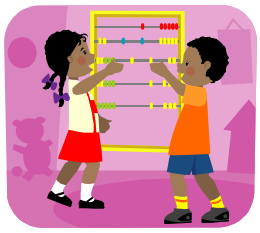
Smiley Face Math

Rising 3rd Graders



Prepared by the University of South Florida Saint Petersburg

For a copy of these materials, go to www.cdnportfolio.net/smileyfacemath

Acknowledgements

These materials were developed during a *Problem Solving for Elementary Teachers* class at the University of South Florida Saint Petersburg (USFSP) during the spring of 2009. The worksheets were field tested by the teachers in their own classrooms.

The project was conceived and directed by Dr. Charles A. (Andy) Reeves. Dr. Reeves previously developed the Superstars, Superstars II, and Sunshine Math packages of supplementary materials for grades K-8. Dr. Reeves is particularly interested in problem solving and in algebraic thinking.

The Writers and Field Testers

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Technical Assistance

Final proofing and editing was provided by Dr. Malcolm B. Butler, Associate Professor of Science Education at USFSP. His educational interests include elementary teacher education, science curriculum development, and multicultural education. Dr. Zafer Unal, Assistant Professor of Early Childhood Education, USFSP, prepared these materials for the internet. Dr. Unal's interests include technology in teacher education, institutional and program assessment, e-portfolios, parental involvement and classroom management.

CONTENTS

Your child will probably have her or his hand up more often next school year, if you use this material during the summer.

Section 1

Overview of the *Next Generation Sunshine State Standards in Mathematics, K-8*, adopted by the State Board of Education in September, 2007.

The Florida Board of Education adopted new mathematics standards in 2007. The standards were developed by Florida teachers, supervisors, and university faculty. The main goal was to reduce the number of standards listed each year so that teachers could focus on fewer topics, but teach those topics in-depth. This emphasis reflects a national trend, and our work was based on the National Council of Teachers of Mathematics' publication *Curriculum Focal Points for Prekindergarten through Grade 8 Mathematics.* (NCTM 2006) The total number of math standards that a K-8 teacher is responsible for covering has been reduced from an average of 87 per grade level, to 18. So teachers will definitely have more time to teach in an in-depth fashion.

Each grade level has three *Big Ideas* and each *Big Idea* contains several benchmarks under it, usually three or four. There are also *Supporting Ideas* for each grade level that round out the curriculum and maintain two strands—algebraic thinking and problem solving—over a several-year span. This strategy combines an in-depth look at the *Big Ideas* in a given year, with topics that students should work on *every* year.

The *Big Ideas* for Grade 3 are:

BIG IDEA 1: Develop understandings of multiplication and division and strategies for basic multiplication facts and related division facts.

BIG IDEA 2: Develop an understanding of fractions and fraction equivalence.

BIG IDEA 3: Describe and analyze properties of two-dimensional shapes.

This means that 3rd graders are going to spend much of their math time (1) developing solid understandings of basic multiplication and division facts and story problems, (2) learning in-depth about fractions and when fractions are equal to each other, and (3) visualizing and analyzing two-dimensional geometric shapes, such as squares, triangles, pentagons, and so forth.

The *Supporting Ideas* for Grade 3 come from the *Algebraic Thinking* strand, the *Measurement* strand, the *Number and Operations* strand, and the *Data Analysis* strand. From the *Algebraic Thinking* strand, students will express number relationships with charts, with words, and with drawings and variables. In *Measurement*, they will learn about perimeter, they will measure actual figures using "friendly fractions" like ½ and ¼, and they will practice telling time and "elapsed time." In the *Number and Operations* strand, they will use numbers up through hundred thousands, and they will solve non-routine problems by making a chart or list, and by searching for patterns. In the *Data Analysis* strand, they will make various types of graphs to display data that they collect in the classroom and at home.

In short, your child will be learning much more about fewer math topics than in the past. This shift in emphasis will produce a curriculum that is much more in-depth about very basic ideas, so that re-teaching in future years will be unnecessary. What is necessary, however, is that the ideas learned in one year be used and reinforced in later years. Some have said that the math curriculum will go from a "mile-wide, inch-deep" curriculum, to an "inch-wide, mile deep" curriculum. The truth lies somewhere between those two extremes.

Reference

National Council of Teachers of Mathematics, *Curriculum Focal Points for Prekindergarten through Grade 8 Mathematics.* Reston, VA: 2006.

How to Use these Materials with Your Child

The worksheets to follow are designed to be used during the summer prior to a student entering 3rd grade. The worksheets are similar to Florida's popular *Sunshine Math* program where students accumulate stars for doing extra problems. The answers and how to help your child, without giving too much help, are in the back of this package. The directions below are written for the individual parent, but can be adapted by schools, churches, or other community groups sponsoring summer camps for youth groups. The worksheets are each two pages in length so that, if copied front-to-back, they will each use one sheet of paper.

Do not feel that you have to "teach" these problems to your child. That is the job of the school system next year. But many times children learn things incidentally, by talking with others. If you simply talk through the problems with your child, perhaps he or she will remember that type of problem when it is encountered in 3rd grade, and therefore be more successful with it.

Give out one worksheet a week during the summer. You might read all the problems with your child the first night, being sure each problem is well understood, but not trying to solve the problems. You should ask for any ideas your child has about how to solve the problems. Then he or she will have all week to complete the worksheet.

When the week is up, have a "help session" with your child in which he or she explains how to solve the problems. Help the child understand the problems that they did not solve because similar problems will be seen later during the summer and all next school year. Each problem is worth 1-4 *smileys*, depending on how hard it is. You can give partial credit for problems if the child understood how to proceed but made a mistake, and you can give a single *smiley* if the problem was tried but completely missed, assuming the child now understands the problem.

Your child's reward for doing this extra work is accumulating *smiley faces* on a chart—you'll need to make one of those and keep up with it each week. The chart needs to occupy a prominent place in your house, where the child and others will see it regularly. You might consider adding some extra incentives for reaching certain levels.

For example, once 10 *smileys* are earned, he or she gets a book of their choice. For reaching 25 *smileys*, he or she might get to go to a movie. For reaching 50 *smileys*, a trip to the beach or a sleepover with friends might be earned. The basic idea is that your child can earn enjoyable prizes by doing some extra math problems. He or she will also realize that next year's math class will be made much easier by knowing how to complete these tasks.

SMILEY FACE MATH

Markus has this many smiley faces: ☻ ☻ ☻ ☺ ☺ ☺ ☺ ☺ ☺

Key: ☻ = 10☺

Note: The process of making the *smiley face* chart is a math task in itself, one from which the child can learn. You—or your child—can make a chart easily using a word processing program by going to the "insert symbol" menu on a PC, and finding the *smiley face* symbol. As the number of *smileys* on the chart becomes large, you can use a key such as ☻ = 10☺'s and your child will have learned something else about mathematics—how to construct a useful chart to display data.

Correlation of the Problems and the *Next Generation Sunshine State Standards in Mathematics* for Third Grade

BIG IDEA 1: ***Develop understandings of multiplication and division and strategies for basic multiplication facts and related division facts.***	
BENCHMARK CODE	**BENCHMARK**
MA.3.A.1.1	Model multiplication and division including problems presented in context: repeated addition, multiplicative comparison, array, how many combinations, measurement, and partitioning. [I 1, 2, 3; II 5, 6; III 8; IV 1, 4, 6, 7; V 1, 6, 7; VI 3; VII 3; VIII 1, 4; IX 2, 3; X 4, 7]
MA.3.A.1.2	Solve multiplication and division fact problems by using strategies that result from applying number properties. [IV, 8; IX 2, 3; X 2]
MA.3.A.1.3	Identify, describe, and apply division and multiplication as inverse operations. [IV 4; V 6, 7; VI 7]

BIG IDEA 2: ***Develop an understanding of fractions and fraction equivalence.***	
BENCHMARK CODE	**BENCHMARK**
MA.3.A.2.1	Represent fractions, including fractions greater than one, using area, set and linear models. [I 5, 6, 7, 8; II 3, 4, 8; IV 5; V 2; VI 2; VII 1; VIII 2, 5; IX 4; X 1, 6]
MA.3.A.2.2	Describe how the size of the fractional part is related to the number of equal sized pieces in the whole. [II 3, 4, 8; V 2; VI 2; VIII 6; IX 4; X 6]
MA.3.A.2.3	Compare and order fractions, including fractions greater than one, using models and strategies. [I 5, 7; II 8; VI 2; VIII 6; IX 4; X 6]
MA.3.A.2.4	Use models to represent equivalent fractions, including fractions greater than one, and identify representations of equivalence. [I 5; IV 5; IX 4]

BIG IDEA 3: ***Describe and analyze properties of two-dimensional shapes.***	
Benchmark Code	**BENCHMARK**
MA.3.G.3.1	Describe, analyze, compare and classify two-dimensional shapes using sides and angles – including acute, obtuse, and right angles – and connect these ideas to the definition of shapes. [I, 4; II 7; III 1, 5, 6; V 4, 5; VII 4, 5; VIII 8]
MA.3.G.3.2	Compose, decompose, and transform polygons to make other polygons, including concave and convex polygons with three, four, five, six, eight, or ten sides. [I, 4; III 1; VI 4; VII 4]
MA.3.G.3.3	Build, draw and analyze two-dimensional shapes from several orientations in order to examine and apply congruence and symmetry. [III 2, 7, 8; VI 6]
Algebra	
BENCHMARK CODE	**BENCHMARK**
MA.3.A.4.1	Create, analyze, and represent patterns and relationships using words, variables, tables and graphs. [III 3; IV 2; V 6; VIII 2; IX 6]

Geometry and Measurement	
BENCHMARK CODE	**BENCHMARK**
MA.3.G.5.1	Select appropriate units, strategies and tools to solve problems involving perimeter. [V 3; IX 1, 5]
MA.3.G.5.2	Measure objects using fractional parts of linear units such as $\frac{1}{2}$, $\frac{1}{4}$, and $\frac{1}{10}$. [III, 8; IX 1; X 6]
MA.3.G.5.3	Tell time to the nearest minute and to the nearest quarter hour, and determine the amount of time elapsed. [II 2; IV 3; V 4, 5; X 1]

Number and Operations	
BENCHMARK CODE	**BENCHMARK**
MA.3.A.6.1	Represent, compute, estimate and solve problems using numbers through hundred thousands. [III 4; VI 5; X 3]
MA.3.A.6.2	Solve non-routine problems by making a table, chart, or list and searching for patterns. [I 3; V 6; VI 1; VII 2; VIII 2; IX 1]

Data Analysis	
BENCHMARK CODE	**BENCHMARK**
MA.3.S.7.1	Construct and analyze frequency tables, bar graphs, pictographs, and line plots from data, including data collected through observations, surveys, and experiments. [II 1; VI 5; VII 5, 7; VIII 7]

Section 2

Smiley Face Math **Name: _____**
Grade 3, Worksheet I

☺ ☺ 1. Shantell wants to plant a flower garden. The garden will have 8 rows with 6 flowers in each row. She has already planted 1 row of her garden.

