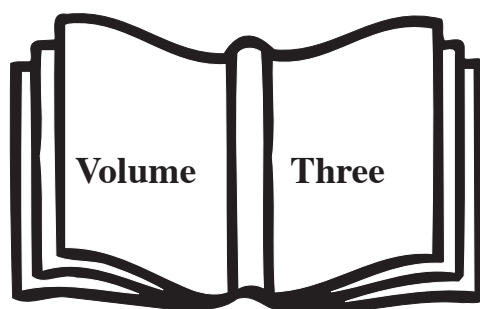


**GRADE THREE INDICATORS**

**FOR THE**

**2003 MATHEMATICS**

**STANDARD COURSE OF STUDY**



## 2.01 Solve problems using measurement concepts and procedures involving:

- a) *Elapsed time.*
- b) *Equivalent measures within the same measurement system.*

*To achieve this objective, students should be able to:*

- *Solve multi-step problems using elapsed time including problems to nearest minute.*
- *Solve problems and follow procedures using equivalent units within the same measurement system.*

*time: seconds/minutes/hours/days/weeks/months/years*

*money: pennies/nickels/dimes/quarters/half-dollars/dollars/bills*

*capacity: cups/pints/quarts/gallons/liters*

*length: inches/feet/yards/miles*

*centimeters/meters/kilometers*

*mass: ounce/pounds*

*grams/kilograms*

- *Tell time to the minute.*

- A.** Jose left home at 2:00 pm and arrived at a birthday party at 2:30 pm. He left the party at 4:15 pm and went straight home. How long was he at the party? What time did he arrive home if it took him the same amount of time to get there? Explain your answer.

### *Vocabulary and Resources*

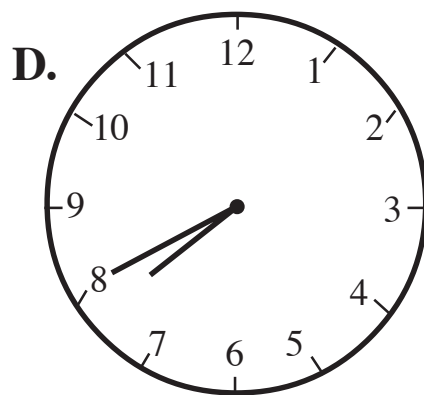
measure  
customary  
standard  
non-standard  
linear  
hours  
minutes  
seconds  
months  
years  
season  
quarter hour  
before/after  
until/after/past  
earlier/later  
half past  
half-hour  
AM/PM  
reasonable  
intervals  
elapsed  
estimate  
convert  
analog  
digital  
inches  
feet  
years  
miles  
metric  
centimeter  
meter  
kilometer  
height/tall  
length/long  
width/wide  
equivalent  
ruler  
trundle wheel  
yard stick  
meter stick  
tape measure  
appropriate units  
estimate

- B.** Jenna recorded how long it took her to get ready for school yesterday. She made the following chart:

Shower:	6 minutes
Get dressed:	5 minutes
Eat breakfast:	12 minutes
Travel to school:	12 minutes.

If she **started** her shower at 7:05 am, what time did she get to school?

- C.** Mike asked his father, “When will dinner be ready?” His dad said, “It’s 5 minutes until 6 now and dinner will be ready in about 30 minutes.” What time will dinner be ready?



Phil looked at his clock before he read his book. It looked like this:

If the clock said 8:11 pm when he stopped, how many minutes did he read his book?

**E.** Frankie was tossing paper airplanes with three friends. Shelly's paper airplane flew 7 yards. Marcus's paper airplane flew 15 feet. Jill's airplane flew 12 feet and Frankie's flew 6 yards. Whose paper airplane flew the farthest? Put their names in order from longest to shortest distance.

**F.** Chloe has 2 cats. If she feeds them each 4 ounces of food a day, how long will a 5 pound bag of cat food last?

**G.** Susan has 4 gallons of lemonade. How many pints of lemonade is this equal to?

*Vocabulary  
and  
Resources*

measure  
customary  
standard  
nonstandard  
linear

inches  
feet  
yards  
miles  
metric  
centimeter  
meter  
kilometer

ruler  
trundle wheel  
yard stick  
meter stick  
tape measure  
height  
length  
width-wide  
equivalent

appropriate units  
estimate

**H.** Tamika's bedroom is 14 feet wide. How many yards is this?

**I.** If a new pencil is nineteen centimeters long, about how many pencils will equal one meter?

**J.** Billy drank four cups of water for six days. How many pints did he drink all together? How many quarts did he drink all together?

**K.** Jesse has 7 coins in his pocket. They are equal to \$1 all together. How many of each coin does he have?

Quarter: \_\_\_\_\_

Dime: \_\_\_\_\_

Nickel: \_\_\_\_\_

Penny: \_\_\_\_\_

- L.** \*You and your classmates must provide music for a puppet show that will last 30 minutes.

The table below shows the songs that you can use and the length in minutes of each song.

Song Title	Length in Minutes
Do Re Me	2
Sara's Waltz	5
Puppet Polka	8
Whispering Leaves	6
General March	4
Bells of Billings	4
Trumpet Tune	6
Spring and Fall	3

Use the information in the table to complete the schedule below. List which songs you will use and the time each song will begin so that you will have exactly 30 minutes of music beginning at 2:00 pm and ending at 2:30 pm.

Time that Song begins	Length in minutes	Song Title
2:00 pm		

\* From the Connecticut Mastery Mathematics Test.

**M.** Arrange the customary units of measure below in order from least to greatest.

41 cups    13 qt    25 cups    3 gal    15 pt

\_\_\_\_\_ < \_\_\_\_\_ < \_\_\_\_\_ < \_\_\_\_\_ < \_\_\_\_\_

**N.** Jenny measures her skirt and finds it is 3 feet around the bottom. If she wants to add three rows of ruffles on the bottom, how many feet of ruffles does she need?

