

MOVIE MATHS

Maths may not be the first useful skill that comes to mind when working in the film industry.

However, there are lots of reasons why it's important! Have a think and **make a list of any reasons why you think maths might be used in filmmaking:**

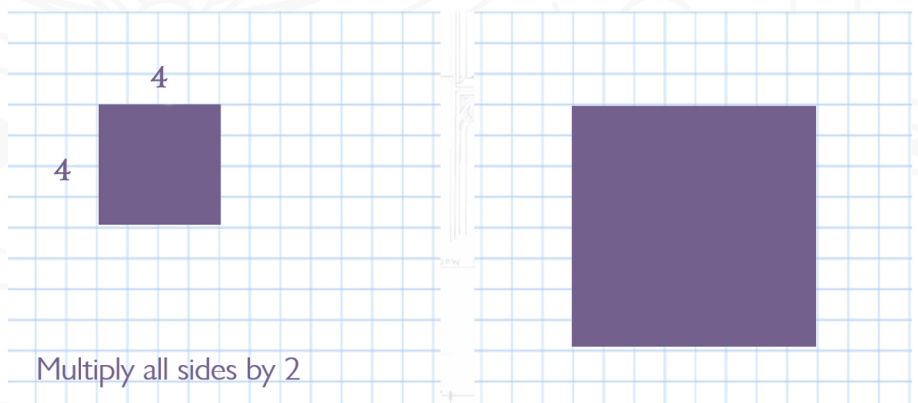
From setting a budget to measuring costumes, from rendering each frame to ensuring sets are built to the correct proportions – maths is used throughout the process of making a film.

One particular area of maths that was needed for the Harry Potter films was **scale**. We needed to make one of the characters seem bigger in proportion to everyone else. This character was, of course, Rubeus Hagrid. To create the effect of Hagrid being a half-giant, **two versions** of his hut were created. A larger version was used to make the other characters look small, whilst a smaller version of the set made Hagrid look bigger. There was a **20% difference in size** between the two sets. We also made the props Hagrid interacts with, such as his pink umbrella, the birthday cake he gives to Harry, and even his teacup, in **two different sizes**.

This meant that lots of people working behind the scenes needed to use their maths skills to ensure that everything we see on screen looks believable – and that the audience never notices the tricks employed to make Hagrid look like a half-giant. One of the areas of maths needed for this task is **scale factor**.

What is scale factor?

A scale factor is the size by which we enlarge a shape. For example, if we want to make a shape two times larger, we need to multiply each side of the shape by two. In the picture below, the shape has been enlarged by a scale factor of 2. **What is the length of each side now?**





ACTIVITY

You will need: a ruler and a pencil.

In this activity you are going to become a **Prop Maker**. First, choose a **genre** for your prop. A genre is a category or type, for example fantasy or comedy.

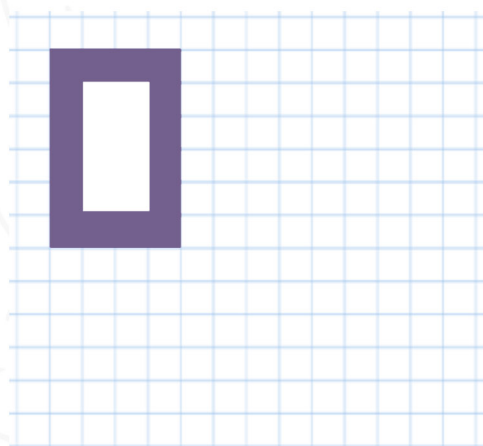
My genre is:

Now, think of a prop which you might see on-screen within your chosen genre. Ask an adult if you can watch some film clips to help you think of ideas!

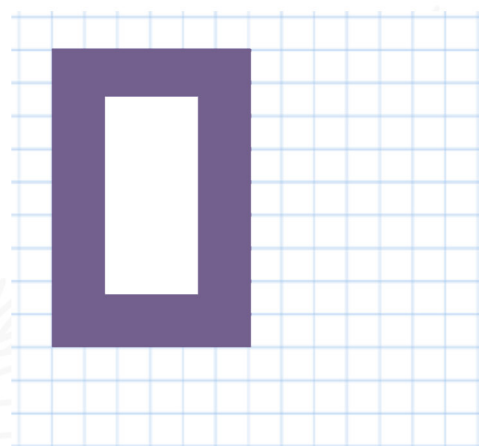
On page 3 of this worksheet, draw out your prop and then **enlarge** the prop using a **scale factor**. Think of a reason why your prop might need to be enlarged – for example, if it needs to be held by a human and a half-giant.

My prop needs to be scaled because:

TIP! It will be easier to enlarge your shape if it is made of straight lines. You can add details such as patterns or writing but remember you will need to scale this too! If you're stuck, there is an example:



Original Prop Design (picture frame)



Scaled Prop Design (scale factor 1.5)

You don't have to make your shape larger – you can make it smaller too. To make your shape half the size, the scale factor will be 0.5. Can you think of another way you could express this in mathematical terms?

Instead of multiplying the sides by 2, you will divide the sides by 2.

You could even create a 3D version of your prop after you've designed it.

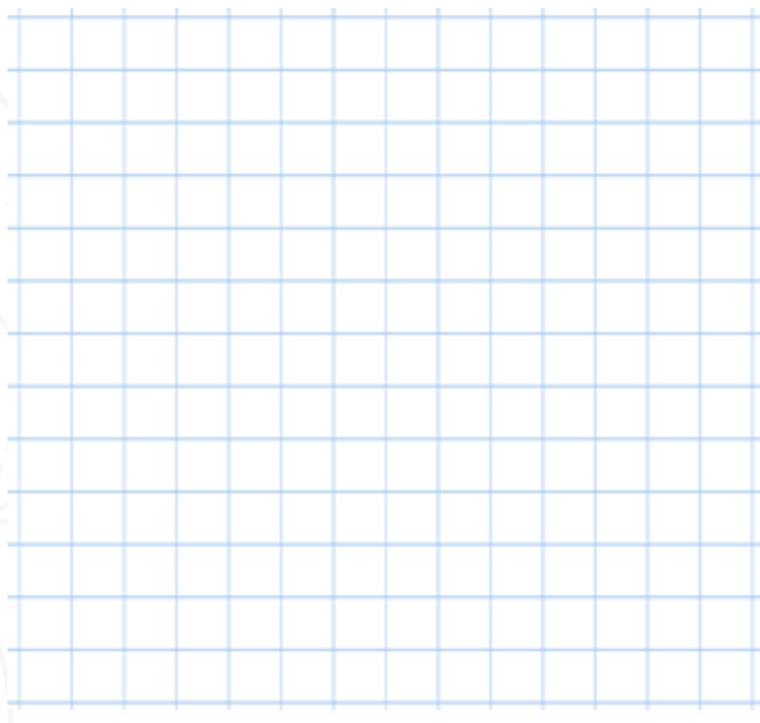
WB
WARNER BROS.
STUDIO TOUR
LONDON

THE
MAKING OF
Harry Potter

Original Prop Design

A large grid of 20 columns and 20 rows, intended for drawing the original prop design.

Scaled Prop Design - Scale Factor: _____

A large grid of 20 columns and 20 rows, intended for drawing the scaled prop design.