Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date:\_\_\_\_\_\_\_\_\_ Core:\_\_\_\_\_

On a Scale of Zero to One

7.SP.5 Understand that the probability of a chance event is a number between 0 and 1 that expresses the likelihood of the event occurring. Larger numbers indicate greater likelihood. A probability near 0 indicates an unlikely event, a probability around indicates an event that is neither unlikely nor likely, and a probability near 1 indicates a likely event.

7.SP.6Approximate the probability of a chance event by collecting data on the chance process that produces it and observing its long-run relative frequency, and predict the approximate relative frequency given the probability. *For example, when rolling a number cube 600 times, predict that a 3 or 6 would be rolled roughly 200 times, but probably not exactly 200 times.*

Theoretical Probability:

Directions: Complete the investigation your teacher gives you using the provided cards. You must find the theoretical probabiliites AND likelihoods posed by each of the questions. Be sure you are able to explain how you determined the probabilities of the events.

To determine theoretical probability, you must write the ratio of the number of favorable outcomes to the number of possible outcomes. Use the correct form P(event). Find the probability as a fraction and percent



Investigation Number: \_\_\_\_\_\_

|  |  |  |  |
| --- | --- | --- | --- |
| 1. | 2. | | 3. |
| 4. | | 5. | |

6. Write your probabilities in order from least to greatest: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Questions about Your Investigation:

1. Which probabilities have the greatest chance of occurring?

2. Which probabilities have the smallest chance of occurring?

3. Why might some probabilities have a greater or smaller chance of occurring?

4. Are any probabilities equally likely? Are there any probability that have 25% chance of occurring?

Experimental Probability:

The experimental probability is the ratio of the number of event occurrences to the total number of trials.



From your investigation, select one of the events that had a theoretical probability of ½ or ¼. Write that probability you selected here:

You are now going to use your cards to experimentally determine the probability when you complete a specified number of trails.

|  |  |  |  |
| --- | --- | --- | --- |
| Number of Trials: | Using your theoretical probability, how many event occurrences would you ***expect*** for the number of trials? | Using your cards or dice, run an experiment for the specified number of trials. Record the number of event occurrences. | Determine the experimental probability for each number of trials. |
| 8 |  |  |  |
| 20 |  |  |  |
| 40 |  |  |  |

5. In any of the trials, did the number of event occurrences match your expected outcome?

6. Write a comparison statement between the theoretical probability and experimental probability after 8 trials, 20 trials, and 40 trials. (So, 3 sentences ☺)

7. What happened to the experimental probability as related to the theoretical probability as the number of trials grew larger? Why do you think this might be?

Adapted from: Teaching the Common Core Math Standards with Hands-On Activities”. Judith, Gary and Erin Muschla. 2012. Jossey-Bass.