- If the ruffles cost 10¢ a foot, how much will she pay?
- If another store charges 1¢ an inch, will she save any money buying at this store?
- How much is the difference in the prices?



Show your work with pictures, words, or numbers.

**O.** Arrange the customary units of measure below in order from least to greatest.

4 ft    2 yd    25 in    3 ft    45 in    1 mi

\_\_\_\_\_ < \_\_\_\_\_ < \_\_\_\_\_ < \_\_\_\_\_ < \_\_\_\_\_ < \_\_\_\_\_

**P.** Arrange the metric units of measure below in order from greatest to least.

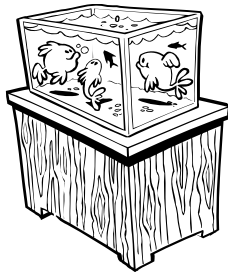
4 km    24 m    150 cm    33 cm    50 km    60 m

\_\_\_\_\_ > \_\_\_\_\_ > \_\_\_\_\_ > \_\_\_\_\_ > \_\_\_\_\_ > \_\_\_\_\_

**Q.** Steve has a 3 quart container. If he is filling a tub that can hold 46 gallons, *about* how many times will he have to fill the 3 quart container to fill the tub?

**R.** Antonio is buying juice for a class party. There are fewer than 25 students in his class. If each student drinks *about* one pint of juice, how many quarts of juice will he need to buy to have enough? About how many gallons is this?

**S.** Kathy wants to finish filling the ten gallon fish tank with water. It has eight gallons and two quarts in it now. If she has only a pint container, about how many trips will she have to make to fill the 10 gallon tank using a pint container? How do you know?



- a. Less than 2
- b. Between 2 and 6
- c. Between 6 and 10
- d. More than 10



**T.** A paper clip weighs about 1 gram. About how many paper clips will equal 1 kilogram?

**U.** Hannah estimated that a large pumpkin weighs 20 pounds. George estimated that it would weigh 240 ounces. The pumpkin weighed exactly 18 pounds. Whose estimate was closer? How close? Explain your answer.

**V.** Josh found that 3 new pencils weighed 4 ounces all together. How many new pencils would weigh one pound? Justify your answer.

**W.** What would be the best unit of measure for each, grams or kilograms?

desk \_\_\_\_\_ watch \_\_\_\_\_  
piece of bread \_\_\_\_\_ your teacher \_\_\_\_\_

- X.** Keesha looks at the clock below before leaving to go home. On her way home she stops at the grocery store for 25 minutes, at the gas station for 10 minutes, and the cleaners for 15 minutes. Driving time is 20 minutes. What time will she get home?



- Y.** Fill in the chart.

<u>Ounces</u>	<u>Cups</u>	<u>Pints</u>	<u>Quarts</u>	<u>Gallons</u>
16	2	1	$\frac{1}{2}$	$\frac{1}{8}$
32	4			$\frac{1}{4}$
		4	2	
128			4	

## 2.02 Estimate and measure using appropriate units.

- a) *Capacity (cups, pints, quarts, gallons, liters).*
- b) *Length (miles, kilometers).*
- c) *Mass (ounces, pounds, grams, kilograms).*
- d) *Temperature (Fahrenheit, Celsius).*

*To achieve this objective, students should be able to:*

- *Estimate and measure with appropriate units.*
- *Select and use the appropriate tools and units for the attribute being measured.*

- A.** The students in Mrs. Walton's class check the temperature inside the classroom. Most of the students are warm without a sweater. What is the temperature most likely to be in Fahrenheit?

