Light and Sound Activity

Fact Card 1

Sound travels at 761 miles per hour

Fact Card 2

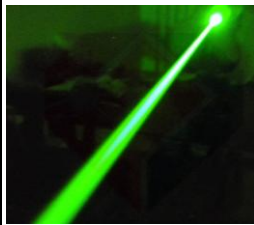The moon is roughly 390,000km from Earth

Fact Card 3

There are 1.6km in a mile

Fact Card 4

The moon orbits the earth once every 28 days

Fact Card 5

Light travels at 300 million metres per second

The Question

How far can sound travel in the time it would take light to reach us from the moon?

Problem Solving 1

What do I want to find out?

What is the question really asking me?

What will my answer look like?

Problem Solving 2

What do I already know?

What information have I been given?

Which bits are going to be useful?

Problem Solving 3

What do I need to do?

What other knowledge/skills do I need?

How do I apply them to get a solution?

Instructions

Cut out all the cards, then use them to find an answer to the question.
In your groups, each try guessing a number first, and see who was the closest. *You may use a calculator, and you will need a pen and paper.*

Light and Sound Activity - Instructions

Designed to be a complex problem-solving activity which requires logical thinking as well as the ability to calculate.

Participants will have all the cards (either cut out or simply printed - a single set will fit on A4).

They will need to sort through them for **Facts**, **Question** and **Problem Solving** cards.

The **fact cards** contain information which may or may not be useful, the **question card** the problem they need to solve, and the **problem solving cards** the techniques they should use to solve it (valid for any problem solving)

To get to the solution (440 metres), it is necessary to link the facts together into a coherent series of calculations

The progression goes like this:

Fact Card 5 *Speed of light*	Light travels at 300000000m/s = 300000km/s
Fact Card 2 *Distance to the moon*	390000km. At 300000km/s, the time taken is 390000/300000 = 1.3 seconds
Fact Card 1 *Speed of sound*	Sound travels at 761mph, which comes to 0.2113 miles per second, so in 1.3 seconds it will travel 0.2113 x 1.3 = 0.27469 miles
Fact Card 3 *Miles to km conversion*	There are 1.6km in a mile, so 0.27469 miles = 0.27469 x 1.6 = 0.439504km In metres, this is 0.439504 x 1000 = 439.504m, or **440m** to the nearest metre.

Note: Fact Card 4 is a red herring - the time it takes the moon to orbit the Earth is irrelevant to this problem.