

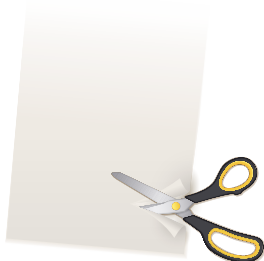
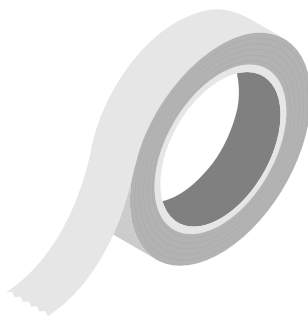
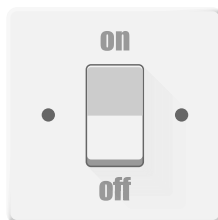


## ACTIVITY CARD 1

You and your group have approximately 5 minutes to read the information on this card and complete the activity.

# FORCE PUSHES AND PULLS

A force is a push or a pull. Nothing can move without a force. Together with your group, can you find 10 examples of pushes and pulls you can see in and around your classroom. Here are some pictures to help you:





## ACTIVITY CARD 2

You and your group have approximately 5 minutes to read the information on this card and complete the activity.

# FORCES

Can you look at the objects on the table and push or pull them and see what effect your pushing or pulling force has.

As a group, decide on the things that forces can cause objects to do.



**Extension:** Draw pictures of the objects on the back of your sheet and try and use an arrow to show the direction of the force you applied in each picture.



### ACTIVITY CARD 3

You and your group have approximately 5 minutes to read the information on this card and complete the activity.

## FRICTION

Friction occurs when two surfaces touch each other.

Can you and your group test friction by pushing a rubber and a plastic pencil sharpener across the table?

Which is easier to push across the desk?

Which has the most friction?

Complete the sentences on your own sheet by crossing out the incorrect word:

*Rough/Smooth surfaces slow things down a lot.*

*Rough/Smooth surfaces don't slow things down as much.*

Extension: Make a list of examples of when friction is helpful (like the grip on the bottom of our shoes).



## ACTIVITY CARD 4

You and your group have approximately 5 minutes to read the information on this card and complete the activity.

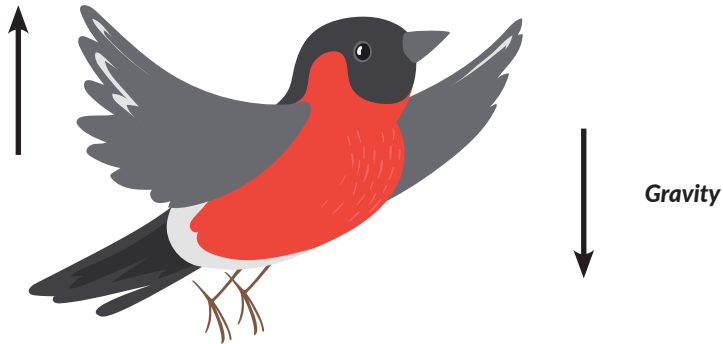
# BEATING GRAVITY

Gravity is an invisible pulling force that pulls everything towards the centre of the Earth. It is what keeps us on the ground and stops us floating about into space.

Can you and your group come up with any ways we can beat gravity?

(Hint: How do birds overcome the force of gravity and stay up in the air? Or how might you beat gravity while you're at Zip World?!)

*The bird's wings push against the air, providing an upward force*



**Extension:** Draw pictures on the back of your sheet to match your descriptions, showing the direction of the forces with arrows if you can.



## QUARRY PRE-VISIT LESSON WORKSHEET 2

### ACTIVITY CARD 5

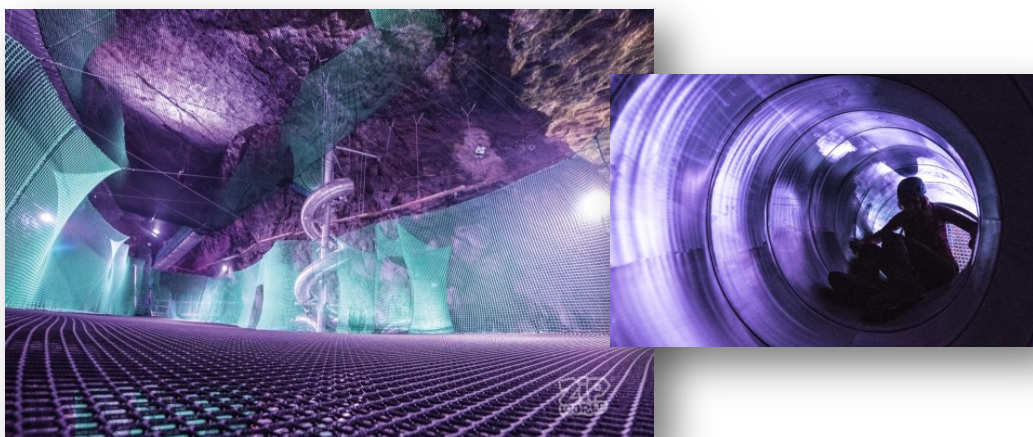
You and your group have approximately 5 minutes to read the information on this card and complete the activity.

