

## Activity 6B The Spinning Coaster



**Skill:** Use a diagram to illustrate and explain a scientific idea

### Materials:

Round coaster (cork)  
Table

### Method

- 1 Spin the round coaster on the table.
- 2 Observe the coaster until it stops spinning.

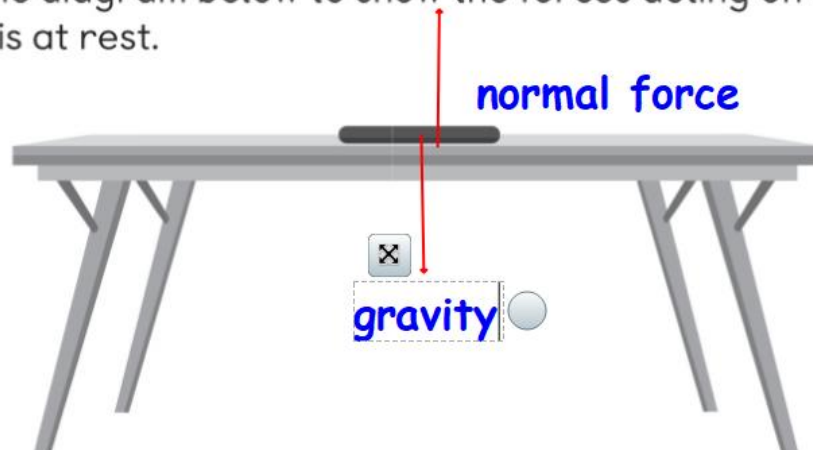
a Why do you think the coaster stops spinning?

As the coaster spins over time, the applied force used to spin the coaster decreases. The coaster stops spinning when the force of friction is greater than the force of the spinning coaster..

b Which forces are acting on the coaster when it is spinning?

gravity, normal force, applied force, air resistance, friction

c Label the diagram below to show the forces acting on the coaster while it is at rest.



Fill in the blanks. Use the following words.

air resistance    applied    balanced    forces  
friction    gravity    normal    pairs  
unbalanced    upthrust    water resistance

There are different kinds of forces acting on us and on objects around us.

Forces always act in pairs.

Two opposing forces are balanced when they are equal in size.

Two opposing forces are unbalanced when one is greater than the other.

friction is a force that resists motion.

applied forces act when we push or pull an object.

air resistance acts between a moving object and the air, opposing gravity and slowing down the fall.

gravity is a force that pulls us towards the centre of the Earth.

water resistance acts between a moving object and the water.

normal force opposes gravity and supports objects on surfaces.

upthrust is another force that opposes gravity. It is exerted by water and prevents ships from sinking to the bottom of the sea.



## Let's Review

- 1 A teacher asks some students to name the force that acts in the opposite direction of motion when two surfaces come in contact.

Gerry says that it is gravity.

Lyn says that it is friction.

Jessica says that it is upthrust.

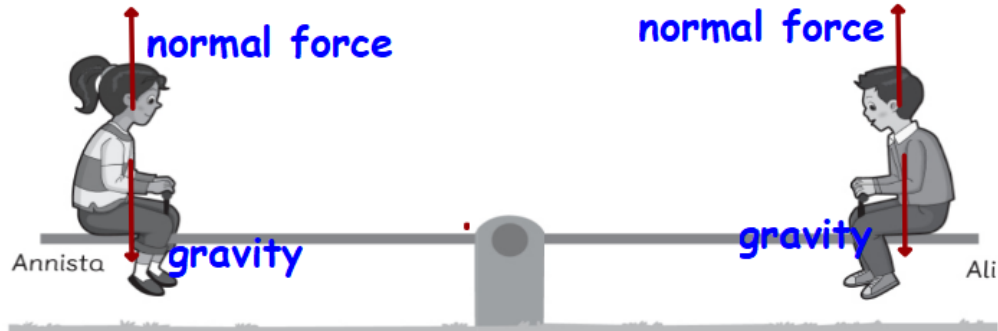
Who is correct? Lyn

- 2 Annista and Ali sit on a see-saw, but it stays stationary.

- a Explain why the see-saw does not move.

The forces are balanced.

- b Use arrows and labels to show the names and directions of forces acting on them.



- 3 Name **two** forces that act in opposite directions.

gravity and upthrust

friction and applied force  
gravity and normal force

- 4 An aeroplane is able to take off and stay in the air. Explain how different forces work to make this happen.



The aeroplane has engines that provide applied force that enables the aeroplane to move forward. Air resistance acts in the opposite direction of movement of the aeroplane. Gravity acts downwards on the aeroplane, while an upward force on the wings of the aeroplane help it to move upwards. As the applied force and upward force are greater than the forces acting on them (air resistance and gravity), this helps the plane fly and stay in the air

- 5 A flying squirrel has a membrane attached from its wrists to its ankles. This allows it to glide through the air. How does the membrane help the squirrel to glide?



**Gravity acts on the flying squirrel. At the same time, air resistance acts against gravity. The membrane acts like a parachute for the flying squirrel. It provides a larger surface area, allowing the flying squirrel to experience greater air resistance. This lowers the speed of the flying squirrel, allowing it to glide through the air.**