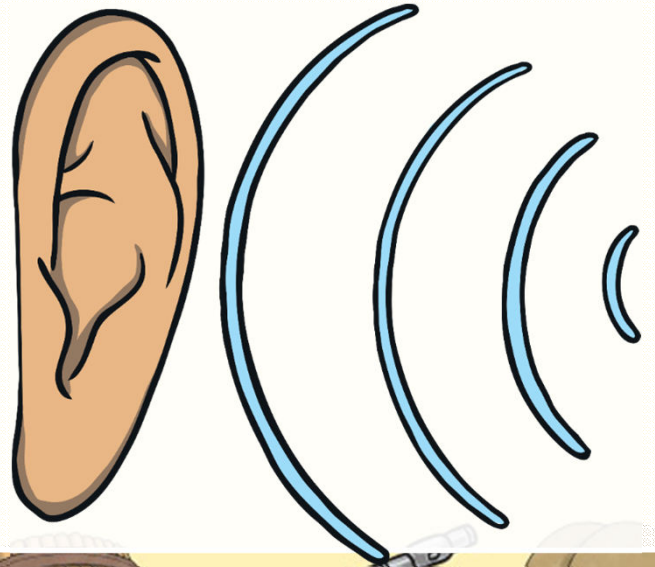
LO: To find patterns between the pitch of a sound and features of the object that produced it

I can look for patterns between the pitch of a sound and the object that has produced it.
I can write up and carry out a fair test
I can record my results in a table.

Recap- Think back to last lesson

- How does sound travel?
- What is sound made by?
- How do we hear sound?

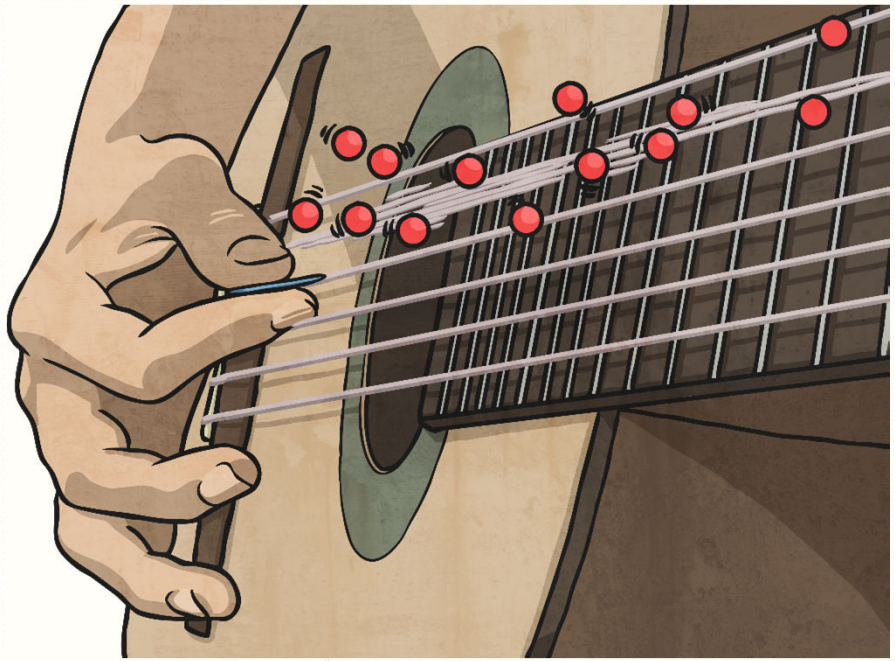


Different Sounds

Sounds can be loud or quiet. Bigger vibrations make louder sounds, and smaller vibrations make quieter sounds.

There are other ways sounds can be different.

