

Unit 10: Probability and Statistics

Patterns, Functions, and Algebra

SOLs: 4.13 a,b & 4.14 & 4.16

VOCABULARY

Probability: the chance of an event happening

Outcome: a possible result after an event has occurred

Event: an experiment that has a set of possible outcomes

Axis: the “x” and “y” lines and that cross and form perpendicular lines and a graph

Line graph: a graph that tells whether something has increased, decreased, or stayed the same with the passage of time.

Bar graph: compare different categories of data using bars

Commutative property of addition and multiplication: changing the order of addends and factors will not change the sum or product

Associative property of addition and multiplication: changing the groupings of addends and facts will not change the sum or product

Likelihood

Certain– It is certain that a standard die will land on 1,2,3,4,5, or 6 when rolled

Likely– It is likely that there will be a boy in your homeroom class.

Equally likely– It is equally likely that I will flip heads or tails

Unlikely– It is unlikely that I will draw an ace when I draw from a deck of cards

Impossible– It is impossible that I will draw a purple card from a standard deck of cards

Sample of Events

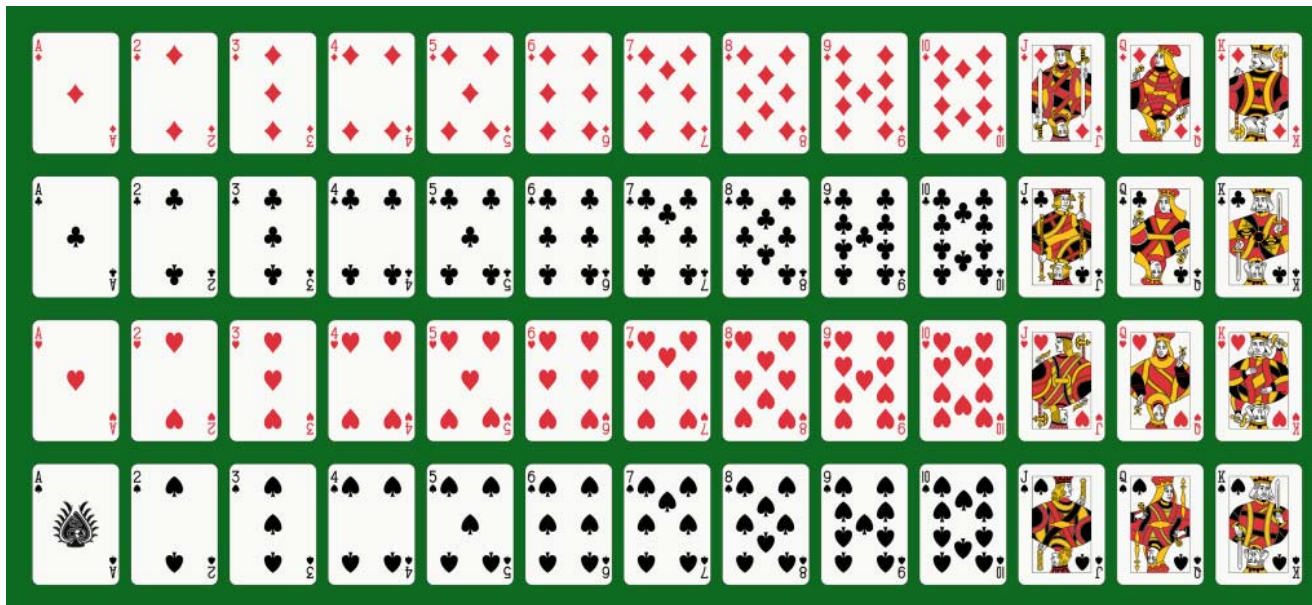


A standard die (dice is plural) has six sides.

Each side is numbered 1-6.

Cards

Ace 2 3 4 5 6 7 8 9 10 Jack Queen King



Red Diamonds


Black Clubs

Red Hearts

Black Spades

Probability

Probability is represented by a fraction or a number between 1 and 0.



