Sound – Investigating sound

Watch the video at https://home.empiribox.com/lessons/sound/

Name_____ **Class**_____

What you will need for this lesson: a bowl, plate or cup, some rubber bands.

You will also need a pen, a pencil and if you have it, access to a computer, tablet or iPad.

LESSON STARTER

Close your eyes and focus on the sounds that you can hear. Below write down what sounds you can hear right now. What are the loudest sounds and the quietest sounds?

_____

_____

_____

What sounds make you feel happy and what makes you feel sad? _____

_____

Now let's think very carefully. What actually is sound? Try and write a definition or a brief description of what sound is? Year 5 and Year 6 pupils should try and include the word 'particles' in their definition.

Sound is

_____

_____

_____

_____

When you've finished, watch the video to see how close your definition was to the correct one.

THE INVESTIGATION

In our investigation we are going to look at how stringed musical instruments make their sound.

When you've created your stringed instrument, play around with the strings to see if you can make them create a different noise or pitch. Make a note of what you find out below:

_____

_____

_____

What we learned!
We know that sound is a word we use to describe what is heard when sound waves pass into our ears. All sounds are made by vibrations of molecules. For example when a drum or cymbal is struck, the object vibrates. These vibrations make the air molecules move in a specific way so that when it enters our ears we hear the vibrations as a sound.

WORKING SCIENTIFICALLY

Our next focus is about working scientifically. All scientists apply these principles whenever they are investigating anything and we've divided them into different skill units.

Find the section your teacher has asked you to focus on and answer the questions in the relevant section.

A. Planning or

B. Presenting and analysing data or

C. Evaluation

A. PLANNING

Every scientist wants to solve a problem and so takes the following steps

1. **Decides on a question that needs answering.** e.g. will the sound made by our instrument change according to the size of the container?
2. **Decides what the independent variable (the thing that is changed) might be in order to work out the answer to the question** e.g. we will use different sized containers.
3. **Decides what the dependent variable might be (how to measure the differences in each different example**) e.g. we will measure which instrument plays the higher notes.
4. **Last of all decide what elements have to stay the same in order to make it a fair test** e.g. each investigation should have the same components except for the different sized container.

Now using this knowledge, see if you can answer the questions below!

Write below one or more examples of a question you might want to find the answers.

_____

Year 3, 4, 5, and 6 pupils - What might be the independent variable you would use in your investigation, in other words what would be the things that you would change to investigate your question?

_____

Year 4, 5 and 6 pupils - What would be your dependent variable, in other words what would you measure to record the difference?

_____

Year 5 & 6 pupils - What was your control variable, in other words what did you keep the same to make sure that it was a fair test?

_____

_____

_____

Now go and carry out your investigation!

B. PRESENTING & ANALYSING DATA

When scientists carry out investigations, it is really important that they capture data to make sure they can then answer the questions that they have set themselves.
The scientist on the video has asked you to complete the following:

Year 3 & 4 pupils – You are carrying out experiments to answer the following question:

Does the size of the rubber band affect the pitch of the sound being made?

What kind of data would you capture to show what happens and why?

_____

_____

_____

_____

Year 5 & 6 pupils – You are carrying out experiments to answer the following question:

Does the length of the rubber band affect the pitch of the sound being made?

What kind of data would you capture to show what happens and why?

_____

_____

_____

_____

Now carry out your investigation!

C. EVALUATION

Evaluating how an investigation went as well as the data that comes from a science experiment is a really important part of science. It may be that you feel your experiment could have been done better or more thoroughly and it is important to understand this.

Answer the questions below:

Year 3, 4, 5 & 6 pupils: Did your experiment work?

Year 3,4, 5 & 6 pupils: Why? Try and explain your answer using diagrams if it helps.

Year 5 & 6 pupils: Try and explain how you know it did or didn't work.

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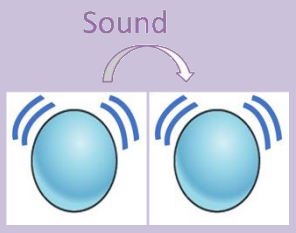
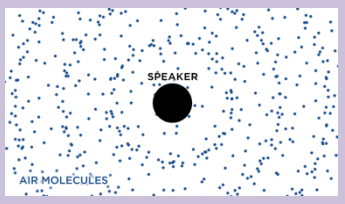
Primary School Science

The science behind the investigation

Sound is a kind of energy just like chemical or heat energy. Sound energy causes the particles in either a solid, liquid or gas to vibrate. They vibrate and then knock on the ones next to them and so the sound energy travels on and on until the sound gradually gets weaker and weaker.



This explains why noises that happen right next to us are very loud but the same noise is heard more faintly the further you are away from it.



Your challenge!

This is a puzzle for you to solve!

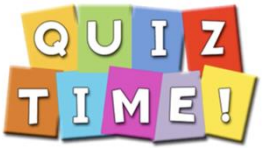
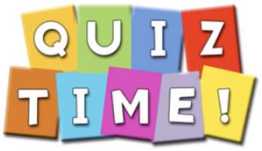
Mark is playing the xylophone in the school orchestra. When he hits a note normally, the note can be heard for 10 seconds. Mark needs to play a note for 5 seconds.

What can he do to stop the note from being heard after 5 seconds?

Year 5 & 6 pupils, how could Mark make the note play for 15 seconds? Try and use what you know about how sound travels to explain your answer.

Research opportunity

Find out whatever you can about Christian Doppler and create a fact file about him.

Where was he born?
When was he born?
Where did he study?
What important scientific knowledge did he find out and how?

What was your score?