February 2021 – Spring Term

#SolveItWithSTEM@Home Secondary Activity Pack
Friday 26th February 2021

Welcome back everybody…

Hey everyone…a week back into school activities already! We hope you had a lovely half term last week.
Due to the recent Government announcement confirming schools will be reopened on Monday 8th March, Eddie and I will be taking a break and our last pack will be w/e Friday 5th March.
BUT…we still have two weeks left to provide a few exciting activities…

…this week we will be focussing on **Sound!**

Want to find out how to make your own loudspeaker? Well look no further…head on down to slide 4.

Please remember to share the packs with your family and friends online via **www.fawleyonline.org.uk**

See you next week for our last week… (crying emoji!)
Alice and Eddie

Activity: The classic paper cup and string phone
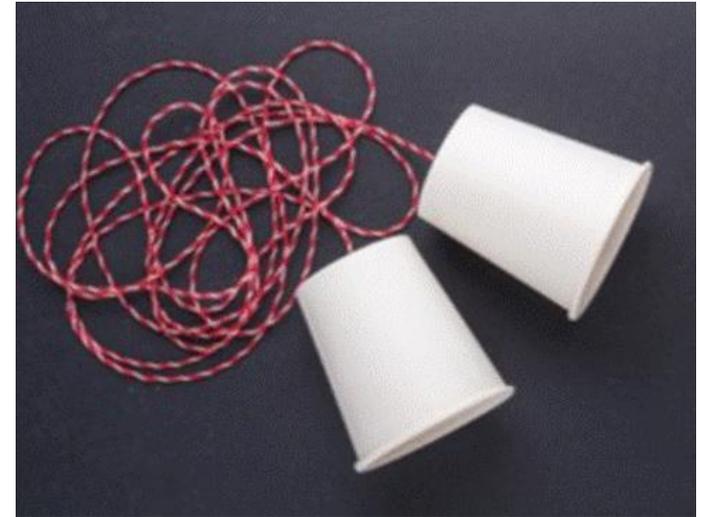## (Make sure you have an adult help you with this activity)

Supplies Needed:
- 2 cups (paper or plastic or even two tin cans)
- Long string (like fishing line or kite string)
- A sharp pencil or needle
- Scissors

What to Do:
1. Start by cutting a long piece of string of at least 50 feet.
2. Using the sharp pencil or needle, poke a small hole in the bottom of each cup.
3. Using each end of the string, thread it through the bottoms of the cups, tying a large knot so that the string does not fall out of the cup. If you make the holes too large, use a washer or paper clip to hold the string in place so that it does not pull out of the cup.
4. Move into position and move away from each other so that the string is far enough to make it tight. Be sure that the string does not touch any other object and that it remains suspended in air as you complete the experiment.
5. Taking turns, talk into the cup, while the other person listens by putting the cup to their ear. Repeat what he or she hears after you have spoken and do the same in return!

How does it work?
Sound waves are created by talking through the cup. The waves travel through the line to the other end, converting back to sound on the opposite side!

Experiment: How to make a loudspeaker
(Make sure you have an adult help you with this activity)

Materials:
- Something to play music from (e.g. laptop)
- Audio cable jack (in other terms, a jack to jack cable, one end will be inserted into the laptop, one end will be used for the speaker)
- Insulated wire
- Wire cutters
- Sticky tape
- Sandpaper
- Crocodile clips
- Plastic cup
- Pen and pencils
- Neodymium magnet (strong magnet – you will need an adult to help)

Steps:
1. Put the spool of wire on a pen – place this between your knees and unspool the wire while wrapping it around a few pencils to make a coil. Leave two lengths at either end to reach the music player.
2. Slide the coil off the pencils and bunch it together…
3. Place the coil onto the base of the cup and tape it down.
4. Sand the spare ends of the wire using the sandpaper and attach each end to a crocodile clip. Take the audio cable jack and insert one end into the laptop/music source. Take the other end of the cable and attach one clip to the base and the other end to the tip. See Image 4.
5. Take the magnet and hold firmly on top of the copper coil.
6. Press 'play' on the music source. You should hear music!

How does it work? The electric current runs through the coil of wire, creating a magnetic field which repels and attracts the magnet as the current changes direction rapidly. This vibrates the cup, making sound!

1.

2.

3.

4.

5.

6.

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If you need help creating the experiment, visit the BBC Bitesize page on how to make a loudspeaker. It includes a step-by-step video which will help demonstrate! How to make a loudspeaker - BBC Bitesize

Maths: these maths questions are sound!...

