



Introduction

This lesson explores how the canals were built, the people who built them and the techniques involved in keeping them watertight.

Learning Objective

- To understand the principle of a fair scientific test
- To understand the meaning of the word 'permeability'
- To design a fair test to investigate the water permeability of different materials
- To draw conclusions about which materials would have been best for lining the bottom and sides of a canal to make it watertight.

National Curriculum

- **Science** Sc1 Scientific Enquiry 1b,2b,2d,2e,2i,2j; Sc3,
- **Materials and Their Properties;** Grouping & Classifying Materials 1a & d
- **History** Victorian Britain 1a

Differentiation & Cross Curricular

- All children will learn that some materials are more permeable than others.
- Most children will learn the principles of a fair test, and which material was most watertight.
- A few children will learn that the most watertight material was the most suitable for lining canals, and why it was chosen by the navigators for this purpose.



Key Vocabulary

Industrial revolution
Navigation
Navvies
Puddle,
Watertight
Permeability

Resources

Sieves,
Measuring containers
Water
Dry and wet clay
Gravel
Sand
Soil
Drip bowls or buckets

Teaching activities

Introduction

Ask the children what they already know about canals and what they are used for. Distribute sheet one and read through it together, discussing any unfamiliar terms. Explain that for the next section, they are going to think like canal engineers and investigate a range of materials to establish their permeability to water.



Activities

Show the class the equipment that is available, & discuss with the class how they will design a fair test to investigate the relative permeabilities of the different materials. What they will keep the same, what they will vary, and what would they measure? (Ensure that they think about pouring the same amount of water through each substance, and also timing the speed with which it passes through). From this write their suggestions on the board.

Ask the children to carry out their investigation making note of their findings as they progress. They can now write their own results chart showing which material they have tested and how they made it a fair test.

Plenary

Ask the children to report back their findings and note these on the board. What conclusions can they draw? Some materials were more permeable than others. Air bubbles between materials means greater permeability. Which material would best line a canal? How do their findings relate to what they read on the sheet about navvies, and how they worked?