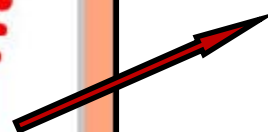
The illustration shows three items on an orange background: a white die with blue pips, a stack of three calendars, and a glass jar with a metal clasp containing several white, red, and blue balls. Below these items is a white spiral-bound notebook with the probability formula written in red:

$$\text{probability} = \frac{\text{event/s}}{\text{number of outcomes}}$$

EXAMPLE: Rolling
"1" on a standard
die



$$\frac{1}{6}$$



Bar Graph

These are parts that are needed for a bar graph

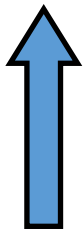
TITLE

SCALE

What kind of pet do you own?



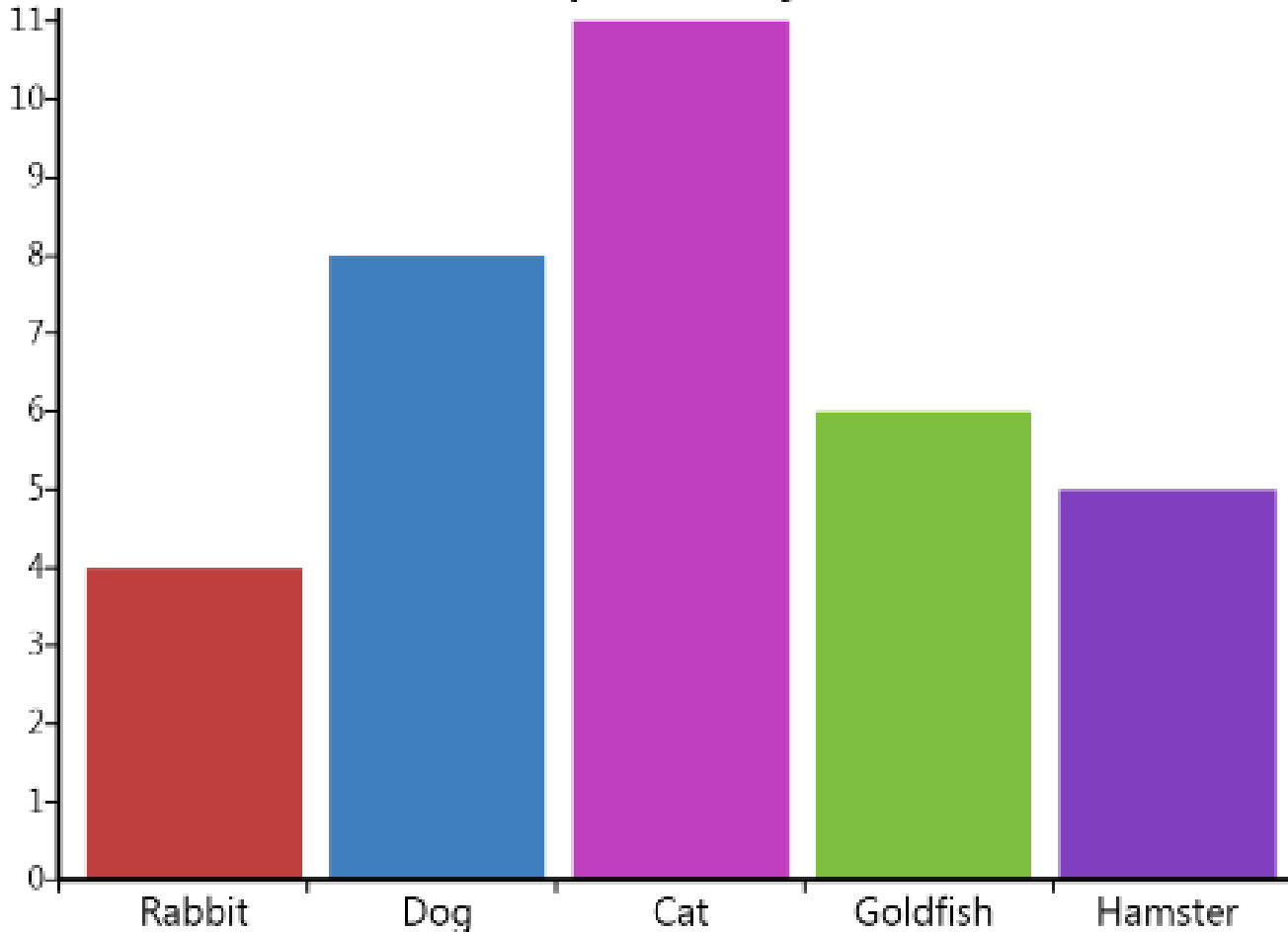
number of people



EACH AXIS IS LABELED

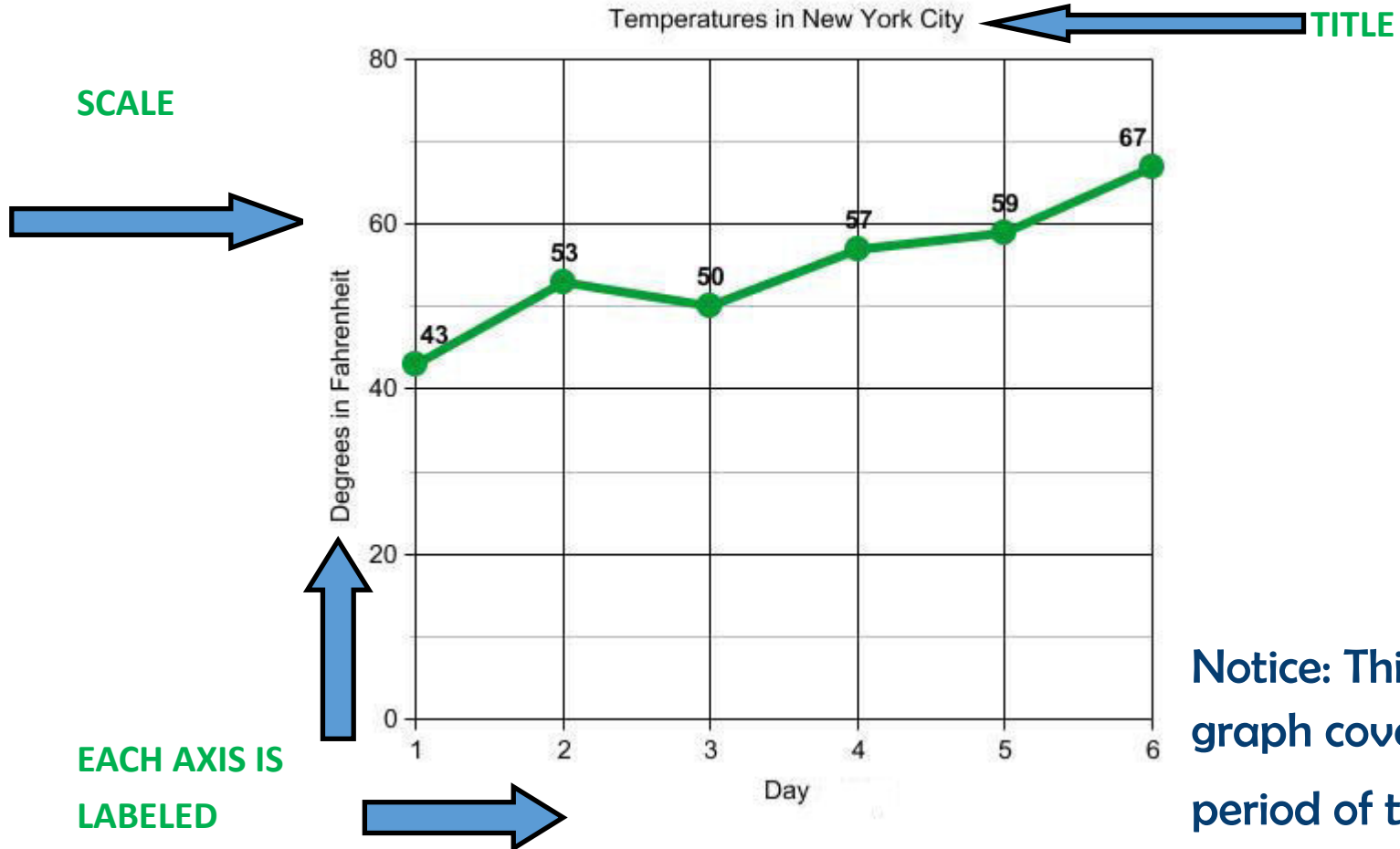


PETS



These are parts that are needed for a line graph

Line Graph



Notice: This line graph covers a period of time

$$(1 + 2) + 3 = 1 + (2 + 3)$$

Examples

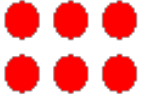
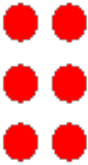
Associative Property

Associative Property

You can change the grouping of addends:

$$3 + (7 + 29) = (3 + 7) + 29$$

Or factors:

 $=$  2×3 $=$ 3×2 6 $=$ 6

Examples

Commutative Property

Commutative Associative Property

You can change the order of the addends:

$$4 + 3 = 3 + 4$$

Or factors:

Algebra Break Down

$$7 + 3 = 6 + \underline{\quad}$$



We need to fill in the blank

The left hand side equals 10 because $(7+3=10)$

$$10 = 6 + \underline{\quad}$$

The right hand side has to equal 10 as well. You can solve for the blank two different ways

- 1) Use subtraction to identify the number that belongs in the blank $10-6=4$ OR**
- 2) Identify what number added to 6 equals 10 $6+4=10$**

$$7 + 3 = 6 + 4$$

Both sides now equal 10



Algebra Break Down

$$3 \times 4 = 2 \times \underline{\quad}$$

We need to fill in the blank

The left hand side equals 12 because $(3 \times 4 = 12)$



$$12 = 2 \times \underline{\quad}$$

The right hand side has to equal 12 as well. You can solve for the blank two different ways

1) Use division to identify the number that belongs in the blank $12 \div 2 = 6$ OR

