





## Learning Scientific Skills Outside the Classroom

### Scientific Skills

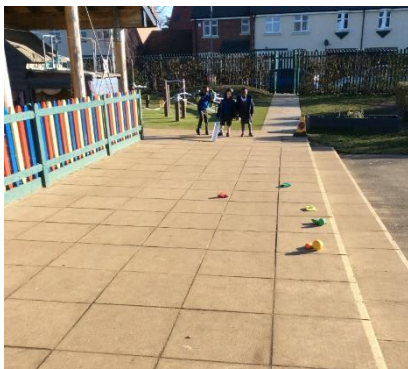
Measuring		Concluding Specific skill – use simple scientific language to answer simple questions	
Country of Origin	Suggested Age Range	Suggested Theme	
 UK	4 – 5	Forces	
Location outside the classroom		Benefits of using this location	
Outside on playground		There needs to be a large space for the ball to travel after it has left the ramp. A hard surface is best.	
Learning Objectives – Scientific Skills		Learning Objectives – Knowledge	
To measure how far a ball travels before stopping To say what they found out using simple scientific language		To know that the steeper a ramp, the further a ball travels before stopping To know that the faster an object falls, the further it will travel before stopping	
Key Vocabulary			
Scientific skills vocabulary – measure, measuring, conclude, concluding, communicate, tell Knowledge vocabulary – fall, higher, steeper, further, faster			
Resources / Equipment			
<ul style="list-style-type: none"> <li>• Equipment to make ramp – guttering or a piece of wood, stand/objects to make a stand</li> <li>• Objects to roll down ramp – balls of different colours (but same diameter and mass)</li> <li>• Equipment to measure distance – beanbags, rulers</li> </ul>			
Teaching Activities			
<p><b>Discuss</b> – What will happen if I put an object at the top of a ramp and let it roll down. Where does it stop? Why does it stop? What might affect how fast it rolls down? Will the height of the ramp affect how far it travels before it stops? Will the colour of the ball affect how far it travels before it stops?</p>			
		<p><b>Explain</b> – They are going to explore the question, ‘Will the height of a ramp affect how far a ball travels before it stops?’</p>	
		<p><b>Demonstrate</b> – Show the children a ramp outside which has been made using guttering so the ball does not fall off. Demonstrate how to place a ball on the top of the ramp and let go to see how far it travels after reaching the bottom of the ramp and travelling on the ground. They do not need to push the ball but just let go of it. The children should place a bean bag on the playground where the ball has stopped as a way of measuring how far it has travelled.</p>	
		<p><b>Activity</b> - Children take it in turns to put a ball down the ramp and see how far it travelled, they mark where it stops with a beanbag. They repeat the activity using different coloured balls.</p>	
		<p><b>Measure</b> - Children measure how far the balls travelled by placing a beanbag where they stopped.</p>	
<p><b>Discuss</b> – Did the colour of the ball make the ball travel a further distance? How do you know? Did the balls all travel the same distance before they stopped? Encourage the children to answer using the scientific language – measure, fall, faster and further. Record their responses.</p>			



**Explain** – We are going to make the ramp higher now which will make it steeper. Explain what you are doing as you raise the top end of the ramp further from the ground.

**Discuss** – Do they think the balls will travel a shorter distance, a further distance or stay the same now that the ramp is steeper? Why do they think this? Do they think the colour of the ball will make a difference to the distance travelled? Do they think the ground surface will make a difference when the ramp is steeper?

**Activity** – Children repeat the activity above taking it in turns to put a ball down the ramp and using a beanbag to measure how far it travels. They can use different coloured balls to confirm their findings from the last activity to see if the colour makes a difference as well as the steepness of the ramp.



**Discuss and conclude** – Did the steepness of the ramp make the balls fall faster? How do they know? Encourage the children to answer using the scientific language – measure, steeper, fall, faster and further.

Did all the balls travel the same distance? Why? Explain that it is friction between the ball and ground that will slow down the moving ball. Did the colour make a difference? Record their responses.

**Explain** –The balls will move with a greater speed down the higher ramp and then travel for a further distance beyond the drain pipe before they stop. Ensure that children understand that the colour of the ball does not affect how quickly it falls to the ground. There will be variations in the distance travelled due to the surface of the ground.

Examples of children’s work and teacher comments from country of origin

*The children really loved doing this activity and using the beanbags to measure how far their ball travelled. They did have to be reminded not to push the ball down the ramp but just to let it fall down on its own. Some of the children asked why the ball fell to the ground. You could introduce the word ‘gravity’ to higher attainers if you feel it is appropriate. The activity produced lots of dialogue using the scientific vocabulary introduced.*