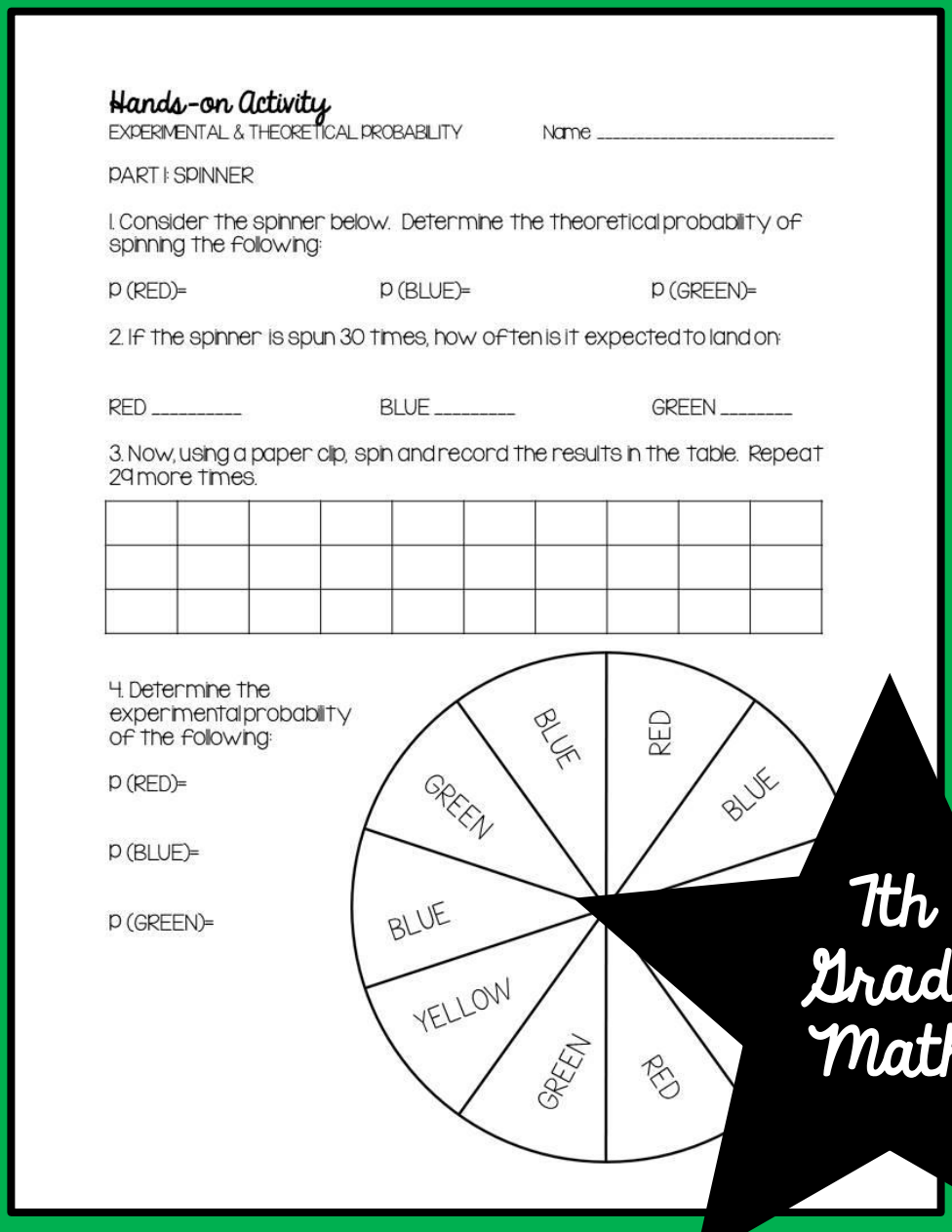
Theoretical vs. Experimental Probability Hands-on ACTIVITY



Hands-on Activity

EXPERIMENTAL & THEORETICAL PROBABILITY Name _____

PART I: SPINNER

1. Consider the spinner below. Determine the theoretical probability of spinning the following:

P (RED)= P (BLUE)= P (GREEN)=

2. If the spinner is spun 30 times, how often is it expected to land on:

RED _____ BLUE _____ GREEN _____

3. Now, using a paper clip, spin and record the results in the table. Repeat 29 more times.

4. Determine the experimental probability of the following:

P (RED)=

P (BLUE)=

P (GREEN)=

7th Grade Math

Activity

THEORETICAL VS. EXPERIMENTAL PROBABILITY

Hands-on Demonstration

CCSS

7.SP.7 Develop a probability model and use it to find probabilities of events. Compare probabilities from a model to observed frequencies; if the agreement is not good, explain possible sources of the discrepancy.

