

Probability

In the real world, some events happen by chance. In mathematics, we study those possibilities through probability. We'll look at simple probability and ways to express probability.

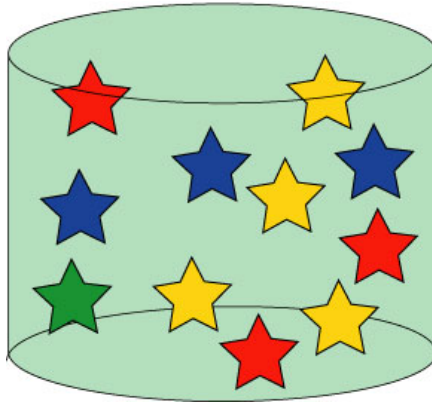
In the study of probability, there is theoretical probability where mathematically this is the way the events should occur. However, in actuality they may not occur exactly as expected. We will test actual outcomes against theoretical outcomes.

Simple Probability

Writing Probabilities as Ratios

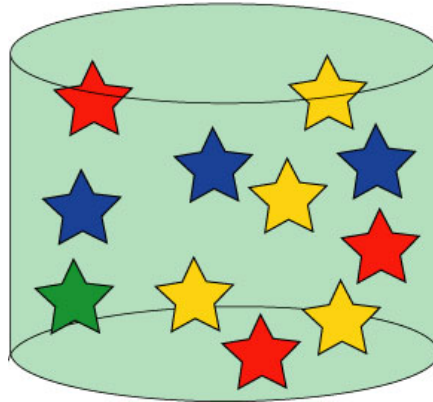
Simple Probability

Cindy has done well on her last test and gets to select a star from the jar. What are her chances of selecting a **gold** star?



There are **11** stars total in the jar with **four** of them being **gold**. Thus, her chance of selecting a gold star is **4 chances out of 11**.

Writing Probabilities as Ratios



The probability of selecting a **gold star** out of the entire container of stars is 4 out of 11.

Probability can be written as a **ratio**.

Number of possible outcomes : all possible outcomes or

$$\frac{\text{Number of outcomes desired}}{\text{All possible outcomes}}$$

The probability of selecting a gold star can be written as **4 : 11** or $4/11$.

What is the probability of selecting a **black star**?

Since there are no black stars then that would be **0 : 11** or $0/11$ or **no** chance of happening.

What is the probability of selecting **any color** of star in the jar?

Since this covers all the stars then the probability would be **11 : 11** or $11/11$ or 1, a **sure thing** that it would happen.