

Objects and their shadows

Outstanding Science Year 6 - Light - OS6D008

National Curriculum Statutory Requirements

6D4 - use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them



Learning Objective

I can explain how the shape and size of a shadow are determined.

Me:   

Teacher:   

Scientific play

Take a torch, a book and a sheet of paper. Shine the torch behind the book so that it casts a shadow on the piece of paper. Can you change the shape and size of the shadow?

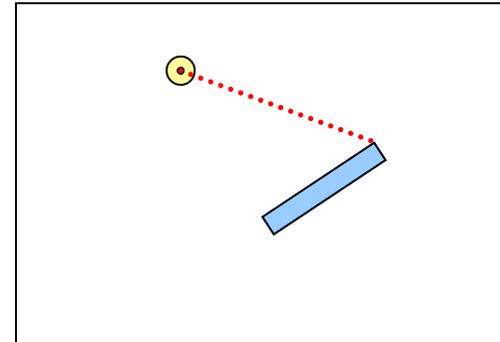
Activity

Look at the pictures on the following pages. They show design plans for different rooms. Each room contains a light source and partitions. The partitions are all the same size and go all the way up to the ceiling.

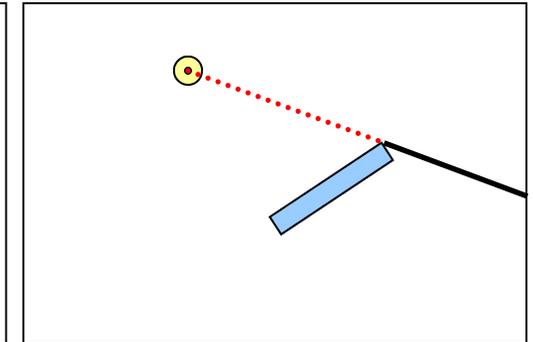
First, estimate the width of the shadow cast by the partition. Record this in the space provided.

Next, calculate the width of the shadow. Place your ruler so that it lines up the centre of the light source with one of the edges of the partitions. Draw a line from the edge of the partition to the wall. Repeat for the other edge of the partition. Use a pencil or black coloured pen to shade in the shadow that you have formed.

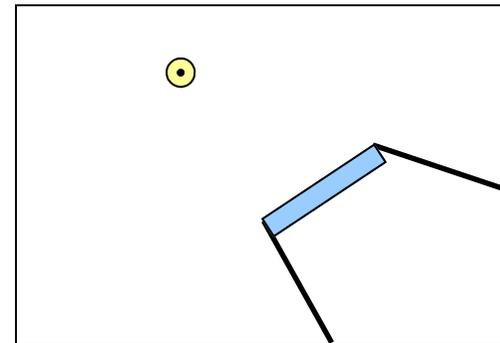
Use your ruler to measure the length of the shadow cast on the wall. Record this in the space provided.



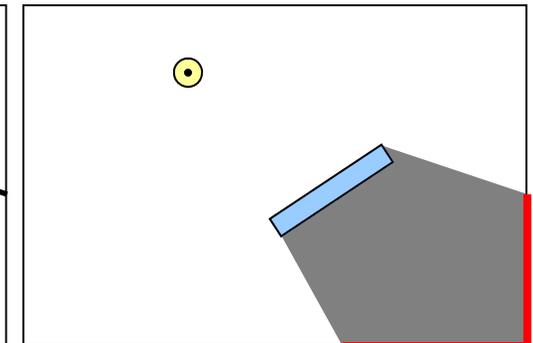
1. Place your ruler so that it lines up on the middle of the ruler and the edge of the partition.



