



Home Learning Music Activities

KS2 Years 3 & 4 - Spring Term – Week 6

NOTE FOR PARENTS/CARERS We hope you and your children enjoy these activities. Dip in and out, try things out, pick and choose what works for you and your children. You don't have to attempt them all! Most of all, have fun together.

We recommend that YouTube videos are reviewed before children access them as, occasionally, inappropriate comments may be posted after we've viewed them.

HELLO MUSIC MAESTROS!

Have you heard of Brian May from the band Queen? Or Edward Elgar? Or Albert Einstein? They were all scientists and musicians! We often think music links with maths but actually it is really scientific. We're going to explore science and music this week. Have fun experimenting!

Singing

First, let's start with our warm-up. This week we're going to use one from our friend Emily at Portsmouth Music Hub. The warmup stops at 4 minutes 19 seconds: [KS2 Singing Session 3 - YouTube](#)

Do you know what gravity is? Do you know who discovered gravity? Have a go at finding out. If you'd like some help, go to the end of these notes.

We love singing this lively song about gravity. Listen to it first (we're sure the chorus will get stuck in your head pretty quickly) and then give it a go. The song is really punchy so see if you can try to make your words punchy and super clear. Imagine there's someone at the back of the room who can't hear you very well and so you're making your mouth shapes clear for them. After you've sung it, see how much you can remember about gravity!

[Gravity \[POPTOPICS\] KS2 Science Lyric Video - Educational song about gravity for kids - YouTube \(youtube-nocookie.com\)](#)

Could you 'think like a scientist'? This amazing rap will show you how. Top tips for rapping successfully include:

- Rap with rhythm and flow – this means you need to really feel the beat of the music you are rapping to and make sure your words fit.
- Find your attitude – remember rapping is as much about attitude and performance as it is about technique.
- Work on your diction – don't try and rap the way you would normally talk. Put the emphasis on the consonants and keep your words clear and sharp.

You can find the rap lyrics at the end of these notes.

[Think Like A Scientist - Blazer Fresh | The Scientific Method | GoNoodle - YouTube](#)

Here's a science question for you! Can you make glass break with your voice?

You may have seen the film 'The Adventures of Tin Tin' and if so, you're sure to remember a great scene where an opera singer called Bianca Castafiore breaks glass with her voice! Unfortunately, the movie clip isn't available on YouTube, but you can listen to it here (fast forward to 3 minutes 10 to get to the glass breaking bit!) [Presenting Bianca Castafiore - YouTube](#)



Here's a funny scene from **Harry Potter and the Prisoner of Azkaban** where the lady singer is trying to break a glass but doesn't quite manage it...

[The Fat Lady Sings | Harry Potter and the Prisoner of Azkaban - YouTube](#)

So... is it possible to break glass with your voice?

Well yes, in theory it is! It is all to do with something called **resonant frequency** and there is a great experiment presented by Dara O'Briain showing how you **can** actually break glass with sound! Fast forward to 1 minute 49: [Breaking a glass with sound in slow motion - Dara O Briain's Science Club - BBC - YouTube](#)

Listening and Appraising

Dr Who is one of the most famous and longest running British children's television series. It first hit our screens in 1963 and is still going strong today. The programme itself is full of science: from discovering new life forms, to flying the TARDIS.



The music for Dr Who is one of the most famous TV theme tunes ever written – but composer Ron Grainer had only written the very basic tune when he handed over the music to Delia Derbyshire. Trailblazer Delia swapped traditional musical instruments for electronic sounds when she arranged the theme. One woman changed the sound of orchestral music forever!

Click on the link, and then click on the top video to learn more about Delia's fascinating and pioneering work! <https://www.bbc.co.uk/teach/ten-pieces/classical-music-delia-derbyshire-doctor-who-theme/zfh792p>

Click on this link below to listen to the original Dr Who theme and see pictures of Delia Derbyshire at work: [Delia Derbyshire - Doctor Who Theme - YouTube](#)

Here's another instrument that was ahead of its time; the **theremin**! Here's a picture:

Although the theremin wasn't used for the Dr Who theme, it has been used in movies like Ghostbusters! Who ya gonna call?! 😊

Click on this link to hear the theremin and find out more about it. Why do you think that was chosen for a film like 'Ghostbusters'?



[You Can Play The Theremin Music Video | Learn Science by Thomas Edison's Secret Lab STEM Videos - YouTube](#)

Now for the science, how does the theremin work? Click on the link below to find out.

