

Delve Into the Deep

Raging Rivers

The Marble Arch Caves are delighted showcase new teacher and student resources to help people get inspired about one of our favourite places, caves.

These resources form part of our teacher packs, available to download free of charge from our website at www.marblearchcaves.co.uk. Within these packs, you will find our practical experiment cards, lesson outcomes, instructions and methods, class questions, our lesson outlines/plans and our plenary activities.

To help teachers and students with their experiments the Marble Arch Caves team have also created a series of three videos, to demonstrate the activities and aid student learning with some background information and ideas for extension activities. These can be accessed via Youtube at; [\(Click Here\)](#)

Experiment 3: Raging Rivers - How to Build a Model River



This activity is designed to help students gain a greater understanding of rivers and how they flow. Rivers form one of the most dynamic environments on the planet and are responsible for many of the processes that shape and sculpt the very land we see before us today.

Freshwater that flows across the landscape can erode material, it can transport loads of all shapes and sizes, and deposit material in many interesting ways. Many of favourite above ground features such as waterfalls and plunge pools also exist underground. Without rivers, the expanse of caves we find in County Fermanagh would not exist.

Equipment & Materials

Here you will find a list of items and materials students will need in order to begin building their very own river model. We have also provided a list of key words that students can research before they begin. By demonstrating how rivers flow, we can draw conclusions as to how rivers have the energy and power to create caves.

You will need

- Aluminium pan, a tray or shallow dish.
- Sand, pebbles, wood chips.
- Water.
- Bottle with a narrow opening.
- Aluminium foil.
- Small bowl.
- Tape.
- Scissors.
- A nail, or hole making tool.
- A book or box to lift the tray.
- Paper towels.
- Blue food colouring.

Key words

- Flow
- Erosion
- Drainage
- Deposition
- Current
- Meander
- Source
- Mouth

Student Learning outcomes

I can;

1. Follow written instructions following a demonstration.
2. Design a project using the internet as a reference.
3. Describe what has happened using keywords.
4. Record my findings.
5. Suggest improvements for making the model more like a local river.

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Method.

1. Find pictures of rivers online and select one to inspire you. This can be a local river or one from a different part of the world.
2. Get a long sheet of aluminium foil and fold it in half **lengthwise** along a meter rule.
3. Fold the sides up so that you get a long 'u' shaped piece of foil, like a gutter.
4. Put bends and meanders into the foil river to simulate a natural river course.
5. Place the river into the tray and tape it down securely. Using blue-tac also works, but make sure it is firmly in place.
6. Put sand, soil and pebbles around the river, just as you see in your image.
7. Pierce some holes where the river exits the aluminium tray. This will act as a drain.
8. Place the end of the river over the sink or a bucket, and lift the start of the river (the source) above it using a box or books.
9. Use some blue food colouring to dye some water in a jug. Pour water into the start of the river and record what you see happening. What is the flow like? What happens if I add in some sand or stones?

Lesson outline.

Preparation

You will need:

Aluminium turkey pan/shallow dish, sand/ pebbles, water, a bottle with a narrow opening, aluminium foil, small bowl, tape, scissors, a hole making tool, books or boxes to raise the tray, a container to catch water, paper towels, blue food colouring.

Introduction

Rivers are an important part of our landscape. They supply water and are used for transportation in many major cities e.g. Paris, London, and New York are located along rivers.

A river's shape is determined by how the water interacts with the earth below it and the geology of the landscape surrounding it.

Let us try to find some aerial pictures of rivers to see what kind of shapes they can be.

Demonstration.

Using the photographs of rivers for inspiration, demonstrate how to fold a length of aluminium foil into a long trough shape, making curves by pinching in the foil at the inner edges of the bends.

The riverbanks (the sides) have to be high enough to have capacity for the water, and level with each other on both sides.

Demonstrate how to safely pierce holes in the aluminium tray using a nail/ toothpick. It may be best for an adult to do this if the students children are younger.

Experiment.

- Be extremely careful when piercing the drainage holes at the end of the tray.
- Make sure that you do not accidentally tear the tin foil when making the riverbed.
- Experiment with the texture of the riverbed. Will the river move faster if it is smooth or crinkly?

Plenary. Water flow test.

Take the completed rivers and drop a teaspoon of sand into the flow at the top of the river.

How does the sand move? What do you think is happening?

Is there anything else that we could try?

What do you think would happen if we dropped a pebble in?

Interesting questions.

1. How does the water move in your river?
2. What difference does changing the angle of the river make?
3. What happens with heavier things like a pebble?
4. How would you make a lake, sea or ocean?
5. How would a lake, sea or ocean be similar or different to a river?

Student Experiment Worksheet - Notes

Name: _____

Before Carrying Out the Experiment	
What do I think will happen?	I think that.....
Why do I think this might happen?	This will happen because.....
After Carrying Out the Experiment	
What happened?	I found that.....
Why do I think this happened?	This happened because.....