next two square numbers are 6×6= 36 and 7×7 = 49. Another pattern is that each n^{th} triangle is the sum of the first *n* odd numbers.

2. **Answer: 360°.** Your child should be familiar with the right angle, 90°. A square has four of those and 4 × 90° = 360°. If your child is unfamiliar with right angles, use an index card or a corner of a page to show this unique and useful angle.

3. **Answer: A is between 5 and 6, but closer to 6; B is between 7 and 8, but closer to 7; C is between 9 and 10, but closer to 9.** The point of this problem is for your child to realize that decimals allow us to name numbers *between* whole numbers. If your child divides the segment from 5 to 6 into 10 equal parts, then 5.7 will be the 7^{th} such mark away from 5. Similarly, have the child divide the segment from 7 to 8 to find 7.3, and the segment from 9 to 10 to show 9.2. A better way to present this problem to your child would be to take a real centimeter ruler which is already marked off in *tenths* between the whole centimeter marks, and use that ruler to measure actual pencils or other such items around your house. (The marks between the whole centimeters are called *millimeters*, but they are also *tenths of a centimeter*. So *5.7 centimeters* is also *5 centimeters, 7 millimeters.*)

4. **Answer: Have your child perform as the problem states, and show it to you.** He or she should trace over the figure, stick a pin or another sharp object in the center as a "turn point", and turn the figure. The traced image should match the original with a "half-turn" of 180°.

5. **Answer: Sue is not right. She needs 10 small tables.** Eight people sitting around the four large tables is seating for 32 people. This leaves 38 people still needing seats. If the small tables seat 4, nine tables would only allow seating for 36, leaving 2 people without a place to sit. A tenth table is needed for the 2 remaining people. A good way for a child to solve this problem is to draw a diagram of the picnic tables. Your child might try Sue's way and draw the four large and nine small tables with the appropriate number of seats at each. After counting the seats, your child should realize Sue is two seats short. Another way your child might solve this problem is to draw her or his own plan for 70 people using four large tables and enough small tables to fit the remaining 38 people. Whichever way is chosen to draw the diagram, your child should see Sue's error. To extend this problem, have the child plan a picnic of their own. What kind of seating would is needed?

6. A**nswer: 2.25.** Each full box is one whole and the last box is divided into four equal sections with one of the sections shaded in. One out of four represents 25 *hundredths* of a box, just like ¼ of a dollar is $0.25. So the whole shaded area is 1 + 1 + 0.25 or 2.25 square inches.

7. **Answer: 12 eggs.** This problem can be solved by the *measurement* interpretation of division, although there are other ways to think of it. Two hours is 60 + 60 or 120 minutes. If you start marking off 10-minute chunks of time, you'll have six of those in each hour, or 12 in two hours. So "120 ÷ 10 = 12" is one way to write a number sentence for the problem.

8. **Answer: Hank is not correct. The toy cars weigh 10 grams each.** The key to this problem is for the child to know Hank has 25 grams total on each side of the scale. If the right side is 25 grams, then the two cars together must be 20 grams, and so each car would be half of that, or 10 grams. This problem is a precursor to solving the equation "$25 = 5 + 2x$," where x is the unknown weight of one car. If you subtract 5 grams from both sides of the equation, you have that "$20 = 2x$". Dividing both sides by 2 yields "$10 = 1x$".

Suggestions for helping your child find the answers

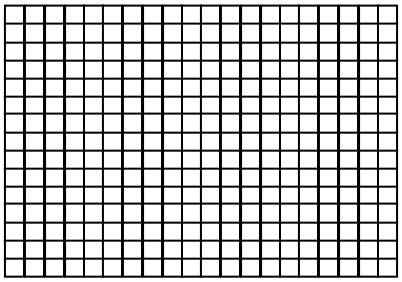
Grade 4, Worksheet VII

1. **Answer: 93½ square inches**. Help your child start with a clean sheet of paper, and mark off inches around the perimeter so that square inches (and ½ square inches) are produced when the marks are connected. There should be 8 × 11 or 88 whole square inches when counted, and another 11 one-half square inches. When the half square inches are put together, you have 5½ square inches to go with the 88 whole square inches. Altogether, then, there are 93½ square inches. You might point out to your child that 8½ × 11 is 8 × 11 + ½ × 11.

2. **Answer: A: 0.1 B: 0.2 C: 0.3 D: 0.4.** Be sure your child notices where 0 and 1 are on the number line, and that he or she realizes that the other numbers will be smaller numbers than 1 whole. The number line goes up each notch by one-tenth beginning with zero and ending at 1.1.

