

Science - Year 5

Earth and Space – Block 5ES

Space Presenters

Session 4

Resource pack

Changing shadows planning investigation questions

- *Do you think a shadow stays the same at all times of the day?*
- *What might happen to a shadow if the Earth is moving?*
- *If the Earth wasn't moving and it was always the same time of day, would the shadow change?*
- *What could we do to track changing shadows?*
- *What could you use to create a shadow?*
- *What would we need to do to track a changing shadow?*
- *What would we need to keep the same throughout the investigation?*
- *How would we record our findings?*
- *Do you know of a type of clock that uses shadows to measure time?*

Changing shadows doing investigation questions

- *What is the significance of the shadow length?*
- *What do they think will change: direction, length, definition?*
- *Why is the shadow moving?*
- *What is causing the shadow?*
- *Where is the sun (light source) if the shadow is pointing a certain direction?*
- *Why might the shadow become less defined?*
- *Why might the shadow become longer or shorter?*
- *Why might the direction of the shadow change?*

Modelling/reconstructing changing shadow investigation questions

- *What do you think each bit of equipment could represent (Earth, Sun, person on the Earth)*
- *How could we recreate/model what happens during an Earth day? (move the globe/Earth)*
- *How can the Lego™ person help us with our shadow investigation? (they can be stuck on the globe and move with it – their shadow should change as they move)*
- *Where will the Lego person be in the early morning/late morning/midday/early afternoon/late afternoon?*
- *What will happen/has happened to the Lego person's shadow?*
- *Can you spot any pattern?*
- *Does this change your thoughts on what will happen to our outside shadow experiment?*

Sample table (completed) for shadow investigation

SHADOW INVESTIGATION		Enquiry question/s: <i>What will happen to the length and definition of a shadow as the day progresses?</i>					
Variables we kept the same: <i>Rounders post, position of post, light source</i>				Variable changed: <i>Time of day</i>			
Time of day ➡➡➡	9.30	10.30	11.30	12.00	12.30	13.30	14.30
Length of shadow	<i>120cm</i>	<i>80cm</i>	<i>30cm</i>	<i>10cm</i>	<i>30cm</i>	<i>80cm</i>	<i>120cm</i>
How defined is the shadow?	<i>Not very</i>	<i>fairly</i>	<i>very</i>	<i>very</i>	<i>very</i>	<i>fairly</i>	<i>Not very</i>
Patterns noticed	<i>The shadow got shorter and more defined towards the middle of the day and longer and less defined towards the beginning and ending of the day.</i>						
Scientific explanation	<i>As the sun's position changes it alters the angle at which it hits the post and changes the length and definition of the shadow.</i>						
Possible improvements to our investigation <i>We could have investigated the shadows from dawn to dusk. We could have photographed the shadow or created a time-lapse video.</i>							
What else could we investigate? <i>The position of the sun and the direction of the shadow</i>							

Sample table for shadow investigation

SHADOW INVESTIGATION		Enquiry question/s:					
Variables we kept the same:				Variable changed:			
Time of day ➡	9.30	10.30	11.30	12.00	12.30	13.30	14.30
Length of shadow							
How defined is the shadow?							
Direction of shadow							
Position of sun							
Patterns noticed							
Scientific explanation							
Possible improvements to our investigation							
What else could we investigate?							