

# TEACHER NOTES

## The Power of Steam!

Materials all change at the Isle of Wight Steam Railway



### Contextual Summary

This resource is for upper key stage 2 students who are covering 'Properties and Changes of Materials' in Year 5 as part of the compulsory science element of the National Curriculum.

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. 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 are 3 versions of this resource intended for low, middle and high ability at upper key stage 2. Teachers can adapt these resources further if required. There are versions of this resource for key stage 3 that could be used for stretch and challenge, and a mixed ability version for lower key stage 2 that could be adapted for SEN.

### 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 National Curriculum 2014, for upper key stage 2 SCIENCE, and the Curriculum for Excellence.

#### SUBJECT

Science

#### UNIT

Properties & Changes of Materials

#### OPPORTUNITIES FOR USE

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



45 - 60 Mins

#### APPLICABILITY



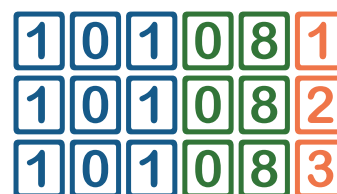
Upper KS2

P6 - P7

#### CURRICULUM / SYLLABUS

- ✓ National Curriculum 2014
- ✓ Curriculum for Excellence

Applies to Resources numbered:



## 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 most effectively.

### During the Visit

Completion of Science KS2 Properties and Changes of Materials / Changing Materials at Isle of Wight Steam Railway resource linked to this document:

*The Power of Steam!*

Resource ID: **101081** (low ability), **101082** (mid ability), **101083** (high 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 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:

<b>101022</b>	English	10 questions to ask at the railway
<b>101111</b>	English	Review and comment
<b>101182</b>	English	Understanding railway texts
<b>101202</b>	English	Comprehension of information
<b>101132</b>	History	Railway events in chronological order
<b>101232</b>	History	Investigate the railway!
<b>101141</b>	Maths	Applying mental maths to the railway
<b>101151</b>	Maths	Interpreting railway data
<b>101051</b>	Science	Forces

For further details visit [www.edudest.info](http://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