3. **Answer: 3.** This problem applies the concept of area to a real world problem. Your child may realize that the area of a rectangle is given by multiplying the length by the width, and your child may be able to do that multiplication. An area of 300 square feet should be obtained, which takes 3 quarts of paint.

If your child needs more help understanding what to do, have them make a drawing that shows a 15-centimeter by 20-centimeter rectangle where each centimeter represents 1 foot. Have the child draw in the grid for the paper—see below—and point out that there are now 15 rows with 20 squares in each row, and that's written as 15 × 20. The answer to 15 × 20 can be obtained by adding 20 fifteen times, or by adding 20 five times to get 100 square feet, then tripling that amount. In any case, once the child determines there are 300 squares in the grid, and every 100 squares requires 1 quart of paint, he or she can reason that 3 quarts are required.

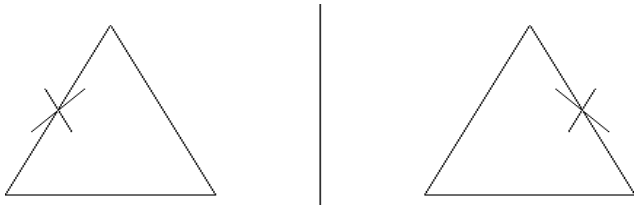


Each row has 20 squares in it, and there are 15 such rows.

4. **Answer: 30,000 tickets each month.** This problem shows another real-world use of multiplication. If your child can compute 24 × 1250 directly, then encourage that procedure. Or the problem can be approached by repeatedly adding 1250, doing so 24 times. Or the child might make short cuts to the addition, realizing that two 1250s is 2500, and two 2500s is 5000, so that would be 4 groups of 1250, and proceed further in that manner. Any way that makes sense to your child to find 24 × 1250 is appropriate. Multiplying multi-digit numbers will be practiced in 4th grade.

5. **Answer: The shaded part is 8/10 as a fraction, and 0.8 as a decimal. The total shaded area (A+B) would be 1 8/10 as a mixed number, or 1.8 as a decimal.** Figure B is separated into ten equal parts, so each part shows *tenths* of the whole. Since eight of them are shaded in, that makes eight tenths, which can be written both as a fraction (8/10) or as a decimal (0.8).

6. **Answer: See figure below.** Have your child practice this concept by creating a shape such as a triangle, tracing over the shape, and then "flipping" the shape over a line placed randomly outside the traced image. He or she can mark where the vertices would be, then remove the tracing and draw in lines to connect the vertices. You might liken this process to the child looking in a mirror, where the right hand becomes the left hand in the mirror image, and so forth. Right and left are reversed in this reflection.



7**. Answer: 134 ounces.** 8 pounds ×16 ounces per pound = 128 ounces. 128 ounces + 6 ounces = 134 ounces. Again, your child may know how to multiply 8 × 16 directly, but if not, he or she can add eight 16s together, and then add on the final 6 ounces. Your child will have plenty of practice with these types of multiplication problems in 4^{th} grade.

8. **Answer: Rotational and line symmetry.** The blades of the windmill have *rotational symmetry* because you can turn the blades around the center point of the windmill, less than a full turn, and the windmill looks the same. It is also possible to cut the windmill in half (*line symmetry*) and put one half over the other, and the two sides match up. So this shape has both *line* and *rotational symmetry.*

Suggestions for helping your child find the answers

Grade 4, Worksheet VIII

1. **Answer: "5" is in the *ten thousands* place. "6" is in the *thousands* place. "8" is in the *hundred thousands* place.** Your child might look at a place value chart like the one below. The chart can be used to see that the 8 is in the *hundred thousands* place, the 5 is in the *ten thousands* place, and the 6 is in the *thousands* place.

Place Value						
Millions	Hundred Thousands	Ten Thousands	Thousands	Hundreds	Tens	Ones

You might point out that we continue with this same system as numbers get larger. Numbers are grouped by commas (in this country) so that we never have to read larger than a 3-digit number, if we know the name of the *period* we're in. Your child might practice naming some larger numbers like:

94,000,000 miles from the earth to the sun—94 million

5,000,000,000 red blood cells in a liter of blood—5 billion

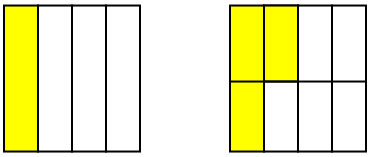
135,000,000,000 stars in our galaxy—135 billion

And the national debt, at the time these materials were prepared, was in the trillions of dollars. Large numbers are all around us, even if we don't think of them all the time. If we know the *period* names like millions, billions, trillions, and quadrillions, we can easily read large numbers.