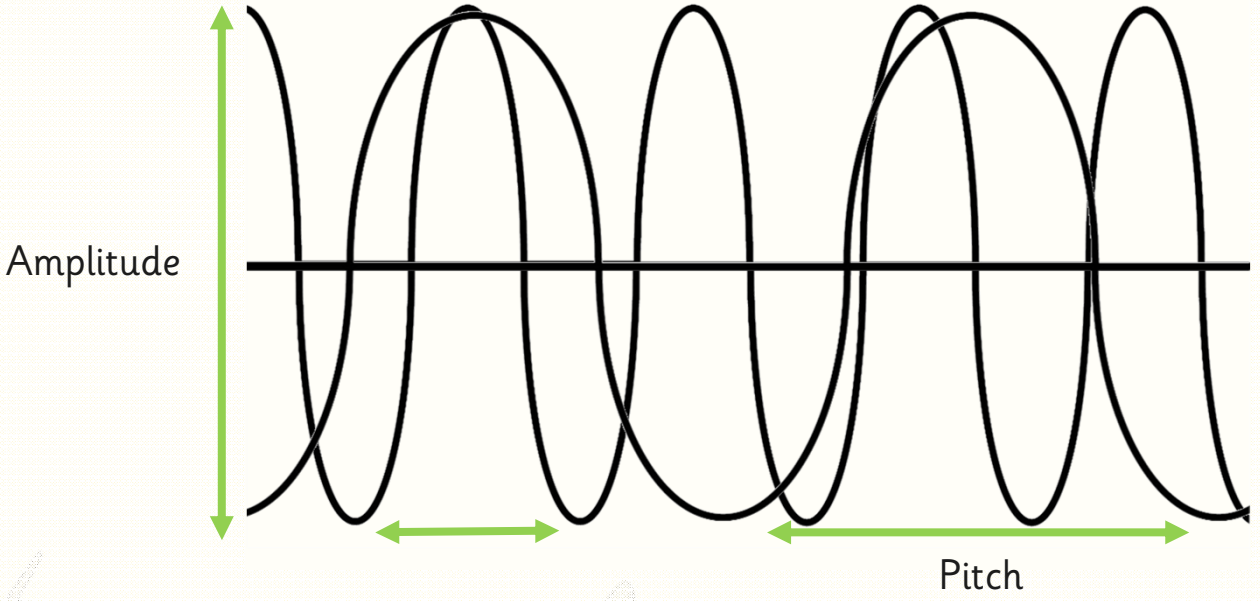
Can you make a high sound? How about a low sound? Show your partner now!



High and low are words to describe the pitch of a sound.

The pitch of a sound is different to the amplitude.

Amplitude is a measure of how loud or quiet a sound is, and pitch is a measure of how high or low a sound is. High sounds can be quiet or loud, and low sounds can be quiet or loud too!