Directions

Using a paper-clip spinner and a number cube, students will explore the difference between theoretical and experimental probability. Based on the given situation they will predict what should happen (theoretical) and then complete trials to determine what actually happens (experimental).

Implementation Ideas

- ❑ Use for practice, review, or centers
- ❑ Students can complete individually or with a partner.

Hands-on Activity

EXPERIMENTAL & THEORETICAL PROBABILITY Name _____

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1. Consider the spinner below. Determine the theoretical probability of spinning the following:

P (RED)= P (BLUE)= P (GREEN)=

2. If the spinner is spun 30 times, how often is it expected to land on:

RED _____ BLUE _____ GREEN _____

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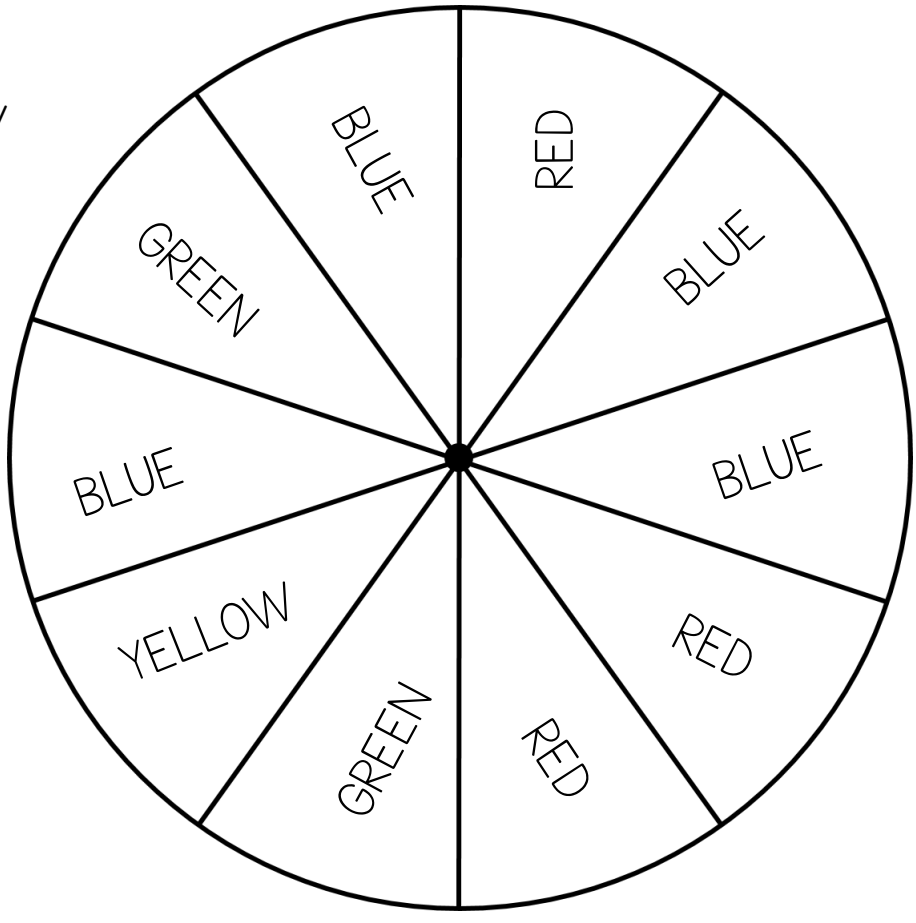
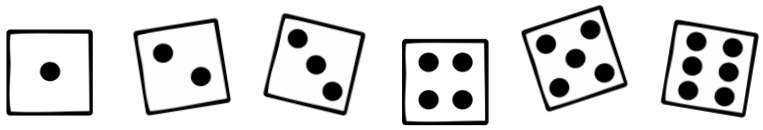
4. Determine the experimental probability of the following:

