

Question: How far can you throw your shadow?

What do you notice about footballers shadows in a night match?

National Curriculum Link

KS2 Science: Y3 Light
KS2 Science Working Scientifically

IB Learner Profile Links

Inquirers – Nurture skills for research and curiosity

Knowledgeable – Develop conceptual understanding and engage with issues and ideas

Principled – think and act with integrity and honesty

Reflective – Consider the wider world and our own ideas and experience

Communicators – express yourself confidently and creatively

Prior Skills – Y1

- Know that electricity is an important source of light
- Identify and name the sources of light, including electricity being an important source of light
- Identify and name sources of light
- Understand what darkness is
- Compare sources of light using scientific language (brightest, duller, darker, lighter)
- Observe and describe shadows during the day
- Know that the Sun lights up the Earth and safety with the sun
- asking simple questions and recognising that they can be answered in different ways
- observing closely, using simple equipment
- performing simple tests
- Explore, using the senses and talk about they see (see, touch, smell, hear or taste)
- Record observations and results to a test using drawings and in simple tables
- Use simple equipment to help them make

New Skills – Y3

- Recognise that they need light in order to see things
- Recognise that dark is the absence of light
- Understand and notice that light is reflected from surfaces
- Recognise that light from the Sun can be dangerous and that there are ways to protect their eyes
- Recognise that shadows are formed when the light from a light source is blocked by a solid object
- Find patterns in the way that the size of shadows change.
- Make and record a prediction before testing
- Measure using different equipment and units of measure
- Record their observations in different ways (labelled diagrams, charts etc.)
- Describe what they have found using scientific words
- Make accurate measurements using standard units
- Explain what they have found out and use their measurements to say whether it helps to answer their question

Future Skills – Y6

- Recognise that light appears to travel in straight lines
- Use the idea that light travels in straight lines to explain that objects are seen because they give out or reflect light into the eye
- Explain that we see things because light travels from light sources to our eyes or from light sources to objects and then to our eyes
- Explain how different colours of light can be created
- Use the idea that light travels in straight lines to explain why shadows have the same shape as the objects that cast them.
- ask a variety of types of scientific questions
- choose the most appropriate scientific enquiry method to answer a question and outline the method
- use simple models to describe scientific ideas
- make predictions based on scientific knowledge
- draw conclusions from observations and findings based on scientific knowledge
- Test a scientific idea

observations • Tell other people about the testing they have done • Record their findings in a table or chart		and show evidence which supports it • Present a report of their findings through writing, display and presentation
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Knowledge, Skills and Understanding for topic area

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Knowledge, Skills and Understanding for Working Scientifically

- Make and record a prediction before testing
- Measure using different equipment and units of measure
- Record their observations in different ways (labelled diagrams, charts etc.)
- Describe what they have found using scientific words
- Make accurate measurements using standard units
- Explain what they have found out and use their measurements to say whether it helps to answer their question

Challenge

- Can they explain the difference between transparent, translucent and opaque?
- Can they explain why their shadow changes when the light source is moved closer or further from the object?
- Can they explain their findings in different ways (display, presentation, writing)?

Resources

- torches with powerful beams
- combs with widely spaced teeth, cardboard tubes
- objects of a variety of shapes
- shadow sticks
- metre sticks or tape measures
- compass
- collection of opaque, transparent and translucent objects and materials eg *plastic bottles, fine gauze, thin nylon, wood, acetate, foils, greaseproof paper*
- white cardboard to act as screen
- overhead projector
- dark tents

Suggested Quality Texts

Non-fiction: What makes a shadow by Clyde Robert-Bulla

Fiction: The Owl who was afraid of the dark

Website/Apps

Shows how shadows are formed.

<http://www.bbc.co.uk/learningzone/clips/how-shadows-are-made-shadow-puppets/2175.html>

How do diff materials affect shadows

<http://www.bbc.co.uk/learningzone/clips/how-do-different-materials-affect-shadows/6663.html>

Extended Writing Opportunities

Non chronological report on sources of light.

Numeracy Skills

Standard units; m, cm, mm. Measure the lengths of their shadows and to present their findings in graphical format. Read scales to nearest division labelled and unlabelled. Bar charts 1:1, 1:2, 1:5 & 1:10 scale.

Frequency table.

Wow starter/experience

Emersion room –

<http://www.bbc.co.uk/learningzone/clips/an-introduction-to-light-and-shadow/2171.html>

Visit Broadgreen International school science lab for work on shadows using their equipment.

Contact Di Stead (a teacher of science who has worked for Hope university) to lead a practical session in school.

Cross Curricular Links/ enquiry time activities:

ICT: A simple graphing program can be used for recording the length of shadows at different times of the day. Use a graphing program to make a bar chart showing the length of the shadow at different times of the day.

Art: Children to look at the work of artist, Turner and use water colour or acrylic paint to create the reflection on water. Make close observational drawings of reflections in shiny objects, e.g. in mirrors, spoons, kettles. Using a torch, some objects and a screen to create silhouettes and then drawing around them
Using a torch, some objects and a screen to create silhouettes and then drawing around them

DT : Design and make periscopes, taking account of the light source
Design and make puppets, create a show using puppets to make shadows using knowledge of materials to make different types of shadows.

Geography: Night and day in different parts of the world. Lengths and times of shadows in different parts of the world.