How many plants will Shantell have in her garden? ____ plants

How many more plants does she need to buy? ____ more plants

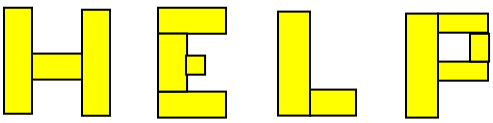
☺ ☺ ☺ 2. A class of 27 students wanted to ride the bumper cars at the fair. Only 10 students can ride at a time. How many turns will it take for the entire class to get to ride on the bumper cars?

Answer: ____ turns are needed

☺ ☺ ☺ 3. Marcus wanted a scoop of ice cream with a topping. He had 2 choices of ice cream: chocolate, and vanilla. He had 3 choices of toppings: an Oreo, whipped cream, or a strawberry. How many different combinations of ice cream and topping did Marcus have to select from?

Answer: _____ choices

☺ ☺ ☺ 4. A word is shown to the right.



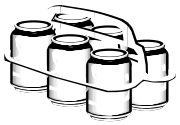
What word is it? _____

How many rectangles did it take to spell this word? ____

How many *right angles* do all of those rectangles have, altogether? ____

☺ ☺ ☺ ☺ 5. Isabella gave 3/6 of her 6-pack of soda to her friends. Cross out the part she gave away. Antoine drank ½ of his 6-pack of soda. Cross out the part he drank.

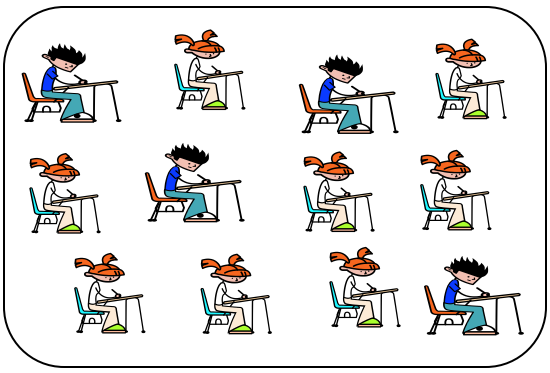
Isabella's 

Antoine's 

a. Who has the most soda remaining, or do they have the same amount left?
Explain:

b. What fraction is bigger, 3/6 or 1/2? Or are they equal fractions? Use your answer above to explain your thinking.

☺ ☺ 6. Look at the class to the right.



a. What *fraction* of the students are girls? _____

b. What *fraction* of the students are boys? _____

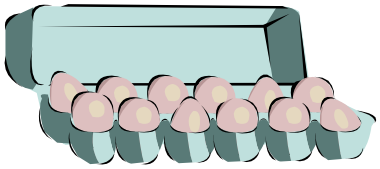
Key: Boy is 

Girl is 

☺ 7. In the classroom above, which is larger, the fraction of girls or the fraction of boys? _____

Explain:

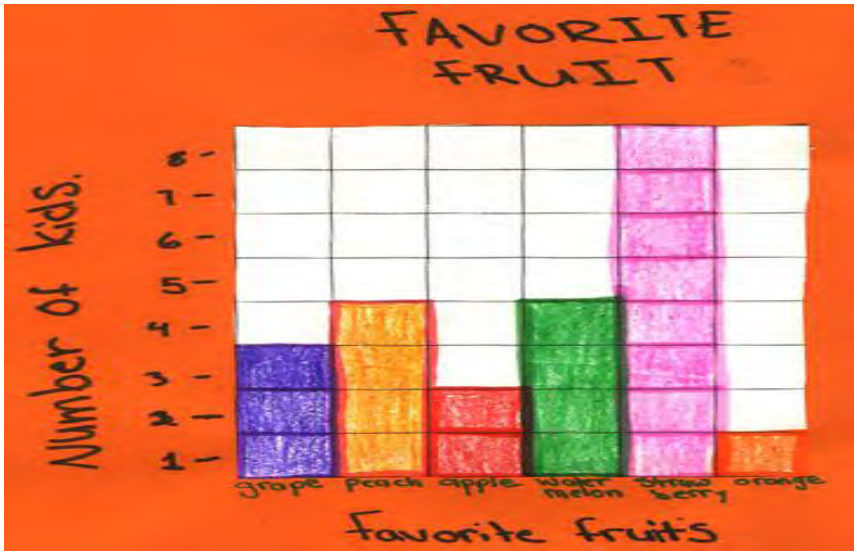
☺ ☺ 8. Bill needed 18 eggs for a camping trip. A full carton of eggs normally has 12 eggs in it. Explain why Bill can say he needs 1½ cartons of eggs.



Explain:

Smiley Face Math **Name:_____**
Grade 3, Worksheet II

☺ ☺ ☺ ☺ 1. a. Explain what this graph shows: _____



b. How many different fruits could a student choose from? _____

c. How many students voted? _____

d. If the students who said *apple* was their favorite switched to *grape*, how many votes would *grape* have then? _____

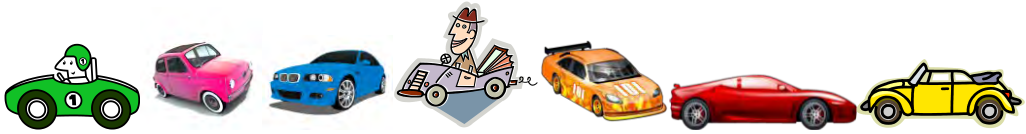
☺ 2. Kelley just showed up for lunch and got in trouble for being 15 minutes late. What time should she have been at the table?

Answer: _____

☺ ☺ 3. a. What fraction of the cake has been eaten? _____ Explain how you know:

b. What fraction of the cake is left? _____ Explain how you know:

☺ ☺ 4. What fraction of the cars would be ok to drive if it were raining outside? _____



☺ ☺ ☺ ☺ 5. Three tables and chairs like the ones below are needed for a meeting.

a. Write and solve an addition problem for the total number of people who can attend the meeting.

_____

b. Write a multiplication problem that also shows how many people can attend the meeting.

_____

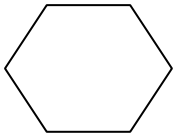
☺ ☺ ☺ 6. Johnny the Clown has two kids himself. His two brothers and three sisters each have 2 kids.

a. Draw a picture to find the number of kids in the family:

b. Write an addition sentence to find the number of kids: _____

c. Write a multiplication sentence to find the number of kids: _____

☺ 7. The shape below has 6 sides and 6 angles. a. What shape is this? _____



b. Are the angles *right angles*, *acute angles*, or *obtuse angles*? _____

c. How can you tell using the corner of a sheet of paper to check?

☺ ☺ ☺ 8. Kids were asked if they preferred pizza or ice cream. The results are shown in the pie chart.

a. What fraction of the students liked pizza best? ____

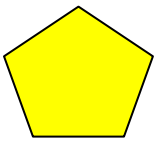
b. What fraction liked ice cream best? ____

c. What is the *largest fraction*, the ones who liked pizza best or the ones who liked ice cream best?

_____

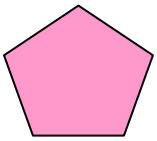
Smiley Face Math **Name:_____**
Grade 3, Worksheet III

☺ ☺ 1. Draw one line to turn this pentagon into *two* polygons with different names. What two polygons have you made?



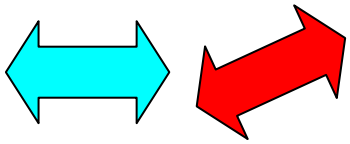
_____ _____

Draw one line to turn this pentagon into 2 polygons with the same name. What polygon have you made?

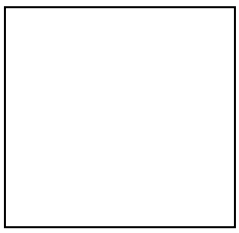


_____

☺ ☺ ☺ 2. The two "double arrows" below are congruent. What does congruent mean?



In the box, draw a congruent shape for this figure.



☺ ☺ ☺ ☺ 3.

1st 2nd 3rd 4th 5th 6th 7th 8th 9th 10th 11th 12th 13th 14th 15th 16th

a. Will the 17th shark be swimming left or right? _____
b. How about the shark after that? _____
c. The 20th shark? _____
d. The 25th shark? _____
e. The 30th shark? _____
f. Tell how to make this pattern of sharks:

☺ ☺ 4. The Tampa Bay Bucs had *five hundred sixteen thousand, one hundred eighty-eight* fans fill the stadium in 2008. Write that amount using numbers.

_____

Their goal for 2010 was to have *ten thousand* more fans attend. Write the total number of fans they wanted in 2010, using digits instead of words. _____

☺ ☺ ☺ 5. The pictures below are all road signs. Tell how many sides and and how many angles each has. Also tell if its angles are *acute, right,* or *obtuse.*

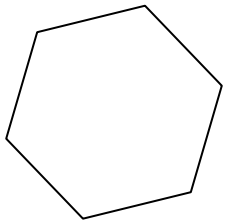
___ sides
___ angles
All angles are _____

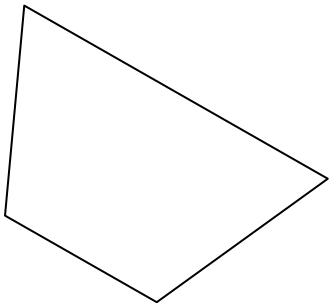
___ sides
___ angles
All angles are _____

___ sides
___ angles
All angles are _____

☺ ☺ ☺ 6. Each of the signs above is a polygon. How are they the same? How are they different?
Explain:

☺ ☺ 7. The star picture below shows a polygon with *line symmetry*. You could fold across any of the lines and the two pieces would be exactly alike. In the two polygons below, draw at least one *line of symmetry* in each figure.





