Light: Refraction

Aim:	**Success Criteria:**	**Resources:**
To recognise that light appears to travel in straight lines by investigating refraction. I can investigate how refraction changes the direction in which light travels.	I can understand how light is refracted. I can investigate the effects of refraction. I can understand the way refraction alters the direction of light.	**Lesson Pack** **Short film about refraction** Small piece of paper (sticky notes are ideal) - 1 per child Glass (or transparent plastic cup) of water - 1 per child Jug - 1 per pair Saucer - 1 per pair
	Key/New Words: Refraction, bend, lens, focus, focal point, transparent.	**Preparation:** Differentiated **Amazing Arrow Activity Sheet** - 1 per child Differentiated **Incredible Images Activity Sheet** - 1 per child

Prior Learning: The children will have learnt how light travels and how we see in lesson 1.

Learning Sequence

	Refraction Riddle: Show children the photo of a straw in a glass of water on the **Lesson Presentation**. Ask them to discuss what is happening, then introduce the concept cartoon showing a group of children talking about their ideas. Ask the children to speak to their partner about which explanation they agree with and why.	
Whole Class	**What Is Refraction?** Show children the **short film about refraction** to demonstrate some examples of refraction. Explain refraction using the **Lesson Presentation**. Address any misconceptions.	
	Refraction Investigations: Explain to the children that they will be carrying out two different investigations to explore refraction. *(You may want to split the class in half so that each half does one investigation, then swap over).*	
	Amazing Arrow: The first investigation asks children to draw a horizontal arrow on a small piece of paper, and hold it behind a glass of water. They should use their differentiated Amazing Arrow Activity Sheet to make a prediction before carrying out the investigation and recording their observations and conclusion. *(The arrow should appear to change direction.)* Look for children who use the fact that refraction causes light to bend in their explanations. ★ Children should use the suggested words and phrases to explain what happened. ★★ Children should use the refraction prompt to help them explain why it happened. ★★★ Children should explain why it happened using their understanding of refraction.	
	Incredible Images: For the second investigation, the children need to draw a small picture (or stick a small sticker) on a piece of paper. They should put a glass of water on top of the picture, then look at their picture through the side of the glass while slowly pouring water in. Once it is full, they should place a saucer on top. Again, they will make a prediction first, then describe their observations and make a conclusion using their differentiated **Incredible Images Activity Sheet**. Look for children who use the fact that refraction causes light to bend in their explanations. ★ Children should use the suggested words and phrases to explain what happened. ★★ Children should use the refraction prompt to help them explain why it happened. ★★★ Children should explain why it happened using their understanding of refraction.	
	What Happened? Ask children to share their thoughts and conclusions. Explain how refraction caused the effects see in each investigation using the **Lesson Presentation**.	

Task*it*

***Draw*it:** Can you do an observational drawing showing refraction? Why not draw flower stems in a vase of water, or your hand underneath the surface of water?

***Explain*it:** Create a scientific diagram to explain refraction to someone who has never heard of it.

***Try*it:** Place a coin in a bowl, then, while looking at the coin, walk away until the moment you can't see it. Ask a friend to pour water gently into the bowl while you watch. What do you see? Can you explain it?