10.2 Probability

**Probability**: a number that measures the likelihood that an event will occur.
- Can be written as a fraction, decimal, or percent
- Impossible: $0$
- Unlikely: $0.1-0.25$
- Equally likely: $0.25-0.5$
- Likely: $0.5-0.75$
- Certain: $1$

**Probability Formula**: \( P(event) = \frac{\# \text{ of favorable outcomes}}{\# \text{ of possible outcomes}} \)

**Example 1**: You roll a dice. What is the probability of rolling an odd number?
- Odd (3) = 1, 3, 5
- Total (6) = 1, 2, 3, 4, 5, 6
- \( P(\text{odd}) = \frac{3}{6} = \frac{1}{2} \) or $0.5$ or $50\%$

**Example 2**: The probability that you randomly draw a short straw from a group of 40 straws is $\frac{3}{20}$. How many are short straws?
- \( P(\text{short}) = \frac{3}{20} \)
- \( \frac{\text{short}}{\text{total}} = \frac{3}{20} \)
- \( \frac{\text{short}}{\text{total}} \rightarrow \frac{\text{x}^2}{40} \)
- \( x = 6 \)
- There are 6 short straws.