

TEACHER NOTES

Physics

Motion & Forces, Working Scientifically

Contextual Summary

This resource is for students at key stage 4 and relates to the 'Motion and Forces' part of the Science National Curriculum, focusing on the use of force diagrams to represent the forces acting on the ferry.

The resource tasks link to their journey on board the Red Funnel vehicle ferry. The task requires students to draw force diagrams with labelled force arrows.

Tasks are designed to appeal to students at key stage 4 working at lower or higher abilities.



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RED FUNNEL

SUBJECT

Physics

UNIT

Motion & Force

OPPORTUNITIES FOR USE

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

Peripheral Task

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Students will complete a *Force Diagram* worksheet that relates to their journey on the Red Funnel vehicle ferry. Students will add labelled force arrows to force diagrams then draw a story board of force diagrams to represent their journey. Some students can then calculate resultant force and direction of travel.

Ideally, teachers will have introduced students to the concept of forces and motion prior to the trip.

Ability Levels

There are two variants of this resource for students of higher and lower ability in key stage 4.

Key skills practised in this unit:

- ▶ Carrying out calculations
- ▶ Application of knowledge
- ▶ Manipulating data into a diagrammatic form
- ▶ Working scientifically
- ▶ Planning scientific enquiry
- ▶ Recognising and controlling variables
- ▶ Taking measurements
- ▶ Recording data.

Relationship to Curriculum

This resource links to the required teaching as specified by the various exam boards at key stage 4.



S4-S5

CURRICULUM / SYLLABUS

- ✓ All exam boards

Applies to Resources numbered:

1	0	7	1	0	1
1	0	7	1	0	2

Learning Opportunities

On-Board & Post-Visit

Students complete the Science resource linked to this teacher note:

Resource ID:

107101 (KS4 low-mid ability)

107102 (KS4 mid-high ability)

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the Key Stage 4 national curriculum and examination board criteria.

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- ▶ The worksheets and experiences will enable students to have a greater understanding of adding vector quantities allowing them to relate to other unfamiliar examples.
- ▶ On returning to school students can carry out an investigation about hull shape and movement through water.

Learning Outcomes

- ✓ Students will draw force diagrams to represent balanced and unbalanced forces.
- ✓ They will calculate resultant force and direction of movement.
- ✓ Students will plan an investigation to determine how hull shape affects the movement of a boat through water.

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