

Science	
Science	Explore
How does light travel?	
Lesson 4 60 mins	Shining Light
<p>Ways of Working:</p> <p>Pose and refine simple questions, and make predictions to be tested</p> <p>Communicate scientific ideas, data and findings, using scientific terminology and formats appropriate to context and purpose</p> <p>identify and apply safe practices</p> <p>Reflect on and identify different points of view and consider other people's values relating to science</p> <p>Reflect on learning to identify new understandings and future applications.</p> <p>Plan activities and investigations, identifying and using elements of a fair test</p> <p>Collect and organise data, information and evidence Evaluate information and</p>	<p>Science Understanding</p> <p>Physical sciences</p> <p>Light from a source forms shadows and can be absorbed, reflected and refracted (ACSSU080)</p> <p>Science as a Human Endeavour</p> <p>Nature and development of science</p> <p>Science involves testing predictions by gathering data and using evidence to develop explanations of events and phenomena (ACSHE081)</p> <p>Science Inquiry Skills</p> <p>Questioning and predicting</p> <p>With guidance, pose questions to clarify practical problems or inform a scientific <u>investigation</u>, and predict what the findings of an <u>investigation</u> might be (AC SIS231)</p> <p>Planning and conducting</p> <p>With guidance, plan appropriate <u>investigation</u> methods to answer questions or solve problems (AC SIS086)</p> <p>Use equipment and materials safely, identifying potential risks (AC SIS088)</p> <p>Processing and analysing data and information</p> <p>Construct and use a range of representations, including tables and graphs, to represent and describe observations, patterns or relationships in data using digital technologies as appropriate (AC SIS090)</p> <p>Compare data with predictions and use as evidence in developing explanations (AC SIS218)</p>

evidence to support data gathered from activities and investigations

Select and use tools, technologies and materials suited to the activities and investigations

Draw conclusions that are supported by evidence, reproducible data and established scientific concepts

Evaluating

Suggest improvements to the methods used to investigate a question or solve a problem ([AC SIS091](#))

Communicating

Communicate ideas, explanations and processes in a variety of ways, including multi-modal texts ([AC SIS093](#))

The Australian Curriculum: Science for Prep (F) – 10
<http://www.australiancurriculum.edu.au/Science/Curriculum/F-10#cdcode=ACSSU080&level=5> Retrieved 6th October 2013.

This lesson is a demonstration of how light travels. In the first lesson I have asked the students to write their understandings of light, this activity will allow the students to test their hypothesis about how light travels.

Introduction:

I will explain to the students that the purpose of these experiments is to test their original hypothesis regarding how light travels. This will also be an opportunity to demonstrate the importance of diagrams in scientific explanations and work through from the hypothesis to the testing to conclusion.

Questions for this investigation:

- Does Light travel in a straight line?
- Why do you think that?
- Can light curve? Why?
- Can light change direction on its own? Why?

I will display the sheet how light travels investigation and explain that these are the instructions for the investigation.

Read with the sheet with students and discuss the investigation, and explain that the investigation involves two steps by referring to 'Procedure 1' and 'Procedure 2'.

Body of lesson:

I will ask the students to move into their groups and for the Team manager will come forward to collect the materials needed.

I will distribute the instructions for the investigation
I will distribute the worksheets for How light travels and explain that students need to fill in the sheet as they work through the investigation.

Ask students to complete the first five steps of procedure 1.

Monitor student engagement.

Allow students to investigate the best way of keeping their cards straight and in line with one another.

Remind students to record their observations on the sheet *How does light travel?*

Explain that they are to complete the first prediction.

Note: Refer to information in the teacher notes *How does light travel?*

Ask students to continue with the investigation.

Tell students to stop at the end of the first procedure.

We will then discuss how the students drew their diagrams
Perhaps at this stage I could model a few diagrams on the board using the appropriate language and techniques, or students could volunteer to share their diagrams on the board.

Explain to students that ray arrows are a scientific convention that is used in diagrams to show the path of light.

Display the sheet Labelled diagram of investigation set-up and draw ray arrows, explaining how they show the path of light.

Ask students to redo their diagrams using ray arrows.

Direct students to complete procedure 2.

Monitor students as they are completing their observations.

Question students throughout the activity to elicit their understanding.

Questions for this investigation:

- What is happening to the light?
- Is the light behaving the way that you have predicted?
- How is it different or the same?
- What did you notice about the shape of the light on the book?

I could assist the students to construct an explanation using their observations as evidence.

Conclusion:

The class could then share their observations as a teacher directed discussion.

	<p>Questions for this investigation:</p> <ul style="list-style-type: none"> • What did you notice about the way that the light moved from the torch to the book? • What did the strings show you about the movement of light? • Did you get the results that you thought you would? • Does Light travel in a straight line? <p>This lesson about how light travels in a straight line will explain how light helps us to see.</p>
<p>Knowledge and understanding: Science as a human endeavour.</p> <p>Scientific ideas can be used to explain the development and workings of everyday items</p> <p>Science can contribute to people's work and leisure</p>	<p>Resources:</p> <ul style="list-style-type: none"> • Science journals • Science chat board <p>Prepared resources.</p> <ul style="list-style-type: none"> • Template of light shield card • Instructions on the procedure • Equipment list • Labelled diagram for students to model <p>For Teams:</p> <ul style="list-style-type: none"> • Badges for team roles, Manager, Director, Speaker. • Marking Pens • Light Shield Cards x 3 • Ruler • Scissors • Tape • Thick book • Torch • Blue tack • Science Journals • Worksheets • Instruction sheet • A piece of string
<p>Evidence of learning:</p> <p>Students will</p>	<p>General Capabilities:</p> <p>Literacy</p> <p>Word Knowledge</p>

understand that light travels in a straight line

Students will use labelled diagrams and a ray diagram to demonstrate their understanding

- Understand learning area vocabulary

Composing texts through speaking, writing and creating

- Compose texts

Compose spoken, written, visual and multimodal Grammar knowledge

- Use knowledge of sentence structures
- Use knowledge of words and word groups
- learning area texts

Critical and Creative Thinking:

The particular elements of Critical and creative thinking addressed by this content description

Inquiring – identifying, exploring and organising information and ideas

- Organise and process information
- Pose questions
- Identify and clarify information and ideas

Reflecting on thinking and processes

- Reflect on processes

Analysing, synthesising and evaluating reasoning and procedures

- Evaluate procedures and outcomes

Personal and social capability

The particular elements of Personal and social capability addressed by this content description

Self-management

- Become confident, resilient and adaptable
- Work independently and show initiative

Social management

- Communicate effectively

	<p>Information and communication technology capability</p> <p>The particular elements of Information and communication technology capability addressed by this content description</p> <p>Creating with ICT</p> <ul style="list-style-type: none"> • Generate ideas, plans and processes <p>Investigating with ICT</p> <ul style="list-style-type: none"> • Define and plan information searches
<p>Helpful Teachers Resources:</p>	<ul style="list-style-type: none"> • I have prepared resources for this activity. • Template of light shield card • Instructions on the procedure • Equipment list • Labelled diagram for students to model
<p>Possible Alternative conceptions or misunderstandings about light.</p>	<p>By using ray diagrams and ray diagrams I will be able to elicit misunderstanding, and through diagrams we can readjust this thinking.</p>