2. Extend the straight line from the edge until it touches the wall. Draw this line.



3. Extend the straight line from the edge until it touches the wall. Repeat on the other edge.



4. Shade in the shadow cast by the partition. Measure the width of the shadow (shown in red).

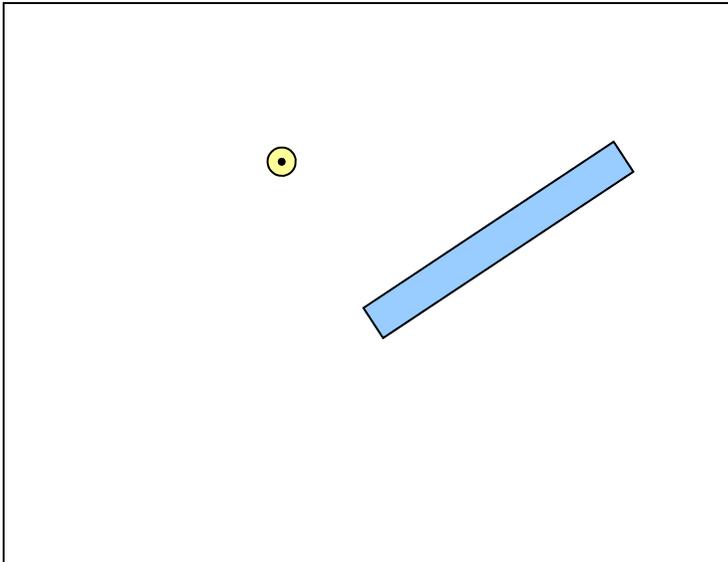
Discussion

How accurate were your predictions?

Which room design has the widest shadow? Why?

Which room design has the narrowest shadow? Why?

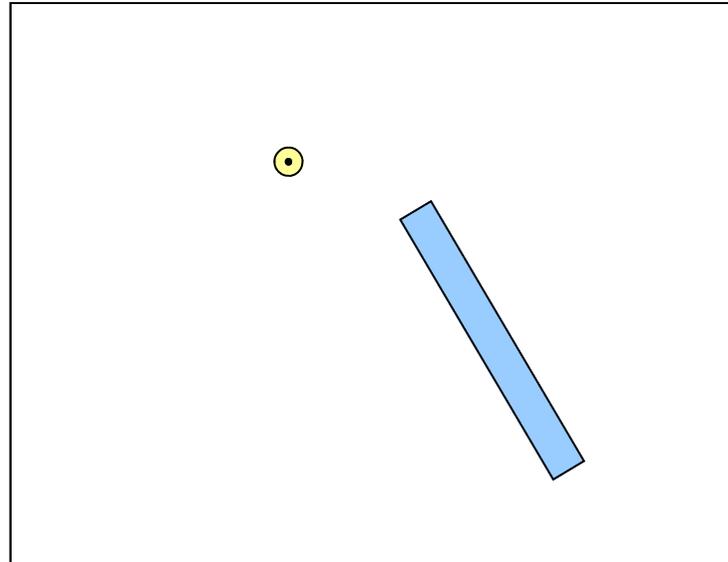
Room design 1



Predicted width of shadow:

Measured width of shadow:

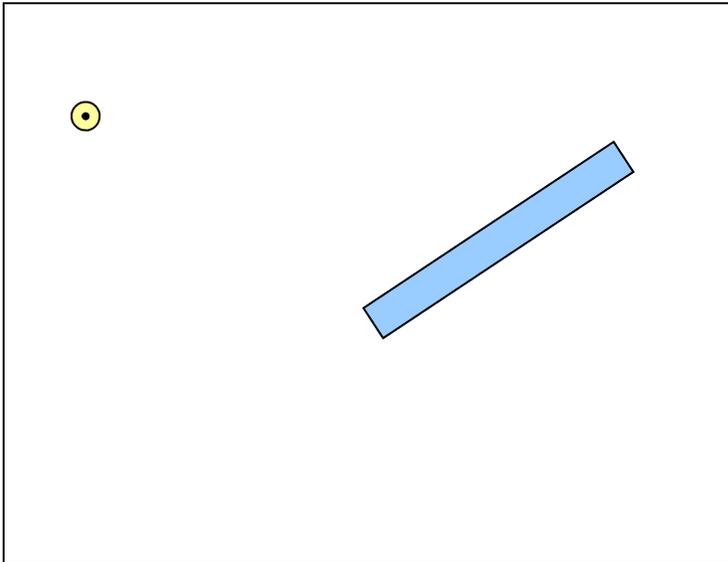
Room design 3



Predicted width of shadow:

