

# TEACHER NOTES

## Motion, Distance, Time & Force

### Contextual Summary

This resource is for key stage 3 students who are covering the topic 'Motion and Force' as part of the compulsory science element of the 2014 National Curriculum.

It allows students who visit Isle of Wight Steam Railway to engage with the scientific aspects within this environment.

Students can use formulae to work out the average speed of the train. They will also analyse which forces are in action on the railway, commenting on balance and impact of forces on the locomotive in action.

Students will present their observations and data using appropriate methods, including tables and graphs, showing how they have used and devised simple equations.

### Task Implementation

This task can be introduced to students before their visit to Isle of Wight Steam Railway; before their visit students should learn the formula  $\text{speed} = \text{distance} \div \text{time}$ . Students should also learn how to convert this into kilometres per hour. Students should also learn how to draw distance time graphs, as this resource practises all of these techniques.

When on site at the railway, students can then complete their practise and answer 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 2 versions of this resource intended for lower and higher abilities in key stage 3. However, the resource can be adapted by teachers for other ability groups or younger students for stretch and challenge if required.

### Key skills practised in this unit:

- ▶ Present observations and data using appropriate methods, including tables and graphs
- ▶ Use and devise simple equations
- ▶ Identifying forces
- ▶ Drawing conclusions from their observations at the railway

### Relationship to Curriculum

The above skills are required to be taught and practised as per the National Curriculum 2014, for key stage 3, and the Scottish Curriculum for Excellence.



#### SUBJECT

Science

#### UNIT

Motion & Force

#### OPPORTUNITIES FOR USE

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



45-60 Mins

#### APPLICABILITY



KS3



S1 - S3

#### CURRICULUM / SYLLABUS

- ✓ National Curriculum 2014
- ✓ Curriculum for Excellence

Applies to Resource number



## Learning Opportunities

### Pre-Visit

Before the visit, students will need to know about force diagrams, specifically how the size and direction of a force is represented by arrows. Students should learn the formula  $\text{speed} = \text{distance} \div \text{time}$  before they visit, and should also learn how to convert this into kilometres per hour.

Students should also learn how to draw distance time graphs.

### During the Visit

Completion of Science key stage 3 Isle of Wight Steam Railway resource linked to this document:

*Motion, distance, time and force at the Railway*

Resource ID: **101061** (higher ability), **101062** (lower ability),

### Post Visit

Follow-up tasks could include:

- ▶ Class discussion of their overall findings at Isle of Wight Steam Railway
- ▶ Completion of labelled diagrams, PowerPoint slides, or animations showing these examples

## Enrichment Opportunities

This resource enables students to practise and see their calculations in action, in situ, which will enhance their understanding and compound prior learning.

## Learning Outcomes

Students will be able to practise and present observations and data using appropriate methods, including tables and graphs, such as force diagrams, whilst using and devising simple equations.

## See Also...

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

<b>101011</b>	English	10 questions to ask at the railway
<b>101112</b>	English	Review and comment
<b>101171</b>	English	Understanding railway texts
<b>101381</b>	English	Comprehension of information
<b>101294</b>	History	Changes on the railway over time: Train Story
<b>101133</b>	History	Placing events in chronological order
<b>101583</b>	History	Restoring the railway
<b>101159</b>	Science	States of Matter

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

