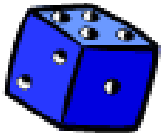
15.2

Probability

Do Now

1. **Is rolling an even number on a number cube an outcome or an event? Explain.**



2. **Describe how an outcome and a favorable outcome are different.**

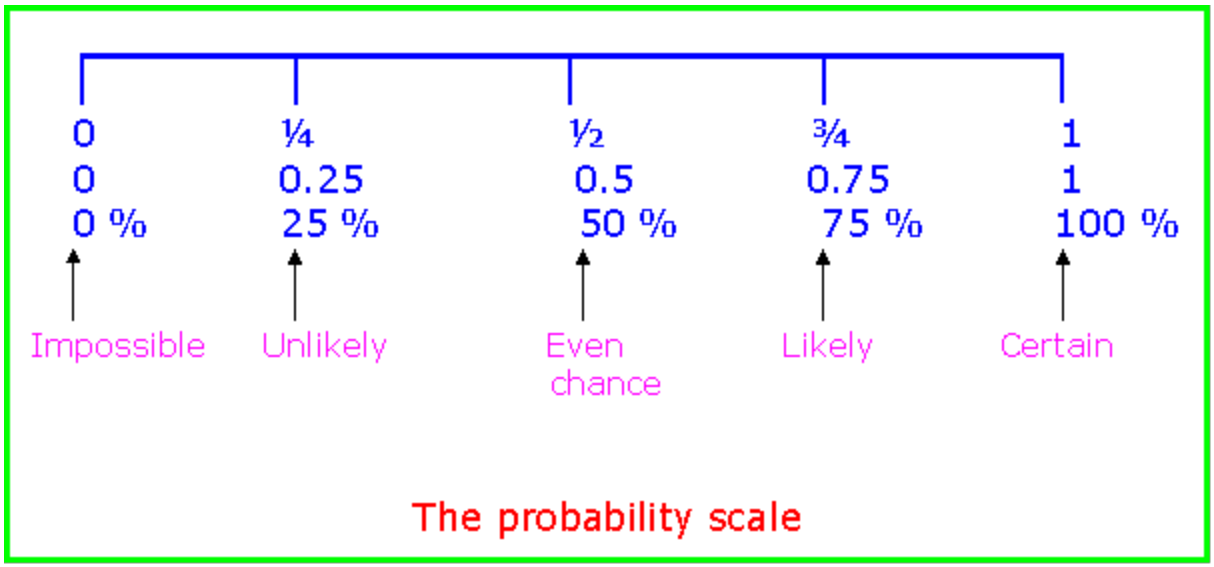
Learning Target:

- I can understand the concept of probability and the relationship between probability and likelihood.
- I can find probabilities of events.

Key Ideas:

Probablity: **of an _____ is a _____ that measures the _____ that the event will occur.**

Probabilities are between ___ and ___, _____ 0 and 1.



**probabilities can be written as fractions, decimals, or percents*

Describing the Likelihood of an Event

There is an 80% chance of thunderstorms tomorrow. Describe the likelihood of the event.

Practice:

Describe the likelihood of the event given its probability.

1) The likelihood that you land a jump on a snowboard is ½.

2) There is a 100% chance that the temperature will be less than 120°F tomorrow.

Finding the Probablity of An Event

When all possible _____ are equally _____, the _____ of the _____ of _____ _____ to the _____ of _____ _____.

the probability of an event is written as P(event).

$$P(\text{event}) = \frac{\text{number of favorable outcomes}}{\text{number of possible outcomes}}$$

Practice:

3) What is the probability of rolling a number greater than 2?

4) What is the probability of rolling a 7?

Using ProbablitY

The probability that you randomly draw a short straw from a group of 40 straws is $\frac{3}{20}$. How many are short straws?

Ⓐ 4 Ⓑ 6

Ⓒ 15 Ⓓ 34

Practice:

5) The probability that you randomly draw a short straw from a group of 75 straws is _____. How many are short straws?

