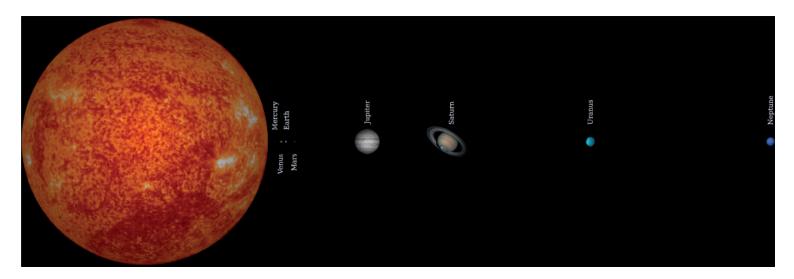# Phizzi practical

Playdough planets

Introduction

The solar system consists of eight planets and their moons, orbiting a star, our Sun. There are also a number of dwarf planets, asteroids and comets. The Sun contains 99.8% of the mass of the solar system and is the largest object with a diameter of 1.4 million km.
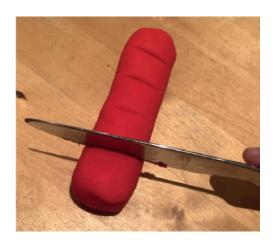
This practical activity challenges children to apply their understanding of fractions to compare the relative sizes of the eight planets and develop a more detailed understanding of the solar system in which they live.
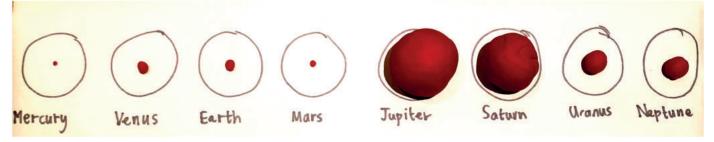
Scientific explanantion

Scientists now have evidence that the solar system was formed 4.6 billion years ago when a massive spinning cloud of dust and gas collapsed inwards due to the force of gravity. As most of the material concentrated in the centre, it became so hot and dense that it formed a new star (our infant Sun), surrounded by a disk of spread out dust and gas. Small clumps of matter began to form in the disk; as these got bigger, their force of gravity attracted other clumps and they continued to grow, forming planets and moons. Near to the Sun, only metals and rocky materials could withstand its intense heat, so the inner four planets are 'small' rocky ones. By contrast, as the outer planets began to form, far away from the Sun's heat, more materials could collect, and their gravitational pull became strong enough to even capture gases. We call the four outer planets the gas giants. Icy matter settled in the furthest regions of the solar system.
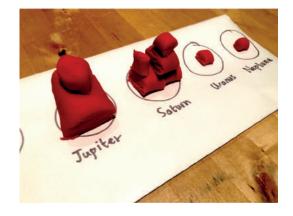
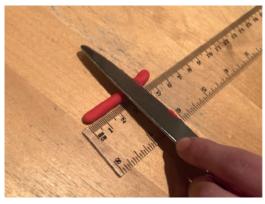**Teaching tip**   Works well with teacher narrating the activity for the class.

Method

1. Roll the dough into a cylinder and cut it in half. Place one of these halves in a pile labelled Jupiter and then cut the other half into fifths. Add one of the fifths on the Jupiter pile and three fifths into a new pile labelled Saturn.

2. Take the remaining piece and roll it into a new cylinder, then cut this cylinder into fifths. Add one of these fifths to a new pile labelled Neptune, add another to a new pile labelled Uranus and add two fifths to Saturn's existing pile.

3. Re-roll the remaining piece and cut into fifths again. Add three fifths of these to Saturn's pile.

4. Re-roll the remaining two fifths into a cylinder and cut this into fifths again. Add one fifth to a new pile labelled Earth and one fifth to a new pile labelled Venus. Add two fifths to the existing pile for Uranus.

5. Re-roll the remaining piece and again cut it into fifths. Give one fifth to a new pile labelled Mars, add one fifth to Neptune's existing pile and add two fifths to the existing pile for Uranus.

6. Cut the remaining piece into fifths. Give three fifths to a new pile labelled Mercury and add two fifths to Saturn's existing pile.

7. Roll each of the piles of dough into a ball to represent the size of each of the planets. The Sun is about 10 times the diameter of Jupiter – so if you were to model that you would need a ball of dough about half a metre in diameter!

Tip to increase mathematical demand

Every time the dough is rolled into a cylinder, use a ruler to ensure the length is a multiple of five and then use the ruler to increase the accuracy with which the cylinder is cut into fifths.

Based on an original idea from JPL NASA.