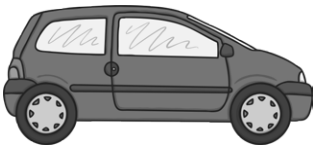
Name: Date:

25 total marks

Science Assessment Year 5: Paper B: Forces

Forces Acting on Objects

1. Label these diagrams to say whether the forces are balanced or imbalanced:



A car accelerating

.....

A woman skydiving

.....

A girl sitting on a chair

.....

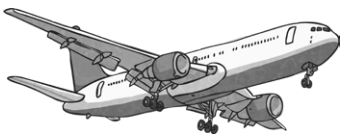
Bicycle stopped at traffic lights

.....

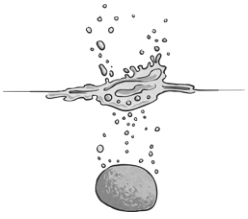
2 marks

2. Label **gravity** and **one other force** on these two diagrams, showing the directions of these forces using arrows.

An aeroplane flying



Dropping a stone in water



3 marks

Total for this page

Mechanisms

3. Name these three mechanisms that make things easier to do as they lessen the force needed to be used.

…… …… ……

2 marks

Friction

4. Why do your hands feel hot when you rub them together?

……

1 mark

5. Circle the correct word in each box:

Friction is a [force / weight] that happens between two surfaces rubbing together. Friction always acts in the [same / opposite] direction to the moving object, and always [slows down / speeds] up a moving object. Smooth surfaces like ice create [some / no] friction.

2 marks

6. Tick all the pictures that show something where friction is a **good** thing:

 Skiing ☐	 Stopping a bike ☐	 Climbing a rope ☐	 Ice skating ☐
 A car going round a bend ☐	 Water slide ☐	 Running ☐	 Catching a rugby ball ☐

4 marks

Total for this page

Forces in Air

7. If you drop a beach ball and a cannon ball on **Earth** at the same time:

a) Which will fall to the ground first?

.....

1 mark

b) Explain why this happens?

.....

.....

1 mark

8. If you drop a beach ball and a cannon ball on **the Moon** at the same time:

a) Which will fall to the ground first?

.....

1 mark

b) Explain why this happens?

.....

.....

1 mark

Air Resistance Investigation

9. If we want to investigate whether the size of a parachute affects the speed in which an object falls, what is the **Independent Variable**?

.....

1 mark

10. What would be the **Dependent Variable** in this investigation?

.....

1 mark

11. Name 2 **Controlled Variables** for this investigation.

.....

1 mark

Total for this page

12. Here are the results:

Size of parachute	1st drop (in seconds)	2nd drop (in seconds)	3rd drop (in seconds)
4cm x 4cm	1.32	1.22	1.50
8cm x 8cm	2.50	2.66	5.02
16cm x 16xm	3.32	1.33	3.45
32cm x 32cm	4.32	4.94	4.11

Why have the group done each drop 3 times?

.....

1 mark

13. Which results look like anomalies?

.....

1 mark

14. What could be the reason for these anomalies?

.....

1 mark

15. If we dropped the 32cm x 32cm parachute a 4th time what result would you predict?

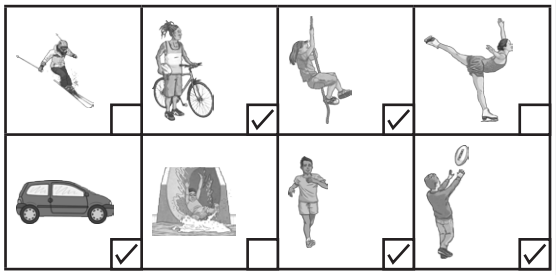
.....

