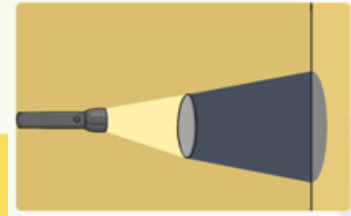


To investigate how a light source can change the size of a shadow

If you have access to the internet, the link below is an informative video about sun and shadows:
<https://www.bbc.co.uk/bitesize/clips/ztys34j>

Then read the information below about how shadows are formed:

Making Shadows



Shadows are created when an opaque object blocks light.

The light cannot go through or around the object, so a darker patch of less light is created behind the object.

Shadows are not reflections! Reflection is when light bounces off an object. A shadow is caused by light being blocked.

These children are talking about shadows and reflections.
Talk to your partner about the children's ideas.
Do you agree or disagree with any of their thoughts?

1

Our shadows are reflections from the sun.

2

The stronger the source of light the bigger a shadow will be.

3

I think shadows are made by something blocking the light.

Task 1

- In your Home learning books, answer the question above about which child you think is correct and why. Remember to use scientific language in your answer.
- Answer these questions below in your Home Learning Books:

- 1) When is your shadow in the playground the longest? Shortest? Why do you think this happens?
- 2) When you stand outside, have you noticed where the sun is in the sky and whether your shadow is in front/ behind you?

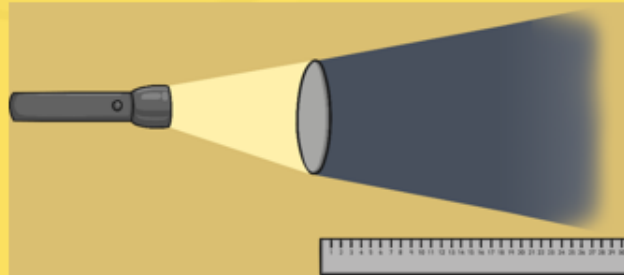
Task 2- Shadow investigation

Question: How do shadows change when the distance between the light sources and object changes?

You will set up an investigation to find an answer to this question.

You will use a **torch**, a **ruler** or **metre stick**, and an **object**.

You will measure the shadow of the object at different distances from the torch (the light source).



Mild: Steps 1, 2 and 3; Spicy/Hot: all steps

Step 1 - In your Home learning books, write a prediction of what you think will happen during this investigation using the sentences below to help:

a) I think that the closer the object is to the light source, the _____ the shadow.

b) I think that the further away the object is from the light source, the _____ the shadow.

Step 2 - Complete your investigation and complete the results table to the right in your books.

The measurements below are a guideline if you are using a metre stick or tape measure. You can carry out the investigation using your own smaller measurements if you only have a 30cm ruler.

Distance between light source and object	Size of the object's shadows
10cm	
20cm	
30cm	
40cm	
50cm	

Step 3 - Look at the results you have collected. Do you notice a pattern? Does the shadow change when the distance between the object and light source changes?

Using the sentence starters below write a conclusion to explain what your results show:

I have noticed that _____. This is because _____

Are there any results which don't fit your pattern? If so why?

Step 4 - Write a final concluding statement using the sentences below to help:

I have found out _____. Therefore the _____ the light source to an object, the _____ the shadow.

Answers

Task 1

From the concept cartoon picture:

Child 1 is incorrect

Child 2 is incorrect

Child 3 is correct because shadows are formed when objects block a source of light.

1) When is your shadow in the playground the longest? Shortest? Why do you think this happens?

My shadow is longest in the playground early in the morning and shortest at midday. This is because of the sun is further away from Earth in the morning and closest to Earth at midday.

2) When you stand outside, have you noticed where the sun is in the sky and whether your shadow is in front/ behind you?

I notice that if I stand outside in front of the sun, then a shadow forms behind me. If the sun was to my left then a shadow would be to my right.

Task 2-

Step 1 - The prediction is what YOU think so there is no right or wrong answer.

Step 2 – your own results

Step 3 -

I have noticed that the length of a shadow is bigger when it is closer to the light source. This is because the object will block out more light and so a bigger shadow forms.

Are there any results which don't fit your pattern? If so why?

This question will be down to your individual results.

Step 4 -

I have found out that my measurements for a shadow size of an object are bigger the closer it is placed to an object and the further away the distance is from my object to the light source, the smaller the shadow measurement. Therefore the closer the light source to an object, the larger the shadow.