



Knowledge and Skills Mind Map (Science)

Year 3 Autumn Term 1 (Page 1)

Knowledge - 
Skill - 



1. Can I ask scientific questions about light and shadow and make predictions based on what I think will happen?

- **Prior knowledge:** N/A
- **Vocab:** light, shadow, prediction
- Know that light is needed to see things and that darkness is when there is no light
- Know that shadows are formed when light is blocked by an opaque object. A shadow appears on the ground when your body blocks sunlight.
- Know that scientists ask questions and make predictions before investigating, e.g. asking "What will happen to the shadow if I move the torch closer to the object?" and predicting that it will get bigger.
- Know that scientific questions can be answered in different ways such as observing, testing or re-searching, for example observing how a shadow changes when a light moves or testing different objects to see if they create shadows.
- **Ask relevant questions and using different types of scientific enquiries to answer them**
- **Use results to draw simple conclusions, make predictions for new values, suggest improvements and raise further questions**

5. Can I explain how shadows are formed and investigate patterns in how shadow size changes by measuring and observing?

- **Prior knowledge (last lesson):**
- **Vocab:** shadow, opaque, distance
- Know that shadows are formed when light from a source is blocked by an opaque object.
- Know that the size of a shadow changes depending on the position of the light source or the distance between the object and the light.
- Know that we can measure shadows to help us observe patterns and changes, (e.g. measuring shadow length as a torch is moved closer or further away).
- Know that careful observations help us identify patterns in how shadows change.
- **Make systematic and careful observations**
- **Identify differences, similarities or changes related to simple scientific ideas and processes**

Light

2. Can I identify light sources and use evidence to explain why light is needed to see?

- **Prior knowledge (last lesson):** asked scientific questions about light and shadows
- **Vocab:** light source, reflect, darkness
- Know that a light source is something that produces its own light, (e.g. the Sun, a torch or a light bulb).
- Know that we see objects because light reflects off them and enters our eyes.
- Know that darkness is the absence of light and without light we cannot see.
- Know that some objects are not light sources because they only reflect light, (e.g. the Moon appears to shine but reflects light from the Sun).
- **Use straightforward scientific evidence to answer questions or to support findings.**
- **Identify differences, similarities or changes related to simple scientific ideas and processes**

4. Can I plan and carry out a fair test to compare how different materials reflect light and record my results?

- **Prior knowledge (last lesson):** how light reflects and identified reflective materials
- **Vocab:** fair test, material, reflective
- Know that a fair test is when one thing is changed and everything else is kept the same to ensure results are reliable.
- Know that different materials reflect light in different ways and amounts.
- Know that results can be recorded to help answer questions, (e.g. using a table to show which materials are most or least reflective).
- Know that comparing results helps us to identify which materials are more reflective than others.
- **Setting up simple practical enquiries, comparative and fair tests.**
- **Gather, record, classify and present data in a variety of ways to help answer questions**

3. Can I observe how light reflects from surfaces and identify reflective materials using scientific evidence?

- **Prior knowledge (last lesson):** identify light sources explained why light is needed to see
- **Vocab:** reflect, reflective, surface
- Know that light reflects from surfaces and travels in straight lines.
- Know that some materials reflect light well and are called reflective, (e.g. mirrors and shiny metal surfaces reflect a lot of light).
- Know that dull or rough surfaces reflect less light and are not very reflective.
- Know that we can identify reflective materials by observing how much light bounces off them, (e.g. seeing a clear reflection in a mirror compared to no reflection on fabric).
- **Make systematic and careful observations**
- **Use straightforward scientific evidence to answer questions or to support their findings.**



Knowledge and Skills Mind Map (Science)

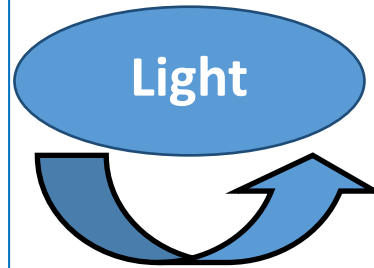
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Knowledge - 
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6. Can I classify materials (transparent, translucent, opaque) and record and present my findings using tables, labelled diagrams and charts?

- **Prior knowledge (last lesson):** how shadows are formed and investigated how size changes
- **Vocab:** transparent, translucent, opaque
- Know that transparent materials let all light pass through, translucent materials let some light pass through and opaque materials block light.
- Know how to test materials to find out whether they are transparent, translucent or opaque, (e.g. shining a torch through an object to see how much light passes through).
- Know that sorting materials into groups helps us to classify them based on how they interact with light.
- Know that results can be recorded clearly using tables or labelled diagrams to help answer scientific questions.
- **Recording findings using simple scientific language, drawings, labelled diagrams, keys, bar charts and tables.**
- **Gather, record, classify and present data in a variety of ways to help answer questions**



7. Can I use scientific evidence to explain how to stay safe in the sun and present my findings clearly to others?

- **Prior knowledge (last lesson):**
- **Vocab:** UV, evidence, protection
- Know that scientific evidence is information that has been gathered to support an idea or explanation.
- Know that UV stands for ultraviolet and UV rays are invisible
- Know that too much exposure to the sun can damage skin and eyes
- Some exposure is good as it provides Vitamin D
- Know ways to stay safe in the sun: seek shade, wear protective clothing (hats and sunglasses), apply sun cream with a high SPF, stay hydrated
- Sun screen with at least SPF 30 can block harmful rays
- Evidence:
 - Australian showed that applying screen every day reduced the chance of skin damage by 50%.
 - Norwegian study found that using SPF 15 reduced risk by 30%
- **Using straightforward scientific evidence to answer questions or to support their findings.**
- **Report on findings from enquiries, including oral and written explanations, displays or presentations of results and conclusions**