

UNIT 10

PROPERTIES OF LIGHT

SCHEME OF WORK

Suggested time frame: 8 periods (1 period is approximately 40 minutes.)

Lesson	No. of Periods	Learning Objective(s)	Process Skill(s)	Vocabulary	Resource(s) and Material(s)
1	4	<ul style="list-style-type: none"> Know how the properties of light affect sight. Recognise that more light is reflected from smooth surfaces than rough surfaces. Know how light is reflected from a mirror. Know how light travels. Know how a periscope works. 	<ul style="list-style-type: none"> Analysing Communicating Generating possibilities Inferring Observing 	<ul style="list-style-type: none"> Dull Periscope Reflect Rough Smooth Source Straight 	<ul style="list-style-type: none"> Textbook, pp. 143–148, p. 154 Activity Book, pp. 91–94 <p>Optional:</p> <ul style="list-style-type: none"> Internet, periscope template Glue A4-sized cardboard Two 4 cm by 4 cm square “mirrors” (or any reflective surfaces like aluminium foil pasted onto cardboard)
2	4	<ul style="list-style-type: none"> Know how to classify materials as opaque, translucent and transparent. Understand that light cannot pass through some materials and this leads to the formation of shadows. 	<ul style="list-style-type: none"> Analysing Classifying Communicating Generating possibilities Inferring Observing 	<ul style="list-style-type: none"> Opaque material Translucent material Transparent material 	<ul style="list-style-type: none"> Textbook, pp. 149–153 Activity Book, pp. 95–103 Internet

Note: This unit is supported by PowerPoint Slides and an online Question Bank, which can be found at: www.MCEduHub.com

Lesson 1**Duration of lesson:** 4 periods**Learning objectives**

- Know how the properties of light affect sight.
- Recognise that more light is reflected from smooth surfaces than rough surfaces.
- Know how light is reflected from a mirror.
- Know how light travels.
- Know how a periscope works.

Process skills

- Analysing, communicating, generating possibilities, inferring, observing

Vocabulary

- Dull, periscope, reflect, rough, smooth, source, straight

5E	Lesson	Resource(s) and Material(s)
Engage (10 min)	<i>(Process skills: Generating possibilities, observing)</i> <ul style="list-style-type: none"> • Get pupils to look at the picture on Textbook p. 143. • Ask pupils the following question: <ul style="list-style-type: none"> ➢ What are some other surfaces that allow you to see something behind you? 	<ul style="list-style-type: none"> • Textbook, p. 143
Explore (10 min)	<i>(Process skills: Generating possibilities, observing)</i> <ul style="list-style-type: none"> • Go through Textbook p. 144 • Ask pupils the following question: <ul style="list-style-type: none"> ➢ What are some other light sources? • Get students to list everyday examples not found in the Textbook. 	<ul style="list-style-type: none"> • Textbook, p. 144
Explain (40 min)	<i>(Process skills: Inferring, analysing, observing)</i> <ul style="list-style-type: none"> • Ask pupils the following questions: <ul style="list-style-type: none"> ➢ Why are we not able to see an object around a corner? ➢ Why do some surfaces look shiny while others look dull? ➢ How do mirrors allow us to see objects we cannot look at directly? • Go through Textbook pp. 145–148 with pupils and explain that these things can happen because light travels in a straight line and can be reflected. 	<ul style="list-style-type: none"> • Textbook, pp. 145–148

5E	Lesson	Resource(s) and Material(s)
Elaborate (40 min)	<p><i>(Process skills: Communicating, generating possibilities)</i></p> <ul style="list-style-type: none"> • Get pupils to use Language Connect on Textbook p. 146 to come up with some words to describe shiny surfaces. • Get pupils to read Science Today on Textbook p. 154 to show them how large amounts of information is transmitted over the Internet so quickly. • Ask pupils the following question: <ul style="list-style-type: none"> ➤ How else is information transmitted in the form of light? <ul style="list-style-type: none"> ○ Television, lighthouse, traffic lights • Get pupils to use Research on Textbook p. 144 to find out which living things can give out their own light. • Get pupils to use Research on Textbook p. 148 to find out why the word “AMBULANCE” is spelt backwards on the front of the vehicle. 	<ul style="list-style-type: none"> • Textbook, Research, p. 144, 148, Language Connect, p. 146 and Science Today, p.154
Evaluate (60 min)	<p><i>(Process skills: Observing, analysing)</i></p> <ul style="list-style-type: none"> • Get students to answer the question in Quick Check on Textbook p. 148. • Get pupils to complete Activity 1 on Activity Book pp. 91–92. • Get pupils to complete Activity 2 on Activity Book pp. 93–94. 	<ul style="list-style-type: none"> • Textbook, Quick Check, p. 148 • Activity Book, Activity 1, pp. 91–92, Activity 2, pp. 93–94
Additional Activity	<p><i>(Process skills: Observing, analysing, communicating, inferring)</i></p> <p>Note: Before class, print out the periscope template at: https://www.sea.museum/-/media/anmm/files/kids-make-and-do/periscope.pdf?la=en</p> <ul style="list-style-type: none"> • Get students to carry out the following activity: <ul style="list-style-type: none"> ➤ Paste the template onto a piece of cardboard. ➤ Cut out the periscope along the solid lines. ➤ Fold the periscope along the dotted lines. ➤ Use the tabs at the edges to join the periscope together with glue. ➤ Turn the periscope over to the undecorated side. Add a 4 cm x 4 cm mirror to each of the mirror flap sections. ➤ Fold in the mirror flaps so that the mirrors face one another. Glue the mirror flaps into place. 	<ul style="list-style-type: none"> • Internet, periscope template • Glue • A4-sized cardboard • Two 4 cm by 4 cm square “mirrors” (or any reflective surfaces like aluminium foil pasted onto cardboard)
Enrichment for Advanced Learners	<p><i>(Process skill: Communicating)</i></p> <ul style="list-style-type: none"> • Get pupils to find out the speed of light. • Encourage pupils to share their findings with the class. 	

