

Year 8 Independent Learning Project – Communication with Sound and Light

Start Date:		Due Date:		My Target Level:	
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Aims/Learning Outcomes:		How should I submit my work?	
- Describe that sound is transmitted through a variety of materials by vibration of particles (level 4) - Explain using particle model diagrams how sound travels through a solid, liquid, gas and a vacuum - relate it to their loudness (level 5-6) - Explain transmission of sound through your telephone in terms of loudness and speed with reference to the materials you've used (level 7)		Success Criteria: L4 Use of key words L5 Understanding the particle model L6 Draw straight forward conclusion from making their telephones L7 Identify scientific evidence (peer assessment of each other's model telephones)	
- Describe how light is reflected and the characteristics of the image in a plane mirror (Levels 4–5). - Describe how periscopes work by the application of the Law of reflection (Levels 6–7).		L4 Use of key words L5 Understanding reflection and refraction L6 Draw straight forward conclusion from making their periscopes L7 Identify scientific evidence (peer assessment of each other's model periscopes)	
What you need to do		Extension Task	Useful Topic Related Words
You are going to learn how telephones and periscopes work. You will use your knowledge of sound and light to design, make and test model telephone and periscope. You Must: - Decide on the choice of materials using your knowledge of sound and light to design the models - Design, make and test your models - Use correct spelling, punctuation and grammar. You Should: - Evaluate your model and modify if necessary		You Could: Explain how fibre optics work, what total internal reflection and its uses. Present in any work you want e.g. poster, role play, PowerPoint, video etc	- speed of sound - decibel - pitch - vibrate - transmit - vacuum - medium - amplitude - wavelength - frequency - echo - reflect - refract - periscope - compression - rarefaction - longitudinal - transverse - dissipated
What steps can I use to help along the way? These steps will be helpful when completing the project.			

Checkpoint 1 (due in ? weeks)

Homework: define keywords highlighted on previous page (lesson 1)

Teacher to check and grade telephone model (lesson 2)

Checkpoint 2 (due in ? weeks)

Pupils to make notes on how they made their telephone, any modifications they made to their telephone and what their findings were from the investigation

Complete for homework if not completed in class

- Complete their investigative write up on their telephone; it must include a method with diagram, their findings and an evaluation.

Homework

- Research 3 uses of periscopes in everyday life describing/ explaining how they work (lesson 4)

Checkpoint 3 (due in ? weeks)

Homework

- Write a scientific report on how your periscope work, explaining how light travels from the object to your eyes and how you are able to see it
- Your report must include method with diagram, findings and an evaluation of your periscope

Please remember to plan out your time carefully and ask your subject teacher if there is anything that you do not understand.

Level achieved: _____

Teacher comments:

ILPS – Sound and light

Lesson 1: Sound through different mediums

- Circus of experiments to include tuning fork, slinky, plastic cables, a range of musical instruments
- Discuss outcomes of experiment

Homework:

Define keywords of sound using the textbook: speed of sound, decibel, pitch, vibrate, transmit, vacuum, medium, amplitude, wavelength, frequency, echo, refract (compression, rarefaction, longitudinal, transverse, dissipated)

Lesson 2: Investigative lesson on transmitting sound

- 1) Display a range of materials and get the pupils to write down a hypothesis of the investigation
- 2) Design, test and modify a telephone using available materials to communicate between a long distance

Homework

Make notes how you made your telephone, how you modified it and your findings.

Lesson 3: Report writing based on previous investigative lesson

Complete for **homework** if not completed in class.

Write a scientific report on your telephone explaining the choice of materials and how sound travels through them

- Report must include method with diagram, findings and an evaluation of your telephone

Lesson 4: Periscopes

Introduce reflection and refraction using a range of practical e.g law of reflection, prism, glass blocks and Isaac Newton's dispersion experiment and potential uses of refraction

Homework:

Research 3 uses of periscopes in everyday life describing/ explaining how they work

Lesson 5: Making your own periscope

Plan and design your own periscope using the materials available

- 1) Display a range of materials and get the pupils to write down a hypothesis of the investigation
- 2) Design, test and modify your periscope using available materials

Homework:

Write a scientific report on how your periscope work, explaining how light travels from the object to your eyes and how you are able to see it

- Report must include method with diagram, findings and an evaluation of your periscope

Lesson 6: Peer assessment of each other's telephone and periscope

Morse code/ Optic fibres (extension)