26°F      51°F      70°F      95°F

*Vocabulary  
and  
Resources*

equivalent measures

Fahrenheit

Celsius

degrees

intervals

increments

measure

customary

Metric

increasing

decreasing

reasonable

justify

cups

pints

quarts

gallons

liters

miles

kilometers

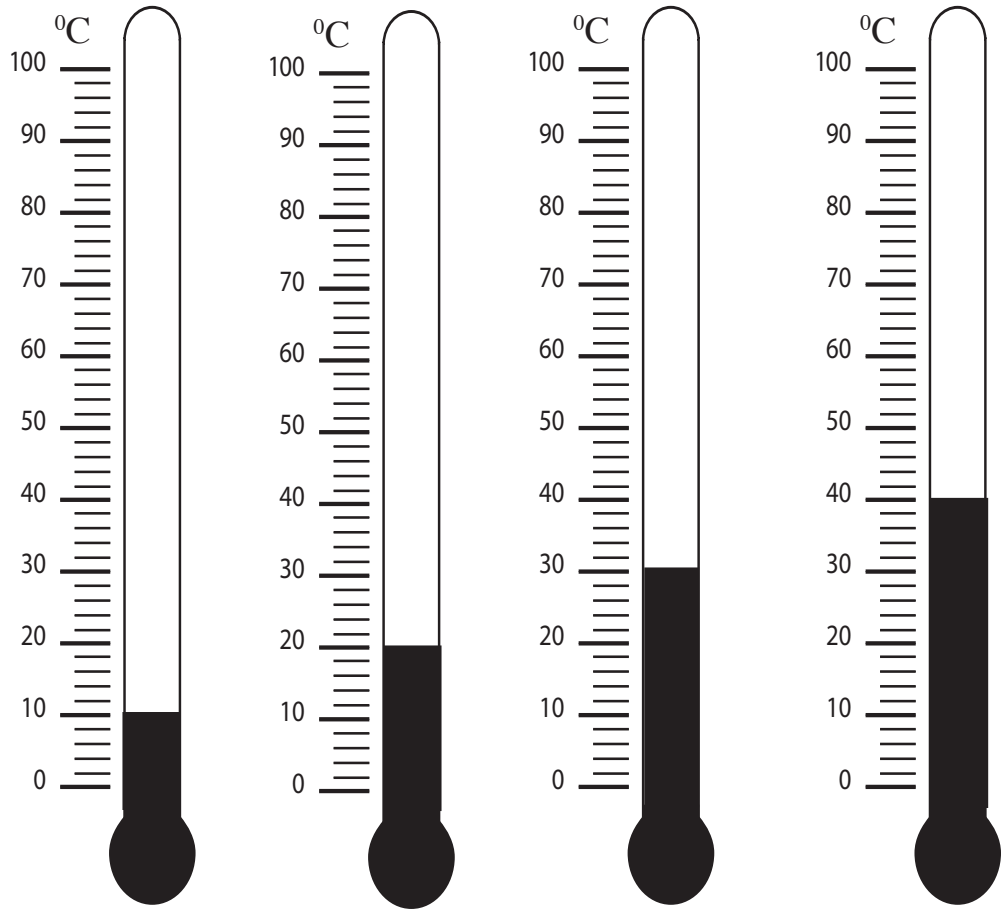
ounces

pounds

grams

kilograms

**B.** What could the outside temperature be in Celsius if Marie can go to the beach and swim?



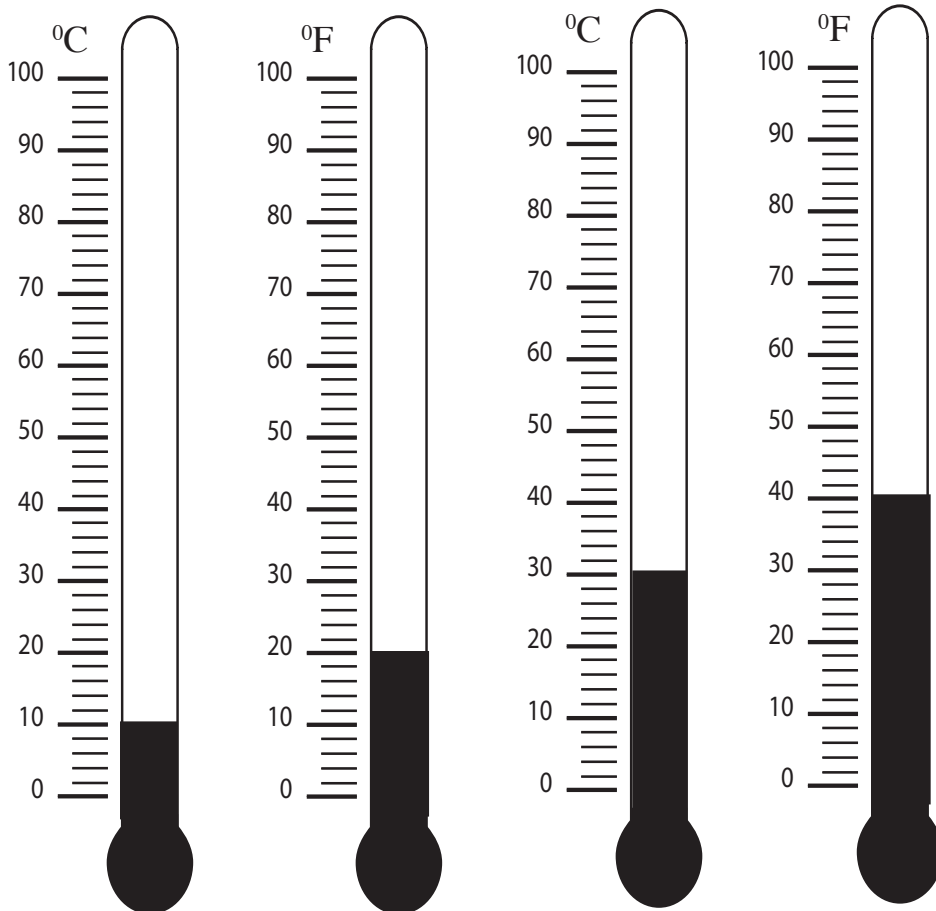
**C.** Which of the following would be measured in miles?

- the width of a desk
- the distance from Raleigh to Asheville
- the distance your teacher can throw a ball
- the distance around a basketball court

- D.** Which of the following would be measured in kilometers?
- a. the width of the door
  - b. the distance from your desk to your teacher's desk
  - c. the distance it is from your classroom to your gym
  - d. The distance from Charlotte to Raleigh

*Vocabulary  
and  
Resources*

- E.** Read the following thermometers.  
What is the temperature of each?



- F.** Mice weigh one pound. Cats weigh 8 pounds. On one side of the balance scale there are 15 mice and 2 cats. On the other side of the balance scale there are 4 mice and 3 cats. Explain 2 ways to make the balance scale equal on both sides.
- G.** A lawn mower holds  $1\frac{1}{2}$  gallons of gas. How many quarts will it hold?
- H.** A large can holds 15 gallons of gas. How many quarts will it hold? How many pnts will it hold?

- I.** Allison ate 32 ounces of food for lunch.  
How many pounds did she eat?
- J.** Tate found a treasure chest with 16 ounces of gold.  
How many pounds of gold did she find?
- K.** A bobcat weighs 50 pounds. How many bobcats of the  
same weight would make a ton?

*Vocabulary  
and  
Resources*

congruent  
symmetric  
shapes  
symmetry  
polyhedrons/3-D  
sphere  
cube  
prism  
cylinder  
cone  
lines  
line segment edge  
plane figures/2-D  
polygon  
grid  
path  
triangle  
circle  
square  
rectangle  
trapezoid  
parallelogram  
rhombus  
quadrilateral  
hexagon  
pentagon  
octagon  
decagon  
kite  
attributes  
regular  
irregular  
flat  
curved/straight  
base  
acute  
obtuse  
square angle/right angle  
parallel  
vertex  
face  
surface  
endpoints

### 3.01 Use appropriate vocabulary to compare, describe, and classify two- and three-dimensional figures.

To achieve this objective, students should be able to:

- Recognize and name geometric figures (two- and three-dimensional figures).

