

## Smooth Moves – Stage 2


### Physical World Strand


Term	1	2	3	4	Weeks	1	2	3	4	5	6	7	8	9	10	11
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Outcome	Lesson Sequence – Overview	Resources	Word Wall
<p><b>ST2-9PW-ST describes how contact and non-contact forces affect an object's motion</b></p> <ul style="list-style-type: none"> <li>describe forces and motion</li> <li>observe the effect that different-sized forces have on objects</li> <li>caption their annotated drawing with descriptions of the forces used in their game.</li> </ul> <p><b>ST2-1WS-S questions, plans and conducts scientific investigations, collects and summarises data and communicates using scientific representations</b></p> <ul style="list-style-type: none"> <li>contribute ideas to a class</li> <li>discussion about ways to move a marble</li> <li>understand the purpose and features of a science journal</li> </ul>	<p><b>Lesson 1</b></p> <p>Games Galore- Lesson focus p11</p> <ul style="list-style-type: none"> <li>To capture students' interest and find out what they think they know about how forces can be exerted by one object on another through direct contact or from a distance.</li> <li>To elicit students' questions about different-sized forces and their effect.</li> </ul> <p><u>Students:</u></p> <ul style="list-style-type: none"> <li><i>play a game in collaborative learning teams</i></li> <li><i>describe how to play the game</i></li> <li><i>create an annotated drawing of their game, using captioning to describe forces acting on objects.</i></li> </ul>	<p>For the class</p> <ul style="list-style-type: none"> <li>class science journal</li> <li>word wall</li> <li>'Smooth moves' information wall</li> <li>team skills char</li> <li>team roles chart</li> <li>marbles</li> <li>several self-adhesive notes per student</li> </ul> <p>For each student</p> <ul style="list-style-type: none"> <li>role wristbands or badges for Director, Manager and Speaker</li> <li>each team member's science journal</li> <li>equipment for 1 game (see 'Preparation')</li> </ul>	<p><i>compare</i></p> <p><i>direct contact</i></p> <p><i>distance</i></p> <p><i>Earth</i></p> <p><i>energy</i></p> <p><i>fall</i></p> <p><i>force</i></p> <p><i>friction</i></p> <p><i>gravity</i></p> <p><i>journal</i></p> <p><i>magnetism</i></p> <p><i>mass</i></p> <p><i>measurement</i></p> <p><i>motion</i></p> <p><i>movement</i></p>

<ul style="list-style-type: none"> <li>• create an annotated drawing of their game</li> <li>• use talk to describe their game and contribute to a team discussion about forces</li> <li>• record observations in the class science journal.</li> </ul>			<i>non-contact object observation pull push roll science size slide speed</i>
<p><b>ST2-9PW-ST describes how contact and non-contact forces affect an object's motion</b></p> <ul style="list-style-type: none"> <li>• observe, compare and record the use of different-sized forces to move cans</li> <li>• make predictions and give reasons about the movement of objects</li> <li>• draw conclusions about the effect of different-sized forces on the movement of objects.</li> </ul> <p><b>ST2-1WS-S questions, plans and conducts scientific investigations, collects and summarises data and communicates using scientific representations</b></p> <ul style="list-style-type: none"> <li>• understand the purpose and</li> </ul>	<p><b>Lesson 2</b> <b><u>Making moves – Lesson focus p16</u></b></p> <ul style="list-style-type: none"> <li>• To provide hands-on, shared experiences of different-sized forces acting on an object.</li> </ul> <p><b>Students:</b></p> <ul style="list-style-type: none"> <li>• <i>explore the effect of different-sized forces on rolling cans</i></li> <li>• <i>contribute to a class discussion about how to represent different-sized forces</i></li> <li>• <i>use arrows to represent different-sized forces.</i></li> </ul>	<p><b>For the class</b></p> <ul style="list-style-type: none"> <li>• class science journal</li> <li>• word wall</li> <li>• 'Smooth moves' information wall</li> <li>• team skills chart</li> <li>• team roles chart</li> </ul> <p><b>For each team</b></p> <ul style="list-style-type: none"> <li>• role wristbands or badges for Director, Manager and Speaker</li> <li>• each team member's science journal</li> <li>• 2 full tin cans of the same weight (eg, 300 g tinned tomato cans)</li> <li>• table or flat surface</li> </ul>	<i>non-contact object observation pull push roll science size slide speed</i>

