Mansfield and Pinxton Railway

Keeping the Mansfield and Pinxton line on track

LO
LESSON OVERVIEW

In this lesson pupils will gain an understanding of speed, velocity and gradient. Through a practical construction activity, they will be able to test a scientific hypothesis by recording the speed at which an object travels on a 'rail track'.

The exercise provides a fun and collaborative learning experience which will help explain the reason why the original line for the Mansfield and Pinxton Railway had to be straightened out to accommodate the faster locomotive trains.

WHAT YOU WILL NEED

M&P_L4TS	Keeping the Mansfield and Pinxton line on track
M&P_L4TN	Keeping the Mansfield and Pinxton line on track
M&P_L4HO1	Gradients Kirkby to Pinxton
M&P_L4HO2	Train line experiment instructions

LEARNING ACTIVITIES

1. Using cardboard, Sellotape and creative problem-solving design a straight railway line and a curved railway line (to depict the Mansfield and Pinxton rail track) to compare a comparative experiment.
2. Using a ball record the speed at which your 'train' travels down the railway track.

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LINKS TO THE CURRICULUM

DESIGN AND TECHNOLOGY

Build structures, exploring how they can be made stronger, stiffer and more stable.

Key Stage 2

Design

Use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose, aimed at particular individuals or groups.

SCIENCE

Setting up simple practical enquiries, comparative and fair tests.

Making systematic and careful observations and, where appropriate, taking accurate measurements using standard units, using a range of equipment, including thermometers and data loggers.

Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions.

Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts, and tables.

Reporting on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions.

Taking measurements, using a range of scientific equipment, with increasing accuracy and precision, taking repeat readings when appropriate.

MATHEMATICS

Upper Key Stage 2

Pupils connect tenths to place value, decimal measures and to division by 10.

Pupils should be taught to measure, compare, add and subtract: lengths (m/cm/mm); mass (kg/g); volume/capacity (l/ml).

Estimate and read time with increasing accuracy to the nearest minute; record and compare time in terms of seconds, minutes and hours; use vocabulary such as o'clock, a.m./p.m., morning, afternoon, noon and midnight. Know the number of seconds in a minute and the number of days in each month, year and leap year. Compare durations of events (for example to calculate the time taken by particular events or tasks).

Geometry

Draw 2-D shapes and make 3-D shapes using modelling materials; recognise 3-D shapes in different orientations and describe them.

Identify horizontal and vertical lines and pairs of perpendicular and parallel lines.

Pupils connect decimals and rounding to drawing and measuring straight lines in centimetres, in a variety of contexts.

Statistics

Pupils should be taught to:

- Interpret and present data using bar charts, pictograms and tables.
- Solve one-step and two-step questions (for example, 'How many more?' and 'How many fewer?') using information presented in scaled bar charts and pictograms and tables.

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Lower Key Stage 2

Number Fractions

Pupils should connect hundredths to tenths and place value and decimal measure.

Measurement

Estimate, compare and calculate different measures, including money in pounds and pence.

Pupils build on their understanding of place value and decimal notation to record metric measures, including money.

Statistics

Interpret and present discrete and continuous data using appropriate graphical methods, including bar charts and time graphs.

Solve comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other graphs.

Upper Key Stage 2

They continue to use number in context, including measurement. Pupils extend and apply their understanding of the number system to the decimal numbers and fractions that they have met so far.

Measurement

Pupils should be taught to:

- Convert between different units of metric measure (for example, kilometre and metre; centimetre and metre; centimetre and millimetre; gram and kilogram; litre and millilitre).
- Use all four operations to solve problems involving measure (for example, length, mass, volume, money) using decimal notation, including scaling.