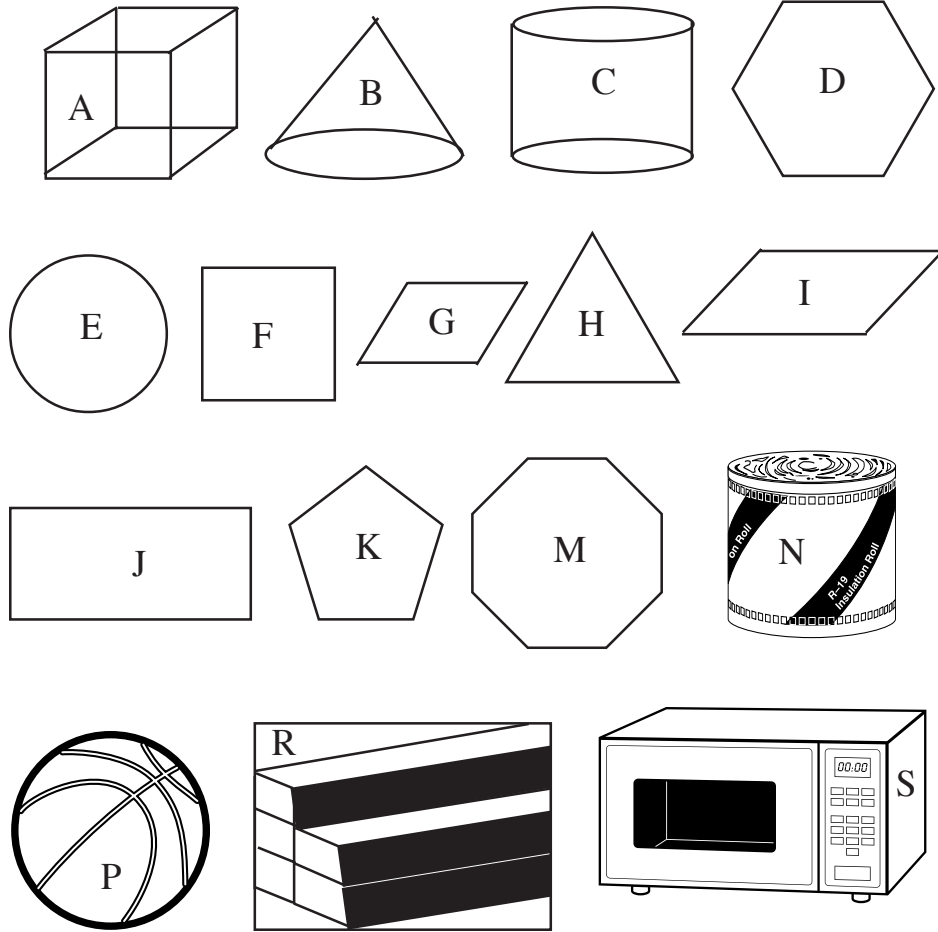
**A.** Use the following to complete a tree map.

one curved surface	two circle faces
party hat	all edges same length
six square faces	six rectangle faces
one vertex	shoe box
basketball	no faces, edges or corners
one flat surface	soup can
slides and rolls	six edges not all the same length

#### Characteristics and Examples of Three Dimensional Figures

cube      cone      sphere      cylinder      rectangular prism

Use the following figures for problems B and C.



- B.**
- I have six rectangular faces. What am I?
  - I am the shape of a number cube. What am I?
  - I can slide and roll. What am I?
  - I have five sides and five vertices. What am I?
  - I have one curved surface and one flat surface. What am I?
- C.**
- How are the figures G, I, and J alike?
  - How are they different?
  - How are the figures F, H, K alike?
  - How are they different?

*Vocabulary  
and  
Resources*

- attributes
- regular
- flat
- straight/curved
- base
- acute
- obtuse
- square corner/right angle
- parallel
- vertex/vertices/vertexes
- side
- height
- face
- surface
- endpoints
- line
- line segment
- ray
- point
- edge
- symmetric
- symmetry
- line of symmetry
- congruent

grid  
ordered pair  
point  
axis  
axes

path  
diagonal  
east  
west  
north  
south

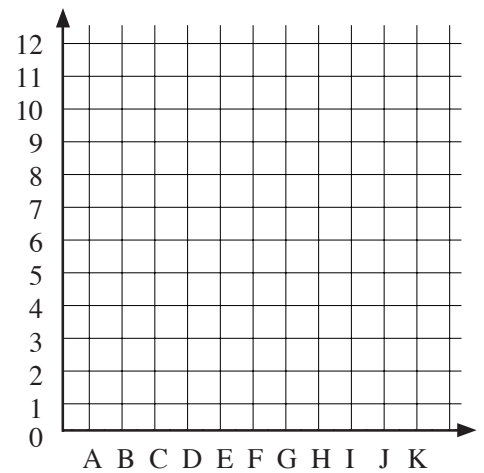
Note:  
ordered pairs  
may be  
(letter, number)  
(K, 2)  
or  
(number, number)  
(4, 3)

