## Packet 7: Probability

Dear Parents/Guardians,

Packet 7 introduces students to probability. Students will conduct probability experiments and express the likelihood of events occurring in words and quantitatively as fractions, decimals and percents. Students will represent the sample space of the theoretical probability of games as lists, outcome grids and tree diagrams. Based on these sample spaces, students will use probability to determine the fairness of games.

## **Representing Probability**

The <u>probability</u> of an event is a measure of the likelihood of that event occurring. The probability of an event occurring can be represented as a fraction, a decimal, or a percent.

- If an event is impossible, then P(E)=0. Its chance of occurring is 0%.
- If an event is certain, then P(E)=1. Its chance of occurring is 100%.
- If an event is just as likely to happen as not, then P(E)=0.5. Its chance of occurring is 50%.

Students discuss different events and determine the likelihood of their occurrence. They can then estimate the likelihood on a number line. Example: What is the probability of rolling a 6 on a die?



Since there are 6 numbers on a die, the probability of rolling a 6 is

P(6) =  $\frac{1}{6}$   $\frac{1}{6}$  = 0.16 = 16.6% = 16 $\frac{2}{3}$ % This is unlikely.

## **Representing Data**

Students will use lists, outcome grids, and tree diagrams to represent the different possible outcomes of a probability experiment.

Example: Show all of the possible outcomes for choosing a red or white shirt with navy, khaki, or black pants.



Outcome Grid			
	Navy Pants (N)	Khaki Pants (K)	Black Pants (B)
Red Shirt (R)	R,N	R,K	R,B
White Shirt (W)	W,N	W,K	W,B

#### Organized List R, N W,N

R,K

W,K R.B

W.B

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# By the end of the packet, your student should know...

How to represent probabilities using fractions, decimals, and percent Lessons 7.1, 7.2, and 7.3

How to collect data and use it to make predictions Lesson 7.2

How to develop probability models to find the theoretical probability of an event occurring Lesson 7.2

How to represent the data from a probability experiment as a list, outcome grid and tree diagram Lesson 7.3

How to record analyze the outcomes from a probability game and determine its fairness Lesson 7.3

Additional Resources

Resource Guide (RG) Part 1, Pages 53-55

## **Experimental Probability versus Theoretical Probability**

Students will explore two types of probability.

Experimental probability is an estimated probability based on the data obtained from conducting an experiment or playing a game.

<u>Theoretical probability</u> is derived from the sample space and is what is expected to occur in the experiment or game.