

Name _____ Date _____

Worksheet: 3.1A

Going to the Moon

In this activity you will make predictions using what you know about gravity, weight and mass.

Fact

The strength of gravity on the Moon is less than the strength of gravity on Earth.

Use this fact to decide whether each of these statements is correct or incorrect.

If a statement is correct, put a tick (✓) after it.

If a statement is incorrect, put a cross (✗) after it.

Statements

- 1 If you go to the Moon, your weight will be less than on Earth. ☐
- 2 If you go to the Moon, your mass will be less than on Earth. ☐
- 3 The same objects will feel heavier on the Moon than on Earth. ☐
- 4 You could throw a ball higher on the Moon than on Earth. ☐
- 5 Your rocket will need more force to take off from the Moon than from Earth. ☐

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Worksheet: 3.1B

Weight and mass on the Moon

In this activity you will work out the values of weights and masses.

Facts

The strength of gravity on Earth is 10 N/kg

The strength of gravity on the Moon is 2 N/kg

The equation for weight, gravity and mass is: $\text{gravity in N/kg} \times \text{mass in kg} = \text{weight in N}$

Use these facts to help with these calculations.

Calculations

- 1 Calculate the weight of a 55 kg person on Earth.

_____ N

- 2 Write down the mass of a 55 kg person on Earth.

_____ kg

- 3 Calculate the weight of a 55 kg person on the Moon.

_____ N

- 4 Write down the mass of a 55 kg person on the Moon.

_____ kg

- 5 A television camera has a weight of 20 N on the Moon. Calculate its mass.

_____ kg

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Worksheet: 3.1C

Explaining changes on the Moon

In this activity you will make and explain predictions using what you know about gravity, weight and mass.

Fact

The strength of gravity on the Moon is less than the strength of gravity on Earth.

Use this fact to decide whether each of these statements is correct or incorrect.

If a statement is correct, put a tick (✓) after it.

If a statement is incorrect, put a cross (✗) after it.

Then give a reason for each of your choices.

Statements

- 1 If you go to the Moon, your weight will be less than on Earth. ☐

Reason: _____

- 2 If you go to the Moon, your mass will be less than on Earth. ☐

Reason: _____

- 3 The same objects will feel heavier on the Moon than on Earth. ☐

Reason: _____

- 4 You could throw a ball higher on the Moon than on Earth.

☐

Reason:

- 5 Your rocket will need more force to take off from the Moon than from Earth.

☐

Reason:

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Worksheet: 3.2A

Ideas of how the Solar System began

In this activity you will think about how the Solar System was formed.

- 1 Scientists have an idea about how the Solar System was formed.

What is this idea called?

Tick (✓) **one** box.

an hypothesis ☐

a conclusion ☐

a model ☐

a result ☐

- 2 Scientists can use a computer model to test ideas about the formation of the Solar System.

What is a model?

Tick (✓) **one** box.

An experiment that is difficult to do accurately. ☐

A conclusion from a difficult experiment. ☐

A way to represent something that is difficult to see. ☐

A prediction that is difficult to test. ☐

- 3 Sometimes a model does not work perfectly.

What is this called?

Tick (✓) **one** box.

a calculation ☐

a limitation ☐

a prediction ☐

an experimentation ☐

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Worksheet: 3.2B

Supporting or contradicting ideas

In this activity you will consider whether evidence supports or contradicts an hypothesis.

Scientists think that the Solar System was formed from a cloud of spinning dust and gas.

Decide how each piece of evidence either supports or contradicts this hypothesis.

After each piece of evidence, write 'supports' or 'contradicts'.

Evidence

- 1 All the planets orbit the Sun in the same direction.

- 2 Venus and Uranus spin on their axes in a different direction to other planets.

- 3 All the planets and most of their moons are in the same plane.

- 4 Scientists can see other stars forming in clouds of dust and gas.

- 5 All the planets seem to be about the same age.

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Worksheet: 3.2C

Why use models?

In this activity you will consider why scientists use models.

- 1 Give two reasons why scientists use models to study how the Solar System formed.

1 _____

2 _____

- 3 Many models have limitations.

Explain what is meant by a limitation.

- 4 Give one other example of a model being used to study the Solar System.

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Worksheet: 3.4A

What are tides?

In this activity you will consider tides and what causes tides.

- 1 Complete the sentences using words from the list. Each word can be used once, or not at all.

Earth Sun gravity tidal Moon

- a The forces that cause tides are called _____ forces.
- 2 The forces that cause tides come from the _____ and the _____.
- 3 The forces are pulling forces referred to as _____.
- 4 Read the statements and write 'true' or 'false' after each one.
- a A tide is the change in depth of the ocean every day.
- _____
- 5 A tide is the change in the height of the land above sea level every day.
- _____
- 6 The time between high tide and the next high tide is six hours.
- _____

Name _____ Date _____

Worksheet: 3.4B

What are tidal forces?

