

Ferry Forces: Maintaining the Balance!

Balanced and Unbalanced Forces

Student Introduction

- ▶ This activity is all about understanding forces in relation to ferries, and how they change throughout the phases of your ferry journey.
- ▶ You will also think about how influences such as wind and tides affect the ferry.



Q1 You have just boarded the ferry to the Isle of Wight, and it is currently stationary and floating in the water.

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- ▶ Add forces arrows to the diagram opposite to show why the ferry is stationary but floating.
- ▶ Label the forces.



Explain if they are balanced or unbalanced, give reasons why:

Q2

The ferry begins its journey to the Isle of Wight. This will take around an hour.

- ▶ Draw the forces which are now acting upon the ferry.



Are the forces balanced or unbalanced? Explain your reasons why.

Resultant Forces



To calculate a **resultant force**, you must find the **difference** between the forces.

If the forces are **balanced**, the resultant forces will be **zero**.

If the forces are **unbalanced**, something must happen, for example the ship moves in a particular direction.

Q3

In the table below **calculate the resultant forces** and describe in your own words what you would expect to happen to the boat as a result:

Force	Force	Resultant Force	What Happens?
300N →	 RED FUNNEL	← 50N	
100N →	 RED FUNNEL	← 100N	

Q4

If, during the crossing, the **wind speed** were to pick up in the direction that the ferry was moving, explain how this would affect the ferry's speed.

Add force arrows to the ferry picture on the right to demonstrate your answer.



Q5

How might the **tides** (in/out) affect the way in which the ferry travels?

Add force arrows to the ferry picture on the right to demonstrate your answer.



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Q6

The ferry docks and you join your coach. Add and label the forces acting upon the coach as it leaves the ferry.



Are the forces balanced or unbalanced? Explain your answer.