<p>features of a storyboard</p> <ul style="list-style-type: none"> <li>• contribute to a class discussion about different-sized forces</li> <li>• represent their understanding of different sized forces using different-sized arrows.</li> </ul>			
<p><b>ST2-9PW-ST describes how contact and non-contact forces affect an object's motion</b></p> <ul style="list-style-type: none"> <li>• identify forces that act in direct contact</li> <li>• investigate frictional forces between an object and different surfaces</li> <li>• observe and describe ways of reducing and increasing friction.</li> </ul> <p><b>ST2-1WS-S questions, plans and conducts scientific investigations, collects and summarises data and communicates using scientific representations</b></p> <ul style="list-style-type: none"> <li>• contribute to a class discussion about friction</li> <li>• use oral, written and visual language to describe observations of</li> </ul>	<p><b>Lesson 3</b>  <b>Feeling friction – Lesson focus p20</b></p> <ul style="list-style-type: none"> <li>• To provide hands-on, shared experiences of friction (a force which acts through direct contact).</li> </ul> <p><b>Students:</b></p> <ul style="list-style-type: none"> <li>• <i>observe how friction is different with different surfaces</i></li> <li>• <i>explore what more or less friction feels like</i></li> <li>• <i>use arrows to represent frictional forces.</i></li> </ul>	<p><b>For the class</b></p> <ul style="list-style-type: none"> <li>• class science journal</li> <li>• word wall</li> <li>• 'Smooth moves' information wall</li> <li>• team skills chart</li> <li>• team roles chart</li> <li>• long length of rope</li> <li>• 1 pair of disposable gloves per student</li> <li>• detergent</li> </ul> <p><b>For each team</b></p> <ul style="list-style-type: none"> <li>• role wristbands or badges for Director, Manager and Speaker</li> <li>• each team member's science journal</li> <li>• heavy object (see 'Preparation')</li> <li>• range of different surfaces (see 'Preparation')</li> </ul>	

<p>pulling objects across different surfaces.</p>			
<p>ST2-9PW-ST describes how contact and non-contact forces affect an object's motion</p> <ul style="list-style-type: none"> <li>identify forces that act at a distance</li> <li>explore gravity's effect on an object</li> <li>discuss gravity and the different ways they experience it in their lives.</li> </ul> <p>ST2-1WS-S questions, plans and conducts scientific investigations, collects and summarises data and communicates using scientific representations</p> <ul style="list-style-type: none"> <li>contribute to a class discussion about gravity</li> <li>use oral and visual language to represent their understanding of gravity.</li> </ul>	<p><b>Lesson 4</b>  <u>Faraway forces – Lesson focus p25</u></p> <ul style="list-style-type: none"> <li>To provide hands-on, shared experiences of gravity (a force which acts at a distance).</li> </ul> <p><u>Students:</u></p> <ul style="list-style-type: none"> <li>participate in a class game: 'Going up'</li> <li>observe how gravity makes objects fall</li> <li>participate in a discussion about gravity around the world</li> <li>represent gravity acting on objects around the world.</li> </ul> 	<p><b>For the class</b></p> <ul style="list-style-type: none"> <li>class science journal</li> <li>word wall</li> <li>'Smooth moves' information wall</li> <li>1 globe</li> <li>1 balloon per class/group</li> </ul> <p><b>For each team</b></p> <ul style="list-style-type: none"> <li>each team member's science journal</li> </ul>	
<p>ST2-9PW-ST describes how contact and non-contact forces affect an object's motion</p>	<p><b>Lesson 5</b>  <u>Figuring out forces – Lesson focus p29</u></p> <ul style="list-style-type: none"> <li>To support students to represent and explain their understanding and observations of how different forces affect the movement of objects, and to introduce current scientific views.</li> </ul> <p><u>Students:</u></p>	<p><b>For the class</b></p> <ul style="list-style-type: none"> <li>class science journal</li> <li>word wall</li> <li>'Smooth moves' information wall</li> <li>team roles chart</li> </ul>	

