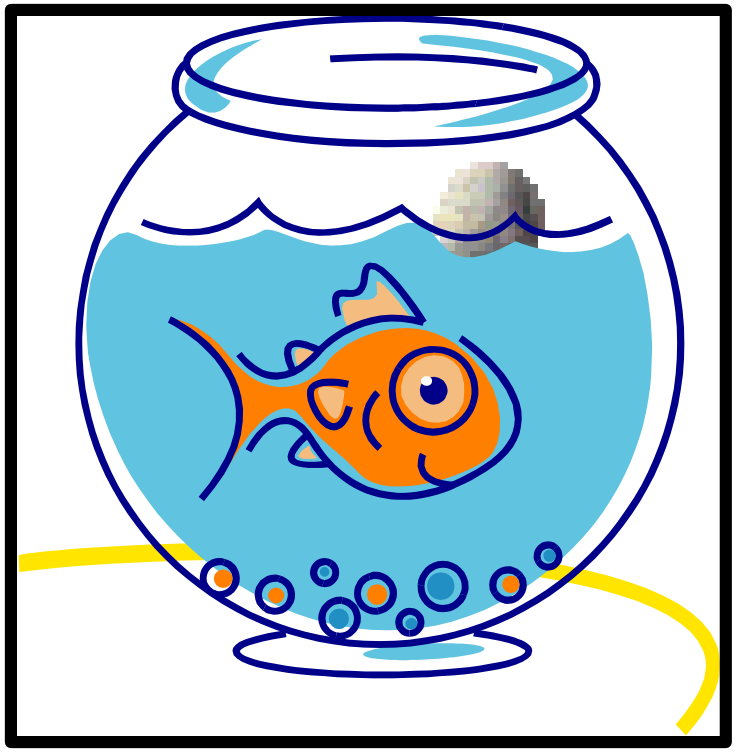
Business Finance: Experimental Probability



What is the likelihood that a ping pong ball bounced across the table will land in the fishbowl?

Lesson Objective

Students will learn how to project probabilities through experiment.

Probability Equation

$$\text{Probability} = \frac{\text{Number of desired outcomes}}{\text{Number of possible outcomes}}$$

How do we solve the Probability equation when the total number of possible outcomes is unknown?

You conduct an experiment.

Probability in Practice
Experiment 1

1) Everyone in class get one sheet of paper.

Probability in Practice
Experiment 1

1) Everyone in class get one sheet of paper.

2) Crumple it into a ball.

Probability in Practice
Experiment 1

1) Everyone in class get one sheet of paper.

2) Crumple it into a ball.

3) Without leaving your chair, toss it into the trash can.

Probability in Practice
Experiment 1

Number of possible outcomes from this experiment=

Number of balls thrown

Number of desired outcomes from this experiment=

Number of balls that landed in the trash can.

Probability in Practice
Experiment 1

$$\text{Probability} = \frac{\text{(Number of desired outcomes)}\ \text{Number of balls that landed in the trash can}}{\text{Number of balls thrown}\ \text{(Number of possible outcomes)}}$$

Probability in Practice
Experiment 1

$$\text{Probability} = \frac{\text{(Number of desired outcomes)}}{\text{(Number of possible outcomes)}}$$

$$= \frac{\text{Number of balls that landed in the trash can}}{\text{Number of balls thrown}}$$

Convert the fraction to a percent.

Probability in Practice
Experiment 2

Now run the experiment again.

Probability in Practice
Experiment 2

Now run the experiment again.

What was the result this time?

Probability in Practice
Experiment 2

Now run the experiment again.

What was the result this time?

Average the two results together.

Probability in Practice
Experiment 2

Now run the experiment again.

What was the result this time?

Average the two results together.

The more times you run the experiment, the closer you will come to the real probability.

Real World Experimental Probability

Consider the goldfish carnival game. It is impossible to say the exact number of ping pong balls that customers are going to be able to bounce into the fishbowls. So the owners will run experiments to help establish a reasonable probability rate at which they can expect customers to win a prize. This helps them know how much they need to charge for the game so that they can make money.

Review:

1. What is the probability equation?

2. What can you do when you don't know the number of possible outcomes?

3. How many times should you run the experiment?

Review:

1. What is the probability equation?

$$\text{Probability} = \frac{\text{Number of desired outcomes}}{\text{Number of possible outcomes}}$$

2. What can you do when you don't know the number of possible outcomes?

   Run an experiment

3. How many times should you run the experiment?

   The more experiments you run, the more accurate your answer will be.