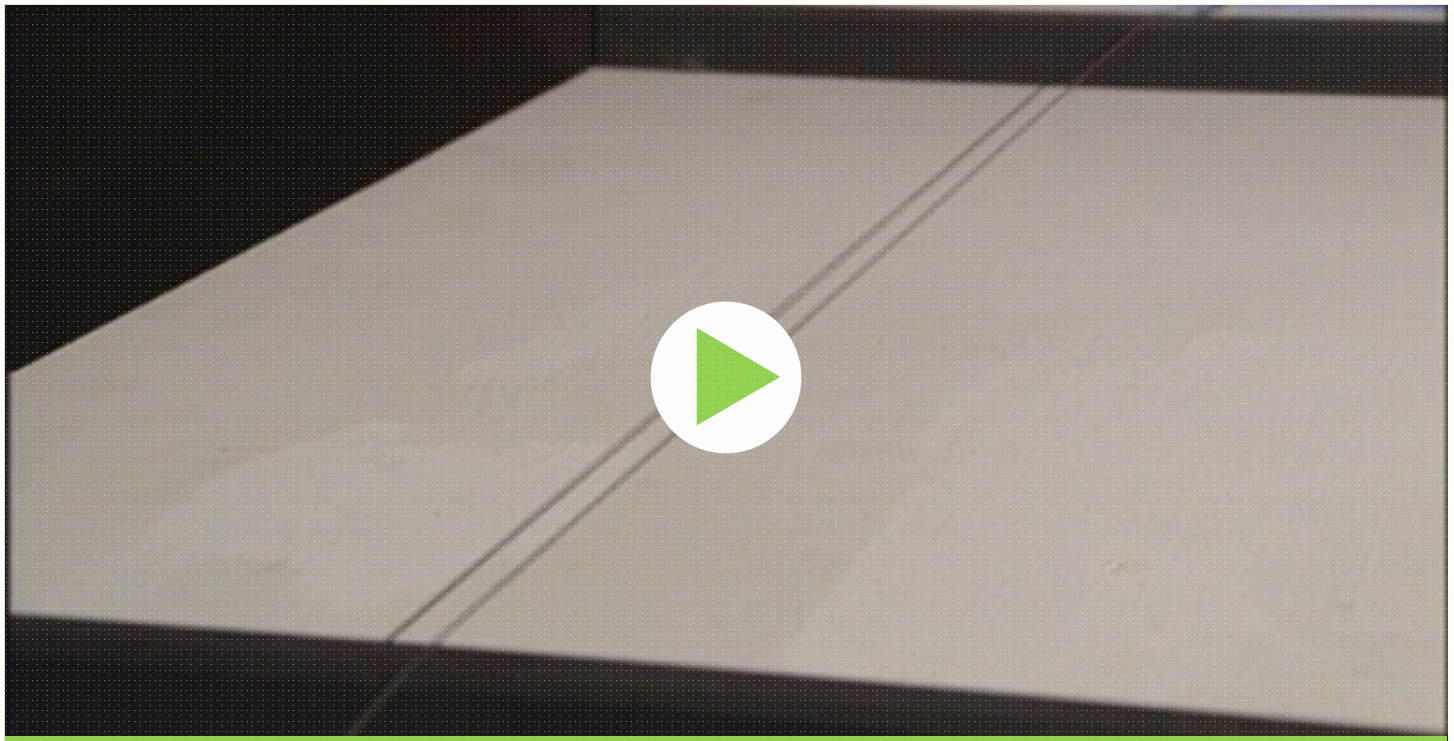


Watch this clip to see if you can hear and identify how different musical instruments create different sounds.

Click on this image to play the video in a new window.

Changing Pitch

Watch this clip explaining how the pitch of a sound can be changed. Did you observe or notice anything similar?



Click on this image to play the video in a new window.

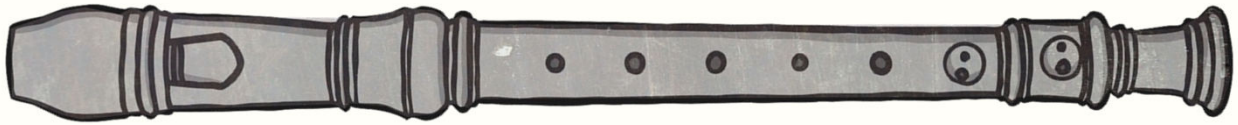
Changing Pitch

On a wind instrument, the column of air inside the instrument is what vibrates to cause the sound.

Shortening the column of air will create a higher sound, and lengthening the column of air will create a lower sound.

This can be done with a sliding mechanism, such as in a trombone.