☺ 8. The piece of paper you are writing on has *line symmetry* because there are two lines you can fold on so the sides match up. Draw those two lines, and then measure their length in inches.

Answer: The two *lines of symmetry* for this paper are _____ inches long and _____ inches long.

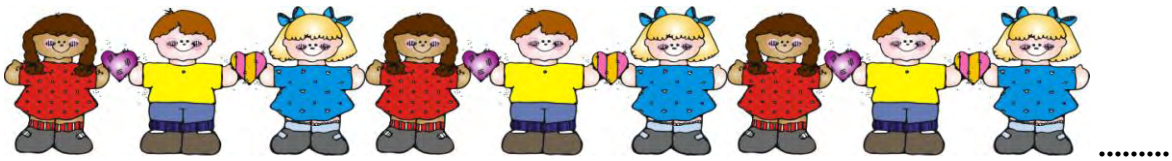
Smiley Face Math **Name: _____**
Grade 3, Worksheet IV

☺ 1. There are seven ants marching in a line. 

Write an addition sentence to show how many legs there are in all. _____

Write a multiplication sentence to show how many legs there are in all. _____

☺ ☺ ☺ 2. Look at the pattern below:



red yellow blue red yellow blue red yellow blue .....

a. If the pattern continues, what colored shirt would the 12th student wear? _____

b. What colored shirt would the 13th student wear? _____

c. What colored shirt would the 20th student wear? _____

☺ ☺ ☺ 3. The clock below shows what time Shamar's soccer practice ended.

a. What time did practice end? _____

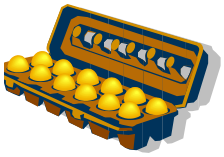
b. If practice was 1½ hours, what time did it start? _____

c. Shamar took 15 minutes to go home after practice. What time did he get home? _____

☺ ☺ ☺ 4. A third grade class took a field trip to The Florida Aquarium. In the octopus tank the students counted 32 legs.

How many octopi were in the tank? _____ 

☺ ☺ 5. Shown is 1 whole carton of eggs.



a. If 6 eggs are cracked and have to be thrown out, what *fraction* of the carton is left?

_____

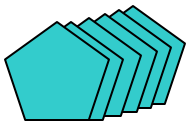
b. What is another fraction name for the carton with 6 eggs left?

_____

c. If another whole carton of eggs is added to the 6 eggs left above, what is a *mixed number* name for all the eggs you have?

_____ cartons of eggs

☺ ☺ 6. a. Finish this addition sentence to show how many angles there are in 6 pentagons:

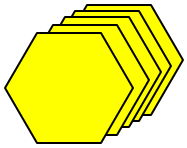


5 + 5 + 5 + _____ = _____

b. Finish this multiplication sentence to show how many angles there are in 6 pentagons:

6 × ___ = ____

☺ ☺ 7. a. Finish this addition sentence to show how many angles there are in 5 hexagons:



6 + 6 + 6 + _____ = _____

b. Finish this multiplication sentence to show how many angles there are in 5 hexagons:

5 × ___ = ____

☺ 8. Compare what you wrote for 6 (b) and 7 (b) above.

Use this information to finish this new multiplication sentence:

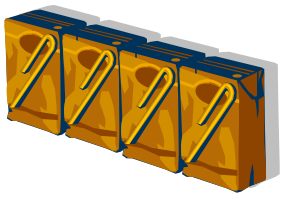
6 × 5 = ___×___ = 30

Smiley Face Math **Name: _____**
Grade 3, Worksheet V

☺ ☺ 1. Which story problem below can be described by the equation 7 × 2 = 14? Circle it.

a. There were 7 bicycles in the shop. 2 bicycles were sold. How many bicycles are there now?
b. There were 7 bicycles in the shop. 2 new bicycles arrived. How many bicycles are there now?
c. There were 7 bicycles in the shop. How many wheels are there in all?
d. There were 7 bicycles in the shop. 2 bicycles lost their wheels. How many wheels are there now?

☺ 2. There were 4 juice boxes in a package. After school, Dominic had one juice box and gave one to his friend Michael.

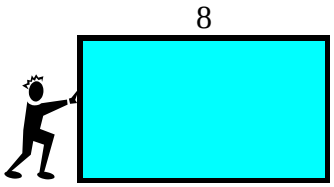


a. What fraction of the package was left? _____

b. Dominic's friend, James, came over and had a juice also. What fraction of the package was left then? _____

☺ ☺ ☺ 3. The *perimeter* is the distance around a figure. The perimeter of the rectangle below is 20 units.

The length of the rectangle is 8. What is the width of the rectangle? _____units



Explain how you found the answer:

☺ ☺ ☺ 4. A *right angle* is where two lines meet to make a perfect square corner. Some examples are shown below:

An *acute angle* is an angle which is *smaller* than a right angle. An *obtuse angle* is an angle which is *larger* than a right angle.

The clock hands below form angles. First tell what time it is on each clock. Then use the corner of a piece of paper and write either *right*, *acute*, or *obtuse* to describe the angles on each clock face.

Time: _____ Time: _____ Time: _____

Angle type: _____ Angle type: _____ Angle type: _____

☺ ☺ ☺ 5. Draw the hands to make *right* angles on the clocks below. Make the clocks show 2 different times. Use your card to draw the angles. Also, tell the time for both clocks.

Time: _____

Time: _____

☺ ☺ 6. Lucy liked to paint her friends' fingernails at Halloween. Finish this chart that shows how many fingernails she had to paint for different numbers of friends she had.

Number of friends:	1	2	3	4	5	.....	10
Number of nails:	10	___	___	___	___	.....	____

☺ ☺ ☺ 7. If Lucy painted 120 fingernails, how many friends did she have? _____

Smiley Face Math **Name _____**
Grade 3, Worksheet VI

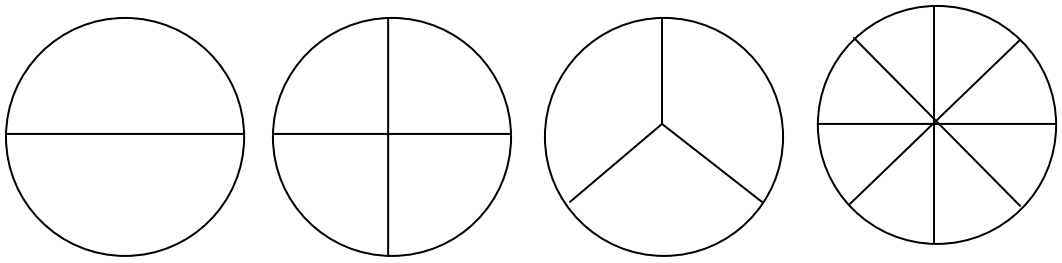
☺ ☺ ☺ 1. Joshua has $1.00 to spend at lunch. He gave his friend 1 quarter and 1 dime from his lunch money.

a. How much money does Joshua have left to spend? _____ ¢

b. List five possible coin combinations that total the money Joshua has left:

Quarters	Dimes	Nickels	Pennies

☺ ☺ 2. Shade one part of each of the fraction models below.
Write the fraction for each shaded piece:



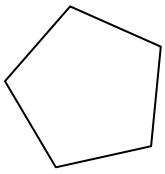
A. _____ B. _____ C. _____ D. _____

Which fraction above is the greatest? _____

Explain how you know.

☺ ☺ ☺ 3. There are 60 seconds in one minute. How many seconds are in 5 minutes? ___
In 6 minutes? _____ In 10 minutes? _____

☺ ☺ 4. What is the name of this shape? _____



Draw a line to cut the shape into a 3-sided shape and a 4-sided shape.

What is the name of the 3-sided shape you made? _____

What is the name of the 4-sided shape you made? _____

☺ ☺ 5. Use the table below to answer the following questions.

Number of students

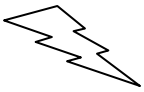
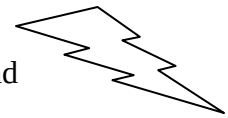
Grade	Boys	Girls
2	215	187
3	155	129
4	253	186
5	209	242

Which grade has ABOUT 300 students in all? _____

Which **two** grades have ABOUT 400 girls altogether? _____ & _____

☺ ☺ ☺ 6. If you can trace a figure and place it over another figure and turn it so it exactly matches, the two figures are *congruent*. *Similar* figures have the same shape but not usually the same size. Tell if each pair of shapes below is *congruent* or *similar*.

 and  are _____.

 and  are _____.

 and  are _____.