[#SparkofScience: Theremin - YouTube](#)

Questions:

1. Who were the composers of the original Dr Who theme?
2. What were their roles in composing the music?
3. Who invented the theremin?
4. In which decade was the theremin invented?
5. What was the original name for the theremin?
6. Apart from the sound, what is unusual about the theremin? (HINT: think about how it's played)

Just for fun: Join Matt Smith and err... 'friends' and listen to more music from Dr Who. Hope you've got a sofa to hide behind! [I Am The Doctor / BBC doctor Who at the Proms Live 2013 - YouTube](#)

Composing

This week we are going to compose a piece of music using science, by creating a water xylophone! You might need to remember that 'pitch' is the word musician use for changes in high and low in music. More about this later!



Sound waves - what are they?

When you tap the bottle the glass it is made of starts to wobble, or vibrate, at a speed that depends on the shape of the glass and how much water is in the bottle. This vibration of the glass causes the air around it to vibrate. The vibration of the air is called a soundwave. When the soundwave reaches our ears, we hear it as a sound. When the amount of water in the bottle is changed, the sound you hear changes too! Why is that? The more water there is in the bottle, the harder the glass finds it to vibrate and the slower the vibrations of the glass become. The slower the vibrations, the lower the pitch of the sound becomes. So now you know!

Find out how the amount of water affects the pitch of the sounds as you play your water xylophone!

These are the items you will need:

- Glass bottles or jars
- Water
- Measuring jug
- Wooden or metal spoons
- Food colouring (optional!)

How to make your water xylophone (ask a grown up to help you with this!)

1. Carefully measure different amounts of water and pour them into each jar or bottle. The amount of water will depend on how many jars you have and their size but try to make sure each has slightly more than the last. Experiment with this as much as you like!
2. If you have food colouring you would like to add, then do so now.
3. Use your spoon to play your water xylophone. Experiment with how firmly you can tap the glass (safely) to get the best sound

- Experiment with the order you play the sounds
- Try repeating some sounds
- Leave a few gaps between some sounds
- Play more than one jar at a time
- Record your piece on a mobile phone or tablet and listen back, or better still, perform your composition to the people at home!



Making and Performing

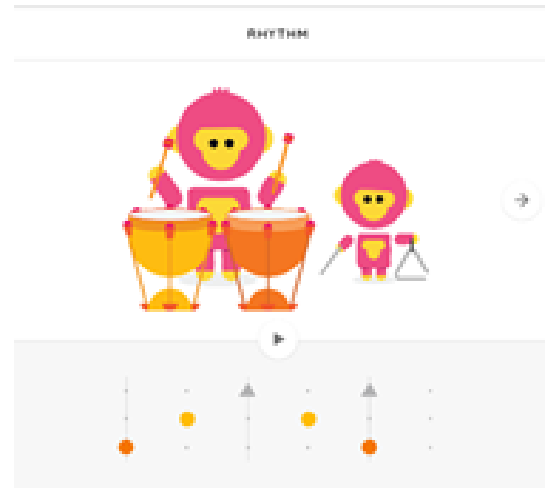
Chrome Music Lab

This is a wonderful piece of software that allows you to explore musical elements in a scientific way. (Basically, you get to play with stuff 😊). There are 14 different activities to have a go at. We're going to tell you about three of them. You might like to have a look at some of the others but ask whoever looks after you if it's OK first. You can find all the experiments by following this link. It should work from any web browser on a tablet, phone or computer. [Chrome Music Lab \(chromeexperiments.com\)](https://chromeexperiments.com)

Rhythm

This activity features animals playing percussion instruments. By clicking on the different dots, you can change when they play. You may want to have a couple of things going on at the same time. Or add some rests in between. You can pause the clip to add in new things or leave it playing and change the sound as you are listening. Try out different ideas until you find your favourite.

Top tip: the vertical lines show the strong beats; any dots between these are the weak beats or off beats. If you play around with these, you can create some really funky syncopated rhythms. Have a go!



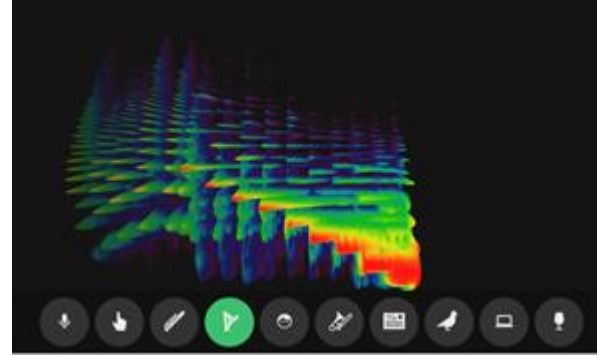
Melody Maker

This experiment lets you create your own tunes and see what your music sounds like. If you click on boxes that are high up on the screen, they will play high notes, boxes lower down on the screen will play low notes. You can change the tempo (speed) of your piece by dragging the dot at the bottom. You can also play more than one note using the button next to the play button.