Measured width of shadow:

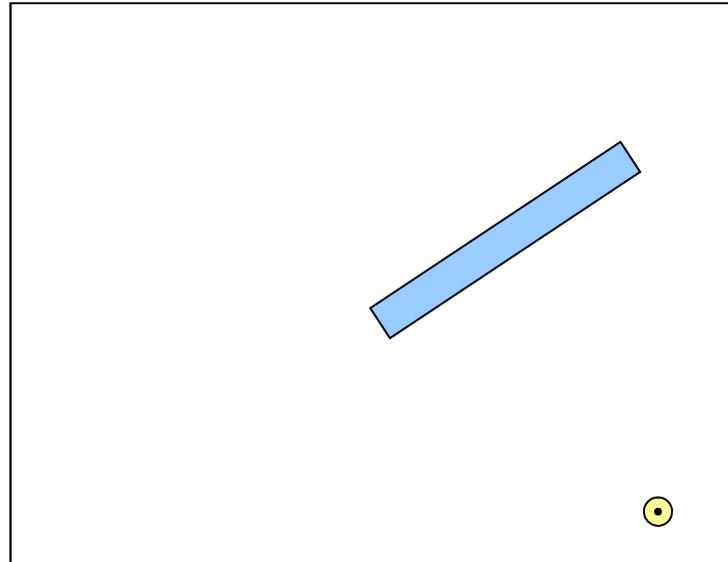
Room design 2



Predicted width of shadow:

Measured width of shadow:

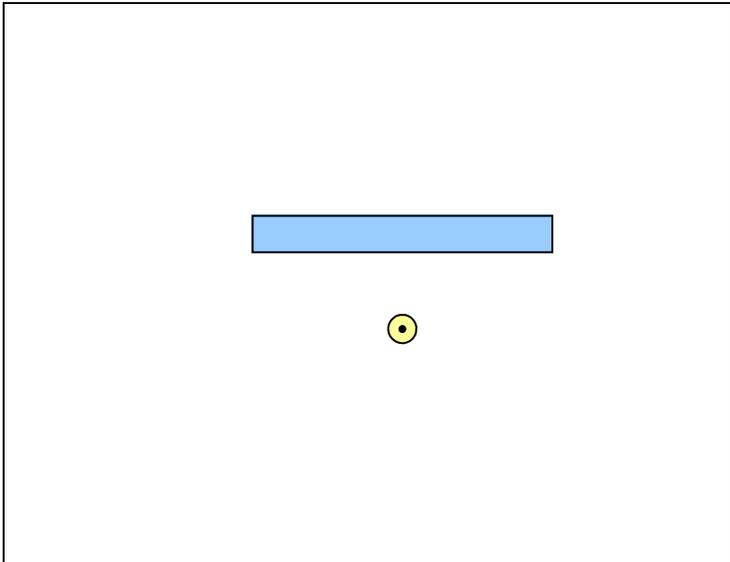
Room design 4



Predicted width of shadow:

Measured width of shadow:

