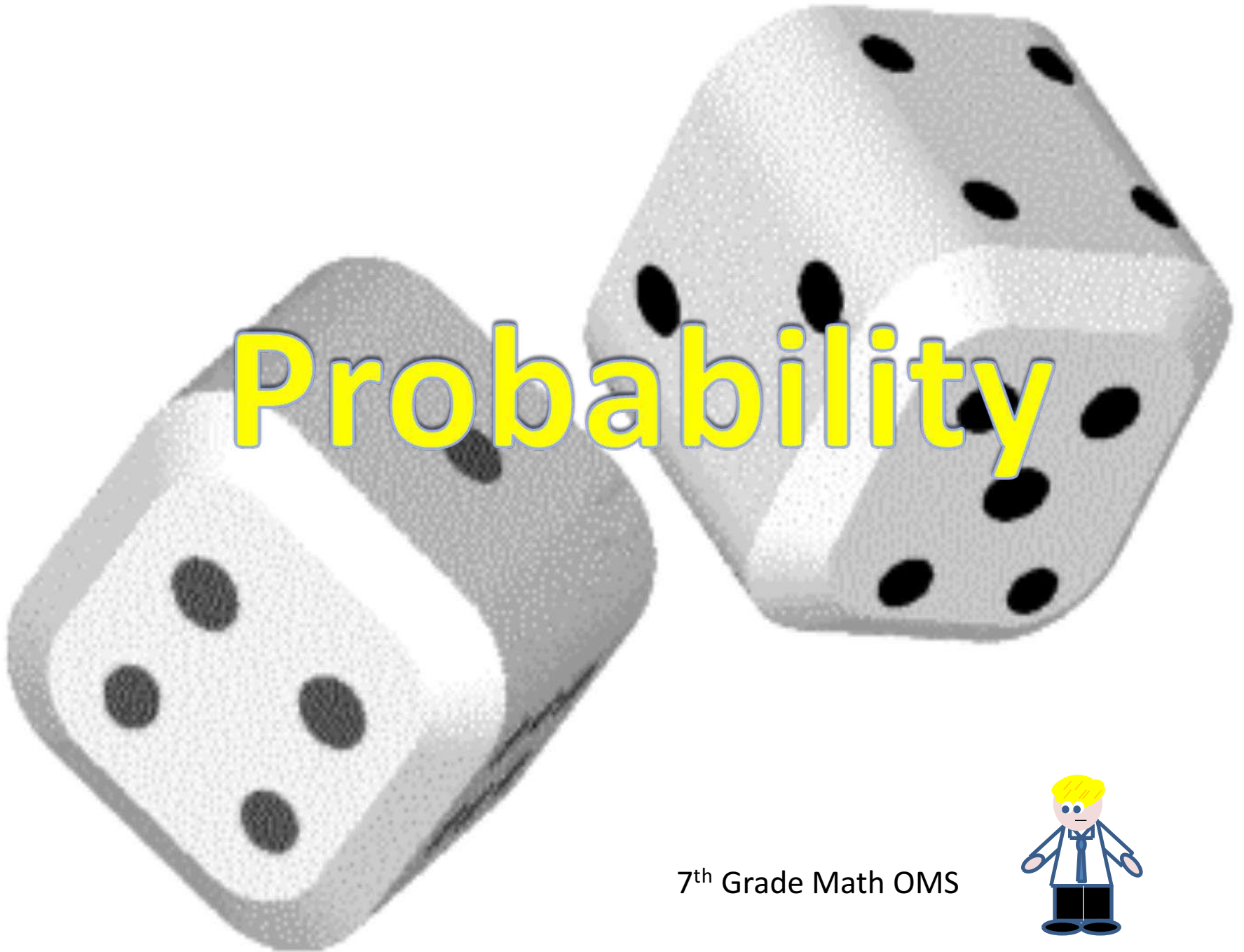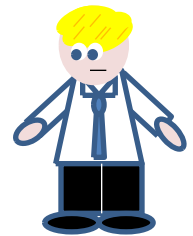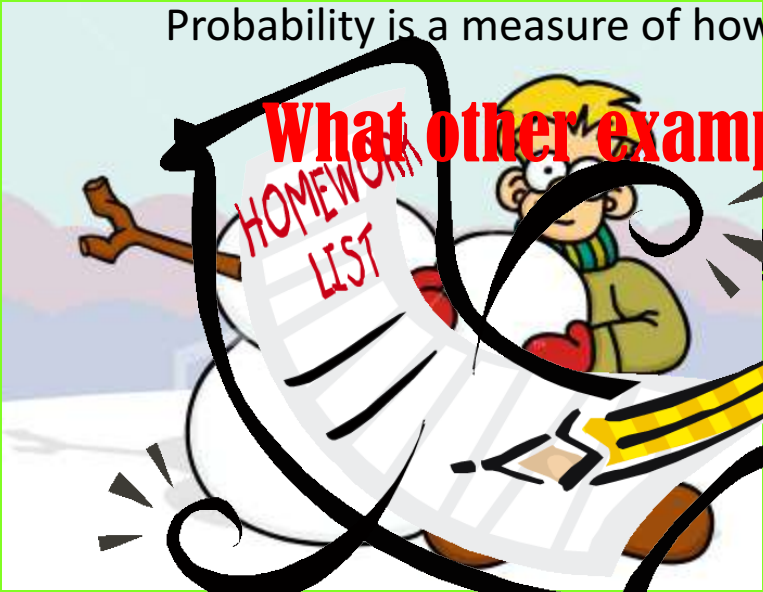# Probability

7th Grade Math OMS

Probability is a measure of how probable it is that an event will occur.