In this activity you will think about tidal forces and the effects of tidal forces.

- 1 a** Name two objects that cause tidal forces on Earth.

1 _____

2 _____

- b** Describe two effects of tidal forces on Earth.

1 _____

2 _____

- c** Could the Earth cause tidal forces on the Moon?

Circle one answer.

yes

no

Explain your answer.

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Worksheet: 3.4C

Changing tidal forces

In this activity you will consider tidal forces and what affects the size of tidal forces.

- 1 Explain what causes the **largest** tidal forces on Earth to happen. Draw a labelled diagram as part of your answer.

- 2 The planet Jupiter has four large moons. These moons cause tidal forces on Jupiter.
Explain what will happen to the tidal force on Jupiter when all four large moons are in line and on the same side of Jupiter.

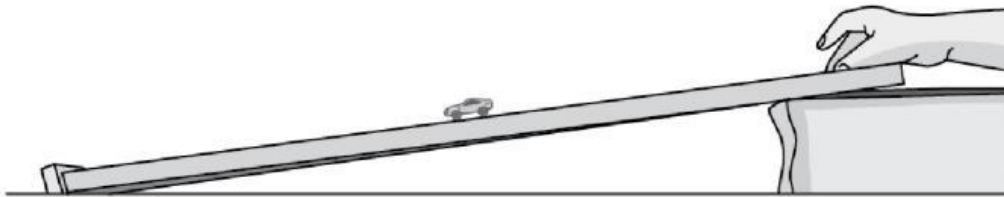
- 3 Sometimes, a comet comes very close to a planet. Part of a comet is made from rocks. When this happens, tidal forces from the planet can cause the comet to break apart into many smaller rocks. Suggest why tidal forces could cause a comet to break apart.

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Worksheet: 3.6A

Getting faster

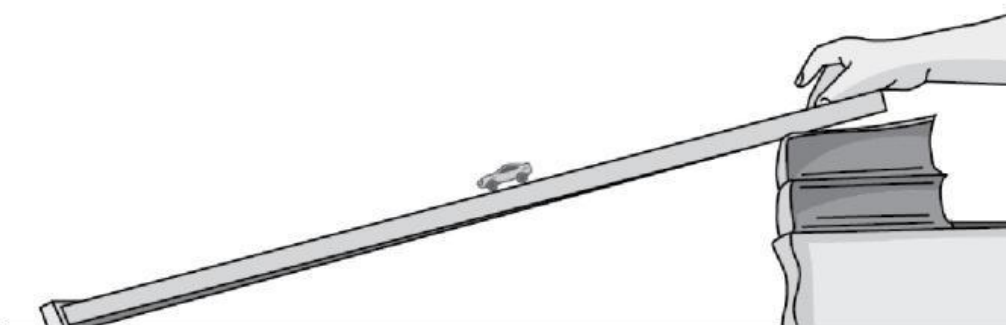
Marcus makes a ramp using a piece of wood and some books. He puts a toy car at the top of the ramp and releases it.



Complete these sentences using energy stores or transfers.

- 1 When Marcus lifts the toy car up onto the ramp, he gives the car _____ energy.
- 2 As the car goes down the ramp, _____ energy gets changed to _____ energy.
- 3 When the car gets to the bottom of the ramp, the car has the most _____ energy.

- 4 Marcus makes the ramp higher by adding more books.



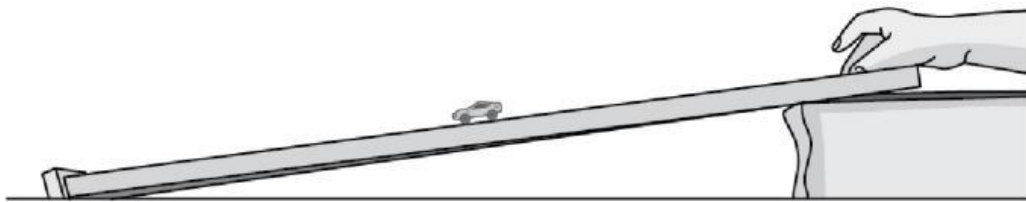
Marcus predicts that the car will go faster on the higher ramp. Explain Marcus's prediction using ideas about energy changes.

Name _____ Date _____

Worksheet: 3.6B

Moving down a ramp

Marcus makes a ramp using a piece of wood and some books. He puts a toy car at the top of the ramp and releases it.



- 1 Explain what happens to the toy car after it is released. Use ideas about energy in your answer.

- 2 Marcus wants the car to go faster down the ramp. Describe what change he could make so the car will go faster.

Explain your answer. _____