2. **Answer: From the left: *acute, obtuse, right, obtuse,* and *right*.** The question itself gives the clues as to how to classify each of the angles. If your child is unfamiliar with the measurement of angles have her or him practice drawing some angles with an index card or another right-angled corner. One point of this problem is to show your child that angles are all around us. (Note: if your child says "acute" for the right-hand clock, and can explain that it's real close to *right*, then they are correct also. It's too hard to tell for sure.)

3. **Answer: There are several creative ways that your child might explain how to get from 5×6 to 7×6 quickly.** One way is to say "5×6 = 30", and two more 6s is 12, and 30+12 is 42. Another way is to start with 5×6 = 30, and add 6 more for 36, then count 6 more up to 42. The main point of the problem is for your child to learn to use what he or she knows, to quickly get things he or she doesn't know. You child might know that 8×6 = 48, for example, and 1 less 6 would be 48 – 6 = 42.

4. **Answer: Diana's square should be partitioned into equal 4 pieces, with one of them shaded, while Wayne's square should be partitioned into 8 pieces, with 3 of them shaded. Your child can see that 1 out of 4 shaded pieces is less than 3 out of 8 shaded pieces.** Watch and assist your child to divide the square for "Diana's potatoes" into 4 equal regions, and shade in 1 of those**,** and Wayne's into 8 equal regions, and shade in 3 of those. He or she can see that Wayne's square has more shaded area than Diana's, so 3/8 is bigger than ¼.



5. **Answer: Diana bought 4 ounces and Wayne bought six ounces.** The process of dividing the squares above into 16 pieces, all the same size, is similar to dividing them into 4 or 8 pieces. The result is that Diana will have 4 of her 16 pieces shaded, and Wayne will have 6 of his shaded, and that gives the number of ounces directly. The important part of this problem is for your child to realize that 4/16 is another name for ¼, and 6/16 is another name for ⅜. A good deal of time will be spent finding new names for fractions in 4th grade, and hopefully much of the class work will be similar to the above—drawing diagrams into equal parts, then shading the parts to show various fraction names for the same amount.

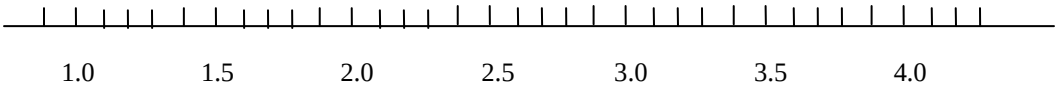
6. **a. 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24, 26, 28, and 30 should be circled. 3, 6, 9, 12, 15, 18, 21, 24, 27, and 30 should have squares around them. b. 6, 12, 18, 24, and 30 have both circles and squares around them. The latter numbers are all multiples of 6.** If your child doesn't know what "multiples of 2" means, have her or him simply count by 2's—those are the multiples of 2. Likewise for the multiples of 3—the child can count by 3's to find them. The numbers that are multiples of both 2 and of 3 are numbers you hit when you count by 6. What your child is doing in this problem is a precursor to finding *common multiples*, and eventually the *least common multiple* of two given numbers. This procedure will profit the child when he or she starts adding fractions and needs to find a common denominator.

7. **Answer: 50¢ or 51¢ or 52¢.** The important part of this problem is for your child to realize that $3.10 needs to be split into six pieces all the same size (or close to the same size, since the question calls for an estimate.) A hint is the picture shown of the dollar bills. If your child is having trouble knowing what to do, have them draw 6 apples and three $1 bills, and then divide the dollar bills in half and give ½ dollar to each apple. Then the child can trade in the dime for ten pennies, and further distribute the money to the apples. The child will wind up with 51¢ for each apple, with 4¢ left over. An answer of 50¢ is appropriate as an estimate, or 51¢ or 52¢, depending on how accurate an answer the situation calls for.

Suggestions for helping your child find the answers

Grade 4, Worksheet IX

1. **Answer: Any mileage between 10 miles and 15 miles is acceptable.** Your child may need help realizing what 1.8 miles and 3.2 miles mean. You might show these numbers on a number line as below, and then ask what "friendly numbers" 1.8 and 3.2 are close to. He or she will likely say 2 and 3, so John travels somewhere between 2 and 3 miles each day. You might get the child to name a number between 2 and 3, and 2½ (or 2.5) is the most likely number for them to say. So if John went about 2½ miles each day for five days, your child will probably know that 2½ + 2½ gives 5, since 2 + 2 = 4 and ½ + ½ gives 1, and 4 + 1 = 5. So four days like that would be 10 miles, and another 2½ on the 5th day gives 12½ or 12.5 miles. However, the child might just use 2 miles per day, or 3 miles per day, as "about how far John went each day", and get an answer of 10 or 15 miles per school week.



