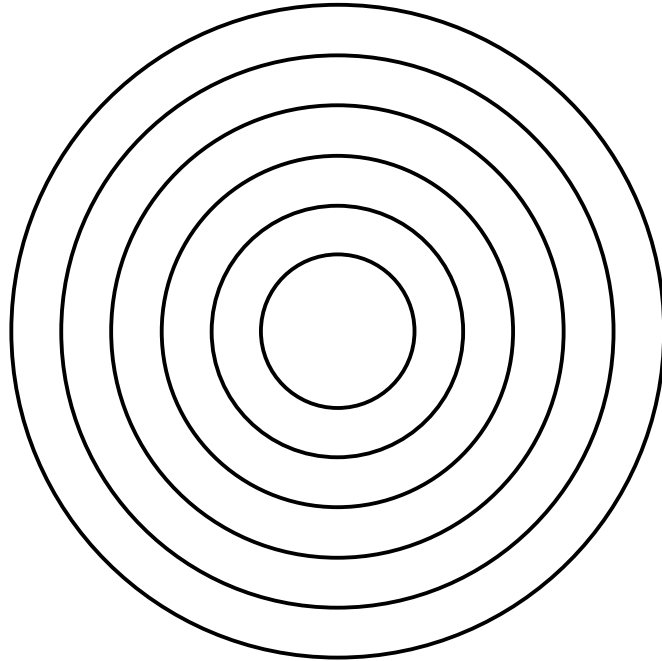


Name: \_\_\_\_\_ Date: \_\_\_\_\_ Period: \_\_\_\_\_

## Spinner Mania!

### Creating a Spinner Like the Outside One:

You will be creating a spinner just like the one you used outside. To do this, lay the  $\frac{1}{4}$  fraction piece inside your circle so that the vertex is on the center of the circle. Draw a line from the center of the circle to the outside edge going along the fraction piece. Color this sector blue. Lay the  $\frac{1}{3}$  piece next to this, and color that sector red/pink.



### Predictions

Predict how many times, out of 50 spins, you think the spinner will land in each of the colors, and record this answer on your chart. Spin the spinner (paper clip) 50 times, keeping track of which color it lands on each time. When you've completed the 50 spins, record the actual frequencies in the chart. After the experiment, calculate the theoretical frequencies, and record the probability as a fraction and a decimal.

## Spinner Mania Data Sheet

	Landing in Red	Landing in Blue	Landing in White	Total
Predicted Frequency				
Actual Frequency				
Theoretical Frequency Using Fractions (Show Calculations)				
Theoretical Frequency Using Decimals (Show Calculations)				

Analysis Question:

How did the “actual frequency” compare to the “theoretical frequency”? How could you get those numbers to be even closer to being the same?

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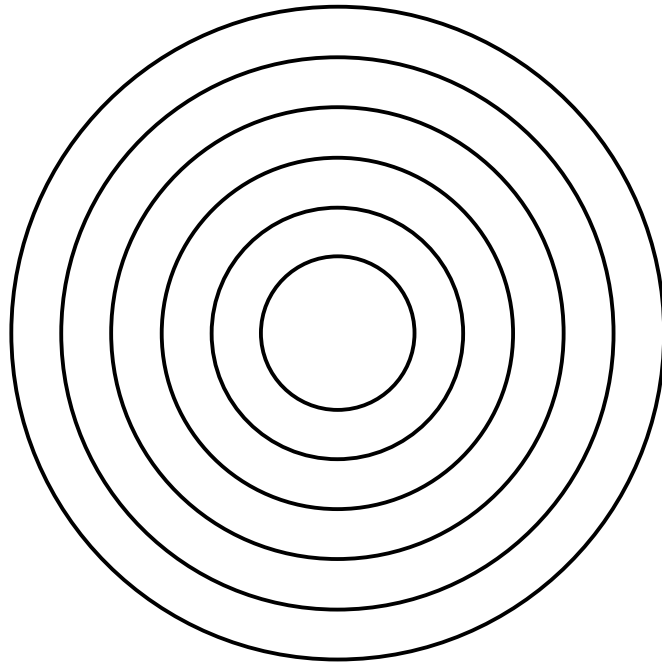
Considering Scenarios from Outside: Calculate the Probability of each scenario

1. You win if you end up in the red sector.
  
2. You win if you end up in the white or red sector.
  
3. You pass the first round if you end up in the white sector. You win if you end up in the red sector in round 2.
  
4. You pass the first round if you end up in the red sector. You win if you end up in the red sector in round 2.

Building a Team Spinner:

Using the fraction pieces and the circle below, your group needs to build a spinner. Your spinner should have between 3 and 5 different colors. Once your spinner is created, write 3 true and 3 false statements concerning probabilities and expected frequencies.

Consider using the following sentence frames in your statements: “out of \_\_\_\_\_ spins, I expect \_\_\_\_\_ to land in \_\_\_\_\_”; “The probability of the spinner landing in \_\_\_\_\_ or \_\_\_\_\_ is \_\_\_\_\_”; “The probability of the spinner landing in \_\_\_\_\_ and then in \_\_\_\_\_ is \_\_\_\_\_.” As you write your statements on the page provided, mix them up, so that it is not obvious which ones are true and false. Trade your spinner and statements with another group. Try to discover which of their statements are true and false.