What other examples can you think of???

The number you will be Friday
It will be widely read tonight
Homework will be served for lunch today
sky will darken tonight

P = 0	P = 0.25	P = 0.5	P = 0.75	P = 1

It'll NEVER happen!!!

It is not very likely it'll happen.
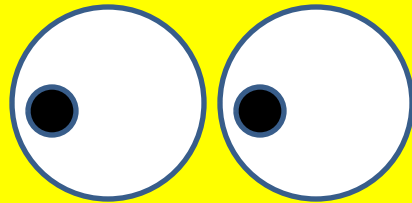
It might happen

There is a strong chance it'll happen

It'll definitely happen!!!

Experimental Probability

Data is collected through observations or experiments.

Each result from the experiment is called an event.

The probability of an event is equal to the number of times an event occurs divided by the total number of experiments.
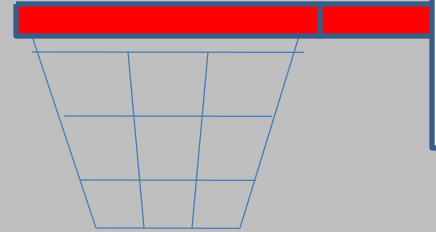
$$P\text{ (event)} = \frac{\text{Number of times an event occurs}}{\text{Total number of experiments}}$$

Experimental Probability

$$P (event) = \frac{\text{Number of times an event occurs}}{\text{Total number of experiments}}$$

Event = scoring a basket

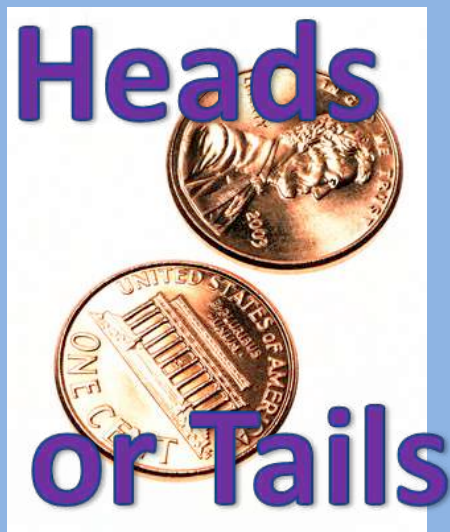$$\frac{\text{Number of baskets scored}}{\text{Number of shots taken}} \qquad \frac{1}{3}$$

Theoretical Probability

When all possible events or outcomes are equally likely to occur, the theoretical probability can be found without collecting data from an experiment.

Heads
or Tails

A penny has two sides

When you flip a coin there are two possible outcomes

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

$$\frac{Heads}{Heads\ or\ Tails} = \frac{1}{2} \qquad \frac{Tails}{Heads\ or\ Tails} = \frac{1}{2}$$

How many possible outcomes are there when flipping a coin? _____

What is the theoretical probability that you will get "heads "when flipping a coin? _____

Flip a coin 50 times!!!

Record your results below

Heads	Tails

What did you get for the experimental probability of getting heads? _____

Rolling a Die

If a die is rolled, how many possible outcomes are there?

6

What is the theoretical probability that you will throw a six?

What is the theoretical probability that you will throw a two?

What is the theoretical probability that you will throw a seven?

What is the theoretical probability that you will throw an even number?

$$\frac{1}{6} \qquad \frac{1}{6} \qquad \frac{0}{6} \qquad \frac{3}{6} \quad \frac{1}{2}$$

Probability of Compound Events

Real-World Link

Travel: **Aimee wants to pack enough items to create 6 different outfits. She packs 1 jacket, 3 shirts, and 2 pairs of jeans.**

Can Aimee create 6 different outfits from her clothing items?

Complete the table below.

1	Jacket, Shirt 1, jeans 1
2	Jacket, Shirt 1, jeans 2
3	Jacket, Shirt 2, jeans 1
4	Jacket, shirt 2, _____
5	Jacket, shirt 3, _____
6	Jacket, _____, _____

How many possible outcomes are there when flipping a coin and rolling a die? List them below the first is done for you.

Heads and 1

What is the **theoretical** probability of each of the following?
  a. Heads and 2b.   Heads and an even number
  c.   Tails and 7d.   Tails and a number greater than 4

Flip a coin and roll a die 50 times!!!

Record your results below

H1	H2	H3	H4	H5	H6	T1	T2	T3	T4	T5	T6

What did you get for the **experimental** probability of each of the following?
  a. Heads and 2b.   Heads and an even number
  c.   Tails and 7d.   Tails and a number greater than 4
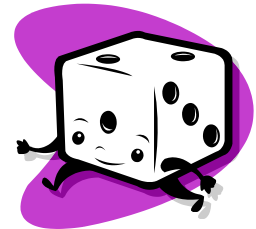
Fundamental Counting Principle

Find the total number of outcomes when a coin is tossed **_and_** a number cube is rolled.

A coin has 2 possible outcomes. A number cube has 6 possible outcomes. Multiply the possible outcomes of each event.

2 x 6 = 12

Now create a tree to check :

Check for understanding:

Find the total number of outcomes when choosing from bike helmets that come in three colors and two styles.