Tree Diagram Activity **Name:**

Using the cup and pennies, start with two pennies in the cup, shake them up and dump them out writing down the results in the table below. (ex. TH if one is tails and one is heads) then use three coins and then four. You will do 50 trials of each as a group writing the same results on each group member's packet.

2 pennies	3 pennies	4 pennies

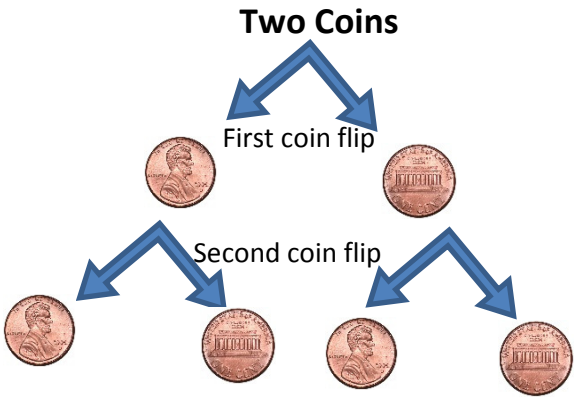
* Highlight the trials in each column where they all came up the same (all heads or all tails).

* Count these up and put the total at the bottom of the column.

1) Do you notice anything about the numbers you just wrote as they correspond to how many coins were used?

2) If each penny has a 50/50 chance of coming up heads or tails, why would the number of pennies used affect the chance of all heads or all tails?

Complete the following graphics for each scenario with H and T.



3) Of the four possible scenarios in our diagram above, how many lead to the same side of the coin on both flips?

4) Given this probability, did your 50 trials lead to the same (or close to the same) result?

Repeat this procedure for three and four coins.

Three Coins

5) Of the eight possible scenarios in your diagram above, how many lead to all heads or all tails?

6) Given this probability, did your 50 trials lead to the same (or close to the same) result?

Four Coins

7) Of the sixteen possible scenarios in your diagram above, how many lead to all heads or all tails?

8) Given this probability, did your 50 trials lead to the same (or close to the same) result?

Practice Problems

For each problem, construct a tree diagram to generate a list of all the possibilities on graph paper.

1. Two arrows are shot at a target. They will either hit the bull's eye (10 points), hit the outside (5 points), or miss the target (0 points). List the possible score outcomes.

2. Students are classified according to eye color – blue, brown, green; gender – male and female; and major – chemistry, mathematics, business, and physics. List the possible outcomes.

3. Four balls numbered 0, 1, 2, 3 are placed in a box. The box is shaken and the balls are drawn out in sequence, without replacement. List the possible 4-digit number outcomes.