

## **Week beginning Monday 11<sup>th</sup> May: Years 5 and 6 Science**

Did you enjoy the lesson on the Solar System last week? Today we are going to carry on with our project on light, and we are going to learn about **refraction**.

**First watch this clip from BBC Bitesize. (Wait for the clip to appear on the site. It might come up after the rest of the page.)**

<https://www.bbc.co.uk/bitesize/clips/zqg3cdm>

### **This week's activities**

**LO: To recognise that, whilst light does travel in straight lines, sometimes it changes direction when travelling from one thing into another.**

Revise this question:

Does light always travel in straight lines?

Start off by placing a pencil in a beaker/glass and look at it carefully and draw a diagram of what you can see. Then slowly pour water into the glass and watch what is happening very closely. When the glass is almost full, stop and observe closely and draw another diagram.

- If you look at all of the pencil, does it look completely straight?
- What have you noticed and why might it be happening?

Even though light does travel in straight lines, it can sometimes do strange things. The scientific word for what is happening is called **'refraction'**.

**Refraction is the bending of light as it passes from one substance to another.**

Write this definition of refraction under your diagrams.

You are going to discover more about refraction today (and learn some cool tricks to try out at home).

There are four different activities.

- Water magnifier
- The surprising coin
- Oil, water and a pencil
- Amazing arrows

The instructions and worksheets for the activities are below. The challenges are differentiated by the level of detail and explanation required from you in your descriptions.

**Challenge 1:** Record your observations, complete at least two of the activities and write down or draw a picture of what you observed using the worksheet as a template.

**Challenge 2:** Record your observations with explanations, complete at least two of the activities and write down or sketch your observations for at least two of them. For at least one of the activities, include some extra information about what you think was happening. Think about:

- What is happening to the light in this activity?
- What might make the light do that?

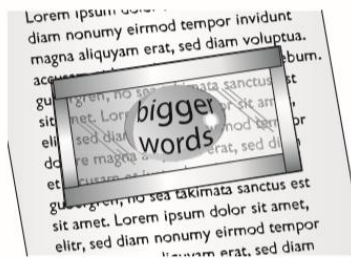
**Challenge 3:** Record your observations and add extra details, complete and record observations for at least three of the activities. For at least two of the activities, add some extra information about what you think is happening. You must include the oil, water and pencil activity and try to explain, using a diagram, why the oil and water do different things to the light. Think about:

- What is different about the water, oil and air that might affect what the light does?
- Have you seen any other places where light appears to do the same thing, for example, change direction or appear 'bent'?

## Activities and Worksheets

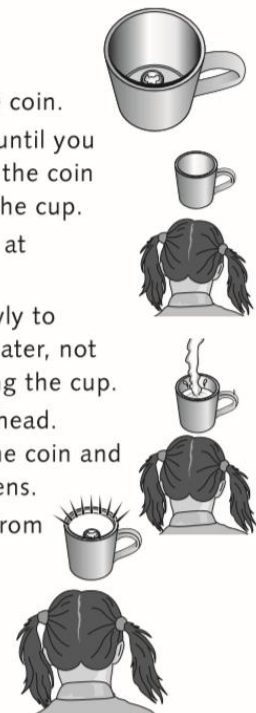
### WATER MAGNIFIER

- Look at the sheet of newspaper closely.
- Place the plastic sheet over the newspaper and look at the print closely, to see if there is any change.
- Use the matchstick to transfer a small drop of water from the cup to the sheet of plastic; you may need a few drops but don't put too much on.
- Look at the writing through the drop of water. Is anything different? Try sliding the plastic sheet gently from side to side.
- Now try looking at the newspaper through a magnifying glass and a glass bead. See if you can make any more observations, to compare what you can see with a normal eye and through a water drop, a magnifying glass and a glass bead.





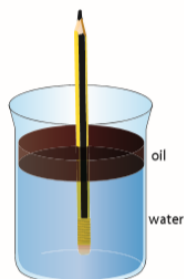
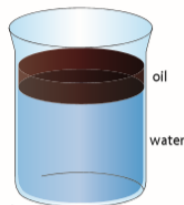
### THE SURPRISING COIN

- When the cup is empty, look at the coin.
- Move to the side until you can no longer see the coin over the edge of the cup.
- Keep still, looking at the cup.
- Ask a partner slowly to fill the cup with water, not touching or moving the cup.
- Don't move your head. Keep looking at the coin and notice what happens.
- Empty the water from the cup back into the water container and try it again.


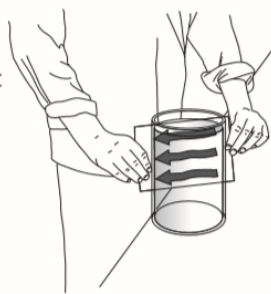


### OIL, WATER AND A PENCIL

- Look at the pencil and check that it is straight, not bent. 
- Move your head so it is on a level with the jar from the side.
- Ask your partner to place and hold the pencil upright into the jar.
- Observe what the pencil looks like.
- Ask your partner to tilt the pencil from side to side, keeping the bottom of the pencil touching the bottom of the beaker in the middle. 



### AMAZING ARROWS

- Take the card with the three arrows on and hold it behind the jar of water. 
- Move the card around a little behind the water jar and notice what happens to the arrows.
- Turn the card around and repeat the activity. 

**WATER MAGNIFIER**

Draw a picture of what the newspaper writing looked like before the water drop was put on the plastic.

Draw a picture of what the newspaper writing looked like after the water drop was put on the plastic.

Write down any extra notes or comments about what you think might be happening.

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**THE SURPRISING COIN**

Record what happened when the water was slowly poured into the cup.

Draw pictures or diagrams to help.

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**OIL, WATER AND A PENCIL**

Draw a picture of what the pencil looked like when it was completely upright in the jar.

Draw a picture of what the pencil looked like when it was tilting to one side in the jar.

Write down any extra notes or comments about what you think might be happening.

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**AMAZING ARROWS**

Record what happened when you move the card with the arrows on it behind the jar.

Draw pictures or diagrams to help.

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