

Put a Ring on It

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Erasmus+

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Metadata

General Info

Title

Put a Ring on It

Short description

Students learn why some planets have rings and what they are made of. They then investigate and practice ways of painting rings whilst making a 3D model of a made-up planet with rings using Styrofoam balls and acrylic sheets.

Keywords

Rings, ice, gas giants, transparent, opaque, albedo

Educational Context

Age

11 - 14

Prerequisites

None

Duration

2 – 3 hrs

Educational Objectives

Cognitive Objectives

- To learn how planetary rings are formed
- To describe what planetary rings are made of

Affective

- To appreciate the link between the Arts and Science

Psychomotor

- To paint on acrylic in transparent layers

Connection to the curricula

Links to the Solar System topic – structure of the solar system KS3 (UK)

Also links into methods in painting and drawing in the Art curriculum

Can be extended to link to the Light topic in KS3 and colour theory

Work sheet

In this activity students will learn what planetary rings are made out of and create their own made-up planet with rings as a 3D model. You will need Styrofoam balls for the planet core, acrylic sheets for the rings, and acrylic paint.

Begin by showing pictures of Saturn's rings and asking some exploratory questions:

What are the rings made of?

How big are they?

How can we paint them accurately? (You might like to have some visual hints based on the materials they will be using)

You can use the PPT which has images of the rings to help guide this questioning.

Before the students can make their 3D model, using a Styrofoam ball for the planet and a thin sheet of acrylic for the rings, they should complete a 2D mock up of their planet with its rings as part of a fact file.

Name: _____

FACT FILE

My Planet's Name is _____

Number of Moons:

Sketch of my planet and its rings:

Students have complete creative freedom here to make up a planet with rings.

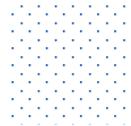
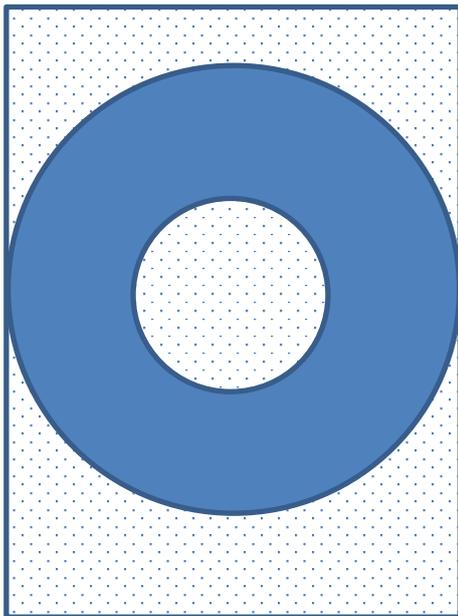
After completing the 2D sketch its time to create the 3D model. If you have an example made before hand it will help students visualize their own model. Take some time to discuss different painting techniques for the rings such as:

- You can water down the paint to make the rings more transparent and to layer up different colours.
- Use a thin brush to make sure you the rings don't blur into one ring.
- You can add glitter or metallic paint to make the rings shimmer etc.

Encourage students to paint each ring slightly differently, perhaps the colour changes or the rings get more transparent further out. They can also paint any small moons on if they wish in between the rings.

The basic planet and ring's structure is created as follows:

1. In the centre of the acrylic sheet draw a circle the same diameter as the Styrofoam ball.
2. Cut the sheet into a larger circle shape and cut out the inner circle.



= Cut and remove



Central cut out should be the same diameter as the Styrofoam ball

3. Now paint the planet and the rings.
4. Glue the rings to the planet with a glue gun.

EXTRA INFO

The rings of Saturn shimmer because they are mainly made of small chunks of ice which is very reflective, think about bright white snow. The other gas giants all have rings but they are made of mostly rock not ice so aren't visible. The rings are leftovers from planet formation when debris gets caught by the planet or a moon gets broken up by the planet's gravity. Gaps in rings are often caused by a moon near or inside the gap which clears some of the ring particles out of the way.