### 3.02 Use a rectangular coordinate system to solve problems.

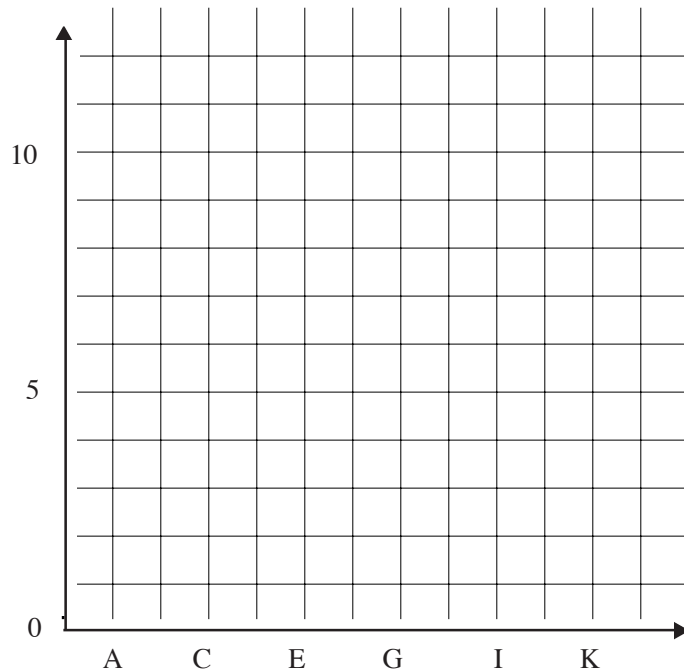
To achieve this objective, students should be able to:

- Graph and identify points with whole numbers and/or letter coordinates.
- Describe the paths between given points on the plane.

- A.** Graph the triangle with vertices at (C, 4), (F, 10), and (I, 4). What are the coordinates of the three points that lie on a line of symmetry for this triangle?



- B.** Graph the points with the following coordinates and connect them in the order given. Draw at least two lines of symmetry for the shape. Do the paths of both lines of symmetry pass through a common point? If so, give the coordinates for this point.
- (2, 3) → (2, 9) → (8, 9) → (8, 3) → (2, 3)



**C.** Describe how you would travel from (2,3) to (11,11).

**D.** Graph the points with the following coordinates and connect them in the order given.

1. (A, 3) → (C, 5) → (D, 4) → (A, 3)

Give the coordinates of a point inside this triangle.

2. (F, 2) → (F, 7) → (J, 7) → (J, 2) → (F, 2)

Give the coordinates of two points inside this rectangle.

**E.** Graph the following points and connect them in the order give.

1. (C,9); (C,8); (E,8); (E,4) What coordinates will have to be plotted to complete the letter T?

2. (H,5); (H,0); (I,0); (I,2); (J,2); (J,0); (K,0)

What coordinates will have to be plotted to complete the letter H?

circle graph  
table  
pictograph  
line plot  
tallies  
survey

Venn diagram  
(triple and double)

## 4.01 Collect, organize, analyze, and display data (including circle graphs and tables) to solve problems.

To achieve this objective, students should be able to:

- Make predictions based on data.
- Choose appropriate chart/graph/diagrams to display data.

**A.** Forty students are surveyed at Lincoln Elementary School. The following data reflects the student's favorite lunch:

Pizza	20	Tacos	10
Hot Dogs	5	Hamburgers	5



- Create a table and a circle graph to display this data.
- Based on this information, what will the expected results be if 80 more students are surveyed?
- Explain your answer with pictures words, or numbers.

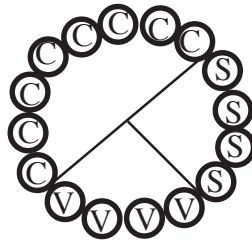
**B.** Jessica's classmates survey all the third grade students to find out their favorite sport. Here are the results from the classes:

	Mrs. Walton's	Ms. Taylor's	Mr. Scott's
Basketball	11	8	4
Soccer	9	7	9
Football	3	6	8
Baseball	5	4	6

- What is the favorite sport?
- How many more like soccer then baseball?
- How do you know?
- Survey your class to find out their favorite sport.
- Organize and display it on a table.

- C.** The third grade class collected data about student's favorite ice cream flavors: chocolate, vanilla, and strawberry.

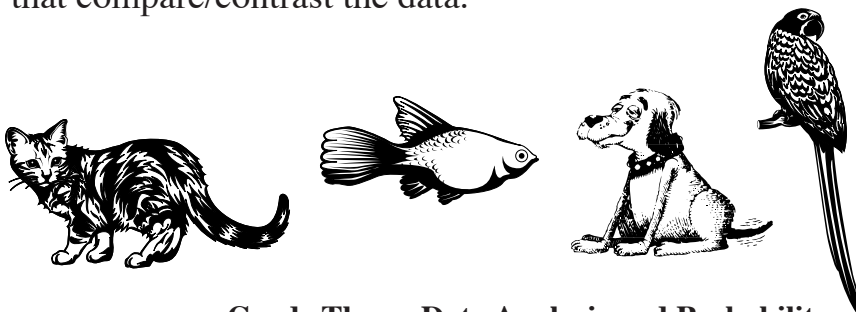
Analyze the data by providing at least 3 different facts that compare/contrast the data.



