The Helper Dilemma

1. Use two TI-73 calculators to simulate the probability. Each student should hold a calculator. One calculator should be used to simulate the coin toss and the other used to simulate rolling a 10-sided number decahedron. Follow the instructions below to simulate the events with the calculators. Combine the results and place a tally mark in the frequency table below. Perform the experiment 40 times.

Coin Toss
APPS 7: Prob Sim Press any key 2. Toss Coin Toss (Window)

Roll Dice
APPS 7: Prob Sim Press any key 1. Roll Dice Set (Zoom) Sides: 10 OK (Graph) Roll (Window)

Combination	Tally	Frequency
Head, 1		
Head, 2		
Head, 3		
Head, 4		
Head, 5		
Head, 6		
Head, 7		
Head, 8		
Head, 9		
Head, 10		

Combination	Tally	Frequency
Tail, 1		
Tail, 2		
Tail, 3		
Tail, 4		
Tail, 5		
Tail, 6		
Tail, 7		
Tail, 8		
Tail, 9		
Tail, 10		

2. Graph the data using the instructions below. Sketch the resulting graph.

Graph Data

Enter the frequency data in L2 of the LIST feature.

2nd
Plot (Y=)
1: Plot 1
On
Type: Pie Chart
Graph

Sketch graph here.

3. Find the experimental probability for each.

Combination	Experimental Probability
Head, 1	
Head, 2	
Head, 3	
Head, 4	
Head, 5	
Head, 6	
Head, 7	
Head, 8	
Head, 9	
Head, 10	

Combination	Experimental Probability
Tail, 1	
Tail, 2	
Tail, 3	
Tail, 4	
Tail, 5	
Tail, 6	
Tail, 7	
Tail, 8	
Tail, 9	
Tail, 10	

(continue: The Helper Dilemma)

4. How were the experimental and theoretical probabilities the same? Explain.

5. How were the experimental and theoretical probabilities different? Explain.

6. If the fractions were changed to percents, what would you expect the percents to total and why?

7. If Mrs. Alexander has more students enrolled in her class, how can she change or modify her procedure for finding a helper?

Use the following information to answer questions 8-13.

In one particular class, Mrs. Alexander assigned combinations with Heads and a prime number to only boys and combinations with Tails to only girls.

8. What is the sample space for this class?

9. What can you conclude about this particular class? Explain.

10. Which gender is most likely to be the helper? Explain.

11. What is the probability of a girl being the helper? Explain.

(continue: The Helper Dilemma)

12. What is the probability of a boy being the helper? Explain.

13. How could Mrs. Alexander change or modify her procedure for finding a helper in this class to eliminate the extra combinations? Explain.

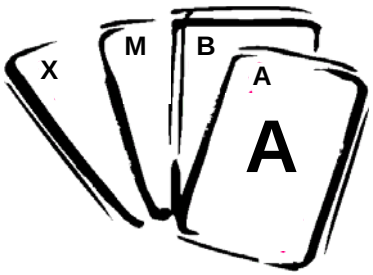
The Choir Helper

The choir teacher, Mr. Roberts, heard Mrs. Alexander in the teacher's lounge describe her method for assigning a helper. He thought the idea would be a big help in his classes. Since his choir classes sometimes have between 45 and 50 students and no students can be assigned the same "code," Mr. Roberts cannot use the coin and 10-sided number decahedron. Mrs. Alexander gave Mr. Roberts 8 different items that he could use to assign helpers in his class.

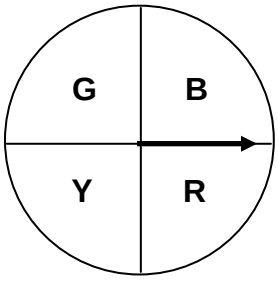
A Coin

A Six-Sided Number Cube

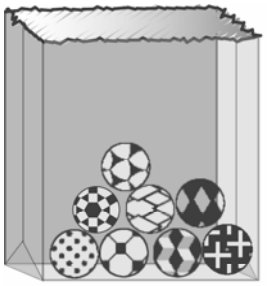
A 10-sided Number Decahedron with the numbers 1-10



