

How Likely Is It?

Glossary

Chances – The likelihood that something will happen. For example, “What are the chances that it will rain tomorrow?”

Equally likely events – Two or more events that have the same chance of happening. For example, when you toss a fair coin, heads and tails are equally likely.

Experimental Probability – A probability that is found by experimenting. The experimental probability would be ratio of the number heads to the total number of trials.

Fair Game – A game in which each player has the same chance of winning.

Impossible Event – An event that cannot happen, for example, the probability of putting a quarter in a gumball machine and getting the moon is zero

Theoretical Probability – A probability found by analyzing a situation mathematically.

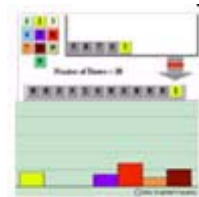
Trial – One round of an experiment

Web Resources

You will find web resources at:

www.illuminations.nctm.org

Simulating Probability Situations



Exploring Histograms



Connected Mathematics Project

Everett Public Schools Mathematics Program

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Probability

Unit Goals

- ◆ Become acquainted with probability informally through experiments
- ◆ Understand that probabilities are used for predicting what will happen over the long run
- ◆ Understand the concepts of equally likely and unequally likely
- ◆ Determine and critically interpret statements of probability

Proposed Time Frame:
Approximately 6 weeks

Mathematics in Investigations



Investigation 1 A First Look at Chance

- * To build understanding that probability has to do with uncertain events, but has a pattern of regularity over the long haul
- * Determine relative frequency from experimental data
- * Observe that small numbers of trials may produce wide variation in results

Investigation 2 More Experiments with Chance

- * Gain experience finding experimental probabilities of unequally likely events
- * Understand that chance is an estimate of behavior over the long run
- * Understand that to make good decisions based on experimental probabilities, the probabilities must be based on a large number of trials
- * Understand that each game of chance is fair only if each player has the same chance of winning, not just a possible chance of winning.

Investigation 3 Using Spinners to Predict Chances

- * Develop strategies for finding experimental probabilities with a new simulation tool: spinners
- * Understand that to make good decisions based on experimental probabilities, the probabilities must be based on a large number of trials

Investigation 4 Theoretical Probabilities

- * Understand that there are two types of probability; Experimental and Theoretical
- * Understand the relationship between experimental and theoretical probability
- * Develop an understanding of the word *random*

Investigation 5 Analyzing Games of Chance

- * Understand two ways to obtain probabilities
- * Develop strategies for finding theoretical probabilities
- * Gain a better understanding of what it means for events to be equally likely

Tips for Helping at Home

Good questions and good listening will help children make sense of mathematics and build self-confidence. A good question opens up a problem and supports different ways of thinking about it. Here are some questions you might try, notice that none of them can be answered with a simple “yes” or “no”.

Getting Started

- * What do you need to find out?
- * What do you need to know?
- * What terms do you understand or not understand?

While Working

- * How can you organize the information?
- * Do you see any patterns or relationships that will help solve this?
- * What would happen if...?

Reflecting about the Solution

- * How do you know your answer is reasonable?
- * Has the question been answered?
- * Can you explain it another way?

At Home:

- 1 Talk with your child about what’s going on in mathematics class.
- 2 Look for ways to link mathematical learning to daily activities. Encourage your child to figure out the amounts for halving a recipe, estimating gas mileage, or figuring a restaurant tip.
- 3 Encourage your child to schedule a regular time for homework and provide a comfortable place for their study, free from distractions.
- 4 Monitor your child’s homework on a regular basis by looking at one problem or asking your child to briefly describe the focus of the homework. When your child asks for help, work with them instead of doing the problem for them.

At School

- 1 Attend Open House, Back to School Night, and after school events.
- 2 Join the parent-teacher organization

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