P (RED)=

P (BLUE)=

P (GREEN)=



PART 2: NUMBER CUBE 

1. Consider rolling a number cube. Determine the theoretical probability of rolling the following:

P (1)= P (odd)= P (factor of 6)=

2. If the number cube is rolled 18 times, how often will it land on:

1 _____ odd _____ factor of 6 _____

3. Now, roll the number cube. Record the results in the table. Repeat this 17 more times.

4. Based on your results, determine the experimental probability of the following:

P (1)= P (odd)= P (factor of 6)=

CONCLUSIONS:

1. Were the results of each of the experiments what you expected? Explain.

2. What is the difference between theoretical and experimental probability?

3. What could be done to make the results of the experiment closer to the theoretical probability?

Hands-on Activity

EXPERIMENTAL & THEORETICAL PROBABILITY

ANSWER KEY

Name _____

PART I: SPINNER

1. Consider the spinner below. Determine the theoretical probability of spinning the following:

P (RED)= 3/10 P (BLUE)= 4/10 = 2/5 P (GREEN)= 2/10 = 1/5

2. If the spinner is spun 30 times, how often is it expected to land on:

RED 9 BLUE 15 GREEN 6

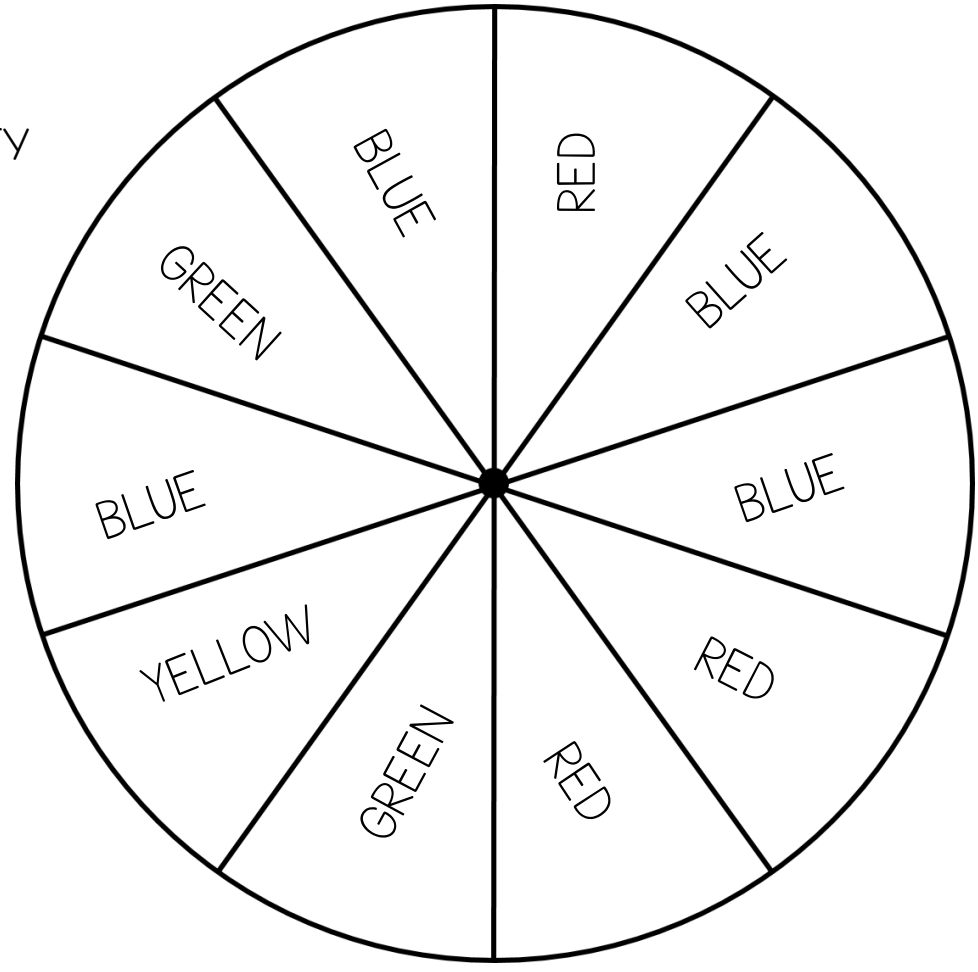
3. Now, using a paper clip, spin and record the results in the table. Repeat 29 more times.

