What Do You Expect?

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.

Law of Large Numbers – This law states, in effect, that the more trials of an experiment that are conducted, the more the experimental probability will approximate the theoretical probability

Outcome – A possible result of an action. For example, when a number cube is rolled, the possible outcomes aer 1,2,3,4,5 and 6.

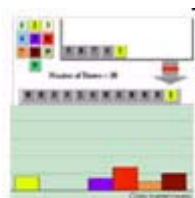**Theoretical Probability** – A probability found by analyzing a situation mathematically.

Trial – One round of an experiment

Web Resources

You will find the Factor Game and the Product Game at:

www.illuminations.nctm.org

Exploring Probability

Exploring Histograms

Everett Public Schools

Connected Mathematics Project

Everett Public Schools Mathematics Program

What Do You Expect?

Probability

Unit Goals:
- **Understand Probability**
- **Understand, determine and reason with experimental probability**
- **Understand, determine and reason with theoretical probability**
- **Find and reason with expected value**

Proposed Time Frame:
Approximately 6 weeks

Mathematics in Investigations

Investigation 1: Building Boxes
* Develop the concept of surface area
* Develop the concept of volume

Investigation 2: Designing Packages
* Find the surface area of a rectangular box
* Determine which rectangular prism has the least (greatest) surface area of r a fixed volume

Investigation 3: Finding Volumes of Boxes
* Find volumes of boxes by filling with unit cubes
* Determine that the total number of unit cubes in a rectangular prism is equal to the area of the base times the height (the volume)
* Learn that surface area is the sum of the areas of its faces.

Investigation 4: Cylinders
* Find the volume and surface area of a cylinder
* Investigate interesting problems involving the volumes and surface areas of cylinders and prisms.

Investigation 5: Cones and Spheres
* Find the volumes of cones and spheres
* Find the relationships among the volumes of cylinders, cones, and spheres

Investigation 6: Scaling Boxes
* Design boxes for given specifications
* Investigate effects of varying dimensions on volume and surface area

Investigation 7: Finding the Volumes of Irregular Objects
* Estimate the volume of an irregularly shaped object by measuring the amount of water it displaces
* Understand the relationship between a cubic centimeter and a milliliter

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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