☺ ☺ 7. Jayne had 3 pieces of bread for breakfast. For lunch, she had twice as much bread as she had at breakfast. For supper, she had half as much as she had at lunch. How many pieces of bread did she have at supper? _____ pieces

Smiley Face Math **Name: _____**
Grade 3, Worksheet VII

☺ 1. Dontae had 10 baseball cards in his collection. He gave 4 away to his sister.

a. What *fraction* of baseball cards did he give away? _____

b. What *fraction* of baseball cards does he have left to keep? _____

☺ ☺ ☺ 2. Naya made a chart to keep up with how much money she was saving when she received her allowance. She started the chart below:

Number of Weeks	Amount of money saved
1	$6
2	$12
3	$18
4	
5	
6	

a. Finish Naya's chart for 4, 5, and 6 weeks' of allowance.

b. What week will Naya have enough money to buy a $21 dollar computer game? ____

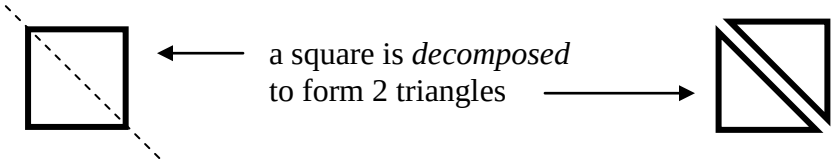
c. If Naya continues to save her allowance, how much money will she save by week 9? ____

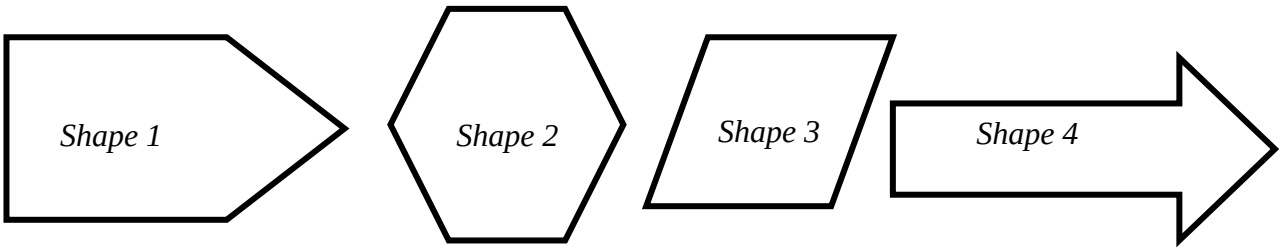
☺ ☺ 3. If Naya saves $60 by week 10, how many computer games can she buy at $7 each? _____

Explain how you know:

☺ ☺ ☺ ☺ 4. Trace over the four shapes below. *Decompose* the two-dimensional shapes to make two other shapes.

Example:





Name the two new shapes that you made from each shape:

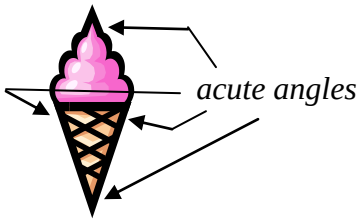
Shape 1 became a _____ *and a* _____.

Shape 2 became a _____ *and a* _____.

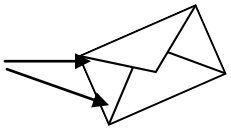
Shape 3 became a _____ *and a* _____.

Shape 4 became a _____ *and a* _____.

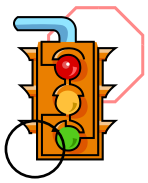
☺ ☺ 5. A picture of an ice cream cone has 4 *acute angles*. An *acute angle* is smaller than a *right angle*, like the picture of the envelope. The envelopes' four corners make up four *right angles.*



right angles at the 4 corners



Find the angles in the pictures below. Look at the angle that is circled. Write if the angle is an *acute angle* or a *right angle.*



_____ _____ _____ _____

Smiley Face Math **Name:_____**
Grade 3, Worksheet VIII

☺ ☺ 1. Aaron was packing for a 7-day camping trip. His mother told him to pack one pair of socks for each day of his trip plus an extra pair. How many socks will Aaron have in his bag? _____

Explain your answer:

☺ ☺ 2. What fraction is one pair of socks from the total pairs Aaron packed? _____

☺ ☺ ☺ ☺ 3. Zauria picks strawberries in a field. Each time she bends down, she picks 5 strawberries but 2 strawberries fall out of her basket. She wants to collect 27 strawberries in all. How many times will she bend down to pick the strawberries?

(Hint: finish the table below. Use counters to keep track.)

Show your work here:

Number of bends	Strawberries in her basket
1	5 – 2 = 3
2	3 + 5 – 2 = 6

Answer: She had to bend over _____ times.

☺ ☺ ☺ 4. Cole, Vaughn, and Gary collect stamps. Cole had 5 stamps in his collection. Vaughn had twice as many stamps as Cole. Gary had 3 times as many stamps as Cole.

a. Which boy had the *fewest* stamps? _____
b. Which boy had the *most* stamps? _____
c. *How many more* stamps did Gary have than Vaughn? _____

☺ ☺ ☺ 5. Roxana loves to eat apples. She ate ¼ of an apple at lunch and ¼ of the same apple after school. What fraction of the apple was left for her to eat at dinner? _____

Explain your answer:

☺ ☺ 6. Which fraction is bigger, 2/4 of an apple or ¾ of an apple? _____

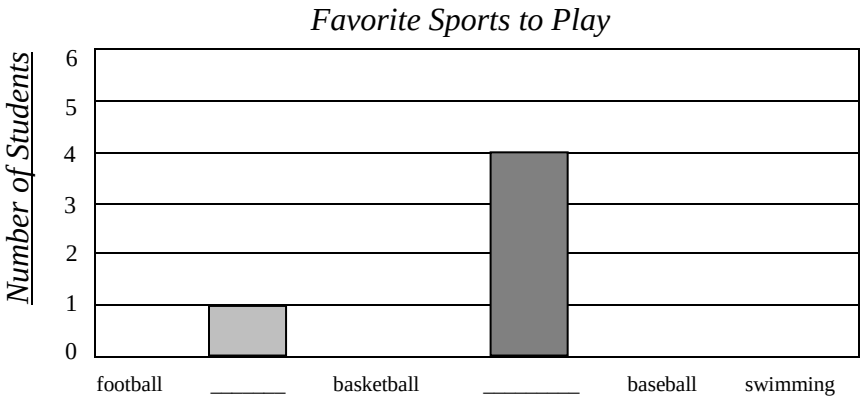
Draw a picture to show what you mean:

☺ ☺ ☺ ☺ 7. A *survey* was taken to find out about 3rd graders' favorite sports. **5 students chose football, 1 chose tennis, 3 chose basketball, 4 chose soccer, 2 chose baseball, and 3 chose swimming**. Use this data to complete the *frequency table* and *bar graph* below.

Frequency Table

Favorite Sports to Play	
Sport's Name	Number of Students
Football	5
Tennis	
Basketball	
	4
	2
Swimming	

Bar Graph



a. In all, how many students answered the *survey*? _____

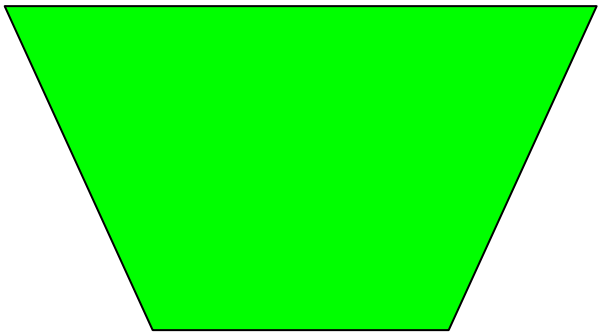
b. How many students liked baseball best? _____

c. Which two sports had the same amount of students as their favorite? _____ & _____

d. *How many more* students liked soccer than tennis? _____

Smiley Face Math **Name: _____**
Grade 3, Worksheet IX

☺ ☺ 1. Use an inch ruler to measure the sides of the trapezoid below. Measure each side to the nearest whole or ½ inch. List the measurements in the appropriate blanks below.



Top: _____ Left: _____ Right: _____ Bottom: _____

Perimeter is the distance around a figure.
What is the *perimeter* of this trapezoid? _____

☺ ☺ ☺ 2. Marcy put 2 dimes and 1 nickel into her piggy bank each week.

a. At the end of a month, how many dimes had she put in? ____ How much money is that? ____

b. At the end of a month, how many nickels had she put in? ____ How much money is that? ____

c. At the end of a month, how much money altogether had she put in? _____

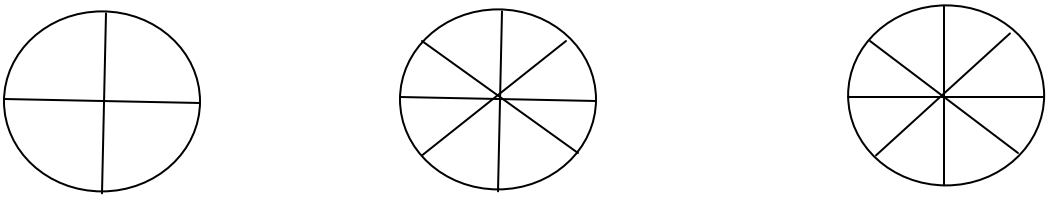
☺ ☺ 3. The next month, Marcy put a quarter into her bank each week.

a. At the end of a month, how many quarters had she put in? ____
How much money is that? ____

b. Explain why Marcy had put in the same amount of money at the end of the first two months. Why is 8 dimes and 4 nickels the same amount of money as 4 quarters?

☺ ☺ 4. Joel, Lorelei, and Allison are triplets celebrating their birthday. Each triplet received their own birthday cake, and the cakes were all the same size.

Joel ate ¼ of his cake. Lorelei ate 3/8 of her cake. Allison ate 2/8 of her cake. Shade each model below to show how much each triplet ate.



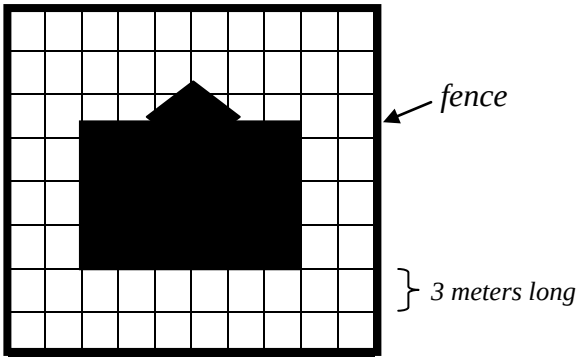
Joel Lorelei Allison

a. Which triplet ate the most cake? _____

b. Did Joel or Allison eat more cake? _____ Explain how can you tell:

☺ ☺ 5. Desireé wants to build a fence around the *perimeter* of her yard. She made a drawing on grid paper. Each length on the grid represents 3 meters. What is the *perimeter* of the yard?

Answer: The *perimeter* is _____ meters



☺ ☺ 6. Jada's parents pay her $5.00 an hour for babysitting her little sister. Fill in the table below to see how much Jada will earn if she babysits for 6 hours.

Hours Worked	1	2	3	4	5	6
Money Earned	$5	$10				

Smiley Face Math
Grade 3, Worksheet X

Name: _____

☺ ☺ ☺ ☺ 1. Nick left for his family vacation on Thursday, May 10th. They traveled for two weeks.