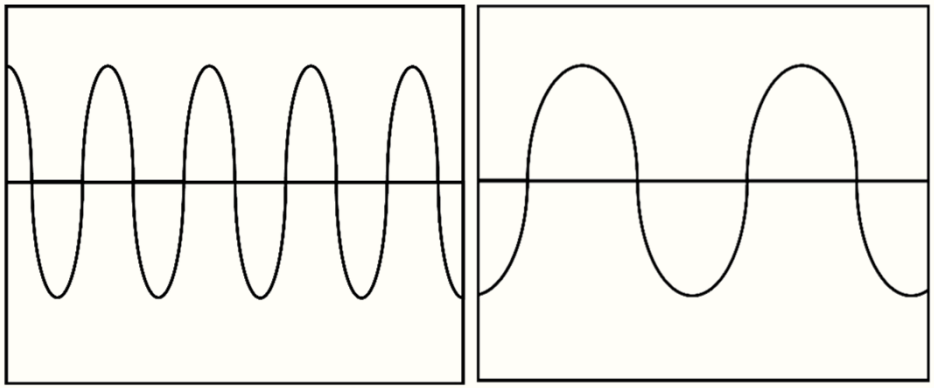
The length of the column of air can be changed by opening or closing holes in the side of the tube, such as in a recorder.



Changing Pitch

Do you notice anything in common with how the different instruments create sounds of different pitches?

Generally, the shorter, tighter or thinner the object is, the higher the pitch of the sound will be. This is because the vibrations will be faster. The longer, looser or thicker the object is, the lower the pitch of the sound will be. This is because the vibrations will be slower.



How does the size or thickness of an elastic band affect its pitch when stretched and twanged?

Today we will conduct an investigation testing whether the pitch of a sound is affected by the length or thickness of an elastic band.

How do you think we could investigate this?

We are going to have 5 different types of elastic bands, each with varied lengths or thickness.

- We are going to stretch the elastic band and release it and listen to the pitch of the noise it makes. Does a thicker band create a high or low pitch? Does a long elastic band create a pitch higher or lower than a short elastic band?
- How can we make this investigation fair? Which variables must we keep the same?

Variables to keep the same

- The person who is listening to the pitch of the noise- People's ideas of what is a "high pitch" or a "low pitch" may differ, so to keep the test fair we must use the same volunteer.
- The distance the elastic band is pulled back before releasing.

Hypothesis and Results

Complete the table to record whether the elastic bands' sound waves had a "high", "medium" or "low" pitch.

What factors do you think will effect the results? Which feature of the elastic do you think will allow the highest pitch? Which do you think will allow the lowest pitch? E.g. length or width?

Conclusion

- What did you find out?
- Why do think this was the case?
- Was your hypotheses correct? Explain why?

Main Task

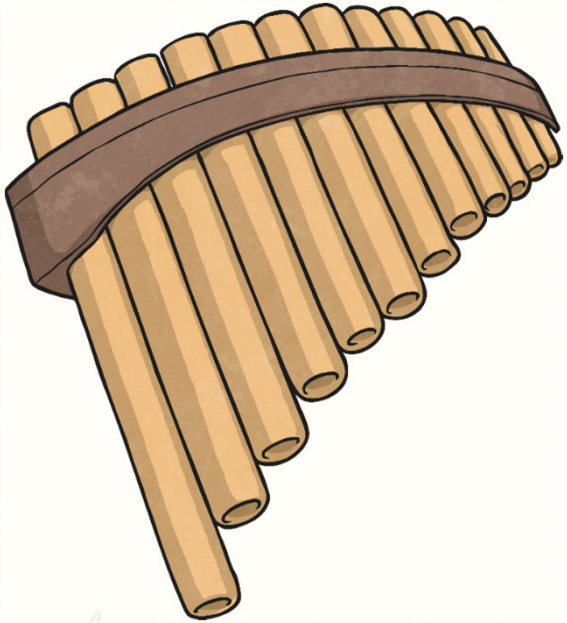
- Hypotheses (What we predict will happen and why)
- Equipment (what we will need)
- Method (What we will do)
- How we can make it a fair test (what we will keep the same)
- Results
- Conclusion (What did you find out? Was your prediction correct?)