A Set of Alphabet Cards A-Z

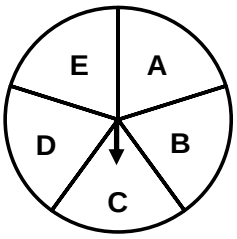


A Spinner



A Bag of 8 Different Marbles

A 12-sided Number Dodecahedron with the numbers 1-12



A Spinner

(continue: The Choir Helper)

1. Help Mr. Roberts pair the items together that he can use to assign helpers. There will be 4 pairs. Justify your reasoning for each pair made and tell how many assignments for helpers could be made from each pair.

2. Choose one of the pairs of items above and describe how to simulate the event using the calculator.

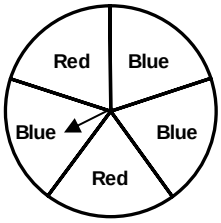
3. Use the plan outlined in #2 to simulate the event for 50 trials. Create a table to record the results.

4. From the above results, predict the results if the event had been simulated for 100 trials.

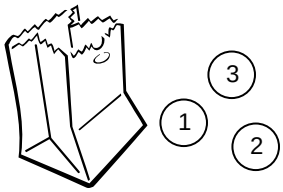
Simulation

The following items are being used to simulate an experiment.

A Coin



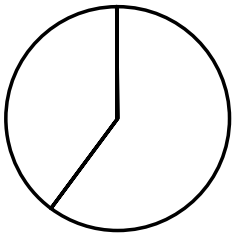
A Spinner



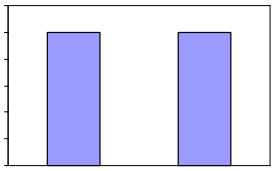
A Bag of 3 Marbles
Numbered 1-3

Which of the following graphs best represent the results of the experiment? Justify your reasoning

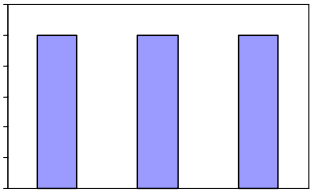
A.



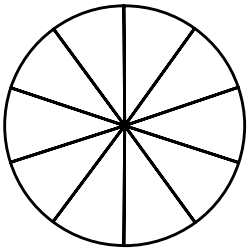
C.



B.



D.



1. Corbyn has a standard code of dress at his school. He can wear a white or green shirt with navy or khaki pants. He had 3 white shirts and 2 green shirts in his shirt drawer and 1 pair of navy pants and 3 pairs of khaki pants in his pants drawer. What is the probability that Corbyn will reach in both drawers, without looking, and get a white shirt and navy pants?

   A $\frac{17}{20}$

   B $\frac{4}{9}$

   C $\frac{3}{25}$

   D $\frac{3}{20}$

2. A 6-sided number cube, a spinner divided into 3 equal parts labeled A, A, B, and a coin are used for an experiment. Ozzie calculated the theoretical probability of an event where the number cube was rolled, coin tossed, and spinner spun. His calculation was $\frac{1}{3}\cdot\frac{1}{2}\cdot\frac{2}{3}=\frac{2}{18}=\frac{1}{9}$. For which of the following events did Ozzie calculate the probability?

   A P(even number, head, B)

   B P(1 or 2, head, A)

   C P(prime number, tail, A)

   D P(odd number, tail, A)

3. The letters of the word WINNER are cut apart and placed in a bag. A letter was drawn from the bag and a coin tossed at the same time. Results were recorded and the letter was placed back into the bag. Which of the following could NOT be used to represent the experimental data?

   A Venn diagram

   B Bar graph

   C Circle graph

   D Line Plot

4. A container of markers containing 3 red, 1 yellow, 2 green and 4 blue are placed at the map center in social studies. The rule is you can only use one marker at a time so that everyone will have a marker to use. What is the probability of reaching into the container without looking for each use and getting a red marker, a blue marker and then a yellow marker?

   A $\frac{3}{250}$

   B $\frac{12}{30}$

   C $\frac{12}{100}$

   D $\frac{8}{10}$