May						
M	T	W	T	F	S	S
	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			

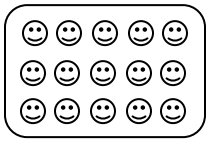
a. How many days make up two weeks? _____

b. On what day did Nick return home? _____

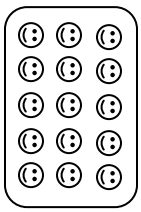
c. What fraction of a month was the family away? _____

d. Put your finger on 3 days after May 1st. Move your finger down 1 row. Move 2 days to the right. Go down 1 row. Move 4 days to the left. What is the date your finger ends up on? _____

☺ ☺ 2. The pictures below show two different ways to think of multiplication.



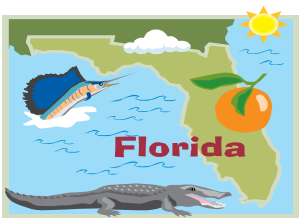
3 rows with 5 in each row
$3 \times 5 = 15$



5 rows with 3 in each row
$5 \times 3 = 15$

Draw your own picture on an index card or sheet of paper, then turn it to show $2 \times 7 = 14$ and $7 \times 2 = 14$. Then draw another one to show that $4 \times 6 = 24$, and that $6 \times 4 = 24$. Explain to your parent what you are showing.

☺ 3.

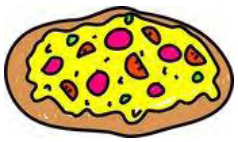


Tampa population:	382,060
St. Petersburg population:	249,079

To the nearest hundred thousand, about what is the population of the Tampa Bay area, which includes both Tampa and St. Petersburg?

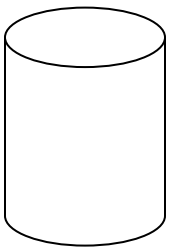
Answer: _____

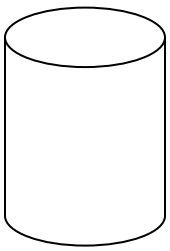
☺ ☺ ☺ 4. Jackie is having a birthday party. She has 14 friends spending the night. How many pizzas would she need to buy if each child, including herself, eats two slices and each pizza has 8 slices? _____ pizzas

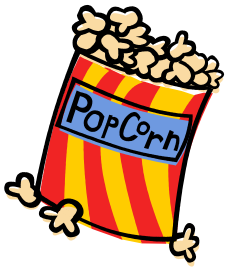


Explain how you got your answer, and what might happen to any leftover pieces:

☺ ☺ ☺ 5. Ana bought a bag of popcorn kernels. She needed to fill the 1-cup cans below with kernels, but she only had a ¼ measuring cup and a ⅓ measuring cup. Show two different ways she can measure the popcorn kernels using the ¼ and the ⅓ measuring cup. Use the containers to show your answer and then explain.





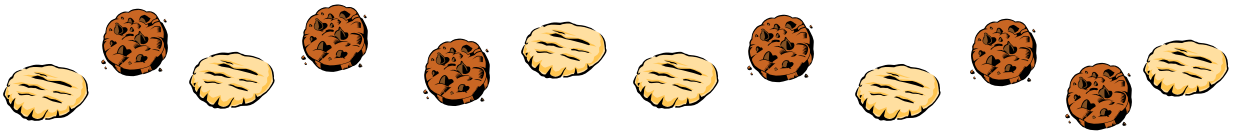


a. How many ⅓'s will she need to make one cup? _____

b. How many ¼'s will she need to make one cup?_____

c. Which is more, ⅓ cup or ¼ cup?_____ How do you know?

☺ ☺ ☺ 6. Jamie made a dozen cookies to share with Chris. Chris invited two new friends over to share the cookies.



a. How many cookies will each boy receive if they all share equally? _____

b. If Jamie also invited two new friends, then how many cookies would each boy receive? ____

c. If Chris and Jamie had not invited any other friends over, how many cookies would each boy get? _____

Section 3

Suggestions for helping your child find the answers.
Grade 3, Worksheet I

1. Answer: 48, 42 This problem introduces the child to an *array* of objects-- that is, objects arranged in rows and columns. The child will soon find that multiplication is repeated addition of a number. The child can draw a diagram—an 8 by 6 array most likely—to finish the problem, and count to find the answer. Or he or she can add 6 + 6 + 6 + 6 + 6 + 6 + 6 + 6 and get 48.

Go over the picture with the child as they might be unfamiliar with *rows* and *columns* in the *array*. You might want to use counters--such as beans, pennies, buttons, or round candies--and have the child lay out them in the rows, with 6 per row.

2. Answer: 3 This problem will later become a division story problem, but for now, the child can solve it by using 27 counters or marks on a piece of paper, and removing them ten at a time. Notice a remainder is involved—two groups of 10 can be removed, leaving 7 children who haven't ridden. But that will take another ride for each child to have a turn. This story problem is an example of one where the remainder forces you to change the whole number answer to the problem.

3. Answer: 6 This problem will later be solved by multiplication, but at this point, the child can make combinations by possibly drawing lines to connect the different flavors of ice cream to the different toppings, and then count the lines. The child might also make a list, or draw out the different combinations. The list might look like this: (chocolate, Oreos); (chocolate, whipped cream); (chocolate, strawberry); (vanilla, Oreos); (vanilla, whipped cream); (vanilla, strawberry). Whatever method they use is appropriate as long as they connect each flavor of ice cream with each topping only once and then count the pairs.

4. Answer: Help, 13, and 52. Your child might think "help" is a funny word to see as the answer to a math problem, but we like to encourage humor in problems when possible. Count each of the boxes as a rectangle, and you should get 3 + 4 + 2 + 4 or 13 rectangles. Each of those rectangles has 4 right angles—be sure to ask the child to tell you about right angles—for a total of 4 × 13 or 52 rectangles. Your child probably won't know to multiply to find the answer—he or she is likely to count by 4s or add 4 thirteen times.

5. Answer: a. They have the same amount. b. The fractions are equal Be sure the child shades in the same amount for each person. The problem is designed to show the child that ½ is the same amount as 3/6. You might want to show them other examples like this--cutting one piece of paper in half and the other piece of paper in sixths. Show the child that 3 of those 6 are equal to the other half of the paper. The point is that fractions might look different but still name the same amount.

6. Answer: 8/12 is the fraction of girl students in the class. 4/12 is the fraction of boy students in the class. This might be the first time the child has encountered fractions as part of a set. He or she might be thrown off because these fractions are written with a slanted line, and the ones in their textbook at school are written with the numerator directly over the denominator. Let them know that the *numerator*, the number on the top of the line, represents the number of items you are thinking about. The *denominator*, the number at the bottom, means the total number of things that make 1 whole. In this case, the whole class has 12 students, so 12 is the *denominator*. Don't try to get them to simplify the fractions—that's a much later skill.

7. Answer: Girls Expect them to say that 8/12 is bigger than 4/12 because 8 is more than 4. Also, if the child counts, he/she will count more girls than boys. As long as the *denominator* of the two is the same, you can compare them by looking at the *numerator*.

8. Answer: will vary If you have an egg carton, put it out for your child to use. The whole egg carton—12 eggs—is 1 whole, and that's what the "1" in "1½" means. The rest of the eggs—6—fill half of a carton, so 1 + ½ or 1½ cartons. Use a piece of string placed down the middle of the egg carton to show that 6 eggs is ½ of a carton of eggs, visually.

Suggestions for helping your child find the answers
Grade 3, Worksheet II

1. Answers: a. The graph shows how students voted when asked their favorite fruit. b. 6 types of fruit c. 22 voters d. 5 now voted for grape Ask your child to tell you what they think the data might be from—probably a class of students who were asked about their favorite fruit. Ask how they can determine how may choices the students had—they can count the columns and see the labels under them. They can determine how many students voted by totaling the numbers for each type of fruit. For the last question, let your child figure out how many people voted for apple and for grape first. Some children will want to do an addition problem (3 + 2 = 5) and some children will want to color in two more places under grape and then recount the votes for grape.

2. Answer: 11:40 a.m. First, discover if your child can read an analog clock. If not, you might have to tell them that the short hand is the hour hand and the long hand is for minutes. Have your child tell you where the hour hand is and come up with the hour. Then count by fives to discover how many minutes past the hour. If you have a clock with moving hands set the clock to 11:55 and count backwards by 5 for 15 minutes until you get the correct answer.

3. Answer: a. ¼ b. ¾ Hopefully your child will understand that before parts of the cake were eaten, there was 1 whole cake. If not give a few examples including pies and pizza. For the first question, have them draw a circle for the cake and divide it into 4ths so it looks like the one shown. For the second question, have them mark out ¼ as what was missing, and count the 4th s left. They should get three fourths left, or ¾.

4. Answer: 4/7 cars would be ok to drive in the rain as they have tops First have your child tell you which cars would be ok to drive in the rain and why. Circling those cars will be helpful. This is the part-to-whole interpretation of a fraction, where the denominator, 7, says how many total cars there are, and the numerator tells how many cars have tops and therefore can drive in the rain.

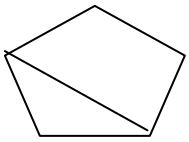
5. Answer: a. 8 + 8 + 8 = 24 b. 3 × 8 = 24 For the addition part of the problem, your child could draw a "top down" sketch of a table with 8 chairs around it, and repeat that diagram 3 times. Or, they could count by 8s, or add 8 three times. If your child is having difficulty with the multiplication problem, ask them how many groups of tables there are. Then ask how many people are at each table. Explain to them, that's where a multiplication problem comes from; how many groups times how many in each group.

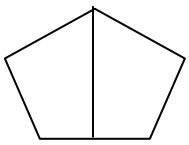
6. Answer: 12 kids Most children will start by drawing a picture of the 6 adults, with 2 kids attached to each. They will then simply count all the children. Some children will go right to the addition problem (2 + 2 + 2 + 2 + 2 + 2 = 12) or will know that there are 6 adults and each has two children, so another way to write the problem is 6 x 2 = 12.