Learning Target:

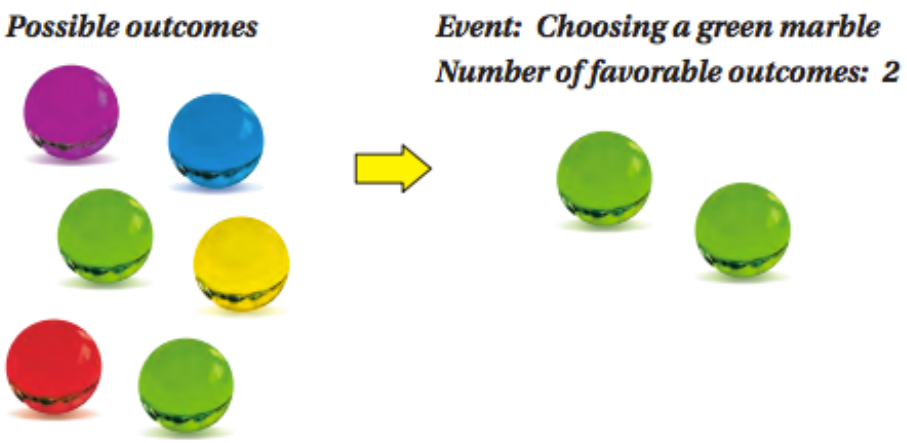
I can identify and count the outcomes of experiments.

Example:

randomly selecting a marble from a group of marbles is an _____.

each marble in the group is an _____.

selecting a green marble from the group is an _____.



When an experiment is performed *at random* or *randomly,* all of the possible outcomes are equally likely.

Identifying Outcomes

a. What at the possible outcomes?

b. What are the favorable outcomes of rolling an even number?

c. What are the favorable outcomes of rolling a number greater than 5?

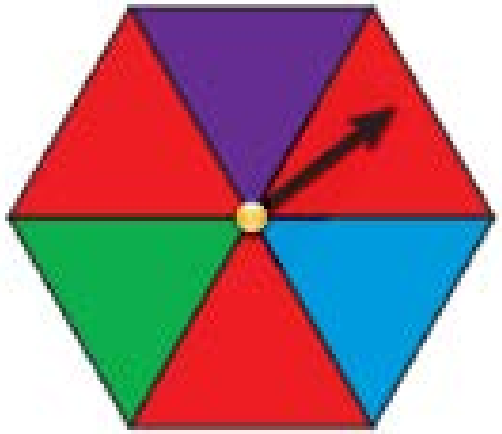
Practice

1. You randomly choose a letter from a hat that contains the letters A through K.

   a) What are the possible outcomes?

   b) What are the favorable outcomes of choosing a vowel?

Counting Outcomes



You spin the spinner.

a. How many possible outcomes are there?

b. In how many ways can spinning red occur?

c. In how many ways can spinning *not* purple occur? What are the favorable ways of spinning *not* purple?

Practice

You randomly choose a marble.

a. How many possible outcomes are there?

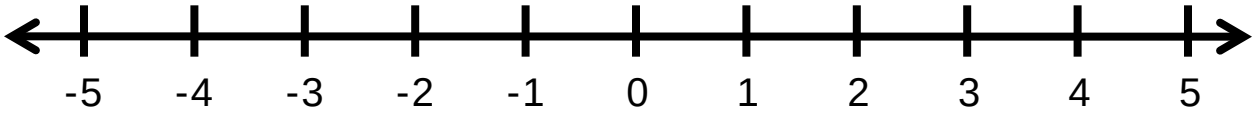
b. How many ways can choosing blue occur?

c. In how many ways can choosing *not* yellow occur?
What are the favorable ways of choosing *not* yellow?

