



Children's Museum of Houston

Pre/Post Classroom Activities

Race to the Top

Rationale

It is the classic good vs. evil adventure as the dastardly Hacker attempts to overtake CyberSpace, but is continuously outsmarted by three curious kids and one cyberbird pal determined to stop him. Join forces with the CyberSquad, Matt, Inez, Jackie and Digit, in their quest to save CyberSpace as they zoom into *Cyberchase – The Chase Is On!*, an out-of-this-world, educational mathematics exhibit.

In this exhibit, children will enter CyberSpace through a special portal to explore favorite cybersites, including the *Control Central*, the *Grim Wrecker* and *Poddleville*. They will help the CyberSquad protect the virtual universe from the villainous Hacker while exploring math concepts such as place value, algebra, geometry, fractions and probability.

In this probability activity, students will play with various spinners to experiment and predict the frequency of various outcomes. This activity will prepare students for the R-Fair City component in the Cyberchase exhibit and help them to analyze their chances of winning or losing any game to determine fairness.

TEKS Objectives

V.E.2 (PreK): Child collects data and organizes it in a graphic representation.

K.12: The student constructs and uses graphs of real objects or pictures to answer questions.

1.9: The student displays data in an organized form.

1.10: The student uses information from organized data.

2.11: The student organizes data to make it useful for interpreting information.

3.13, 4.13, 5.13: The student solves problems by collecting, organizing, displaying, and interpreting sets of data.

5.12: The student describes and predicts the results of a probability experiment.

Background

In a fair game, everyone has an equal chance of winning. Students can learn about fairness through repeated experiences and experiments of various card games, spinner games, and dice games. They can explore probability through experiments that have only a few outcomes, such as using game spinners with various shaded parts. Then they should consider how likely it is that the spinner will land on a particular color. According to the NCTM standards, students will use common fractions to represent the probability of events that are neither certain nor impossible. Through these experiences, students encounter the idea that although they cannot determine an individual outcome, such as which color the spinner will land on next, they can predict the frequency of various outcomes.

Materials

- Spinners
- Markers
- Graph paper

Procedure

Set up: This activity will take place during one class period and works best in small groups of 3-4 students. Set out 3 spinners per group. You will also need at least 3 copies of the graph paper per group. Depending on the age of students, you may need to assemble spinners ahead of time.

1. Choose a spinner.
2. Predict which number will reach the top first.
3. Spin the spinner.
4. Mark or color one square on the game board above the number that the spinner landed on. For example, if the spinner landed on 2, color one box above the number 2.
5. Continue until one number has reached the top.
6. How fast you reach the top depends on which numbers you get when you spin.
7. Compare your prediction to the actual results.
8. Choose a different spinner and repeat steps 2-7.

Questions to ask

- Which number do you think will be chosen most often? Why? Least often? Why?
- Is it okay for your prediction to be different from your actual results?
- Is it possible for a different number to win each time?
- Is the spinner a fair spinner? Can any number win each time?

Extensions

- Make your own spinner with numbers or colors and try to predict which will come up the most.
- Experiment with flipping heads and tails on a coin.
- Play a card or dice game and create rules to make a fair game.

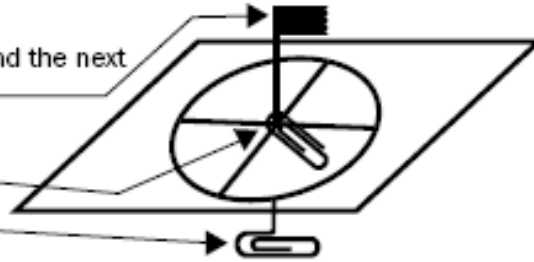
Resources

- Probability *For Real*: A short real life clip featuring Bianca and coin flipping probability: http://pbskids.org/cyberchase/forreal/103_for_real.html
- Discover the probability of coin flipping through many trials on this interactive game: <http://pbskids.org/cyberchase/games/probability/index.html>
- Free interactive spinner online: <http://www.shodor.org/interactivate/activities/ExpProbability/>
- *Probably Pistachio*: Book by [Stuart J. Murphy](#). Walk through a child's bad but humorous day while using words like "probably," "usually," and "sometimes." See how probability doesn't always work out as expected.
- *It's Probably Penny*: Book by [Loreen Leedy](#). Explore probability as Penny makes predictions about what will, might, and can't happen over the weekend. She must also think of different events with varying chances of happening.