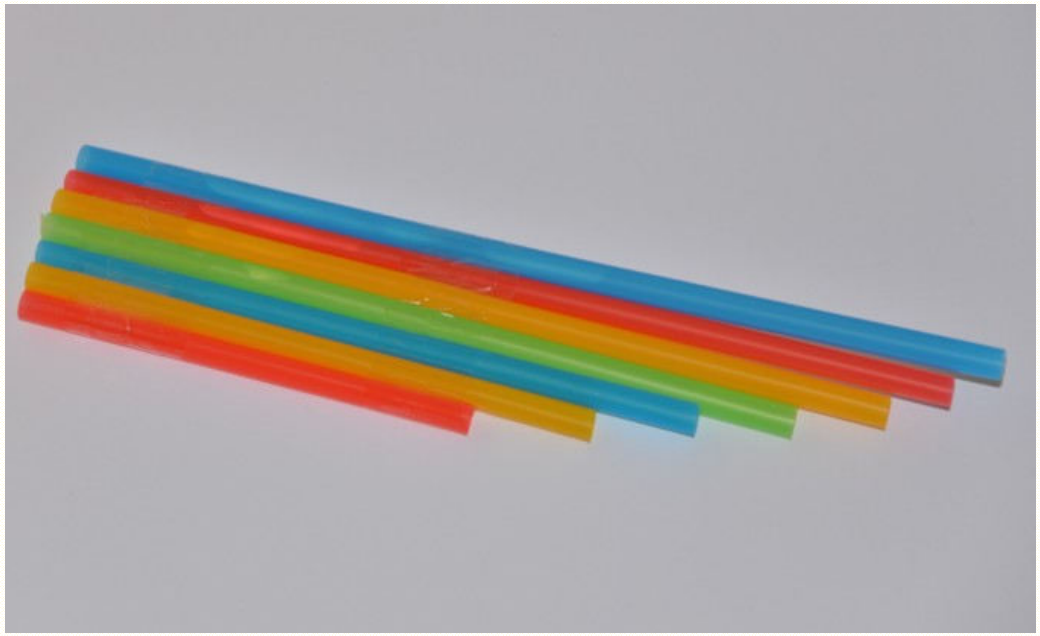
We have been working scientifically:
Gathering, recording, classifying and presenting data in a variety of ways to help in answering questions. Asking relevant questions and using different types of scientific enquiries to answer them. Setting up simple practical enquiries, comparative and fair tests.

Pan Pipes Challenge

Your challenge is to create a set of pan pipes that will create sounds of different pitches, and explain how to change the pitch.

You will use straws, scissors, sticky tape and string to make the pan pipes.

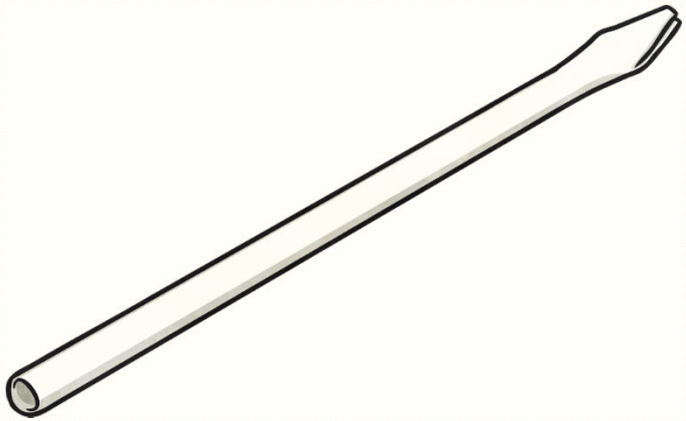




You will need:

