

Listing Outcomes

Outcomes are the possible results from some activity or experiment.

Ex. 1: In a coin toss experiment, the outcomes would be "heads" or "tails."

Ex. 2: In the roll of a die, the outcomes would be 1, 2, 3, 4, 5, or 6.

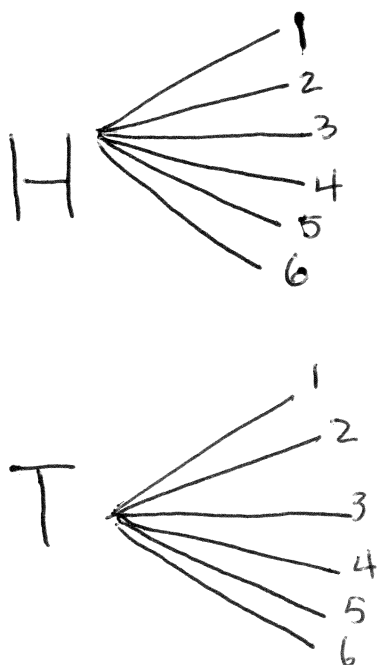
Sample Space is the "outcome set" a.k.a. the set of all possible outcomes of an experiment.

Ex. Toss a coin and roll a die together... The possible outcomes would be:

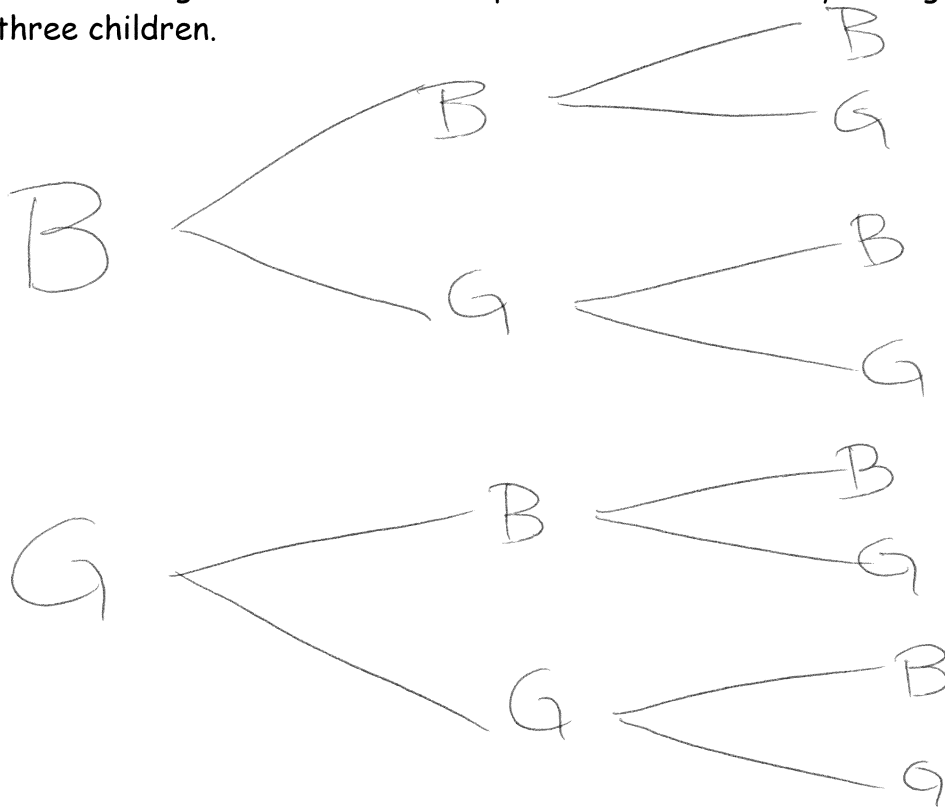
(H,1) (H,2) (H,3) (H,4) (H,5) (H,6)

(T,1) (T,2) (T,3) (T,4) (T,5) (T,6)

Tree Diagrams are used to show possible outcomes and their probabilities. Note: There is one "branch" for each outcome. Let's create a tree diagram for the same experiment of tossing a coin and rolling a die.



1. Create a tree diagram that shows the possible number of boys and girls in a family with three children.



2. Based on the tree diagram you created above, answer the following questions.

- a. What is the probability of having all boys in the family? $P(BBB) = \frac{1}{8}$
 b. What is the probability of having all girls in the family? $P(GGG) = \frac{1}{8}$
 c. What is the probability of having two girls and one boy?

$$\left. \begin{array}{l} P(GGB) \frac{1}{8} \\ P(GBG) \frac{1}{8} \\ P(BGG) \frac{1}{8} \end{array} \right\} \boxed{\frac{3}{8}}$$

3. Finally, list the possible outcomes using a sample space for choosing either a pepperoni or sausage pizza with one topping (olive, extra cheese, eggplant, or mushroom).

Pepperoni olive
 pepperoni extra cheese
 pepperoni eggplant
 pepperoni mushroom

Sausage olive
 Sausage extra cheese
 sausage eggplant
 sausage mushroom

PO	SO
PE	SE
PM	SM

shorthand version ☺

Total of
 $2 \cdot 4 = 8$