10.3
10.4

**Why Are We Able to See Through Some Objects but Not Others?
How Are Shadows Formed?**

Lesson 2

Duration of lesson: 4 periods

Learning objectives

- Know how to classify materials as opaque, translucent and transparent.
- Understand that light cannot pass through some materials and this leads to the formation of shadows.

Process skills

- Analysing, classifying, communicating, generating possibilities, inferring, observing

Vocabulary

- Opaque material, translucent material, transparent material

5E	Lesson	Resource(s) and Material(s)
Engage (10 min)	<i>(Process skills: Observing, generating possibilities, communicating)</i> <ul style="list-style-type: none"> • Show pupils a video on renewable energy (0:00–2:37) at: https://www.dailymotion.com/video/x2mjduh • Ask pupils the following question: <ul style="list-style-type: none"> ➤ Why is light able to pass through air and water? 	<ul style="list-style-type: none"> • Internet
Explore (30 min)	<i>(Process skills: Observing, inferring, communicating)</i> <ul style="list-style-type: none"> • Get pupils to carry out Creative Science on Activity Book pp. 97–98 to tell a story using shadows and observe how the size and shape of the shadows changed. 	<ul style="list-style-type: none"> • Activity Book, Creative Science, pp. 97–98
Explain (40 min)	<i>(Process skills: Inferring, analysing, observing)</i> <ul style="list-style-type: none"> • Ask pupils the following questions: <ul style="list-style-type: none"> ➤ How do you classify materials based on the amount of light that passes through them? ➤ How are shadows formed? • Go through Textbook pp. 149–150 with pupils to explain these concepts. 	<ul style="list-style-type: none"> • Textbook, pp. 149–150
Elaborate (30 min)	<i>(Process skills: Observing, inferring, generating possibilities)</i> <ul style="list-style-type: none"> • Get pupils to carry out the activity in Explore on Textbook p. 149. • Get pupils to complete Activity 3 on Activity Book pp. 95–96. 	<ul style="list-style-type: none"> • Textbook, Explore, p. 149 • Activity Book, Activity 3, pp. 95–96
Evaluate (50 min)	<i>(Process skills: Analysing, observing, evaluating)</i> <ul style="list-style-type: none"> • Go through What We Have Learnt on Textbook p. 151 and Science Glossary on Textbook p. 153 to recall the concepts and vocabulary learnt in this unit. • Get pupils to complete Test Yourself on Textbook p. 152. • Get pupils to complete Let's Review on Activity Book pp. 99–103. 	<ul style="list-style-type: none"> • Textbook, pp. 151–153 • Activity Book, Let's Review, pp. 99–103

Answers to Textbook Questions

Language Connect, Textbook p. 146

Gleaming, polished, sparkling, glistening (Answer varies.)

Quick Check, Textbook p. 148

Light from light sources bounce off the object and into our eyes, allowing us to see it.

Quick Check, Textbook p. 149

Transparent materials allow almost all light to pass through them while opaque materials do not allow any light to pass through them.

We can see through transparent materials more clearly as almost all light can pass through them.

Quick Check, Textbook p. 150

Light travels in straight lines.

Test Yourself, Textbook p. 152–153

1. (4)
2. (3)
3. (a) Tube A. Tube A allows Sue to see the tomato as it is straight and light travels in a straight line.
(b) An opaque object does not allow light to pass through it. When placed between a light source and a surface, it forms a dark shape called a shadow.

Answers to Activity Book Questions

Activity 1, Activity Book pp. 91–92

5.