Review

Graphing & Solving Inequalities

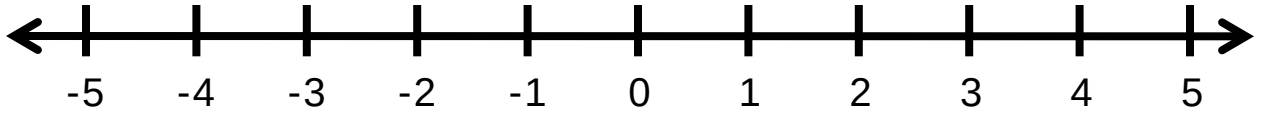
Graphing Inequalities Review



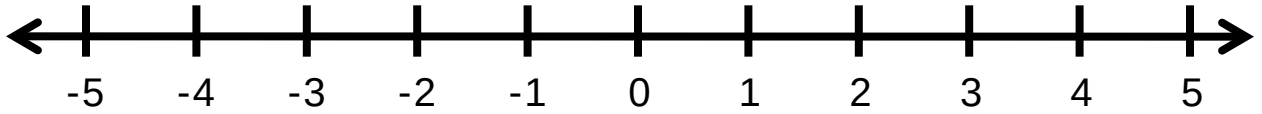
Inequality Symbols

$<$	**"Less than"**	$\leq$	**"Less than or equal to"**
$>$	**"Greater than"**	$\geq$	**"Greater than or equal to"**