2. **Answer: a. 99 b. Answers will vary.** The main point of this problem is for your child to realize that these decimal numbers are all between the two whole numbers 13 and 14. The problem is put into a familiar setting of money, but the same would be true if the setting were weight or distance or any other measure. With decimals, you can always find a number between any two given numbers.

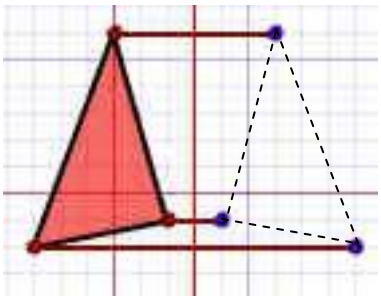
3. **Answer: 90º and 180º.** This problem returns to what the child learned in the previous worksheet about right angles—those with 90º angles. Angles can be checked with the corner of a sheet of paper. Ask your child what they would get if they put two 90º angles together. The answer should be an angle that is twice that large, or 180º, and what would it look like? It actually wouldn't look like an angle at all—it would seem to be a straight line. That's why it's called a *straight angle*. You might have to tell your child to ignore the extra "hand" in the clock on the left—the child might not realize that's the *second* hand.

4. **Answer: The child's drawing should look exactly like the original flag.** The purpose of this problem is for the child to realize that you can perform "rigid motions" with geometric figures—slides, flips, and turns. Occasionally, you will get the same figure back, as in this case—if there is enough symmetry in the original figure. This original flag has 2 lines of symmetry and also has rotational symmetry.

5. **9.7 cm is circled, and 18 cm has a triangle around it** The main point of this problem is for students to compare different lengths using decimals. Have a centimeter ruler and have your child show you the different lengths of each pencil, and keep track of the longest and shortest one they measure. You might point out that a length like 9.8 cm is also called 9 cm 8 mm. But they are simply two names for the same length—*millimeters* and *tenths of a centimeter.*

6. **11** Have your child put out 33 items to represent the sea shells, and then divide them equally into 3 groups. This problem is a foundation for long division—for example, the child could take ten seashells and put them into the 3 groups first, and then deal with the remaining 3 sea shells. Your child will have plenty of practice on this "partitioning" interpretation of long division in 4th grade.

7. **Answer: See below.** The purpose of the problem is for your child to practice moving a figure using a "rigid motion." In this case, the motion is called a *reflection.*



8. **5 packages.** This problem is a different interpretation of division than the one in #6 above, and this one is called *measurement*. Here the question is—if 1 package of balloons suffices for 5 students, how many groups of 5 students are there in 23 students? So you start subtracting 5 from 23, and you can do that 4 times, with 3 students left over. But practicality says that you'll have to buy another package of balloons for those 3 students, so the real-world answer is you'll need 5 packages. Encourage your child to draw 23 items for the students, and then group them into groups of size 5, and see how many groups there are.

Suggestions for helping your child find the answers

Grade 4, Worksheet X

1. Answer: 20 combinations Some students will know that you can multiply 5 and 4 to get the answer to this problem, but most students will not know this before entering 4th grade. They can solve the problem by drawing a line from each shirt to each pair of shorts, and they'll have 20 lines. They might prefer to make an organized list, calling the shirts, A, B, C, and D respectively, and the shorts E, F, G, H and I. Then the list would be something like: (A,E), (A,F), and so on.

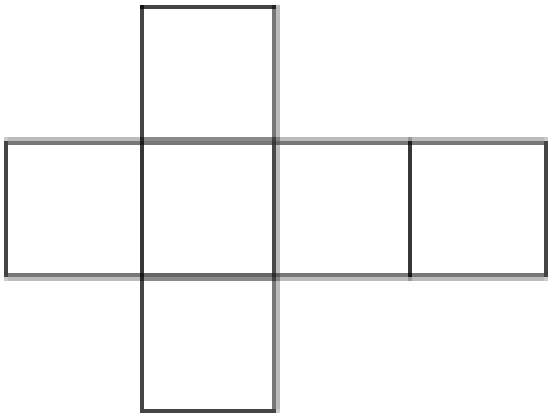
2. Answer: answers will vary Help your child measure the length and width of their mattress, and use words like "It's closer to 5 feet than to 4 feet" to get them to round off. If you have cardboard, then they can make the square as directed and place it down on the bed repeatedly to measure the area. If you don't have cardboard to use, then use a rag cut into a square that size, or a sheet of newspaper.