2) Identify what number multiplied with 2 equals 12

$$6 \times 2 = 12$$

$$3 \times 4 = 2 \times 6$$

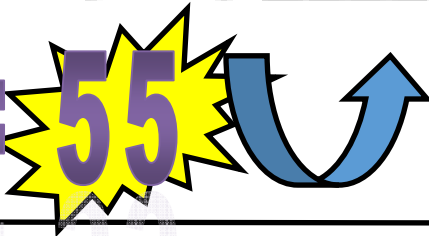
Both sides now equal 12



Patterns

Numbers


20, 25, 30, 35, 40, 45, 50, _____, 60

$$50 + 5 = 55$$


RULE

Add 5

98, 90, 82, 74, 66, 58, 50, 42, _____

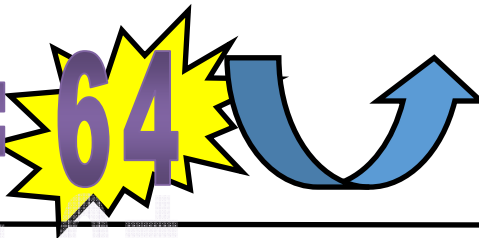
$$42 - 8 = 34$$


Subtract 8

Patterns

Numbers


2, 4, 8, 16, 32, _____

$$32 \times 2 = 64$$