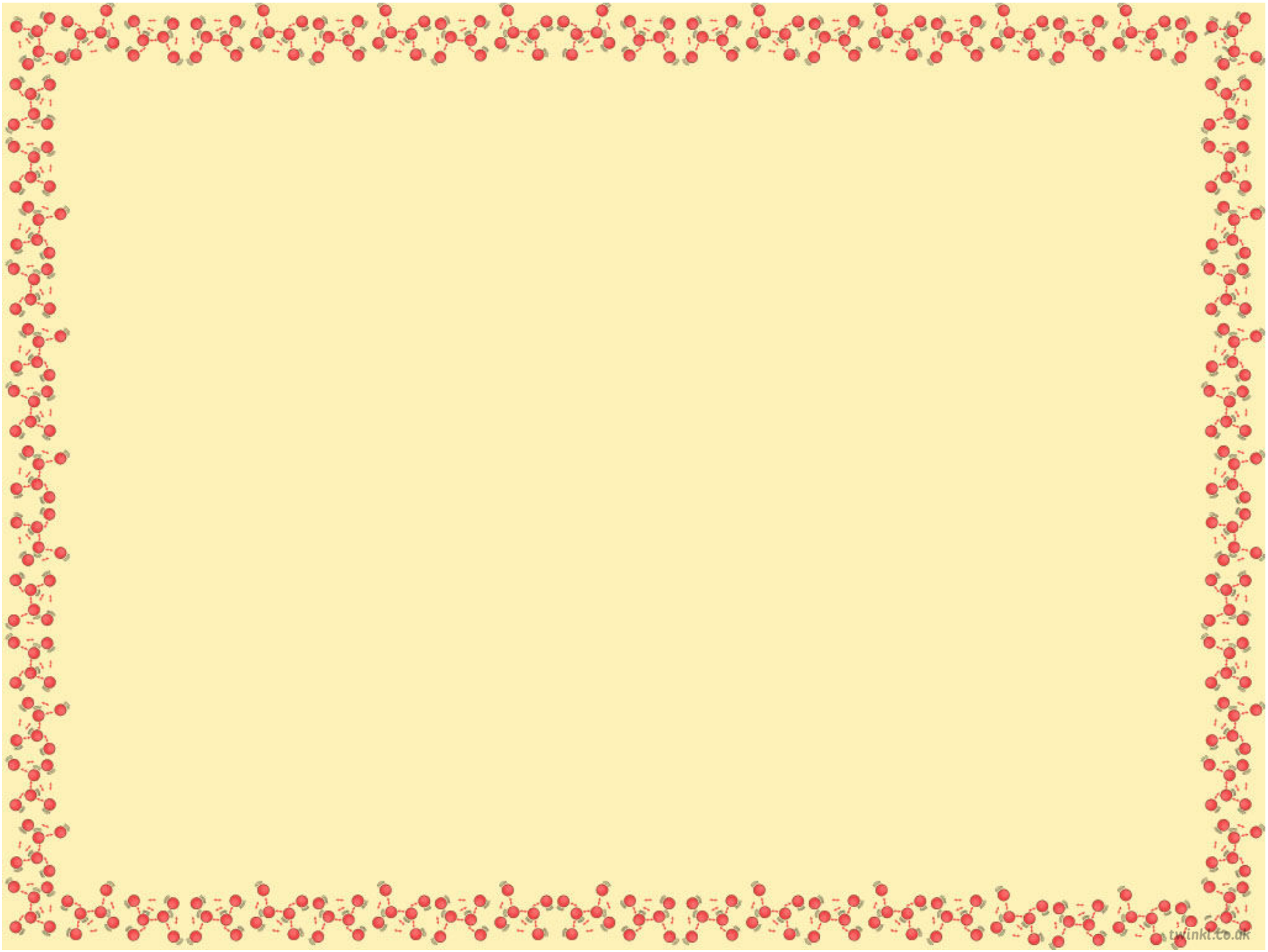
Plastic drinking straws
Sellotape
Scissors

Flatten the end 2cm of each straw, and cut a triangle in the end, like this.



Place the triangular end of the straw in your mouth and blow hard through the straw to make a sound. You may have to try few times to make the sound!

Use several straws to make your set of pan pipes. Stick or tie them together. Think about what you have learnt in order to make each straw make a different pitched sound.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