

## Forces

### Task 1: What do forces do?

Complete this table to explain what different forces do.

Force	What it does
gravity	
friction	
upthrust	
air resistance	
driving force	
support force	

### Task 2: Interaction pairs

Forces always come in pairs. We call these pairs **interaction pairs**.

Complete these examples to describe some interaction pairs. The first one has been done for you.

You might find it easier to draw a picture for each one. Think about which part of each object interacts and which way the force acts.

**1** A book pushes down on a table. The table pushes up on the book.

**2** A boy's finger pushes a key on a keyboard. The key \_\_\_\_\_  
\_\_\_\_\_

**3** A footballer's boot pushes on a football. The football \_\_\_\_\_  
\_\_\_\_\_

**4** A diver pushes on a diving board. The diving board \_\_\_\_\_  
\_\_\_\_\_

### Task 3: Describing the effect of forces

Complete these sentences to describe the effect of forces. Sometimes there are words missing. Sometimes you must choose the right word from the words given in bold.

#### Experiment 1

When I **pull/push** the ends of a piece of elastic apart, the elastic \_\_\_\_\_ .

This \_\_\_\_\_ force **deforms/fixes** the elastic.

If I **double/halve** the \_\_\_\_\_ force on the rubber band, the extension of the rubber band doubles. This is \_\_\_\_\_ law.

#### Experiment 2

When I drop a piece of paper, it \_\_\_\_\_ down because \_\_\_\_\_

attracts it to earth. The paper falls because it is **unsupported/supported**.

The paper feels a force pushing up from the air. This is called \_\_\_\_\_

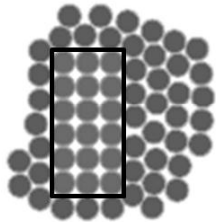
Air resistance is an example of a \_\_\_\_\_ force.

On the Moon, paper falls **faster/slower** than on Earth. This is because gravity is \_\_\_\_\_ on the Moon than on Earth.

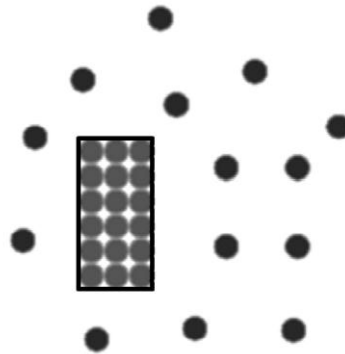
#### Experiment 3

When I roll a ball along the bench, it **speeds up/slows down**. This is because of a force called **friction/gravity**. **Friction/Gravity** is greater if the surface of the bench is **rough/smooth**. The ball changes speed because the forces on it are **balanced/unbalanced**.

### Explanation of drag forces



Solid moving through a liquid



Solid moving through a gas

To explain why drag forces arise, you need to think about the arrangement of particles.

Look at the diagrams above.

- 1 Do you think it is easier for the solid object to move through liquid or gas?  
Circle your answer.

**liquid**

**gas**

- 2 Explain your answer using the key word particles.

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### Task 4: Equilibrium

When forces acting on an object are balanced, the object is in equilibrium. This means the two forces are equal.

- 1 A book is resting on a table. It is stationary. Draw force arrows on the diagram to show it is in equilibrium.



2 Read the descriptions of forces acting. Tick the ones you think are in equilibrium.

Description	In equilibrium?
A girl sitting on a chair.	
A mass hanging from a spring, not moving.	
A car accelerating (increasing in speed).	
A picture hanging on a wall.	

### Task 5: Unbalanced forces

Look at the picture of the car. The arrows represent the driving force and resistive force acting on the car.



1 The driving force is bigger. What effect do you think this has on the car's movement?

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2 Explain what you think would happen if the resistive force was increased (e.g., if the driver applied the brakes).

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