RULE

**Multiply
by 2**

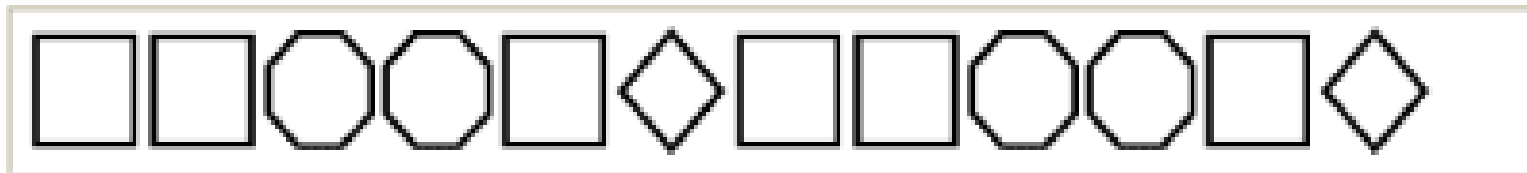
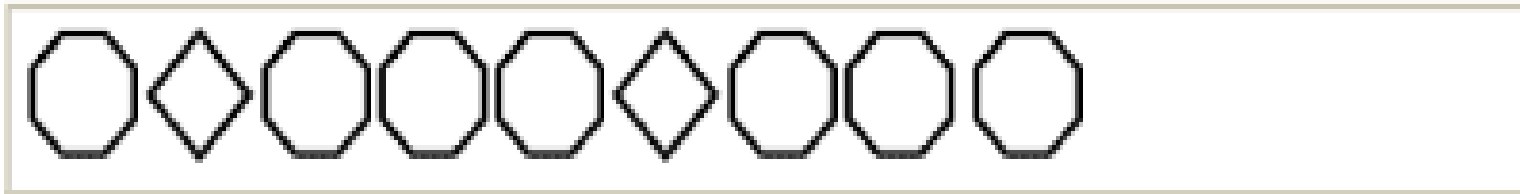
32, 16, 8, 4, _____

$$42 - 8 = 34$$


**Divide
by 2**

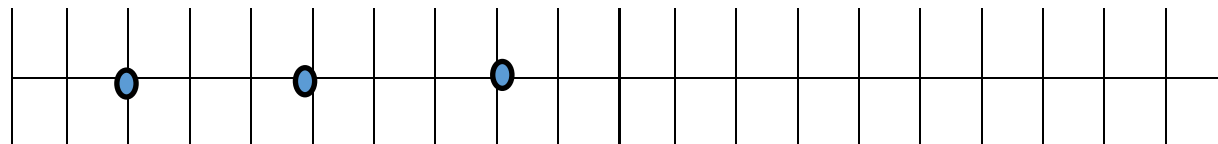
Patterns

Shapes



Number Machines

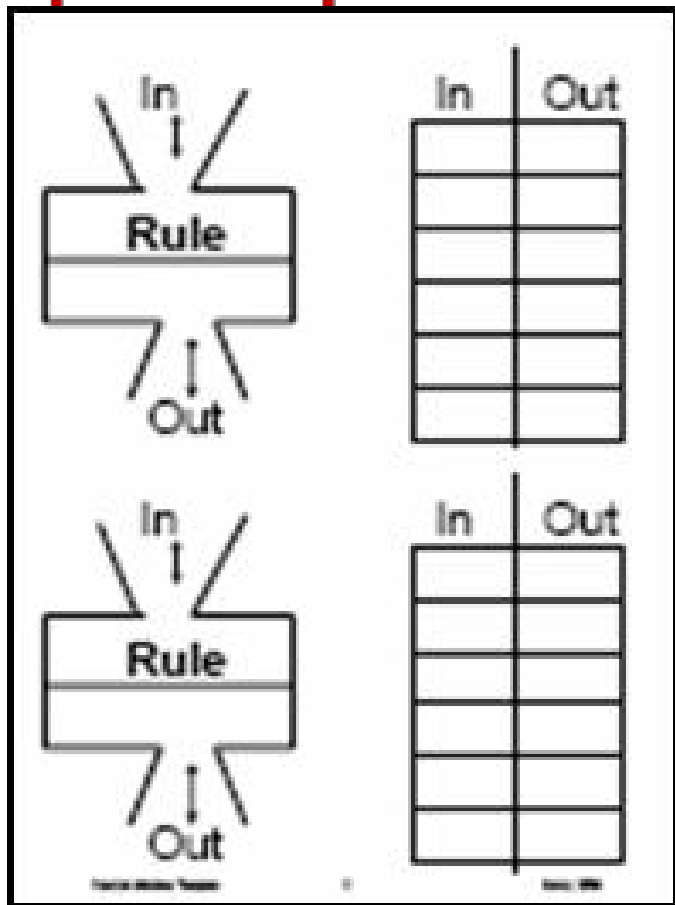
or



12 15 18
↓5 ↓2 ↓8

Input or Output Machines

Complete the pattern if it were to continue on the number line.



In and Out Charts