For part (c), hopefully you can lead your child to see that when he or she has an array of squares like this, that is l units long and w units wide, the area can be found by multiplying $l \times w$. (Don't use variables to describe this process unless the child is fairly advanced in mathematics.)

3. **Answer: $5 \times 8 - h$ or $8 \times 5 - h$.** An expression is like a phrase in English and doesn't have an equal sign. Many students want to find an answer to this problem (which is impossible since we do not know the missing amount). The student is being asked to decide what operations are needed to solve the problem and where the numbers would be placed. The student *should* use a variable here.

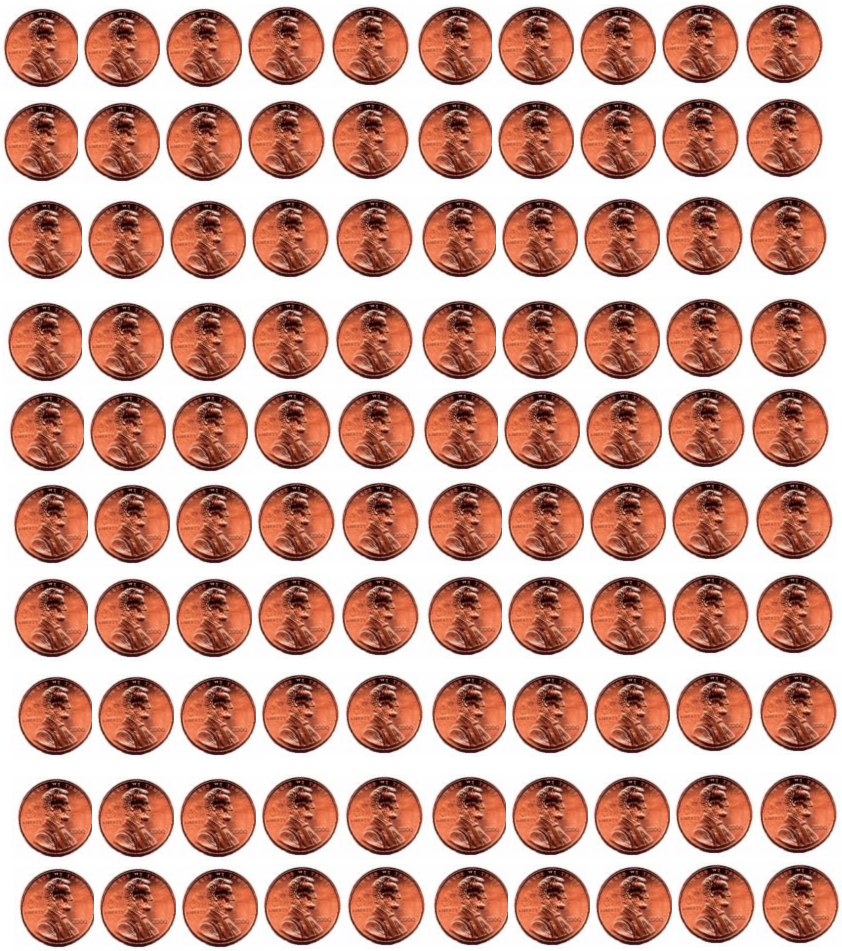
4. **Answer: 40** This problem is an example of the major type of story problem calling for multiplication—repeatedly adding the same amount. In this case, your child will probably add 5 eight times, or maybe count by fives up to 40.

5. **Answer: Cube.** Explain that a net is a three-dimensional shape that is broken down so that all the parts are two-dimensional (flat). Have the child cut out the net below, which is bigger and easier to hold, than the one pictured, and fold the sides to create the three-dimensional shape.



6. **Answer: The output numbers are 11, 5, and 29 respectively.** Discuss what is happening with your child, in terms of what each robot does and what happens when they are hooked together. Hooking together two operations like this produces what is called a *composite function*, an important idea when the child gets to algebra. If your child needs more examples before catching on as to how to get the answers, have her or him work first with the left machine, and if the child doesn't know to multiply, have them notice that it's also the input number added to itself two more times. Then work with the right robot. After that, put the two robots together.

7. **Answer: 0.05** Be sure your child understands that a penny is 1/100 of a dollar, since it takes 100 pennies to make a dollar. Writing 0.01 is simply another way to show 1/100 of something, so a penny is also \$0.01. Since it takes 5 pennies to make a nickel, a nickel would be 5/100 of a dollar, or \$0.05. Your child might practice writing various amounts of money by you circling them in a picture like that below, and the child writing decimal names for the circled amount.



Thank You!

Thank You!