

# Probability

*How likely something is to happen.*

Many events can't be predicted with total certainty. The best we can say is how **likely** they are to happen, using the idea of probability.

## Tossing a Coin



When a coin is tossed, there are two possible outcomes:

- heads (H) or
- tails (T)

We say that the probability of the coin landing H is  $\frac{1}{2}$

And the probability of the coin landing T is  $\frac{1}{2}$

## Throwing Dice



When a single **die** is thrown, there are six possible outcomes: 1, 2, 3, 4, 5, 6.

The probability of any one of them is  $\frac{1}{6}$

In general:

$$\text{Probability of an event happening} = \frac{\text{Number of ways it can happen}}{\text{Total number of outcomes}}$$

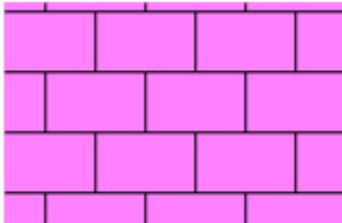
So the probability of rolling a 4 with a 6-sided die is  $\frac{1}{6}$ .

The probability of pulling a red counter from a bag with 5 red counters and 4 blue counters is  $\frac{5}{9}$ . (5 red counters out of 9 altogether.)

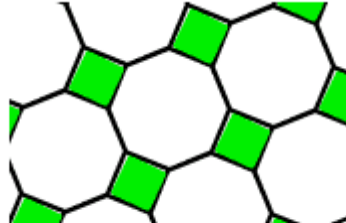
# Tessellation

A **Tessellation** (or **Tiling**) is when we cover a surface with a pattern of flat shapes so that there are no overlaps or gaps.

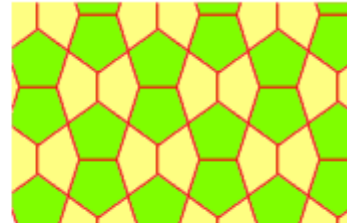
Examples:



Rectangles



Octagons and Squares

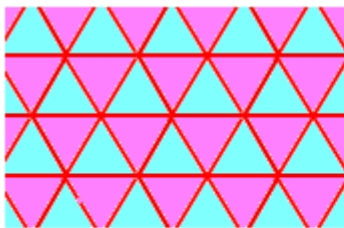


Different Pentagons

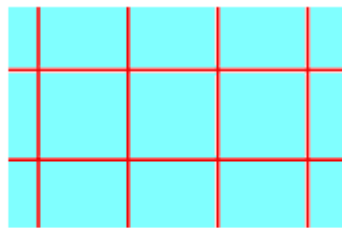
## Regular Tessellations

A **regular** tessellation is a pattern made by repeating a [regular polygon](#).

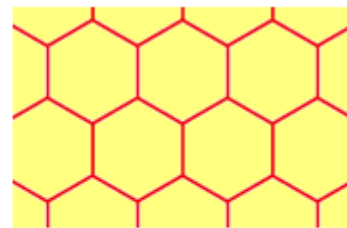
*There are only 3 regular tessellations:*



**Triangles**  
3.3.3.3.3.3



**Squares**  
4.4.4.4



**Hexagons**  
6.6.6

Look at a Vertex ..

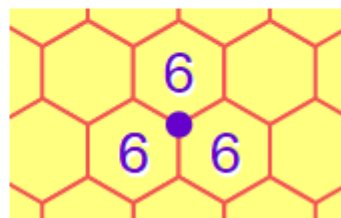


A vertex is just a "corner point".

What shapes meet here?

Three hexagons meet at this vertex,  
and a hexagon has 6 sides.

So this is called a "**6.6.6**" tessellation.



To name a tessellation, go around a vertex and write down how many sides each polygon has, in order ... like "3.12.12".