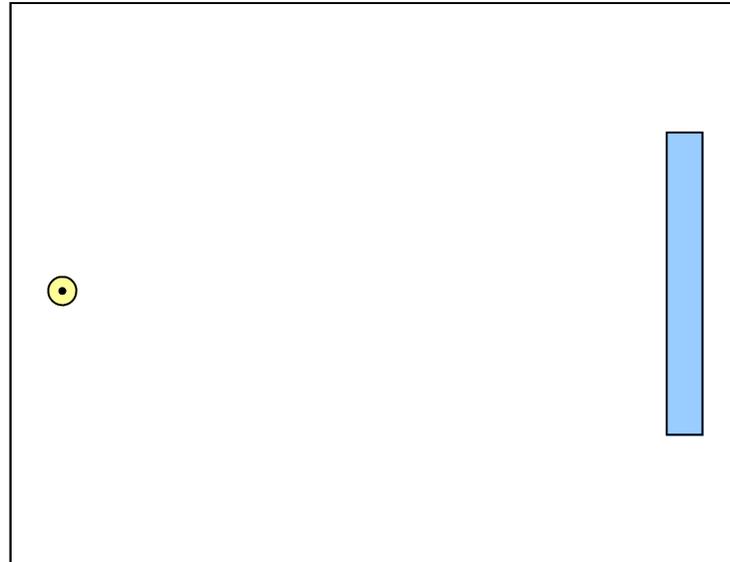
Room design 5



Predicted width of shadow:

Measured width of shadow:

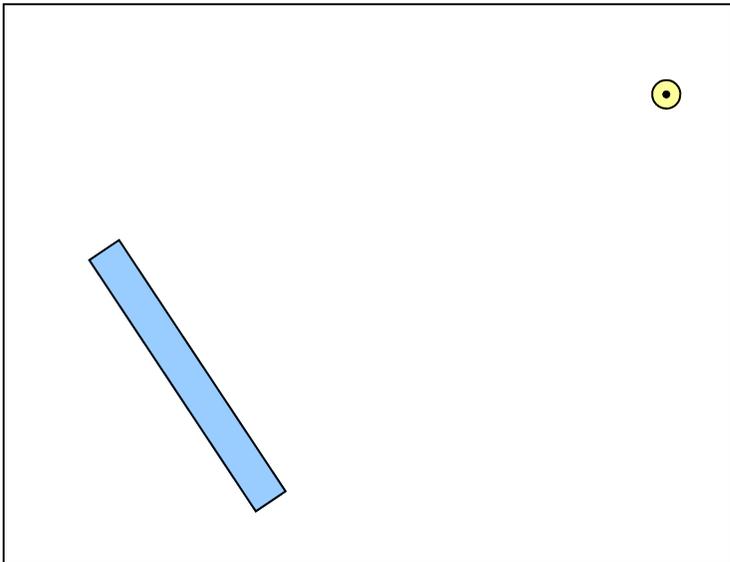
Room design 7



Predicted width of shadow:

Measured width of shadow:

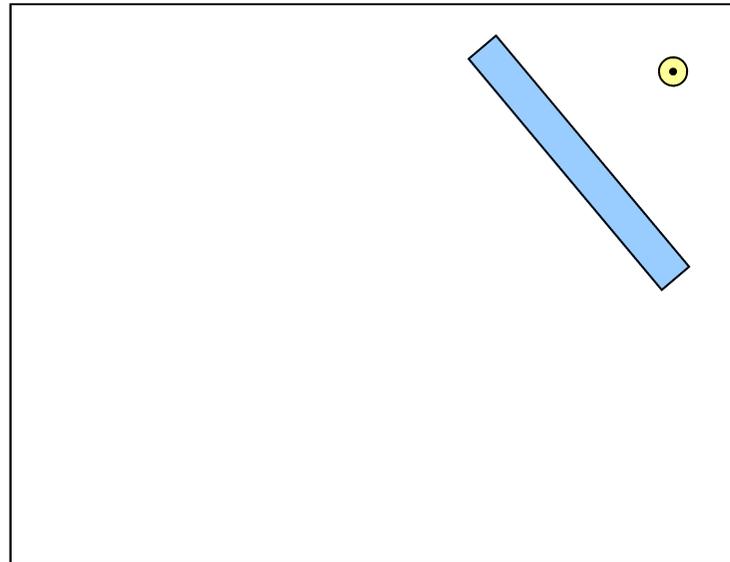
Room design 6



Predicted width of shadow:

Measured width of shadow:

Room design 8



Predicted width of shadow:

Measured width of shadow: