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UNIT 7 LESSON 7

**AIM**: SWBAT predict the sample space of a chance experiment

**THINK ABOUT IT!**

Mr. Roble conducted a probability experiment where he picked a coin out of a hat without looking, recorded the results, and then put the coin back to conduct the experiment again. Mr. Roble knows that there are only ten coins in the hat. He conducted the experiment 100 times and recorded the observed relative frequency in the table below.

|  |  |  |  |
| --- | --- | --- | --- |
| Coin | Penny | Nickle | Dime |
| Frequency | 10 | 40 | 50 |

Estimate the number of pennies, nickels, and dimes that are in the hat.

Pennies = \_\_\_\_\_\_\_\_\_\_\_\_\_

Nickels = \_\_\_\_\_\_\_\_\_\_\_\_\_\_

Dimes = \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Explain how you determined your answer.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Key Point:**

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**Interaction with New Material**

Ex.1) Ms. Fleck conducted a probability experiment in a previous class where scholars picked a color paper out of an envelope and recorded the frequency in the table below. She doesn’t remember the amount of each color in the envelope but she does know that there are 10 pieces of paper. Determine the number of each color without opening the envelope.

|  |  |
| --- | --- |
| **Color** | **Frequency** |
| Green | 11 |
| Purple | 12 |
| Red | 5 |
| Blue | 27 |

**PARTNER PRACTICE**

|  |
| --- |
| *Bachelor Level* |

1. With your partner, you are going to recreate the experiment that was conducted in the Interaction with New Material.

Directions:

* + DO NOT LOOK INSIDE THE ENVELOPE!
  + One person will be in charge of picking colors and the other will record the results
  + The scholar that is picking out the colors must make sure to put the color back and mix the colors up each time or your results will not be accurate.
  + For each color chosen, the other scholar should record tallies.
  + At the end of the time limit, both scholars must record the results of the experiment.

|  |  |  |
| --- | --- | --- |
| **Color** | **Tally** | **Frequency** |
|  |  |  |
|  |  |  |
|  |  |  |
|  |  |  |

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| *Master Level* |

1. Use your results from the experiment you conducted to complete the following steps:

STEP A: Calculate the observed relative frequency for each color as a fraction.

|  |  |
| --- | --- |
| Color | Observed Relative Frequency |
|  |  |
|  |  |
|  |  |
|  |  |

STEP B: Predict the sample space of the envelope if there are 7 pieces of paper in the envelope.

|  |  |
| --- | --- |
| Color | Predicted Sample Space |
|  |  |
|  |  |
|  |  |
|  |  |

STEP C: Open the envelope and record the actual sample space

|  |  |
| --- | --- |
| Color | Actual Sample Space |
|  |  |
|  |  |
|  |  |
|  |  |

STEP D: Reflect – Were you successful in predicting the sample space? Why or why not? What would have resulted in your prediction being even more successful?

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**INDEPENDENT PRACTICE**

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| *Bachelor Level* |

1. Robert has a bag of twenty marbles. He knows that there are 4 different colors of marbles – red, brown, yellow and orange. He conducted an experiment of 300 trials to help him determine the contents of the bag by reaching into the bag 300 times, pulling out one marble, recording the result and replacing the marble. Below is a table of his results.

|  |  |  |  |
| --- | --- | --- | --- |
| **Red** | **Brown** | **Yellow** | **Orange** |
| 120 | 88 | 29 | 63 |

Use the results of the experiment to predict the sample space of the the bag.

1. Explain how you determined your prediction for the number of orange marbles in the bag.

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| *Master Level* |

1. There are six marbles in a bag. You want to know the different colors of the marbles and how many of each there are, but you’re not allowed to look in the bag or pull out more than one marble at a time. Describe how you could determine the number of types of marbles in the bag without looking inside. You answer should be as detailed as possible.

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1. Ms. Ripa suggests conducting a probability experiment with six trials to figure out the contents of the bag. She pulls out a marble, records the color, and then replaces it. Her data is included below.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Trial #** | 1 | 2 | 3 | 4 | 5 | 6 |
| **Result** | Blue | Black | Blue | Blue | Orange | Orange |

She concludes that there must be three blue marbles, one black, and two orange. Are you confident with this conclusion? Why or why not?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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| *PhD Level* |

1. Tamara is conducting a survey of people’s favorite fast food. The results are shown below in the table.

|  |  |
| --- | --- |
| Fast Food | Number of people who voted it best |
| Burger King | 501 |
| McDonald’s | 296 |
| Taco Bell | 98 |
| KFC | 103 |

Using this observed relative frequency, determine how many more people you would predict to pick McDonald’s over Taco Bell if the survey were conducted again but only asking 10 people. Explain your answer and how you determined it.

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

**Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**EXIT TICKET**

|  |  |  |  |
| --- | --- | --- | --- |
| Self-assessment | I mastered the learning objective today. | I am almost there. | Need more practice and feedback. |
| Teacher feedback | You mastered the learning objective today. | You are almost there. | You need more practice and feedback. |

1. Ms. Glass has a bag of 10 jelly beans. She wants to figure out the contents of the bag without looking inside. She conducts 200 trials and records the following results.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Outcome** | Banana | Strawberry | Piña colada | Grape | Root beer | Licorice |
| **Number of times chosen** | 41 | 22 | 18 | 39 | 21 | 59 |

Use the observed relative frequency to make a prediction for how many of each of the six different kinds of jelly beans are in the bag.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Outcome** | Banana | Strawberry | Piña colada | Grape | Root beer | Licorice |
| **Prediction** |  |  |  |  |  |  |