7. Answer: a. hexagon, b. obtuse angles, c. Use the corner of the paper as a right angle, and fit the corner into each of the 6 angles of the hexagon. Since the corner doesn't fill up any of the angles, each angle is more than 90 degrees, so each angle is obtuse. Discuss with your child that using the clue word **six** has been a helpful way for students to remember **hexagon** because not too many words have an **x** in them (hex and six). Use an index card or another such right angle and have the child fit it into each angle in turn—you'll have to show them how to do this. Also tell the child about angles *less than* 90 degrees—acute angles.

8. Answer: a. ¼, b. ¾, c. ice cream Answering part c might be the easiest part of the question for your child. They can look at the graph and decide which part is greater. The next step would be to find out how much of the graph is for pizza and how much is for ice cream. If the student is stumped, have them break the graph in ¼ pieces. Make sure they label each piece. They should now be able to decide how much is for ice cream and how much is for pizza.

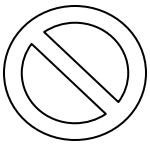
Suggestions for helping your child find the answers
Grade 3, Worksheet III

1. Answer: Two possible answers:  **triangle and quadrilateral**

 **2 quadrilaterals (any 4 sided figure)**

Have your child experiment with drawing a line through the figure. Having a separate sheet of paper to use will make the process easier so you do not have to continue to erase.

2. Answer: "Congruent" means two shapes are identical. If you cut one out and placed it on the other, they would exactly match. So the congruent shape they are to draw in the box is:



Your child will most likely not be able to make this shape perfectly. As long as your child understands that *congruent* means that two shapes are identical, he or she has learned the main point. See worksheet VI, problem 6, for a brief explanation about this concept.

3. Answer: a. left, b. left, c. right, d. right, e. right, f. The pattern has 3 sharks facing left followed by two sharks facing right, and this pattern repeats over and over. Encourage your child to point to each shark in turn, starting on the left, and say out loud "left, left, left, right, right (pause); left, left, left, right, right (pause); and so forth. The verbal reinforcement should help them see the pattern that repeats every 5 sharks. Or they might draw arrows over each shark, pointing in the shark's direction. Every multiple of 5—5, 10, 15, 20, etc.--will be a shark facing right, just like the last shark before the pattern starts again.

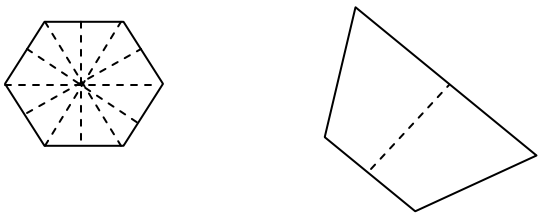
4. Answer: a. 516,188, b. 526,188 The main point of this problem is to reinforce the names of large numbers. Large numbers are separated into groups of threes, starting on the right, and each group of three is the name of a *period*. The period names are, from the right—ones, thousands, millions, billions, trillions, and so forth. To name a large number, then, you just have to repeatedly name a 3-digit number followed by the period it's in, and proceed to the next period to the right. Your child can add 516,188 + 10,000 by lining up the digits from the right-hand side.

5. Answer: Stop Sign-8 sides, 8 angles, obtuse angles (more than 90 degrees)
Yield Sign-3 sides, 3 angles, acute angles (less than 90 degrees)
Cross Walk Sign-4 sides, 4 angles, right angles (exactly 90 degrees)

The only part of this problem that might be difficult for your child is classifying the angles. Have them take an index card or another example of a right-angle, and place it "inside" each angle to see if how the angle compares to a 90 degree benchmark angle. Worksheet V, problem 4 has a good explanation of how your child might determine what to call these angles—see that worksheet for further help.

6. Answer: The signs are all the **same** because they are all polygons. A polygon is a closed figure with 3 or more line segments. The signs are **different** because each sign has a different number of sides and angles. Accept any other likenesses or differences your child notices.

7. Answer: Any of these 6 lines in the hexagon but there is only one in the trapezoid.



If your child is having a hard time visualizing line of symmetry, draw and cut out a few polygons. Have your child fold them to find the different lines of symmetry.

8. Answer: 8½ and 11 inches long The lines of symmetry for an 8½ by 11 inch sheet of paper will cut across the middle horizontally and vertically, and so be 8½ by 11 inches long. Have your child take such a sheet of paper and fold it lengthwise, to be sure the sides match, then draw and measure that line. Then repeat the process going vertically.

Suggestions for helping your child find the answers
Grade 3, Worksheet IV

1. Answer: 6 + 6 + 6 + 6 + 6 + 6 + 6 = 42; 7 × 6 = 42 This problem can be solved by multiplication—multiplying 7 groups of 6—but also by repeated addition. The child may want to either draw pictures, use repeated addition, or count by sixes. The main point is for the child to realize that multiplication is just a short cut for repeated addition.

2. Answer: blue; red; yellow This problem can be solved through various methods. Students could draw the next several children to carry out the pattern in order to find the correct color shirt. However, discuss with them the generalization that, since the pattern is repeating every third term, for every multiple of 3 the shirt will be blue. Therefore, on the 12th student, the shirt would be blue. On the 13th student, your child might recognize that the 12th term would have been a blue, so the next in line—the13th—would be the next consecutive color—red. For the 20th term, your child might recognize that the 18th term would be a blue shirt, therefore, 2 more numbers—the 20th term— would be two colors beyond blue, or yellow.

3. Answer: 4:30; 6:00; 4:45 This problem involves students telling time on a clock as well as elapsed time in 15 minute, 30 minute, and hour increments. The child should know the difference between the hour hand and minute hand on the clock. They should also be aware of how to navigate around the clock, for example, by counting by fives as they move around the numerals on the clock. For the first question, the child should recognize the hour hand pointing between 4 and 5 indicates the hour is 4, and the minute hand pointing to 6 indicates 30 minutes. For the second part of the question, the child calculates elapsed time by an hour and a half. The final part of the question the child calculates elapsed time by 15 minutes.

4. Answer: 4 This problem introduces the concept of division. The child should pay attention to the fact that there were 32 legs in the aquarium, not 32 octopi. Division will be a new concept to the child and they probably won't refer to the problem as a "division problem". The child may draw 32 tally marks and circle groups of 8 and see that they have made 4 groups. The child may start with the number 32 and continue to take away 8 at a time until they reach 0. The child may need guidance to see that they would have subtracted eight 4 times to reach 0.

5. Answer: a. 6/12 b. ½ c. 1½ cartons
This question extends the concept of fractions by bringing in mixed numbers—whole numbers and fractions. The egg carton represents the whole here. Have your child draw an egg carton or use the one pictured, and cross out 6 cracked eggs, leaving 6 good eggs, making the fraction 6/12. Your child might also is recognize that 6 out of 12 is also one half of the carton. Part (c) encourages your child to realize that with one whole carton and one half of another carton, the mixed number name 1½. makes sense.

6-8. Answers: $5 + 5 + 5 + 5 + 5 + 5 = 30$ and $6 \times 5 = 30$; $6 + 6 + 6 + 6 + 6 = 30$ and $6 \times 5 = 30$; $6 \times 5 = 5 \times 6$ The main point of these three problems is to show that multiplication is simply a short cut for repeated addition, and also that multiplication is *commutative.* That is, x groups with y items in each group gives the same answer as y groups with x items in each group. This fact will not be obvious to your child but helps them learn their multiplication facts, so it's worth remembering.

For these problems, draw or cut out 6 pentagons and 5 hexagons, and have your child physically count the angles. Be sure they realize that the multiplication sentence gives the same answer as the addition sentence. The child will need your help for problem 8 as they might not realize what they are being asked to conclude.

Suggestions for helping your child find the answers
Grade 3, Worksheet V

1. Answer: C This problem reinforces multiplication story problems. The concept of multiplication should be reviewed with the child. They should understand that to multiply means to make "groups of". Therefore with 7 × 2 = 14, ask the child which word problem suggests 7 groups with 2 in each group? The child should solve each word problem listed in the answer choices. They will then see the differences among the process of solving them, as well as the answer once they solve them.

2. Answer: 2/4 or ½; ¼ This problem uses part-to-whole concept of fractions. The child should recognize 4 parts (juice boxes) make up the "whole" part and represents the denominator. Once 2 juice boxes had been drunk, 2 are left which is the "part" and represents the numerator. The child may refer to the answer as "two out of four". The child could be guided to refer to the fraction as "two-fourths". The child may also recognize, or may need guidance in recognizing, the equivalence to ½. After one more juice has been drunk, there would be one remaining part therefore making the part-to-whole fraction ¼.

3. Answer: 2 To find the perimeter of a figure, you add the measurements around the figure. The length of one side of the rectangle was given to the students. If they know one length of the rectangle is 8, the length across from (parallel to) is also 8. You could ask the child "How can I find the length of the other side of the rectangle?" The total perimeter so far would be 16, but both widths are missing. If the total perimeter is 20, and so far you have 16, subtract 20 – 16, which leaves 4. The 4 represents the total of both widths, so one width would equal 2.

4. Answer: From left to right, ≈ 11:52 & acute; 12:45 & obtuse; 3:00 & right To help your child, discuss with them the hour and minute hand and be sure the child can tell time using these analog clocks. Then take out an index card or something similar that has a right angle at the corner, and show the child how that corner can be used as an "angle tester" by inserting it at the vertex of an angle. *Right angle* is the benchmark—have them look for other right angles around their house—the corner of a door, corner of the wall of a room, corner of a picture frame, and so forth. Have the child hold their fingers or arms to make right angles, acute angles, and obtuse angles. Finally, he or she can use their "right angle tester" on the clock faces in this problem.

5. Answer: will vary The child can again use their "right angle tester", but this time to make right angles on the clock faces. One corner of the index card goes on the dot on the clock face, and the hands are traced along the edges of the index card.

6. Answer: 20, 30, 40, 50, ... , 100. To help you child, be sure he or she knows what it means to paint fingernails, and that each person would have ten such nails to be painted. Stick figures can be drawn to represent Lucy's friends, and then counted by 10s for the number of friends. An important generalization of this problem, although not called for

on the worksheet, is for your child to be able to say something like: *For any number of people, I could just count by 10s that number of times.* Or, if the child knows how to multiply, he or she can multiply the number of friends by 10, to get the number of nails to be painted.

