



How Fast Is Fast?

This is a maths activity to be done after or in parallel with the science activity ‘Preparing for space: G-Forces’ in the ‘Gravity and weightlessness’ section.

<p>Curriculum Key links</p>	<p>KS2 Pupils should be taught to use simple formulae. KS2 Solve problems involving the calculation and conversion of units of measure KS3 Express ... results using a range of formal mathematical representations KS3 Substitute numerical values into formulae and expressions, including scientific formulae</p>
<p>Learning objective</p>	<p>At the end of this activity pupils will have a feeling for speed expressed in different units. They will be able to use the formula for average speed to make calculations. At KS3 they will be able to model situations using the average speed formula.</p>
<p>Age range</p>	<p>9-12 years We would suggest limiting the accuracy of the measurements, the numbers used and the calculations at Key Stage 2. Notably using $C = 3 \text{ times } D$ for the circle calculations is enough for key stage 2.</p>
<p>Time required</p>	<p>Activity 1 and 2 could take a whole lesson. So could activity 3 and 4 together. However, they can be limited to makes one very busy lesson all together. Activity 1: 20 mins Activity 2: 20 mins Activity 3: 10 mins Activity 4: 10 mins</p>
<p>Equipment required</p>	<p>Internet access for research. A collection of ‘circular’ objects. String and rulers for measuring. Table tennis ball and thin string.</p>
<p>Extension activities</p>	<p>Slide 3 shows the NASA centrifuge for training astronauts to experience high G forces. Calculate the speeds involved by researching the size and rotation times.</p>





TEACHER'S NOTE:

These activities are written as descriptions so that they could be recreated in classrooms. There are 4 slides in the presentation which are intended to be prompts and illustration, to have on while the activity is taking place. Each slide corresponds to one activity in turn.

The HP Prime calculator and software are used throughout, to support the calculations. Notably the tricky conversions between units of speed and the use of the formula for the circumference of a circle. The calculator is only used when the pupils have investigated the ideas for themselves. Use the separate help sheets for HP Prime to help you get started.

RESOURCES:

1. A student support sheet with the outline of the project and the example with instructions for creating a graph on the HP Prime.
2. A presentation with two visual prompt slides.
3. An HP Prime will be needed to generate the graphs and do the tracking.

WEB LINKS:

Web links are shown throughout the description of the activity where they are needed.