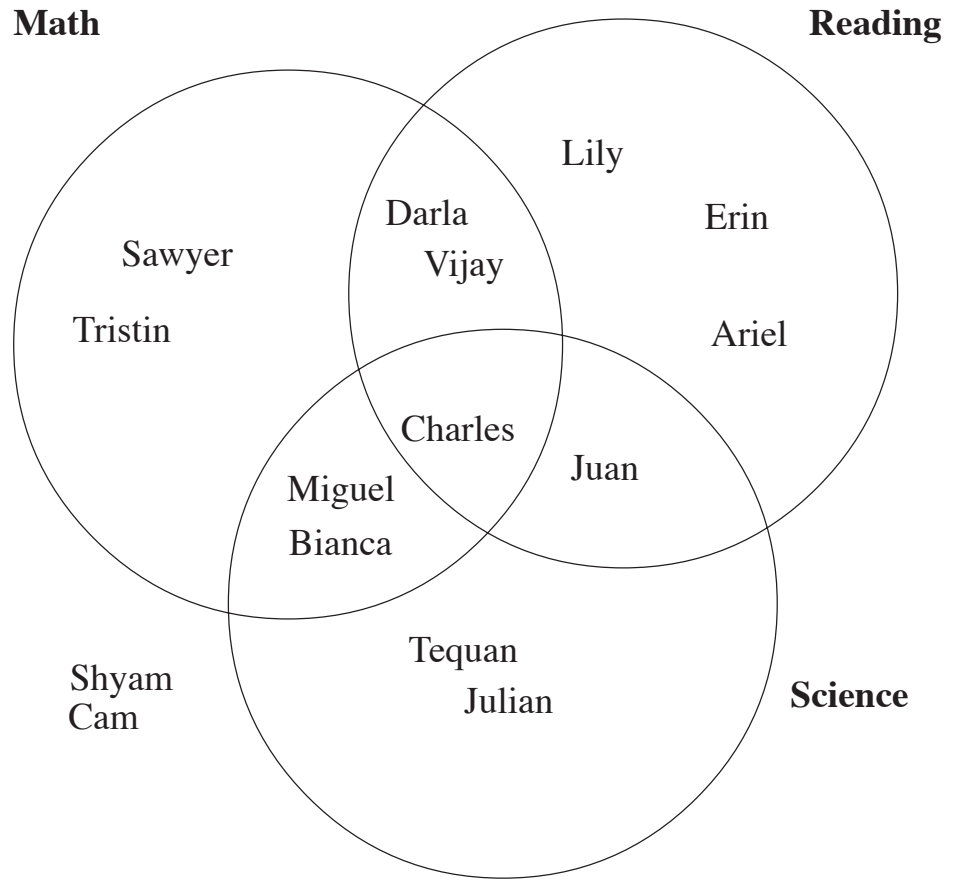
- D.** Mr. Lloyd's class collected data about students' favorite pets. Tally the number of pets in the survey. Create a table and then a circle graph using the following information. (Use beans or counters to assist with the circle graph.)

<u>Student</u>	<u>Pet</u>	<u>Student</u>	<u>Pet</u>
John	dog	Mylene	fish
Toni	cat	Rob	cat
Stormy	bird	Gene	fish
Bill	dog	Ron	dog
Barry	cat	Joshua	bird
Jordan	dog	Ysa	cat
Callie	fish	Linda	cat
Paul	cat	Terry	bird
Michelle	fish	Debbie	cat
Tim	bird	Kam	dog
Tori	dog	Lexi	cat
Taylor	dog	Grayson	dog

Analyze the data by providing at least 3 different facts that compare/contrast the data.



**E.** The Venn diagram shows the subjects third graders like.



- How many students like math? \_\_\_\_\_
- Name the students who like science: \_\_\_\_\_  
\_\_\_\_\_
- Who like all three subjects? \_\_\_\_\_
- What does Juan like? \_\_\_\_\_
- What do you know about Shyam and Cam? \_\_\_\_\_  
\_\_\_\_\_

- F.** Ms. Hudson’s students counted the number of chapter books they read between August and December. This is what they reported.

Matt	
Shanique	
Kelly	
Monica	
Scott	
Quan	
Robert	
Dillon	
Ashah	
Caroline	
Maddie	
Jay	

Make a line plot to show the chapter books that Ms. Hudson’s class read.

12 13 14 15 16 17 18 19 20 21 22 23 24 25 26

- How many students read more than 12 books? \_\_\_\_\_
- How many chapter books were read by the entire class? \_\_\_\_\_
- Who read the most books? \_\_\_\_\_

## 4.02 Determine the number of permutations and combinations of up to three items.

To achieve this objective, students should be able to:

- Know when order matters.

- A.** Thalia, Hilary and Dakota want to have their pictures taken at the mall picture booth. How many ways can they have their pictures taken if only two will fit in the booth at one time?

list  
possible outcomes  
arrangements  
order

- B.** Robby has three strips of wide ribbon to make a flag like this:



If the flag must use all three colors (green, yellow, and black), how many different flags is it possible to make?

Explain your answer with pictures, words, or numbers.

- C.** Using the digits 4, 5, and 7 how many different two-digit numbers can be made? How many are even? How many are greater than 50? How many are greater than 70 and also odd?
- D.** Michelle, Jose and Tomás rode their bikes in a five-mile race. How many different orders can they finish the race?
- E.** Jeremy has a passenger car, a coal car and a box car in his model train set. How many ways can he arrange the cars behind the engine?

likely  
less likely  
more likely  
possible  
certain  
impossible

predictions  
outcomes

list  
possible outcomes  
arrangement  
order

*Note: Students should be able to identify outcomes in the following ways:*

1 out of 3

$$\frac{1}{3}$$

## 4.03 Solve probability problems using permutations and combinations.

*To achieve this objective, students should be able to:*

- *Determine the list of outcomes.*
- *Determine the probability of the desired outcome.*

**A.** John, Bill and Maryanne are standing in line for lunch.

- What is the probability that John is first in line and Bill is last?
- What is the probability that Maryanne is **not** first?
- What is the probability that Bill is second?
- What is the probability that Maryanne is first in line and John is last?

**B.** Trey has the digits 1, 2, and 3. He is making three-digit numbers using only those digits with no repeats.

What is the probability that he makes:

- an odd number?
- a number greater than 500?
- a number less than 150?
- a number between 250 and 375?
- a number greater than 250?
- a number divisible by 5?
- a number divisible by 3?

- C.** If you have the digits 2, 4, and 5 written on three cards and draw two cards without looking:
- What is the probability that their sum is even?
  - What is the probability that their product is odd?
- D.** Hal, Sarah and Holly were running for president and vice president of the student council. What is the probability that the president's name will begin with an H? What is the probability the vice president's name will begin with an S? What is the probability that both of the officer's names will begin with a J?

## 5.01 Describe and extend numeric and geometric patterns.

To achieve this objective, students should be able to:

- Use strategies for adding and subtracting numbers.
- Use ordinal number positions.
- Understand core pattern.

