

## Year 7 Forces Revision

1. List four examples of a pushing force.

Many possible answers : air resistance, buoyancy, pushing a shopping trolley, kneading dough, push a door open, typing on keyboard etc.

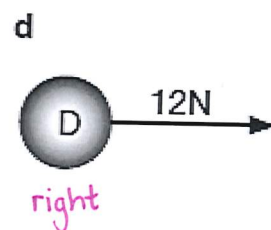
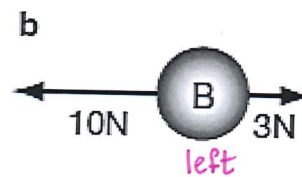
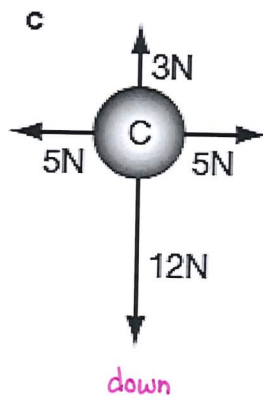
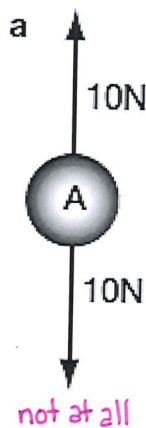
2. Explain the difference between a contact force and a non-contact force. Give two examples of each type.

A contact force requires the two objects to be physically touching each other when the force is applied. Examples: Hitting a cricket ball with a bat, air resistance acting on a parachute. Non-contact forces do not require physical contact between the objects. Examples: Magnet attracting a paperclip, gravity acting on a ball that has been thrown in the air.

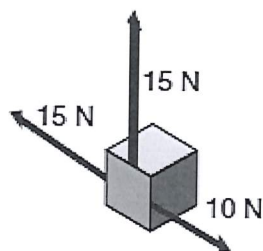
3. Identify whether the forces are balanced or unbalanced in each of the following cases.

- a) A Formula 1 car accelerating from the starting grid. **unbalanced**
- b) A cyclist braking. **unbalanced**
- c) A satellite orbiting the Earth. **unbalanced**
- d) A person resting in an armchair. **balanced**
- e) A truck travelling at a constant speed on straight road. **balanced**

4. Use the diagrams below to identify which direction (up, down, left, right or not at all) each object shown will move when acted upon by the forces shown.



5. The total force acting on an object can be found by comparing the overall horizontal and overall vertical forces. A box is acted upon by three forces as shown below. Which way will the box move as a result of these forces?



- a) Upwards and to the left
  - b) Upwards and to the right
  - c) Downwards and to the left
  - d) Downwards and to the right
6. Identify whether the forces of thrust and drag on an aircraft are balanced in the following cases. If they are not balanced, state which is greater (thrust or drag).
- a) The aircraft speeds up. *unbalanced, thrust greater*
  - b) The aircraft slows down. *unbalanced, drag greater*
  - c) The aircraft cruises at constant speed. *balanced*
7. Analyse the force diagram in Figure 7.5.3. below

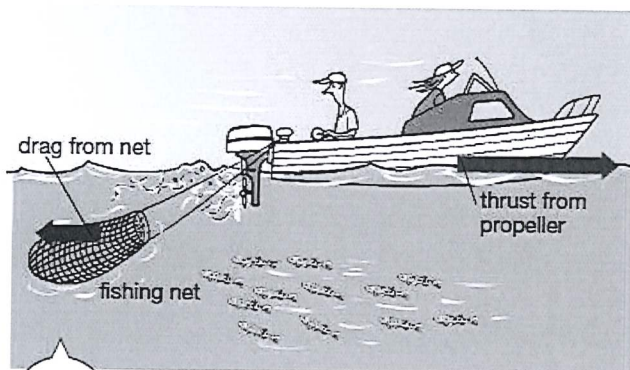




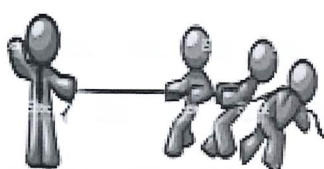
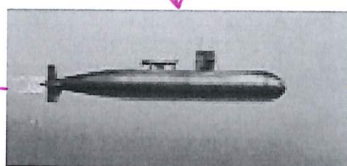




Figure 7.5.3

- a) State in which direction the boat is moving. *To the right (In the direction of the thrust)*
- b) Predict what will happen to the speed of the boat when many fish have been caught in the net. *The boat will slow down. (Speed will decrease)*
- c) If the boat is travelling at a constant speed, compare the size of the thrust and drag forces acting on the boat.  
*The size of the thrust and drag forces will be equal/the same.*

8. For the objects in the pictures below:

- Draw force arrows on the diagram.
- Label the arrow with the size of the force.
- State the direction of the resultant force.
- Calculate the resultant force.

<p>A stationary duck with a weight of 50N sitting on a lake.</p> <p>resultant force = 0N</p> 	<p>A football that has been kicked with a force of 30N that has 20N of air resistance acting on it</p>  <p>resultant force : 10N in direction of kick</p>
<p>A car with 100N pushing it forward, but the brakes are being applied with a force of 110N.</p>  <p>resultant force 10N backwards</p>	<p>Hot air balloon with a weight of 70N travelling at a constant height.</p>  <p>resultant : 0N</p>
<p>A tug of war. The man on the left pulls with a force of 75N. Each of the men on the right pull with a force of 20N <math>3 \times 20 = 60N</math></p>  <p>resultant force : left 15N</p>	<p>A submarine with the weight 10 000N travelling at a constant depth and speed.</p>  <p>drag force = thrust resultant force: 0N</p>
<p>A boy with the weight 50N who has <u>just jumped</u> into the air and is moving up.</p>  <p>resultant force : upwards can not calculate resultant force</p>	<p>A box being pushed along the ground with a force of 10N. The friction force is 8N</p>  <p>resultant force : 2N in direction of push.</p>



9. Recall gravity by selecting the correct term to complete the following sentences.
- a) Gravity is a contact/non-contact force.
  - b) Gravity pulls/pushes objects towards the Earth.
  - c) All objects naturally attract/repel each other.
  - d) Objects fall at different speeds due to their weight/surface area.
10. Name the force that slows an object down as it falls. air resistance
11. The figure below shows three blocks of wood resting on different surfaces. If you were to pull each by its hook, propose which block would move with the least friction and which block would move with the most friction.