7. Answer: 12 This problem reverses the situation of problem 6, and so leads into division, although it's not important to point that out. The child might solve this by reversing the pattern they noticed in problem 6—removing the "0" from "120" to get 12. Or they might subtract 10 from 120 repeatedly, keeping up with how many times they subtract before getting to zero. Some youngsters might count backward by 10s until they get to 0, and conclude that 12 is the number of times they counted, so that's the number of friends Lucy painted.

Suggestions for helping your child find the answers
Grade 3, Worksheet VI

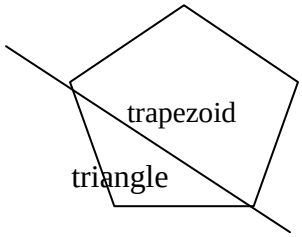
1. Answer: $0.65; multiple combinations of coins equaling $0.65 This problem involves subtracting money as well as making coin combinations. First, your child needs to determine how much money Joshua has left to spend by subtracting 25¢ and 10¢ either separately or together from $1, finding 65¢ he has left. To complete the chart, have your child tell you several coin combinations that total 65¢, and write those in the chart. Below are just a few of the combinations.

Quarters	Dimes	Nickels	Pennies
2	1	1	0
2	0	3	0
2	1	0	5
1	4	0	0
1	1	3	0

2. Answer: A. ½ B. ¼ C. ⅓ D. 1/8; ½; The greatest amount shaded is in the fraction ½. For the first part of the question, encourage the child to shade in one piece of each fraction so they can visualize the part-to-whole relationship. The second part of the questions has the child find which fraction is the greatest. Remind them to look at the pieces that are shaded. A common mistake among children learning fractions, is that they choose which numeral is the largest rather than looking at the actual parts of the fraction. The final part of the question asks the child to explain why they chose their answer to the second part. The child should see that ½ is the largest part shaded and therefore use that in their explanation.

3. Answer: 300; 360; 600 This problem involves multiplication with double digit numbers, although the child can also simply add 60 repeatedly to find the answer. The child is given the information of 60 seconds in one minute, and then asked to find how many seconds in 5 minutes. You could begin by asking how they could find how many seconds in 2 minutes, 3 minutes, etc. To find how many seconds are in 10 minutes, the child could solve the problem the same way as the previous. The child may also recognize that 10 is 5 doubled, therefore they could double the first answer.

4. Answer: pentagon; see figure below; triangle & trapezoid.

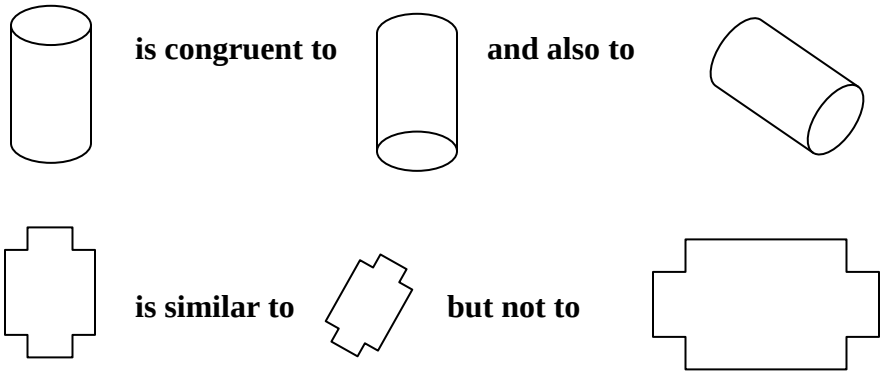


When naming shapes, look at the number of sides the shape has. The original shape has 5 sides, making it a pentagon. The second part of the question asks where you could "cut"

the shape to make it a 3-sided and a 4-sided figure. Have the child sketch lines through angles and then have them redraw the two new figures they have made. The child should know that a 3-sided figure is a triangle but may need some assistance on the 4-sided figure being named a *trapezoid*. (The child could also call the 4-sided shape a *quadrilateral*.)

5. Answer: grade 3; grades 2 and 4 What is important for the child to understand with this question is that the questions are asking for an estimated answer rather than an exact answer. For the first part of the question, the child can round each number to get an estimation of how many girls and boys are in each grade. To round the numbers ask the child if the number they are rounding is closer to the value of the number in the hundreds place, or the next consecutive hundreds place. For example, the number 215, is it closer to 200 or 300? After all the numbers are rounded, the child would add the estimated number of boys and girls to find which grade has about 300 students. For the second part of the question, the child should pay attention to the column which lists the number of girls in each grade. They are looking for two grades with a sum of 400.

6. Answer: a. congruent b. similar c. congruent Have your child start by tracing each figure to the left in a pair of figures, and then slide the shape over and try to make the edges "match up." In the last pair of figures, the child will have to turn the tracing, or flip it over, to make it "match up", and that's fine to determine if it's congruent or not. If the child is having difficulty, have them look at figures like these:



7. Answer: 3 pieces The purpose of this problem is to have child realize that certain operations "undo" the results of other operations. Doubling something and then taking half of that, leaves you with what you started with. When your child gets to multiplication and division, he or she will learn that each one of these "undoes" the other, the same as addition and subtraction "undo" each other.

Suggestions for helping your child find the answers.
Grade 3, Worksheet VII

1. Answer: a. 4/10 b. 6/10 Have your child use real cards—index cards will suffice—and role play the action of the problem. Or, they can draw a diagram of the ten cards, mark out four, and proceed in that fashion to show the action. Remind your child that the *denominator*, which is the bottom number on the fraction, is the number of items you have together as a whole. The *numerator* is the number of items that have been taken, used, or given, which is the part-of-the-whole under consideration. To extend this problem ask the student which fraction is bigger? Look at the numerator to compare the two fractions.

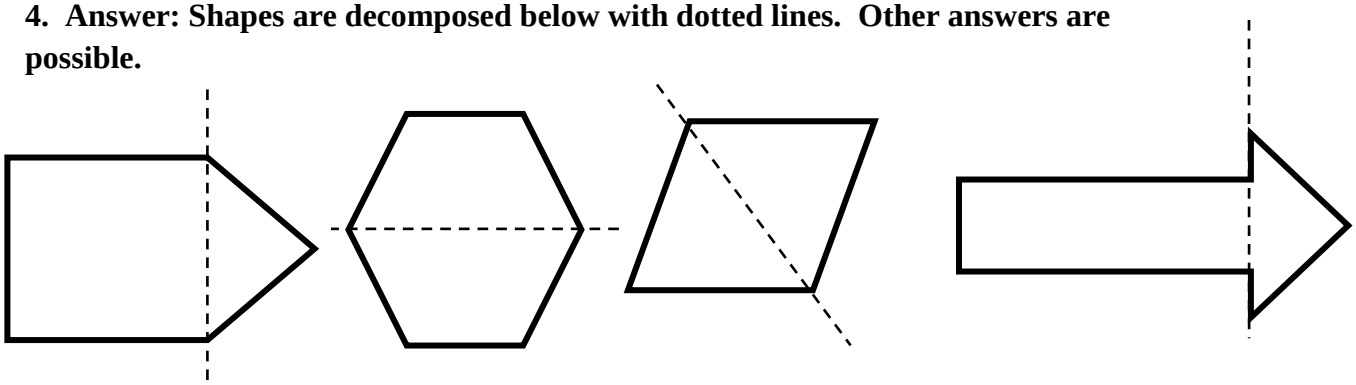
2. Answer: a. The chart would look like this:
b. Week 4
c. $54

Number of Weeks	Amount of money saved
1	$6
2	$12
3	$18
4	$24
5	$30
6	$36

The purpose of the problem is to have the child complete a chart and look for a pattern. Among the patterns the child will see the left side column "go up" by 1 each time, while the numbers in the right column "go up" by 6s. A bigger connection that some will notice is that you can find the answers by adding the number of 6s as given the number of weeks she has saved. Later this will become multiplication.

3. Answer: 8 computer games Your child will later solve this problem by division, and it will have a remainder. At this time, though, your child will likely take manipulatives to show $60—play money, base-ten blocks, or toothpicks—and start removing them 7 at a time. They can remove 8 such groups, using up $56 of the $60, and have $4 left. The child might also make 60 tally marks on a page, and mark them out 7 at a time.

4. Answer: Shapes are decomposed below with dotted lines. Other answers are possible.



Discuss with your child that these shapes are all examples of *polygons*. *Polygons* are composed of 3 or more sides. The child can label the different types of polygons that

make up the new polygons (from the left **new polygons** made up of: *Shape 1:* **Pentagon:** square, triangle; *Shape 2*: **Hexagon:** 2 trapezoids; *Shape 3:* **Parallelogram or rhombus:** 2 triangles; *Shape 4:* **Septagon or Arrow:** rectangle, triangle) You might also want to have the student look for *right*, *acute*, and *obtuse* angles.

5. Answer: right angle; acute angle; acute angle; right angle. The child can check to see if the objects have right angles by using a corner of an index card or piece of paper. An *acute angle* is less than 90 degrees. A *right angle* is exactly 90 degrees like the corner of the index card. (Note: for the picture of a slice of pie, the angle under consideration is the one on the top surface of the pie.)

Suggestions for helping your child find the answers.
Grade 3, Worksheet VIII

1. **Answer: 16** Discuss with your child that the two socks shown in the problem equal one pair. This will help them to see each group of socks needs to be counted as two. The child will likely then count by 2s, or add 2 eight times, to get 16—a precursor to multiplication of 2 by 8. Drawing a picture showing all seven days in the camping trip with two socks underneath each day will help them to develop an understanding of the concept of multiplication. Be sure to remind them to also draw the extra pair of socks his mother told Aaron to pack. Using actual socks will make this a true real life experience and probably a whole lot more fun.

2. Answer: 1/8 Remind your child that two socks equal one pair. If there are 8 pairs total, than one pair of socks (one part of the total) is equal to one eighth of the total number of pairs.

3. Answer: 9 times. You might want to help the child show their work using a table. The table is started for them, and would look like the one below when finished (except for the arrow that has been added.)

