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**Differentiating for Learning in STEM Teaching**

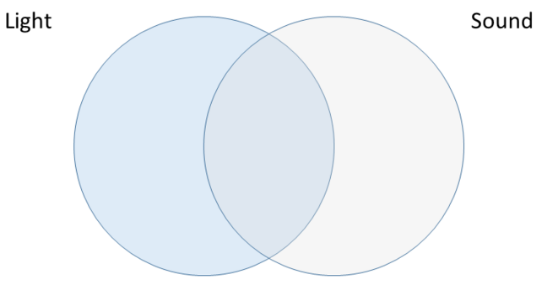
# Exemplars of increasing the degree of challenge

(The four activities are based on work by Ben Law, a PGCE trainee at King’s College, London, 2016.)

#### Sorting statements

Sort the following statements about light and sound into the Thinking Organiser below:

* + Travel as waves
  + Detected by the ear
  + Can be absorbed
  + Can travel through a vacuum
  + Can be reflected
  + Travels well through solids
  + Detected by the eye
  + Can be refracted



#### Correct words

Add the correct word to the paragraph using only **Light** or **Sound**.

\_\_\_\_\_ and \_\_\_\_\_ are both similar as they are both forms of energy and they exist and travel as waves. Three key properties that these have are the amplitude, frequency and wavelength. A \_\_\_\_\_ wave travels as a transverse wave, this means that the oscillations are at right angles to the direction of travel. A \_\_\_\_\_ wave can only travel through matter as it needs particles to vibrate. The \_\_\_\_\_ wave travels as a longitudinal wave with the particles vibrating in the direction the wave travels. A \_\_\_\_\_ wave can travel through a vacuum, however it cannot travel through opaque objects. \_\_\_\_\_ waves travel faster than \_\_\_\_\_ waves. Both \_\_\_\_\_\_ and \_\_\_\_\_ waves interact with different materials; they can be absorbed, reflected, refracted or transmitted.

#### True or false?

|  |  |  |
| --- | --- | --- |
| STATEMENT | TRUE? | FALSE? |
| When light and sound travel through different materials, the speed of the waves change |  |  |
| Light travels faster than sound |  |  |
| Sound waves can be seen on a screen if detected by a periscope |  |  |
| Both sound and light can be blocked by certain materials |  |  |
| You can hear sound in a vacuum like in outer space |  |  |

Rewrite any of the statements that you think are false so they become a true statement.

#### Compare and contrast

|  |  |  |
| --- | --- | --- |
| Question or Statement | LIGHT | SOUND |
| What type of wave? |  |  |
| How are they detected by humans? |  |  |
| Changing the intensity leads to a change in ….. |  |  |
| Changing the frequency leads to a change in ….. |  |  |
| Type of surface that reflects these waves |  |  |
| Reflected waves are called ..... |  |  |
| Through what do they travel fastest? |  |  |
| Speed of travel in air? |  |  |
| Frequencies below visible and audible range are called ..... |  |  |
| Frequencies above visible and audible range are called ..... |  |  |

Complete the columns for light and sound for each of the questions or statements.