4. Determine the experimental probability of the following:

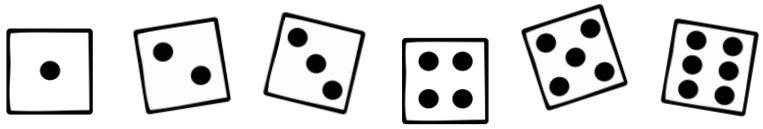
P (RED)=

P (BLUE)=

P (GREEN)=



PART 2: NUMBER CUBE



1. Consider rolling a number cube. Determine the theoretical probability of rolling the following:

P (1)= 1/6 P (odd)= 3/6 = 1/2 P (factor of 6)= 4/6 = 2/3

2. If the number cube is rolled 18 times, how often will it land on:

1 3 odd 9 factor of 6 12

3. Now, roll the number cube. Record the results in the table. Repeat this 17 more times.

4. Based on your results, determine the experimental probability of the following:

P (1)= P (odd)= P (factor of 6)=

CONCLUSIONS:

1. Were the results of each of the experiments what you expected? Explain.

2. What is the difference between theoretical and experimental probability?

Theoretical probability is what should happen while experimental probability is what actually happens when trials are performed.

3. What could be done to make the results of the experiment closer to the theoretical probability?

The more trials are performed, the closer experimental probability will be to theoretical probability.

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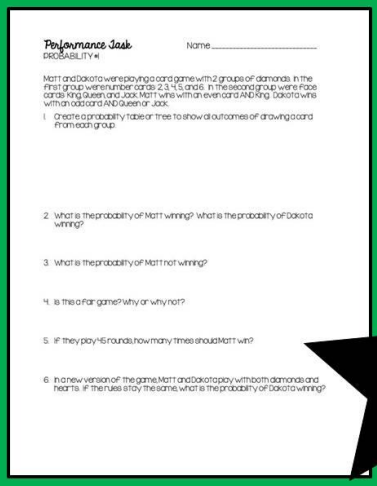
Probability
ACTIVITY: Performance Task



Performance Task
PROBABILITY #

Name .....

Matt and Dakota were playing a card game with 2 groups of diamonds. In the first group were numbered cards 2, 3, 4, 5, and 6. In the second group were face cards: King, Queen and Jack. Matt wins with an even card AND King. Dakota wins with an odd card AND Queen or Jack.

1. Create a probability table or tree to show all outcomes of drawing a card from each group.

2. What is the probability of Matt winning? What is the probability of Dakota winning?

3. What is the probability of Matt not winning?

4. Is this a Fair game? Why or why not?

5. IF they play 45 rounds, how many times should Matt win?

6. In a new version of the game, Matt and Dakota play with both diamonds and hearts. IF the rules stay the same, what is the probability of Dakota winning?

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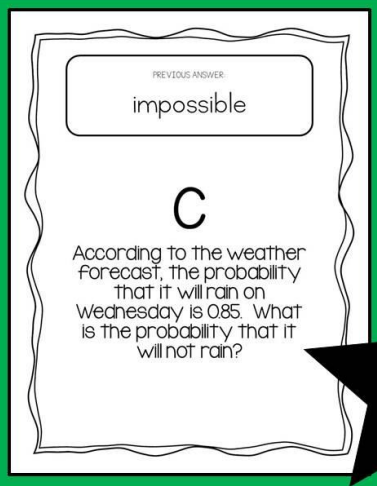
Probability Review
ACTIVITY: Scavenger Hunt



PREVIOUS ANSWER:

impossible

C

According to the weather forecast, the probability that it will rain on Wednesday is 0.85. What is the probability that it will not rain?

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