- A.** If this pattern continues, what number will be in the 6<sup>th</sup> position? The 12<sup>th</sup> position? What is the pattern?

5, 8, 14, 23, \_\_\_\_\_, \_\_\_\_\_

- B.** What is the rule for this number pattern?

3, 7, 5, 9, 7, 11, 9

- C.** Paulo used bricks to make this design in his driveway.



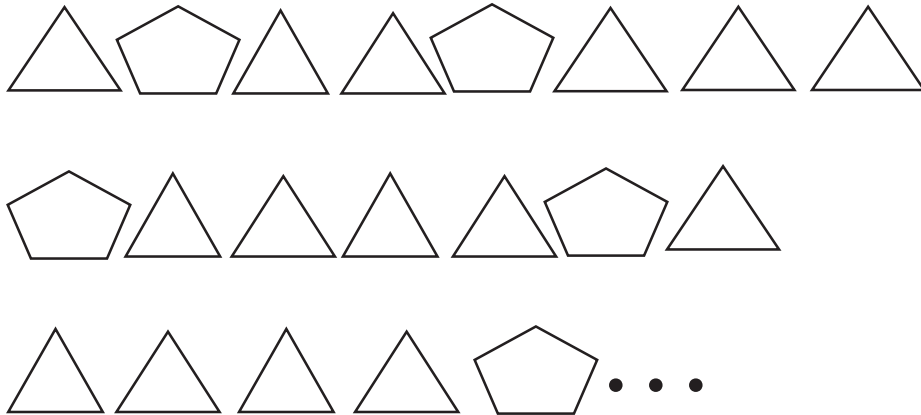
After he used eight bricks like this: , how many bricks were in his driveway design?

He used \_\_\_\_  bricks and \_\_\_\_  bricks.

- D.** Kathryn practices the piano for one hour each day. She earns 12 stickers for each hour of practice. How many stickers will she earn in 2 weeks? Explain your answer with pictures, numbers, or words.

- E.** Todd is saving \$200 for a new bike. In the first week, he put \$1 in his money jar. In the second week, he put \$2 in his money jar. In the third week, he put \$3 in his money jar. If he continues this pattern, how many weeks will he have to save before he will have the \$200 to buy the bike? Show how you know.

**F.** Describe the pattern below and find the 23<sup>rd</sup> shape.



pattern core

Explain your answer with pictures, numbers, or words.

**G.** Describe the pattern; 98, 50, 26, 14, \_\_\_\_\_

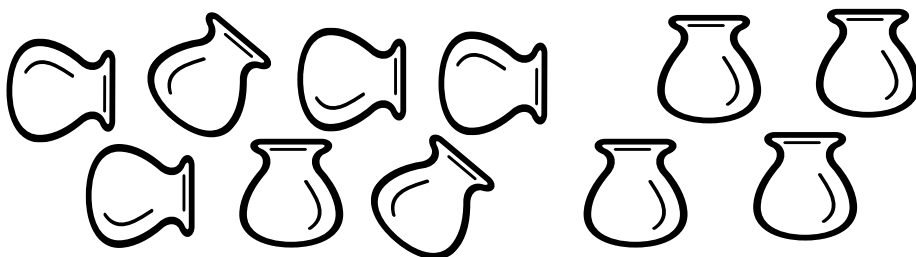
**H.** 50, 75, 45, 70, 40, 65, 35

What is the pattern core?

What would the 28th number be?

**I.** Michael is at the school carnival. He earns points for knocking down bottles. Red bottles are worth 5 points and blue bottles are worth 8 points. The numbers below represent the total number of points Michael has after each turn. If the pattern continues how can Michael determine the number of points he will have after the next two turns?

5, 13, 18, 23, 31, 36, 41, 49, \_\_\_\_\_, \_\_\_\_\_



pattern unit  
pattern core  
unknown  
symbol

## 5.02 Extend and find missing terms of repeating and growing patterns.

To achieve this objective, students should be able to:

- Recognize repeating and growing patterns.
- Extend a given pattern.
- Find missing terms in a pattern.
- Identify the core pattern unit.

**A.** Finish these patterns  
3, 8, 6, 11, 9, 14, 12, \_\_\_\_, \_\_\_\_, \_\_\_\_, \_\_\_\_

a, bb, ccc, dddd, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

\_\_\_\_, \_\_\_\_, 12, 16, \_\_\_\_, \_\_\_\_, 28

**B.** Ashley is going to complete the next five pieces in a pattern. What shapes will complete the pattern?  
Explain how she knows what comes next.



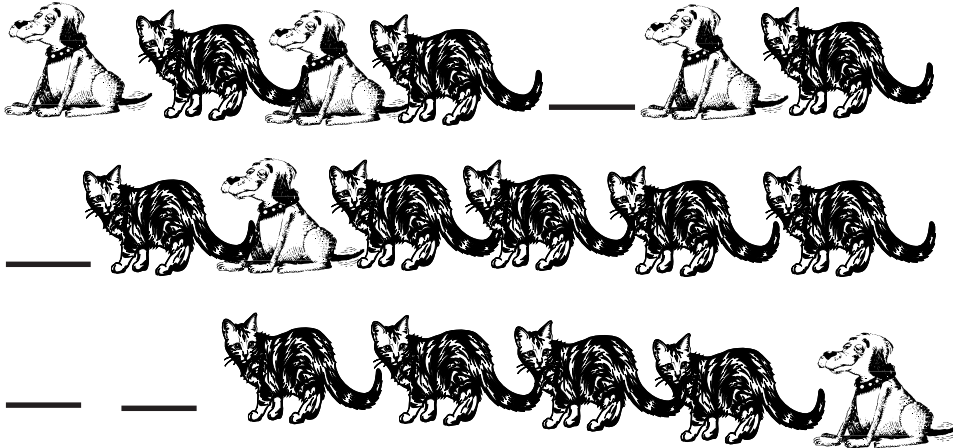
**C.** James lost three pieces of his project. Explain the pattern unit. Which pieces does he need to complete the pattern?  
Where will they go? Use pictures, words or numbers.