Spectrogram

A spectrogram is a picture of a sound. It shows the frequencies that make up the sound and how they change over time, going from left right. With this experiment, you can compare spectrograms of different sounds. Look at how fast the lines move and how high and low they are.

The circles at the bottom let you choose the sound you want to see and hear. If you want to have a go at creating your own sound, you could use the pointy finger or the microphone.



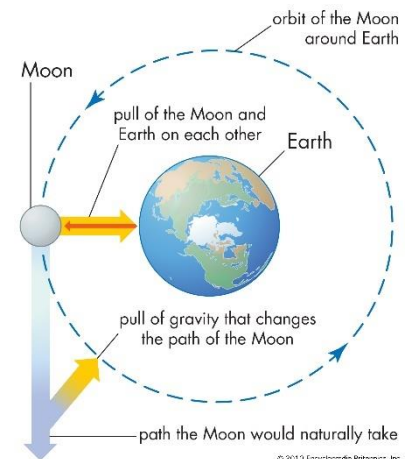
All of us at Encore Music Service would love to see video clips of you taking part in any of this week's activities and share them on our social media channels. Remember, you must get permission from whoever looks after you first! Send to info@encore-enterprises.com

ANSWERS

Singing

*Sir Isaac Newton was an English mathematician and physicist who lived from 1642-1727 and who is famous for his theory of **gravity***

There is a story that Newton came up with his theory when he saw an apple fall from a tree. Newton suggested gravity is a force of nature which keeps you on the ground and which makes things fall towards the earth. In fact, Newton said the force of gravity causes all objects to be attracted (pulled) towards one another. The earth and the sun and the moon all attract one another due to gravity, just like you and the earth attract one another. The more mass (stuff) each of the objects has, and the closer they are together, the greater the force of gravity between them. Really massive objects like planets and stars exert a strong gravitational force.



Listening and Appraising

1. Ron Grainer and Delia Derbyshire
2. Ron Grainer wrote the original theme tune and Delia Derbyshire created the unique sound using electrical beeps and tape recorders
3. Leon Theremin
4. The early 1920's
5. Etherphone
6. You don't touch it when playing it

THINK LIKE A SCIENTIST

Ouch!
That blazer is very freshhhh.
Ah, let me get my lab coat on.
Okay, let's rap now!
THINK LIKE A SCIENTIST
THINK LIKE A SCIENTIST
PUT THE PROCESS IN YA BRAIN
LET'S GET EVERYBODY TRYIN THIS!
THINK LIKE A SCIENTIST
THINK LIKE A SCIENTIST
RULE THAT LAB
LIKE A FIERCE SCIENCE LIONESS!!!
Observe
(Whaaaa?)
Ask a Question!
Hypothesize
(Hmmmm...)
Propose an answer
Experiment
(BeepBoop!)
Test the question!
Analyze
(Bam!)
Look at the results!
Report
(There it is!)
Tell em what you learned!
BRING THAT LAB HEAT Y'ALL!
It's Bunson burned!
Wait!? Isn't that the SCIENTIFIC METHOD?
Yeah, that's another way of saying it!
Got it!
To OBSERVE, you ask a question
And then start to theorize
Make an educated guess about the question
In order to HYPOTHESIZE
When you EXPERIMENT, test the question
Then ANALYZE or study what happened
Finally, you can REPORT the results results
Share it in writing and then start rapping
Let's rap now!
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THINK LIKE A SCIENTIST
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THINK LIKE A SCIENTIST
THINK LIKE A SCIENTIST
RULE THAT LAB
LIKE A FIERCE SCIENCE LIONESS!!!
Alright, here's my experiment: What can I use to stop an
egg from breaking when it's dropped?
Uh, I don't know.
OBSERVE: What's the question?
Could bread protect an egg if I drop it?
HYPOTHESIZE, make an educated guess
I bet three slices would nicely stop it

EXPERIMENT: try it out!
I had to drop a lot of eggs
ANALYZE
I can keep the egg safe
with five slices of bread!
REPORT: Share the data, don't keep it in your head
Graphs, pictures, and writing EARN YOU REAL SCIENTIST
CRED
I'm a scientist!
THINK LIKE A SCIENTIST
THINK LIKE A SCIENTIST
PUT THE PROCESS IN YA BRAIN
LET'S GET EVERYBODY TRYIN THIS!
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THINK LIKE A SCIENTIST
RULE THAT LAB
LIKE A FIERCE SCIENCE LIONESS!!!
Are you going to eat that?
It's really just five raw eggs cracked on a loaf of bread.
I could put it in the microwave.
That's really gross, bro.
(laughs)
BeepBoop!