# GRAVITY AND FRICTION AT ZIP WORLD

At Bounce Below, you will have the opportunity to zoom down a rather long and fast slide! After you have given yourself a push from the top, gravity will make sure you travel downwards. But friction between your clothes and the slide, as well as resistance from the air, will slow your ride.

If you wore a suit made of sandpaper, would you travel faster or slower down the slide? Why?

Can you think of at least three ways you could limit friction to travel faster down the slide?



**Extension:** Think of three ways your journey down the slide could be slowed down. Write them on the back of your sheet.

## ACTIVITY CARD 6

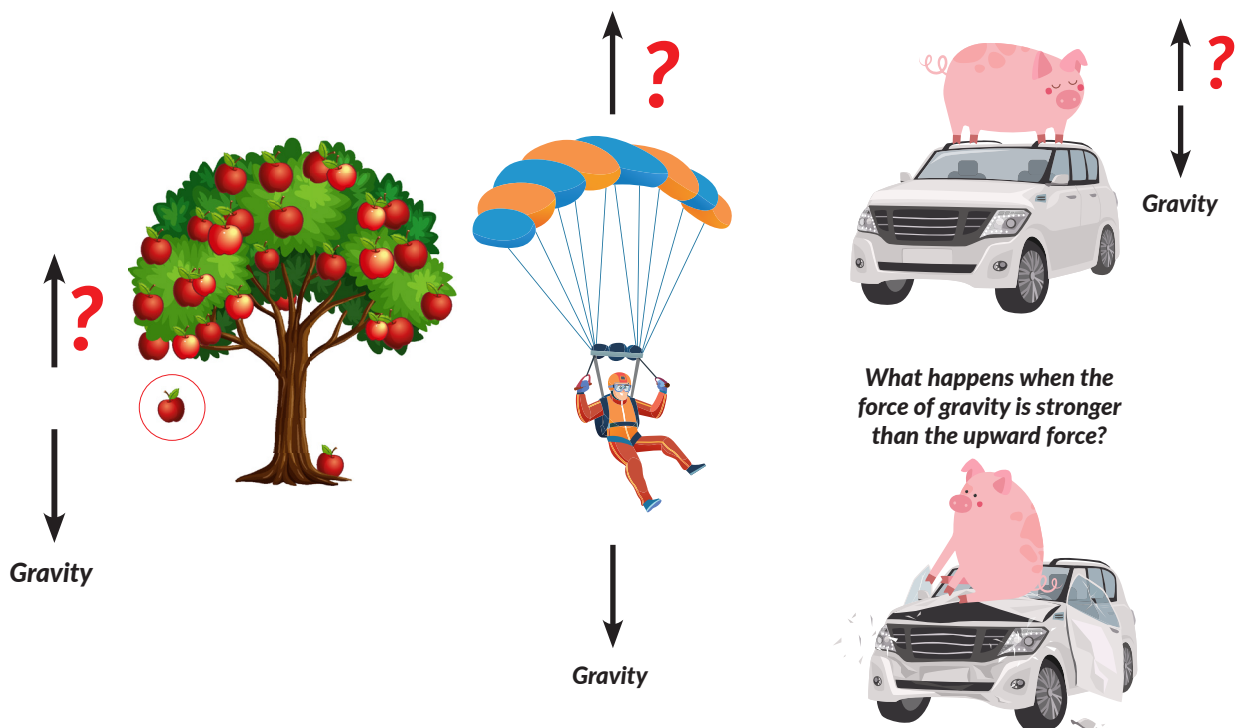
You and your group have approximately 5 minutes to read the information on this card and complete the activity.

# GRAVITY AND OPPOSITE FORCES

Gravity is an invisible force that pulls everything towards the centre of the Earth. It is what keeps us on the ground and stops us floating about into space.

But there is always a force pushing in the opposite direction to gravity (from the air, from water or from the object or ground that the object is touching).

Can you and your group discuss what force is acting against gravity in these pictures?



*What happens when the force of gravity is stronger than the upward force?*

**Extension:** Draw your own diagrams to show gravity (and its opposite force) on the back of your sheet.



## ACTIVITY CARD 7

You and your group have approximately 5 minutes to read the information on this card and complete the activity.

# ELASTICITY AT ZIP WORLD

Some materials stretch when you pull them, or squash when you squeeze them.

If they return back to their original size or shape when the force is removed, they are called **elastic materials** or **elastic objects**.

Look at the objects on your table. Which ones are elastic?

The nets at Zip World are attached with bungee ropes. Elastic materials like these store energy so that they can release it and send you bouncing upwards.

Extension: Look around the classroom, can you see any other objects or materials that are elastic? Make a list on the back of your sheet.