**D.** The soccer team is selling BBQ dinners from 10:30 am to 1:30 pm. If they sell 15 BBQ dinners by 11 am, 23 more by 11:30 am, 31 more by 12 pm and 39 more by 12:30 pm and the pattern continues how many more will they sell by 1 pm? by 1:30 pm? How many will they sell altogether?  
Create a chart or graph to show your answer.

**E.** Savannah has pictures of puppies and kittens on her wall. She needs 4 more pictures to fill in the pattern.

- Which ones does she need?
- Where do they go?
- Explain your answer using pictures, words, or numbers.
- Using letters, symbols, or numbers, complete the pattern below.



**F.** 14, 16, 18, 36, 38, 40, 80, \_\_\_\_, \_\_\_\_, \_\_\_\_, \_\_\_\_

- Describe the pattern.
- Find the next 4 numbers in the pattern.
- What will the 25th number be? the 35th?

### 5.03 Use symbols to represent unknown quantities in number sentences.

To achieve this objective, students should be able to:

- Compose and decompose numbers.
- Use a variety of strategies to find unknown quantities.

A.  $\text{✱} + 900 + 40 + 3 = 7,943$      $\text{✱}$  is equal to \_\_\_\_\_.

$3 \times C = 21$      $C = \underline{\hspace{2cm}}$ .

B. Ashley is at the fall festival. She has earned 70 point for knocking down bottles. The red bottles are worth 5 points and the blue bottles are worth 7 points.

- Write a number sentence using a symbol to represent the total number of bottles she knocks down.
- Write a number sentence using a symbol if she only knocks blue bottles.


C. Jake used the chart below to record temperatures on Monday. If the temperature continues to change in this pattern write a number sentence that represents the outside temperature at 4:30 pm. What number sentence would represent the inside temperature?

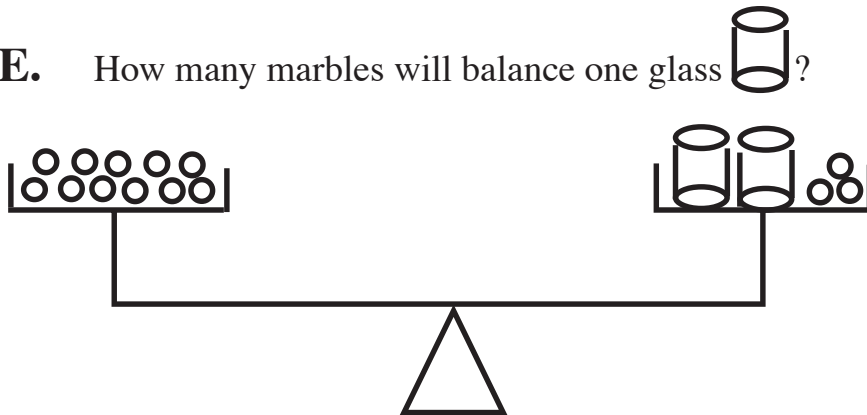
Time	1:30 pm	2:30 pm	3:30 pm	4:30 pm	5:30 pm
Inside Temp	72° F	69° F	66° F		60° F
Outside Temp	67° F	63° F	60° F		57° F

- D.** Tori shares a bag of candy at the party. There are 8 children at the party. If Tori gave each child three pieces of candy, how many pieces were in the bag?

Write a number sentence using a symbol to represent how much candy Tori had at the beginning.

*Vocabulary  
and  
Resources*

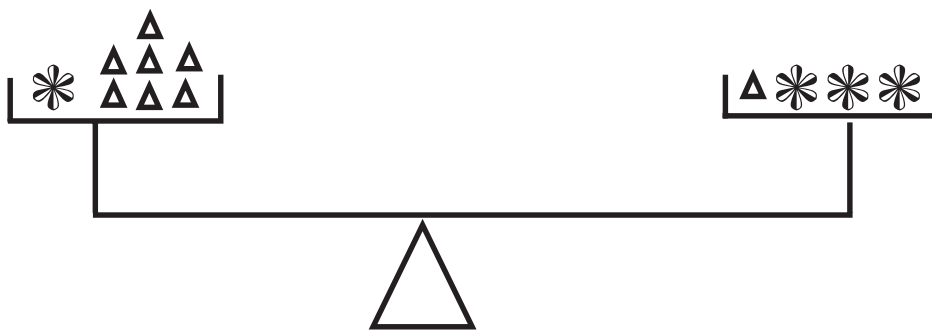
- E.** How many marbles will balance one glass ?



variable  
unknown  
equation  
expression  
number sentence  
symbol  
form

Explain your answer and write an equation using a symbol to represent the unknown.

- F.** How many triangles will balance the ?



Explain your answer and write a number sentence using a symbol to represent the unknown.

## 5.04 Find the value of the unknown in a number sentence.

To achieve this objective, students should be able to:

- Use a variety of strategies to determine the unknown quantity in a number sentence.

variable  
unknown  
expression  
equation  
balance

**A.**  $3 + 4 = * + 5$        $2 + * = 5 + 1$        $\bullet \times 6 = 18$   
 $17 - * = 9$        $12 \div \checkmark = 4$        $78 + 22 = G$   
 $12 - 12 = w$        $15 \div \square = 5$        $28 \times * = 4$   
 $378 + 241 = 1$        $\times + 582 = 721$        $639 - \blacklozenge = 408$

- B.** Zachary gave his sister 12 stickers. He gave his brother 20 stickers. Zachary counted his stickers. He had 13 stickers left. How many stickers did Zachary have to start with?

$$\text{\textcircled{?}} - (12 + 20) = 13$$

- C.** Write a story to go with this equation.

$$50 - n = 34$$

