# 5.1 Exploring Probability p. 302

Name ________________

Date ________________

**Goal**: Use probability to make predictions.

1. **fair game**: A game in which all the players are equally likely to win; for example, tossing a coin to get heads or tails is a fair game.

- The **theoretical probability** of event $A$ is represented as:
  - where $n(A)$ is the number of ________________________________
  - $n(S)$ is the total number of outcomes in the ________________________ where all outcomes are ________________________.
- The **experimental probability** of event $A$ is represented as:
  - where $n(A)$ is the number of times ____________________________
  - $n(T)$ is the total number of trials, $T$, ____________________________
- The probability of an even can range from ___ (impossible) to ____ (certain).

  You can express probability as a ______________, a ______________, or a ______________.

**Example 1**: Ross and Rachel flip a coin to see who gets to pick a movie. Rachel wins if she flips a head.

a. What is the theoretical probability of getting a head?

b. Simulate flipping a coin 1000 times and record the number of times a head appears. From your simulation, what is the experimental probability of getting a head?

c. Is the game fair?

**Example 2**: Rachel now decides that they will toss 4 coins—a nickel, a dime, a quarter, and a loonie. If all 4 land on heads, or all 4 land on tails, Ross wins. Otherwise, Rachel wins. Create a sample space to show all possible outcomes. Determine the probability of Ross winning and of Rachel winning. Is the game fair?

HW: 5.1 p. 303 #2 & 3