1 mark

Total for this page

Answer Sheet: Science Assessment Year 5: Paper B:
Forces

<table>
<tr><th>question</th><th>answer</th><th>marks</th><th>notes</th></tr>
<tr><td colspan="4">1. Label these diagrams to say whether the forces are balanced or imbalanced.</td></tr>
<tr><td></td><td>
<table>
<tr><td>  </td><td>  </td></tr>
<tr><td>Imbalanced</td><td>Balanced</td></tr>
</table>
<table>
<tr><td>  </td><td>  </td></tr>
<tr><td>Balanced</td><td>Balanced</td></tr>
</table>
</td><td>2</td><td>0 marks for 1 correct
1 mark for 2 or 3 correct
2 marks for 4 correct</td></tr>
<tr><td colspan="4">2. Label gravity and one other force on these two diagrams, showing the directions of these forces using arrows.</td></tr>
<tr><td></td><td>1 mark for both Gravity labels and arrow with these things:
• Gravity labelled correctly
• Arrows pointing straight down.
2nd Mark for:
• For Air resistance labelled horizontally towards the aeroplane.
3rd Mark for:
• Water resistance/buoyancy labelled with an upwards arrow touching the stone.</td><td>3</td><td></td></tr>
<tr><td colspan="4">3. Name these three mechanisms that make things easier to do as they lessen the force needed to be used.</td></tr>
<tr><td></td><td>
<table>
<tr><td>  </td><td>  </td><td>  </td></tr>
<tr><td>Lever</td><td>Pulley</td><td>Gear/s</td></tr>
</table>
</td><td>2</td><td>0 marks for 1 correct
1 mark for 2 correct
2 marks for 3 correct</td></tr>
<tr><td colspan="4">4. Why do your hands feel hot when you rub them together?</td></tr>
<tr><td></td><td>1 mark for mention of both:
• Friction
• Creates heat</td><td>1</td><td></td></tr>
</table>

question	answer	marks	notes
5. Why do your hands feel hot when you rub them together?			
	Friction is a **FORCE** that happens between two surfaces rubbing together. Friction always acts in the **OPPOSITE** direction to the moving object, and always **SLOWS DOWN** a moving object. Smooth surfaces like ice create **SOME** friction.	2	0 marks for 1 correct 1 mark for 2 or 3 correct 3 marks for 4 correct
6. Tick all the pictures that show something where friction is a good thing.			
		4	0 marks for 1 correct 1 marks for 2 or 3 correct 2 marks for 4 or 5 correct 3 marks for 6 or 7 correct 4 marks for all 8 correct Ticks or positive notation need to be present, a cross or a blank box is sufficient for the others.
7. If you drop a beach ball and a cannon ball on Earth at the same time:			
a	The cannon ball	1	
b	Air resistance	1	
8. If you drop a beach ball and a cannon ball on the Moon at the same time:			
a	Both land at the same time	1	
b	1 mark for answers that include any of the following: • No air resistance on the moon • There is no air on the moon	1	
9. If we want to investigate whether the size of a parachute affects the speed in which an object falls, what is the independent variable?			
	1 mark for: • The size of the parachute	1	
10. What would be the dependent variable in this investigation?			
	1 mark for: • Time taken for parachute to fall to the ground	1	
11. Name 2 controlled variables for this investigation.			
	1 mark for any two from: • Material of parachute • Height of drop • Weight on parachute	1	

question	answer	marks	notes
12. Why have the group done each drop 3 times?			
	1 mark for any of: • Improve accuracy • Take an average • Double check • Check for anomalies	1	
13. Which results look like anomalies?			
	1 mark for BOTH: • 5.02 secs and 1.33 secs Or • 5.02 and 1.33 • 8cm x 8cm 3rd drop and 16cm x 16cm 2nd drop.	1	
14. What could be a reason for these anomalies?			
	1 mark for any of: • Time started or stopped to early/late • Written down wrong • Misheard • Timer didn't work properly	1	
15. If we dropped the 32cm x 32cm parachute a 4th time what result would you predict?			
	1 mark for: • Any answer in the range 4.00 seconds to 5.50 seconds	1	Accept answers in the range without units (seconds).
		total 25	