Question:

Brian's band is playing at a concert in a hall.
The loudness of a band varies inversely as the square of the distance from the band. Brian measures the normal loudness of his band as 100 decibels at a distance of 5 metres.
The band has to stop playing if the loudness is 80 decibels or more at a distance of 4.8 metres.
Does the band have to stop playing?

Use the space provided to work it out.

Question:

The table gives the sound levels of some sources of sound.
Enter the following sources of sound in the correct places.

- Background noise at home
- At a concert – 1 metre from a loudspeaker
- Normal talking
- Whispering

Source of Sound	Sound level in decibels
Threshold of sound	0
	20
	40
	60
Noise pollution level	90
Pneumatic drill – 5 metres away	100
	120
Threshold of pain	140

Answers: w/e 19th February 2021 STEM Pack
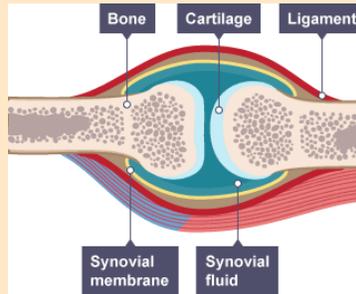
Activity: The human body (Page 3)

1. Tick the correct statement(s) about the skeleton.
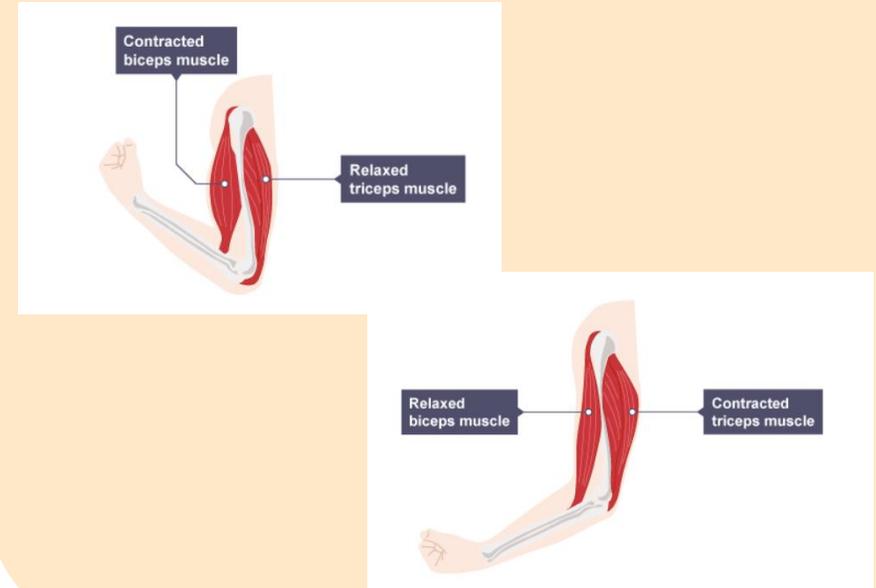
The function of the skeleton is...
- ☑ To support the body
- ☑ To protect some of the vital organs of the body
- ☑ To help the body move
- ☑ To make blood cells

2. Bones are linked together by joints. Most joints allow different parts of the skeleton to move. The human skeleton has joints called **synovial joints**.
Can you correctly label the features shown below using the words provided?

3. Using the space below, illustrate what the muscles are doing to raise the forearm and to lower the forearm.

Maths: Movement mathematics (Page 5)

Question:
Jacob was watching his animals walk into a new grassland area when he noticed one third of them are goats, the rest are sheep. There are twelve more sheep than goats.
How many animals are there altogether in Jacob's flock?

Answer:- If one third of the flock are goats, then two thirds must be sheep.
If there are 12 more sheep than goats: difference between one third and two thirds of the flock must be 12 animals.
So one third of the flock is 12 animals.
So the whole flock is **12 × 3 = 36 animals.**

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Question:
Tommy was pouring water into his cup when he realised it holds 480ml when it is one quarter empty.

How much does it hold when it is one quarter full?
Answer: **160 ml when Quarter full**
As ¾ is 480ml the divide by 3 to give one Quarter
480 ÷ 3 = 160

How much will it hold when full?
When Full then ¼ x 4 = 1 so..
160 x 4 = 640
Answer: **640 ml when full**

We hope you enjoyed this week's activities.

As schools are planning to reopen on Monday 8th March, next week's pack will be our last pack……

Best wishes
The ExxonMobil Fawley #SolveItWithSTEM Team!

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