# Lesson Plan

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| **Title:** Technical writing – Light and Mirrors 4 | **Date:** |
| **Learning objective/s:*** To investigate angles of reflection
 | **Curriculum links:** |
| **Learning outcomes****I want evidence students can:*** Measure angles accurately using a protractor
* Record their results in a table
* Explain how a periscope works
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| **Notes on students who have exceeded the performance expected:** | **Action to be taken:** |
| **Notes on students who did not achieve the performance expected:** | **Action to be taken:** |
| **Essential vocabulary:**Light, opaque, reflects, reflective, emits, mirror, periscope | **Possible misconceptions:** |
| **Cross curricular links:** Science, literacy, numeracy |
| **Teacher resources including ICT:** * Introductory Presentation PowerPoint.
 | **Student’s resources including ICT:** * Whiteboards & markers
* Protractors
* Mirrors
* Torches with narrow slit card (See lesson 1)
* Rulers
* Periscope Worksheet
* Angles Worksheet (optional)
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| **Organisation and class management:** | **Teaching points:** | **Notes:** |
| **Introduction:** Whole class discussion | * Using the powerpoint presentation, remind the students about how light reflects off mirrors and opaque objects allowing us to see the object from around corners.
* Remind the students of our question at the end of session 3 about whether the angle of the mirror makes a difference.
* Explain that today we shall be working in small groups to investigate that question.
* Use the presentation to model how this should be done.
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| **Main phase:**In small groups | * Provide all students with the worksheet to record their findings.
* Provide each group with a protractor, a ruler, a whiteboard and pen, a mirror and a torch with a narrow slit card.
* Students should investigate what angle the light reflects off the mirror at from a range of starting positions, e.g. if the light hits the mirror at 20 degrees, what angle does the reflected light beam leave the mirror at. NB: A worksheet is provided if you feel students might require additional support.
* Students should then write a sentence about what they have discovered.
* Show the students a picture of a periscope, followed by the diagram of how a periscope works.
* What angle is the light being reflected at? So what angle must the mirror be set to?
* Students should then be given worksheet and asked to draw on the light path and annotate the diagram with what is happening, including the angles of the mirrors.
 |  Further information and lesson plans are available on the NSO Website, including a workshop looking at what causes day and night: [https://www.schoolsobservatory.org/](https://www.schoolsobservatory.org/%20discover/activities/daynight)[discover/activities/daynight](https://www.schoolsobservatory.org/%20discover/activities/daynight) |
| **Plenary/Conclusion:**Whole class discussion  | * Remind the students of the letter from session 1, have we solved the problem?
* Explain that tomorrow we shall be writing a report to send to our mysterious friend!
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