Number of bends	Strawberries in her basket
1	5 – 2 = 3
2	3 + 5 – 2 = 6
3	6 + 5 – 2 = 9
4	9 + 5 – 2 = 12
5	12 + 5 – 2 = 15
6	15 + 5 – 2 = 18
7	18 + 5 – 2 = 21
8	21 + 5 – 2 = 24
9	24 + 5 – 2 = 27

You might point out that, each new time through the process of bending over and getting strawberries, the number of berries from the previous line is what she has before 5 are added and then 3 removed. Ask the child if they see a pattern to the resulting numbers—the child might likely say that the number of berries is "counting by 3s."

4. Answers: a. Cole b. Gary c. 25 more Your child might not have encountered the language of "twice as many" or "2 times as many" in school yet. If not, then explain it by showing the amounts with counters by doubling that amount for 2 times as much, then tripling that amount for 3 times as much, and so forth. In general "times as much" means you can add that amount that many times--later, this will become multiplication. For

question (c), if the child has trouble with *how many more*, line up 5 counters for Cole and 30 for Gary, and match as many of Gary's as you can with Cole's—there should be 25 left unmatched for Gary.

5. Answer: 2/4 or ½ Have your child explain the picture to you. The picture shows one whole apple as well as one whole apple cut into ¼ sections. Roxana ate 2 of the 4 sections thus, she has 2 of the 4 sections left to eat or in simplest form, ½. (Do not push your child to learn "simplest form"—you might just mention it in passing.

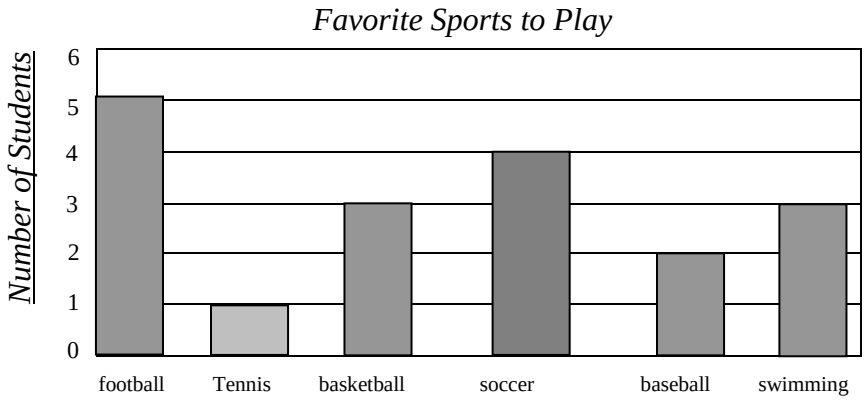
6. Answer: ¾ The apple has been cut into 4 equal sections. When the sections are all the same size, then three of four sections (pieces) are naturally a larger quantity. Hopefully your child's picture and explanation will be along those lines.

7. Answers: Tennis--1; Basketball--3; Soccer--4; Baseball--2; swimming—3. The bar graph should show these numbers also. a. 18 b. 2 c. basketball and swimming d. 3 The object of this problem is for your child to read the data at the top and be able to fill in the data into the frequency table and bar graph. Your child might be familiar with reading the information off the table and graph to answer the questions. If your child is struggling to understand the questions look at some key phrases in the problems. Explain to your child that many times when a question is asking them, "in all", the child will need to find the total. If the question is asking, "how many more", the child will be finding the difference between two numbers. The correctly answers look like this:

Frequency Table

Favorite Sports to Play	
Sport's Name	Number of Students
Football	5
Tennis	1
Basketball	3
soccer	4
baseball	2
Swimming	3

Bar Graph



a. In all, how many students answered the *survey*? 18

b. How many students liked baseball best? 2

c. Which two sports ….. as their favorite? Basketball & swimming

d. *How many more* students liked soccer than tennis? 3

Suggestions for helping your child find the answers.
Grade 3, Worksheet IX

1. Answer: Top: 3 inches, Left: 2 inches, Right: 2 inches, Bottom: 1½ inches. Perimeter: 8½ inches Help your child use an inch ruler to measure each side of the trapezoid. The measurements should equal the closest whole number in inches or the closest ½ inch measurement. Writing a mixed number like 1½ and 8½ will probably be new to your child, so explain the whole number part and the fraction part. Once the child has measured each side of the trapezoid, they can add up each length in order to find the perimeter. Show the child how the whole numbers can be added as they are used to doing, and the ½ inch is added to the total number of inches.

2. Answer: a 8, 80¢; b. 4, 20¢; c. $1.00 Your child will probably get the answer to these problems by counting by twenty four times up to 80, then counting by 5 four times up to 20. Then they'll add 80¢ and 20¢ and get $1. However, discuss with them that they can use multiplication also. 4 × 20¢ = 80¢ and 4 × 5¢ = 20¢, and 80¢ + 20¢ = $1. It's important for them to see the multiplication sentences so they can get the impact of the next problem, combined with this problem.

3. Answer: a. 4; $1; b. Explanations will vary. As above, your child will likely solve this problem by counting by 25¢ four times up to $1. It's important that they realize that a multiplication problem can also be written—4 × 25¢ = $1.

For the explanation, the child will probably say that Marcy is putting the same amount into the bank each week, so she will get the same answer at the end of 4 weeks. The mathematical importance of this is that *multiplication is distributive*, and this is an example of that property: $4\times20 + 4\times5 = 4\times(20+5)$. In general, the *distributive property* says that, for any numbers a, b, and c, $a(b+c) = ab + ac$. In other words, you can add first and then multiply, or multiply first and then add—usually one is easier to do than the other.

4. Answer: a. Lorelei b. They ate the same amount. Take this opportunity to discuss equivalent fractions. Show the child that in Joel's cake, ¼ is shaded and in Allison's cake, 2/8 shaded takes up the same amount of space as ¼. So ¼ and 2/8 are two names for the same amount.

5. Answer: 108 meters. The object is for the child to understand to count around the object and that each square line segment is equal to 3 meters. The term *perimeter* is used again, meaning the distance around the outside edge of a figure. Your child can either count by 3s to get the distance, or might find the length of each of the four sides, and add them.

6. Answer: 6 hours = $30.00. Encourage your child to make play money with paper scraps and use the bills to find the solution. Ask the child to explain how to use the money. Is there a pattern? For every added hour of work, Jada's earnings increase by $5.00. This will help your youngster make the connection that multiplication is repeated addition.

Suggestions for helping your child find the answers.
Grade 3, Worksheet X

1. Answer: a. 14 days b. May 24th c. 14/31 d. May 16 Your child may not know how many days are in one week. Have the child count the days of the week from Monday–Sunday, and then add it again to get the answer for (a). The child may then count on from the 10th to find the answer to (b). For the fraction they were away, ask your child how many days make up the whole month of May, and how they know that. Remind them this is the *denominator* or bottom number. Then ask how many days they were away—this is the top number or *numerator*.

2. Answer: Your child's pictures and explanation should be similar to the example shown. Have the child make the 3-by-5 picture on an index card and then turn it to get the 5-by-3 picture. This problem is an example of the *commutative property of multiplication* where the order of the two factors in a multiplication sentence can be switched and the product will be the same in both instances. (Similarly, there is the *commutative property of addition* in that two numbers can be added in either order.

3. Answer: 600,000 The following table can be useful to explain the concept of place value if your child hasn't encountered numbers this large yet in school. Have your child draw a table and put each digit in its appropriate place. This will help them to realize that each digit has a specific value in relation to where it is in a numeral.

Tampa: 382,060

Hundred Thousands	Ten Thousands	Thousands	Hundreds	Tens	Ones
3	8	2	0	6	0
300,000	80,000	2,000	0	60	0

St. Petersburg: 249,079

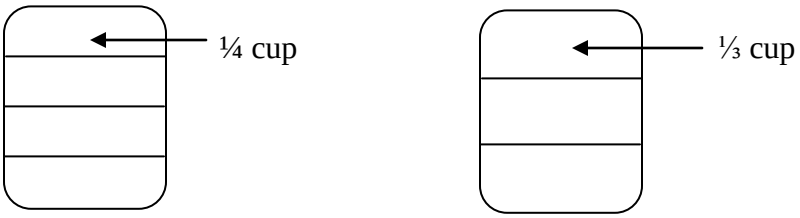
Hundred Thousands	Ten Thousands	Thousands	Hundreds	Tens	Ones
2	4	9	0	7	9
200,000	40,000	9,000	000	70	9

Rounding to the nearest hundred thousand means finding the hundred thousand value closest to the answer, but via estimation. Tampa's population is closer to 400,000 than to 300,000, so it rounds to 400,000. Likewise, St. Petersburg's population rounds to 200,000. So the sum of those rounded numbers is 600,000, an estimate of the total population.

4. Answer: 4 pizzas. Drawing a picture of the pizzas would be an excellent way to start this problem. Have your child count each piece until they have gotten to the desired number of slices. Remind your child they can't order half pizzas so they might have

some left over. Some children who don't use a picture will reason that there are 15 girls altogether, and each gets 2 slices, and 2×15 is 30. So they need 30 slices, but 3 pizzas is only 24 slices since 3×8 = 24. So they need 4 pizzas, and since 4×8 = 32, they'll have 2 slices left over. Things they might do with the leftovers are: give them to her Mom, save them for lunch, and so forth.

5. Answer: a. need three 1/3 cups, b. need four 1/4 cups, c. 1/3 cup
If possible, take out ⅓ and ¼ measuring cups, and a whole cup, and have the child go through these questions filling the cup with water. On part "c" of the question, the child might suggest that the ¼ cup is larger than ⅓ cup because 4 is larger than 3. Have the child draw and label a diagram like the ones below to show the smaller the *denominator*, the larger the quantity. Have the child draw on the containers to see.



6. Answer: a. 3, b. 2, c. 6 This problem involves the partitioning or "equal sharing" concept of division, although your child will probably not solve it using division.. The child might subtract four repeatedly—for part (a) —or put the cookies into four equal groups and not realize that he or she is dividing. You might suggest your child use counters to represent the cookies, therefore you child can count 12 counters and distribute them equally into 4 groups, 6 groups, or 2 groups.

Thank You!