Race to the Top

What You Need

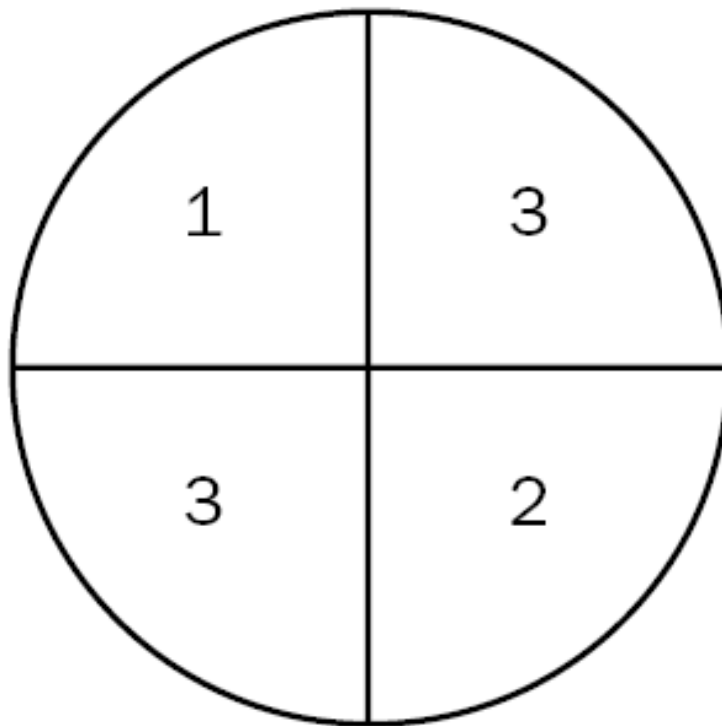
- Three spinners on this page and the next
- Masking Tape
- Scissors
- Paper Clips
- Stiff Paper



What to do

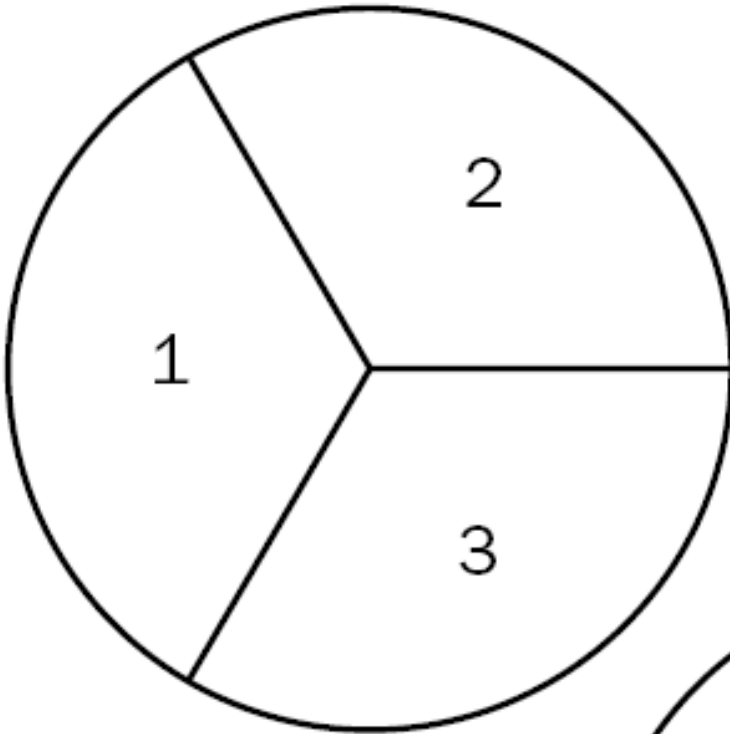
1. Cut out the spinners.
2. Glue each one to a piece of stiff paper (A paper plate will work.)
3. Bend the end wire of the paper clip up so that most of the paper clip lays flat and the wire sticks up into the air.
4. Carefully poke the paper clip through the center of the spinner.
5. Tape the paper clip to the spinner in the back.
6. Place the other paper clip over the wire sticking up from the spinner.
7. Put a small piece of tape onto the top of the wire to keep the paper clip from flying off.
8. Gently flick the paper clip and watch it spin.

Spinner 1

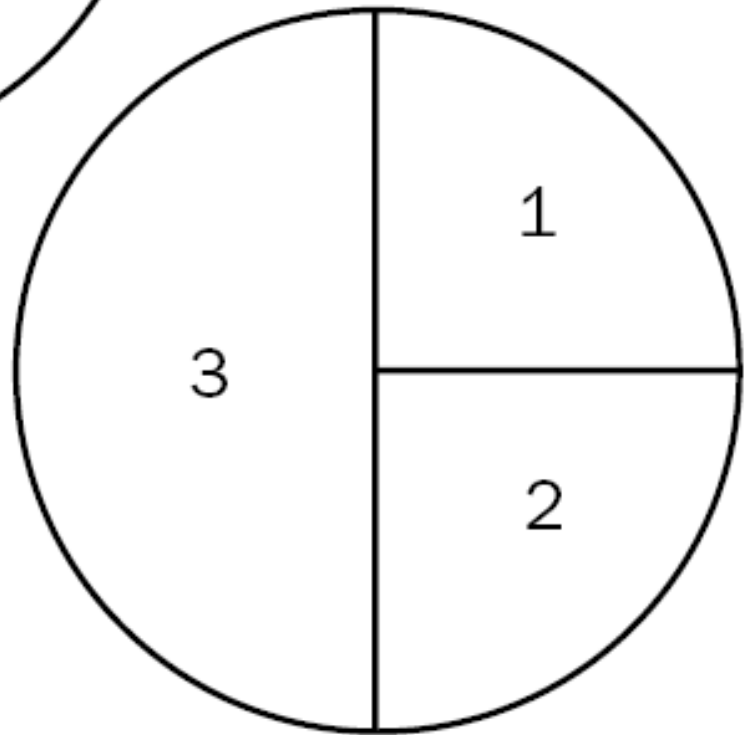


Race to the Top

Spinner 2



Spinner 3



Race to the Top

Game Board										
										1
										2
										3

Game Board										
										1
										2
										3