

TEACHER NOTES

The Power of Steam!

Materials all change at the Isle of Wight Steam Railway



Contextual Summary

This resource is for lower key stage 2 students as an introduction to how materials change in the railway environment. The resource links to upper/lower key stage 2 topics relating to the states of matter and how matter changes when heated, etc.

It allows students who visit Isle of Wight Steam Railway to engage with the scientific concepts and the engineering aspects of these within the railway environment.

Students can explore the steam elements of the locomotive and how the water changes into steam, identifying the basic elements of the process. They can see the water being added at the station, witness the coal fire being stoked, and the resultant expansion of the steam being harnessed to provide traction.

Task Implementation

This task can be introduced to students before their visit to Isle of Wight Steam Railway; it would be particularly useful if they have done some basic work on heating/cooling and the effects of heating on water or fuel. Teachers could show them a basic steam engine diagram or animation ahead of the visit.

When on site at the railway, students can then complete the questions on the sheet as they move around the venue. This will focus students' attention on the key areas for learning.

Ability Levels

There is just one version of this resource intended for mixed ability at lower key stage 2. It is a fairly quick and simple resource for basic engagement with the water/heat/steam process. However, teachers of other ability groups can adapt this resource accordingly. There are versions of this resource for upper key stage 2 that could be used for stretch and challenge.

Key skills practised in this unit:

- ▶ Understanding the properties of materials and how they change
- ▶ How forces are created using heat
- ▶ How energy is created

Relationship to Curriculum

The above skills are required to be taught and practised as per the 2014 National Curriculum, for upper key stage 2 Science, and the Curriculum for Excellence; therefore this resource is a foundation for those skills.

SUBJECT

Science

UNIT

States of Matter

OPPORTUNITIES FOR USE

- ✓ Pre-Visit
- ✓ On-Site Activity
- ✗ Post-Visit
- ✗ Peripheral Task



40 - 60 Mins

APPLICABILITY



Lower KS2

P3 - P5

CURRICULUM / SYLLABUS

- ✓ National Curriculum 2014
- ✓ Curriculum for Excellence

Applies to Resource number

101071

Learning Opportunities

Pre-Visit

Students could learn the basics of heating and cooling, and the effects of these on materials, to allow them to engage with the resource at Isle of Wight Steam Railway.

During the Visit

Completion of Science lower key stage 2 States of Matter/Changing Materials at Isle of Wight Steam Railway resource linked to this document:

The Power of Steam!

Resource ID: **101071** (mixed ability)

Post Visit

Follow-up tasks could include:

- ▶ Class discussion, Q&A etc. of how they saw the water become steam, and how they think this powered the train
- ▶ Completion of labelled diagrams, PowerPoint slides, or animations showing these examples
- ▶ Finding other examples of where water becomes steam in the everyday world

Enrichment Opportunities

This resource allows students to see the process in action, in situ, and enables them to ask questions to enhance their understanding. It is hoped that they will be able to gain a fuller, more hands-on experience.

Learning Outcomes

Students will be able to demonstrate an understanding of how water is converted into steam through burning fuel, and then harnessed to move the locomotive and train at Isle of Wight Steam Railway. They will be able to understand that steam trains need water, fuel and fire to be able to move, and that this is a complex process.

See Also...

Other resources at Isle of Wight Steam Railway relevant to this age group include:

101113	English	Review and comment
101192	English	Understanding railway texts
101131	History	Placing railway events in chronological order
101302	History	The past in the present
101161	Maths	Applying simple maths to the railway
101041	Science	Force

For further details visit www.edudest.info and click:

- ▶ *Resource Finder* - to locate specific resources identified above
- ▶ *Venue Finder* - to learn more about education at this venue
- ▶ *Subject Finder* - to find other relevant Isle of Wight venues

