


Year 8 Science: Home Learning Week 14

Hello Year 8, it's our last week of home learning. This is all a bit odd, it genuinely doesn't seem like four years since you were in year 5 and I'm not sure where the time has gone... Very, very best of luck at high school!

I hope you've enjoyed doing these activities. This week is all about light and I've included instructions for you to make a pin hole camera. I've added a link to the Royal Society's Summer Science programme, one benefit of our current situation is that a lot of these London based activities are now online. The talks and activities are generally suitable for anyone aged 12 +, there's a family quiz on Monday evening featuring celebrity scientists to test your knowledge.

Take care, stay safe, have a lovely summer break. Do say hello rather than running away if you see me in the supermarket, even a stone hearted soul like me feels warm and fuzzy inside when that happens!

Miss Johnston ☺

Task	Description
1	Watch this video about light: https://www.youtube.com/watch?v=cF5hFdodj7U
2	 <p>a) Copy the diagram and label the Earth and Moon. b) Label one luminous source. c) Draw light rays from the Sun to the Earth and Moon, and then from the Moon to the Earth.</p>
3	<p>Sound travels a million times more slowly than light. In a thunderstorm the sound travels a kilometre every 3 seconds after the lightning flash.</p> <p>a) If you count 12 seconds before hearing the thunder, how far away is the storm? b) If the storm is 8 kilometres away, how many seconds will pass before you hear the thunder? c) Draw a diagram to show a person and a flash of lightning. d) Draw rays on your diagram to show how the person sees the lightning.</p>
4	<p>The speed of light is 300 000 km/s. It takes light from the Sun 8.5 minutes to reach Earth. Light has to travel for 4 years from the next nearest star. It takes 1.3 seconds for light to travel from the Moon to Earth.</p> <p>Use this information to answer the following questions (remember to show your working!)</p> <p>a) If we could travel as fast as light, how long would it take to reach the nearest star (not counting the Sun)? b) Jupiter is a planet which is 5 times further away from the Sun than we are. How long will it take for light from the Sun to travel to Jupiter?</p>
5	Practical Activity: Make a pin hole camera.

Practical details:

Make a Pin Hole Camera

Why do this?

A pinhole camera is a very simple camera. This version does not use photography paper or chemicals, so you can't develop your picture but it is very similar to the concept of how a camera works. Try making a pinhole camera and examine your home or garden with it.

Safety

- Take care when using scissors
- DO NOT use the pin hole camera to look directly at the sun – doing so can seriously damage the retina in your eye and cause blindness.

Equipment & materials

- | | |
|---------------------------|----------------|
| • Cardboard | • Sticky tape |
| • Tracing paper | • A glue stick |
| • Pinhole camera template | • Scissors |

Method

1. Glue the camera template to your cardboard and cut it out carefully to make a net.
2. Use a pencil to make a hole on the side with the dot.
3. Cut out the square window and tape the tracing paper in place.
4. Carefully fold the net along the dotted lines to make a box – the tracing paper should be on the inside.
5. Use tape to hold the tabs in place.

Once you've made the camera, place it in a bright room and see what you can see projected onto the tracing paper.

Expected observations and results

You should see an upside down image projected onto the tracing paper.

Background notes

You do need strong sunlight to make this work so if it doesn't, try going outside instead.

Questions and ideas for further investigation

- Did you know that 10% of all photos ever recorded were taken in the last year? Why might that be?
- You could try to make a larger pin hole camera by using a larger box – does it create a larger image?
- How does the size of the pin hole affect the image?
- You can find out about how you can make photographs using a pinhole camera by watching this video from The Royal Institution: <https://www.youtube.com/watch?v=O4bf2IO3-Wg> . Their home developing technique is really good but the direct positive photo paper that you'd need is very expensive!
- Find out about the invention of cameras here: <https://www.youtube.com/watch?v=XaGUL8B-BrE>

