

Science – Year 3/4A Summer 2

Sound

Sounds Spectacular

Session 4

Resource Pack

Name:

I can create and play a rhythm that changes in volume and explain how this happens.

Our Marching Rhythm

Work together on creating your own rhythm. Write each instrument (sound made from everyday items) into the table.

Practise it - first counting out loud as you play and then without counting (you can still count in your head if you like). Remember to make the lead beat the strongest sound.

Now make your rhythm change in volume: first getting louder and then gradually getting quieter until it fades out.

Instrument	1	2	3	4	1	2	3	4	1	2	3	4
Lead Beat	★				★				★			

Changing volume

In the box below, write a few sentences to explain how you make the rhythm change in volume. Explain what you must do to make it first louder and then quieter. Try to use these words: *volume, louder, quieter, energy, more, less, rhythm,*

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Changing volume

In the box below, write a few sentences to explain how you make the rhythm change in volume. Explain what you must do to make it first louder and then quieter and what is happening scientifically when you do this. Try to use these words: *volume, louder, quieter, energy, vibrations, stronger, weaker, more, less, rhythm,*

Session 4 Teachers' Notes

Recognising that sounds get fainter as the distance increases

Last session involved a class investigation of hearing and it is very likely that your class agreed a fair test that involved reducing the volume of a sound by increasing the distance between the sound and the people hearing it. If however your agreed method involved changing the volume by a different means, e.g. dropping an object from different heights, you may wish to do a quick investigation of the effect of distance on hearing.

Suggested Method

1. Take the class to a space where you can spread out, e.g. hall, field or playground.
2. Choose a child to be the sound maker and ask the rest of the class to make a tight circle around them. The children in the circle should orientate themselves facing outwards but turn their heads a little so one ear is facing the sound maker.



3. Ask the sound maker to make a quiet sound, e.g. 2 fingers tapping a short, quiet rhythm on their palm such as “one, two three-ee four” (a rhythm is preferable to a single sound which may be lost among the inevitable background noise).
4. Ask the children to raise their hand in the air every time they hear the sound. Ask the sound maker to make the sound loud enough that everyone can hear the sound when the circle is tight.
5. Ask the sound maker to try to repeat this rhythm at the same volume a few times a minute but at irregular intervals so it is impossible for the listeners to predict when the next one is coming.
6. The children in the circle can then very slowly begin to move outwards at their own pace. A small step every few seconds. It doesn't matter if some children move outwards faster than others. Every time they hear the sound they should raise their hand.
7. Once the circle has spread out stop the activity and ask the children what they noticed. Was it harder to hear the sound as they got further away?

8. Explain that you will now try it again but this time take turns to observe what is happening.
9. Swap your sound maker if you want to at this point and number the children round the circle 1, 2, 3, 1, 2, 3, etc..
10. Ask all the 1s to come out of the circle and observe what is happening. Repeat the task with the remaining children. Do this 3 times so all the children get a chance to observe.
11. Discuss what you notice.
12. Hopefully when the circle was tight (close to the sound) the hands all shot up at exactly the same time. As the circle began to widen it is very likely that the hands began to go up in a more ragged way - some up, some down as people strain to hear the distant sound.
13. Hopefully the further away children were less likely to raise their hands at exactly the same moment as the close children.
14. Ask the children to explain this in terms of vibrations spreading out and becoming weaker and harder to hear (losing energy) as they do so.
15. If you are outside, the children may notice that the children on one side hear the sound better than children on the other. Why might this be? Sound vibrations can be carried further by the wind.

Teacher Led Task - Exploring volume in decibels for a variety of sounds

You will need

- A sound probe that can measure decibels
- A variety of instruments or everyday objects that make sounds

Exploration

1. Show the children the sound probe and demonstrate how to record the volume of a sound in decibels.
2. Allow a few minutes of free exploration - children are naturally very curious so they will probably take the lead on this spontaneously by singing, shouting, clapping etc... to see what happens.
3. Encourage them to find a variety of loud and quiet sounds, swapping roles so everyone gets the chance to read the decibels.

Spontaneous Investigation

1. Listen to the conversation. It is very likely that someone will say something like "I wonder what would happen if we ..."
2. This will give you the perfect opportunity to say "Let's give it a try ..." and together conduct a mini investigation where the children vary something and measure the effect on the volume.
3. Suitable questions to investigate could be:
 - What happens if lots of people clap at the same time? You could try measuring one clap, then 2 people clapping together, then 3 and so on.
 - What happens if we add more marbles into the shaker tub? Try shaking a tub with 1 marble, then 2, then 3 etc. and measuring the decibels.
 - What happens if we drop the spoon from higher? Vary the height of a dropped object and measure the decibels.

- What if we drop the spoon onto different surfaces? Try dropping the same item onto a hard surface, a carpet, clothing, tarmac, sand, foam etc. measure the decibels.
4. Ask the children to try to explain their results in terms of vibrations.
- More vibrating objects means more decibels.
 - More energy in the vibrations means more volume too, e.g. a stronger beat or a higher drop.
 - Some surfaces absorb vibrations (deaden the sound).
 - Increasing distance means weaker vibrations (as they spread out from the source of the sound).

Children with a hearing impairment or increased sensitivity to sound

Be aware of children with a hearing impairment or increased sensitivity to sound. You may need to make some adjustments to the lesson to accommodate them, e.g.

- Talking to children about the lesson content ahead so they know what to expect and can think about strategies to help them adapt or access the activities.
- Working in a smaller group.
- Working in a quieter space away from the rest of the class (you may need to arrange for an extra adult to be present).