

ACT Study Modules

TOPIC: Probability

[Khan Academy Link](#): This video from the beginning to 4:50 demonstrates simple probability.

Probability is the **likelihood of something happening**. Probability is often used in situations involving flipping coins, rolling die, drawing cards, or picking out letter tiles.

Steps to determine simple probability:

Step 1: Determine the total amount of possible outcomes.

Step 2: Determine the total amount of favorable outcomes

Step 3: $Probability = \frac{Favorable\ Outcomes}{Possible\ Outcomes}$

Sample Problem: Suppose you roll a die. What is the probability of it landing on a 4?

How many ways can a die land? 6

How many ways can a die land on a 4? 1

The probability of rolling a 4 is $P(4) = \frac{1}{6}$

What is the probability of landing on a number less than 5?

How many ways can a die land? 6

How many ways can a die land on a number less than 5? 4

The probability of rolling a 4 is $P(\text{number less than 5}) = \frac{4}{6} = \frac{2}{3}$

Items: Suppose you have a pocket full of marbles. You have 6 green, 4 red, 11 blue, and 3 yellow.

$$6 + 4 + 11 + 3 = 24 \text{ total}$$

- a) Find the probability of drawing a red marble

$$P(\text{red}) = \frac{\# \text{ red}}{\# \text{ total}} = \frac{4}{24} = \frac{1}{6}$$

- b) Find the probability of drawing a yellow marble

$$P(\text{yellow}) = \frac{\# \text{ yellow}}{\# \text{ total}} = \frac{3}{24} = \frac{1}{8}$$

- c) Find the probability of drawing a blue marble

$$P(\text{blue}) = \frac{\# \text{ blue}}{\# \text{ total}} = \frac{11}{24}$$

Items: Suppose you have a drawer full of socks. You have 9 black socks, 12 white socks, 2 gray socks, and 3 brown socks.

$$9 + 12 + 2 + 3 = 26 \text{ total}$$

- a) Find the probability of picking a white sock

$$P(\text{white}) = \frac{\# \text{ white}}{\# \text{ total}} = \frac{12}{26} = \frac{6}{13}$$

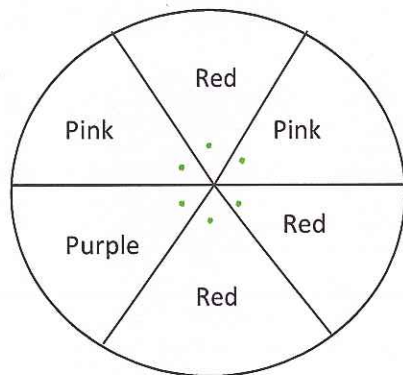
- b) Find the probability of picking a brown sock

$$P(\text{brown}) = \frac{\# \text{ brown}}{\# \text{ total}} = \frac{3}{26}$$

- c) Find the probability of picking a gray sock

$$P(\text{gray}) = \frac{\# \text{ gray}}{\# \text{ total}} = \frac{2}{26} = \frac{1}{13}$$

Spinners: Suppose you are using the following spinner



- a) Find the probability of landing on purple

$$P(\text{purple}) = \frac{\# \text{ purple}}{\# \text{ total}} = \frac{1}{6}$$

- b) Find the probability of landing on red

$$P(\text{red}) = \frac{\# \text{ red}}{\# \text{ total}} = \frac{3}{6} = \frac{1}{2}$$

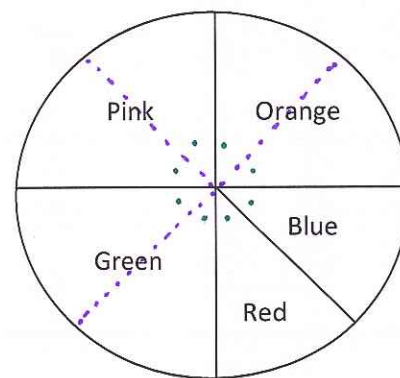
- c) Find the probability of landing on pink

$$P(\text{pink}) = \frac{\# \text{ pink}}{\# \text{ total}} = \frac{2}{6} = \frac{1}{3}$$

- d) Find the probability of landing on blue

$$P(\text{blue}) = \frac{\# \text{ blue}}{\# \text{ total}} = \frac{0}{6} = 0$$

Spinners: Suppose you are using the following spinner



- a) Find the probability of landing on orange

$$P(\text{orange}) = \frac{\# \text{ orange}}{\# \text{ total}} = \frac{2}{8} = \frac{1}{4}$$

- b) Find the probability of landing on red

$$P(\text{red}) = \frac{\# \text{ red}}{\# \text{ total}} = \frac{1}{8}$$

- c) Find the probability of landing on pink

$$P(\text{pink}) = \frac{\# \text{ pink}}{\# \text{ total}} = \frac{2}{8} = \frac{1}{4}$$

- d) Find the probability of landing on blue

$$P(\text{blue}) = \frac{\# \text{ blue}}{\# \text{ total}} = \frac{1}{8}$$