

Probability Instructional Sheet

Probability is the likelihood that something is going to happen. There are two types of probability that we are going to look at.

1. Theoretical Probability - *this is the probability that something SHOULD happen in an event*

$$\text{Theoretical Probability} = \frac{\text{number of favourable outcomes}}{\text{total number of outcomes}}$$

Look at coin flips. There are two possible outcomes, head or tails

- the probability of heads is $\frac{1}{2}$ or 1 " out of " 2
- it would be the same probability for tails: $\frac{1}{2}$

Look at a single six-sided die. There are 6 possible outcomes: 1, 2, 3, 4, 5, 6

- the probability of rolling a 5 is $\frac{1}{6}$ or 1 out of 6
- the probability of rolling an even number (2, 4, or 6) is $\frac{3}{6}$ because there are three possible outcomes (2, 4, 6) out of the 6 possible outcomes

2. Experimental Probability - *this is the probability that something occurs based on the results*

$$\text{Experimental Probability} = \frac{\text{number of times an outcome occurs}}{\text{number of times the experiment is conducted}}$$

Look at coin flips again. Let's say I flip a coin 10 times and I get 3 tails and 7 heads.

My experimental probability of a tail is $\frac{3}{10}$ compared to....

The theoretical probability of tails being $\frac{5}{10}$

Probability can be written as a fraction, percent, or decimal

$$P(\text{heads on a coin flip}) = \frac{1}{2} = 0.5 = 50\%$$

Probability can also be 1 (100%, a certain thing) or 0 (0%, never going to happen)

$$P(\text{heads or tails}) = \frac{1}{1} = 100\%$$

$$P(\text{students hating math}) = 0 \text{ or } 0\%$$