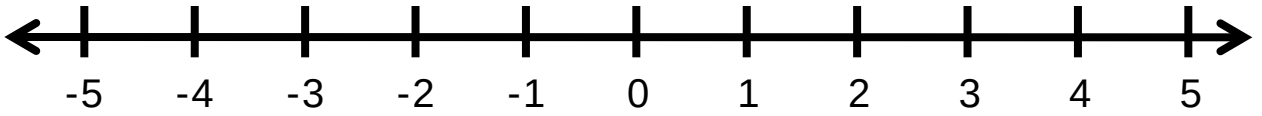
1) $x > -1$



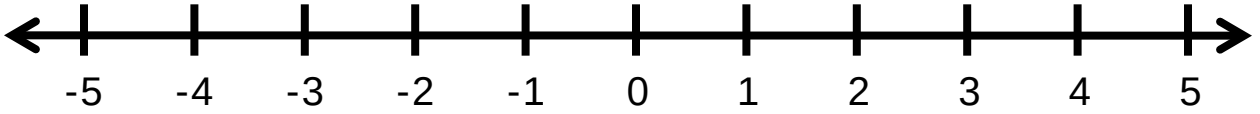
2) $x < -1$



3) $x \geq 2$



4) $x \leq 2$



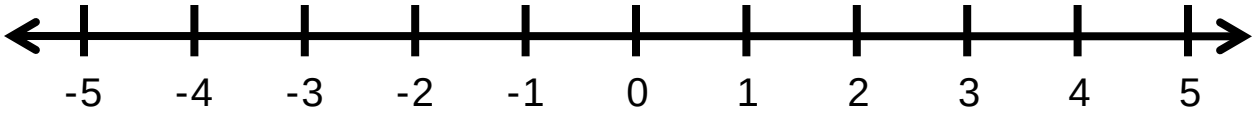
Key

$< \textit{or} >$ - Empty Dots

$\leq \textit{or} \geq$ - Full Dots

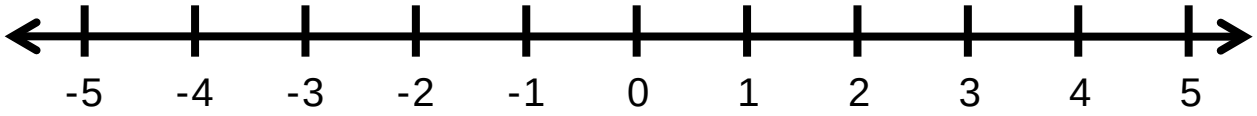
5) $-2 < x$

$\rightarrow \quad x > -2$



6) $3 \geq x$

$\rightarrow \quad x \leq 3$

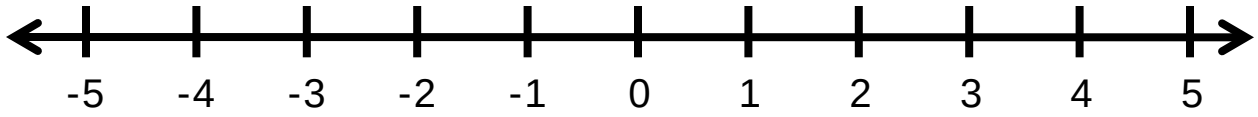


Key

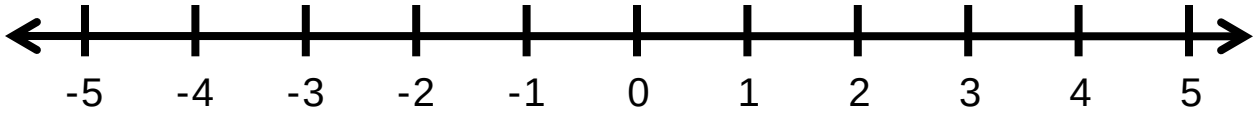
$< \text{ or } >$ - Empty Dots

$\leq \text{ or } \geq$ - Full Dots

7) $-4 < x \leq 2$



8) $-3 \leq x < 5$



Solving Inequalities

Solving inequalities is just like solving regular equations…

9) $t + 3 < 7$

11) $4p < 20$

10) $r - 5 > 7$

12) $\frac{x}{3} \geq 5$

…HOWEVER, if you DIVIDE or MULTIPLY both sides by a NEGATIVE NUMBER, YOU HAVE THE CHANGE THE DIRECTION OF THE INEQUALITY SIGN!!

13) $-5x \geq 30$

14) $\frac{a}{-8} < 72$

Practice

Solve the following:

15) $x - 7 \leq 17$

16) $\dfrac{p}{-13} < -3$

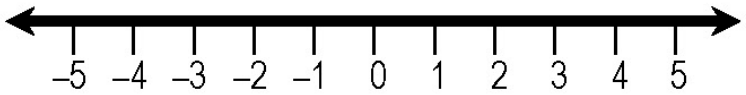
17) $a + 4 < a + 1$

18) $6(2 - x) \leq 3(x - 2)$

Plotting points on a number line

Plot the following on the following number line:

a) x=4 b) x= -3 b) x= 0



What numbers would fall under each of the following problems?