## The Truth About Our Spinner

Task: Write 3 true and 3 false statements about YOUR group spinner. Do NOT fill in the T/F column or reason. Once you trade spinners and papers, you will complete this for another team.

#	Statement	T/F	Reason
1.			
2.			
3.			
4.			
5.			
6.			

## Teacher Directions

### Materials:

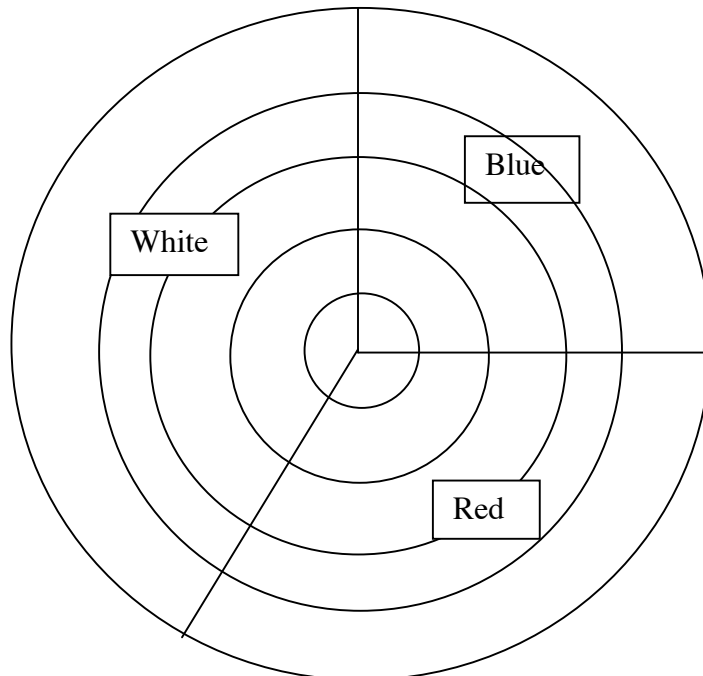
Chalk to make Human Spinner  
Rope to make Human Spinner  
CD player/ I-pod/ Way to project music  
Music  
Fraction Circle Pieces (1 set per group)  
Colored Pencils  
Paper Clips (1 per student)

### Objective:

By seeing a human spinner with single events as well as compound events involving “or” and “and”, students will understand the concept of and calculate basic probabilities, as well as adding and multiplying probabilities. By completing 50 trials, students will understand and explain how completing more trials brings the relative frequency closer to the probability. Finally, students will explain that the probabilities for all outcomes must add up to 1.

Setting Up Your Human Spinner: You need to make one before class (or you can have students to do this if they recall how to form the circle activity!)- this requires 2 people to make.

You need one rope and sidewalk chalk. Once outside, mark a point to be the center of the circle. Have one person hold the rope at the center and have the other person take the chalk and extend the rope, walk in a circle marking the chalk as he/she goes. Repeat this for 4 other distances along the rope so that you have what is shown in the picture below. Lastly, use chalk or label each “sector” with the color by laying down a 1/4 fraction circle piece on the center and drawing a line along it’s edges to the circle. Repeat this for the 1/3 section.



Doing The Activity: Choose 5 students to be in competition #1. Here are the 5 roles a side stepper, a heel-to-toer, a skipper, a power walker, and a jogger. Each person begins on one of your circles at any place they wish. When the music starts, each person starts moving around their circle. It is imperative that each student keeps the same pace throughout. Once everyone has made at least 1 full lap, randomly stop the music and have each student stop where they landed. If you end up in the “right” sector, you win or at least make it past that round. If you end up in the wrong section, you’re out.

Before doing each competition, explain what “winning” will be and ask the students (who should be standing around the circumference) to predict how many students will win. Here are the competition scenarios (note: Get a new set of 5 students for each scenario).

**Competition Scenarios:**

1. You win if you end up in the red sector.
2. You win if you end up in the white or red sector.
3. You pass the first round if you end up in the white sector. You win if you end up in the red sector in round 2.
4. You pass the first round if you end up in the red sector. You win if you end up in the red sector in round 2.

**Students create spinners inside**

Back inside, pass out the activity sheets, colored pencils, fraction circle pieces and paper clips to each group. If needed, model how to use the spinner on page 1 to re-create the outside spinner following the directions on the page. Once each student has their spinner drawn, give them 1 minute to make and record predictions. Next, demonstrate how to open one side of the paper clip to make a pointer. Show them how to hold a pen or pencil on the center of the circle inside of the paper clip to be a spinner. Have each student complete 50 spins, recording the results as “actual frequency”. Once the 50 spins are complete, have the students calculate the probabilities, total and complete the analysis question. Have students share their work and explanations with the class.

**Considering Scenarios from Outside**

Give the students 5-10 minutes to try to calculate the probabilities from each of the 4 competition scenarios. For #2, they should *add* the two probabilities. For #3 and #4, they should *multiply* the individual probabilities as they are looking for a part of a part.

**Building a Team Spinner**

Have each group now create their own spinner following the given parameters. Once they have it drawn, give them 5-10 minutes to write 6 statements about their spinner on the page “The Truth about our Spinner”. Note: They are only writing statements and NOT completing the T/F or Reason columns. Once groups are done, have them trade spinners and statements and try to determine which are true and false. Alternatively, you can bring a spinner to the document camera and go through the statements as a class.