<ul style="list-style-type: none"> <li>• develop an explanation for forces acting on objects in a game</li> <li>• use different-sized arrows to represent different-sized forces</li> <li>• identify and explain the role of forces</li> <li>• present in a real-life scenario.</li> </ul> <p><b>ST2-1WS-S</b>  <b>questions, plans and conducts scientific investigations, collects and summarises data and communicates using scientific representations</b></p> <ul style="list-style-type: none"> <li>• understand the purpose and features of a narrative</li> <li>• understand the purpose and features of a role-play</li> <li>• participate in a role-play to explain the forces present in a real-life scenario</li> <li>• understand the purpose and features of a force-arrow diagram</li> <li>• contribute to a class discussion about forces and motion.</li> </ul>	<ul style="list-style-type: none"> <li>• <i>explain their understanding of the forces acting in their game from Lesson 1</i></li> <li>• <i>use role-play and narrative to describe and represent forces acting in a real-life scenario.</i></li> </ul> 	<ul style="list-style-type: none"> <li>• team skills chart</li> </ul> <p><b>For each team</b></p> <ul style="list-style-type: none"> <li>• role wristbands or badges for Director, Manager and Speaker</li> <li>• each team member's science journal</li> <li>• equipment and props for role-play (see 'Preparation')</li> <li>• several cardboard arrows (see 'Preparation')</li> </ul>	
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ST2-9PW-ST describes how contact and non-contact forces affect an object's motion

- plan and conduct an investigation of the effect of different-sized forces on the movement of an object
- construct a graph to represent their results
- summarise and compare results of the investigation.

ST2-1WS-S questions, plans and conducts scientific investigations, collects and summarises data and communicates using scientific representations

- understand the purpose and features of a table
- understand the purpose and features of a graph
- use written language to represent and record findings using a table and column graph
- record observations and measurements.

## Lesson 6

### Catapult capers – lesson focus p34

- To support students to plan and conduct an investigation to compare the effect of different-sized forces on the motion of objects.

#### Students:

- *plan and conduct an investigation of the effect of different-sized forces on the movement of an object*
- *discuss variables to change, measure and keep the same*
- *observe and record the results of their investigation*
- *create a table and column graph to represent and compare measurements.*



#### For the class

- class science journal
- word wall
- team skills chart
- team roles chart
- 'Smooth moves' information wall
- self-adhesive notes
- 1 enlarged copy of 'Forces investigation planner' (Resource sheet 1)
- 1 copy of 'Measuring forces' (Resource sheet 2)
- 1 table
- 1 empty matchbox
- 20 paperclips
- 1 thick elastic band
- ruler
- 1 length of streamer
- self-adhesive tape

#### For each team

- role wristbands or badges for Director, Manager and Speaker
- each team member's science journal
- 1 copy of 'Forces investigation planner' (Resource sheet 1) per team member
- copy of 'Measuring forces' (Resource sheet 2)
- 1 table
- 1 matchbox
- 20 paperclips
- 1 thick elastic band

		<ul style="list-style-type: none"> <li>• ruler</li> <li>• 3 lengths of streamers</li> </ul>	
<p>ST2-9PW-ST describes how contact and non-contact forces affect an object's motion</p> <ul style="list-style-type: none"> <li>• identify and describe different forces and motion</li> <li>• explain that forces can act through direct contact or at a distance</li> <li>• represent different-sized forces using different arrow lengths.</li> </ul> <p>ST2-1WS-S questions, plans and conducts scientific investigations, collects and summarises data and communicates using scientific representations</p> <ul style="list-style-type: none"> <li>• contribute to team discussions about forces acting on objects</li> <li>• use visual and oral language to represent and describe forces using arrows</li> <li>• use oral, written and visual language to</li> </ul>	<p><b>Lesson 7</b>  <b>Forces finale – Lesson focus p44</b></p> <ul style="list-style-type: none"> <li>• To provide opportunities for students to represent what they know about how forces can be exerted by one object on another through direct contact or from a distance, and to reflect on their learning during the unit.</li> </ul> <p><b>Students:</b></p> <ul style="list-style-type: none"> <li>• <i>review the unit, using the class science journal, word wall and 'Smooth moves' information wall</i></li> <li>• <i>create a game representing their understanding of forces acting on objects</i></li> <li>• <i>draw an annotated drawing of their new game</i></li> <li>• <i>reflect on their learning during the unit.</i></li> </ul>	<p><b>For the class</b></p> <ul style="list-style-type: none"> <li>• class science journal</li> <li>• word wall</li> <li>• 'Smooth moves' information wall</li> <li>• selection of equipment from games (see Lesson 1)</li> <li>• team roles chart</li> <li>• team skills chart</li> </ul> <p><b>For each team</b></p> <ul style="list-style-type: none"> <li>• role wristbands or badges for Director, Manager and Speaker</li> <li>• each team member's science journal</li> <li>• selection of materials to construct game (see 'Preparation')</li> </ul>	

describe forces and  
reflect on their  
learning during the  
unit.