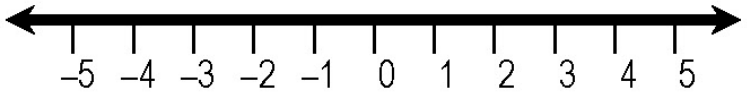
a) $x < 3$

b) $x \leq 3$

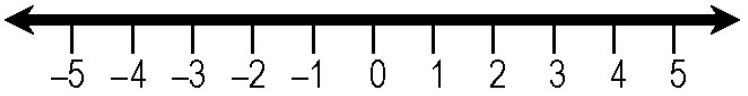
c) $x \geq -2$

Graph the following problems

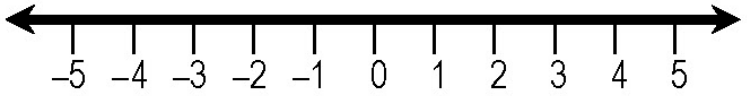
1) $x < 3$



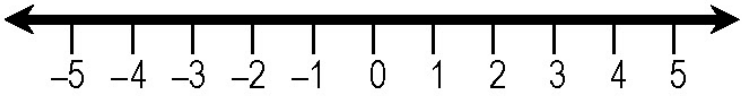
2) $x \leq 3$



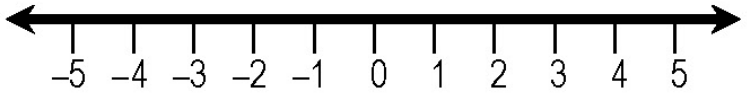
3) $x \geq -2$



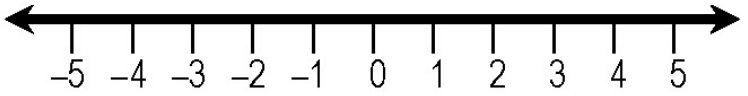
4) $x > -4$



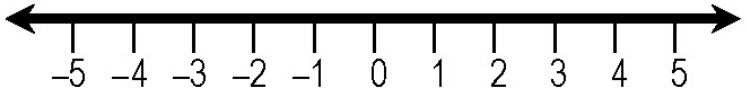
5) $x \geq 0$



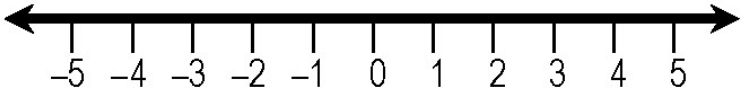
6) $-1 \leq x$ Pay Attention!!!



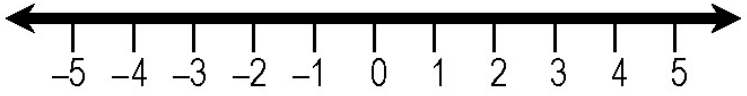
7) $x > 4$



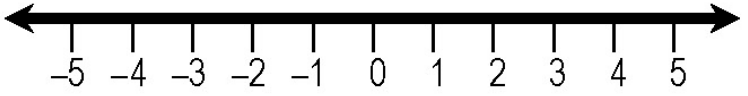
8) $0 < x$ Pay Attention!!!



9) $-3 > x > 2$



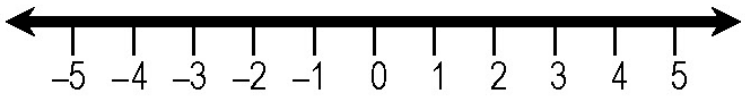
10) $-4 \geq x > -2$



Solving Inequalities

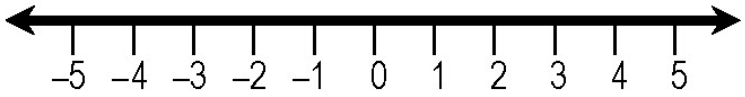
-You solve inequalities exactly the same way as regular equations.

11) $x+5>2$

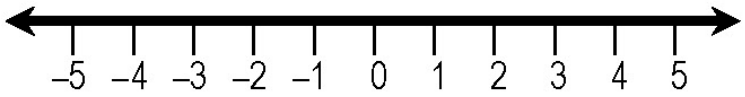


12) $x-9\leq -12$

13) $6x>-24$

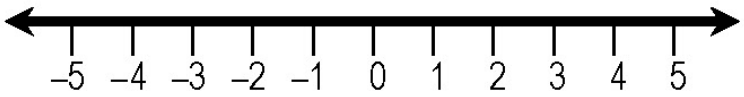


14) $\frac{x}{4}>1$

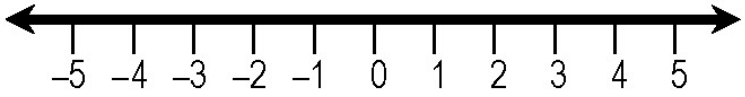


-HOWEVER, WHENEVER **MULTIPLYING OR DIVIDING** BOTH SIDES BY A **NEGATIVE NUMBER**, YOU MUST SWITCH THE DIRECTION OF THE INEQUALITY SIGN!!!!!

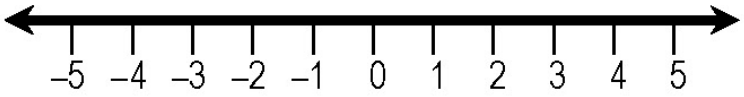
15) $-4x > 12$



16) $\frac{x}{-5} < 1$



17) $-\frac{x}{6} \leq \frac{1}{2}$



18) $-5x + 8 > 28$