

Year 5 – Sound and Music

Guidance on the Joint Delivery of Design & Technology and Science Units of the Key Stages 1 and 2 QCA/SEU Schemes of Work

Design & Technology Unit 5A

Musical Instruments

Science Unit 5F

Changing Sounds

Activities

D&T Unit 5A Musical instruments

IEA: investigative and evaluative activities

Investigate a collection of simple musical instruments, naming parts. Discuss why music is important in different cultures. Find out further information using secondary sources. Listen to music played on different instruments.

FPT: focused practical tasks

Experiment with making sounds in different ways using everyday materials. Investigate the strength of sheet materials and methods for strengthening.

DMA: design and make assignments

Design and make a musical instrument to accompany a performance.

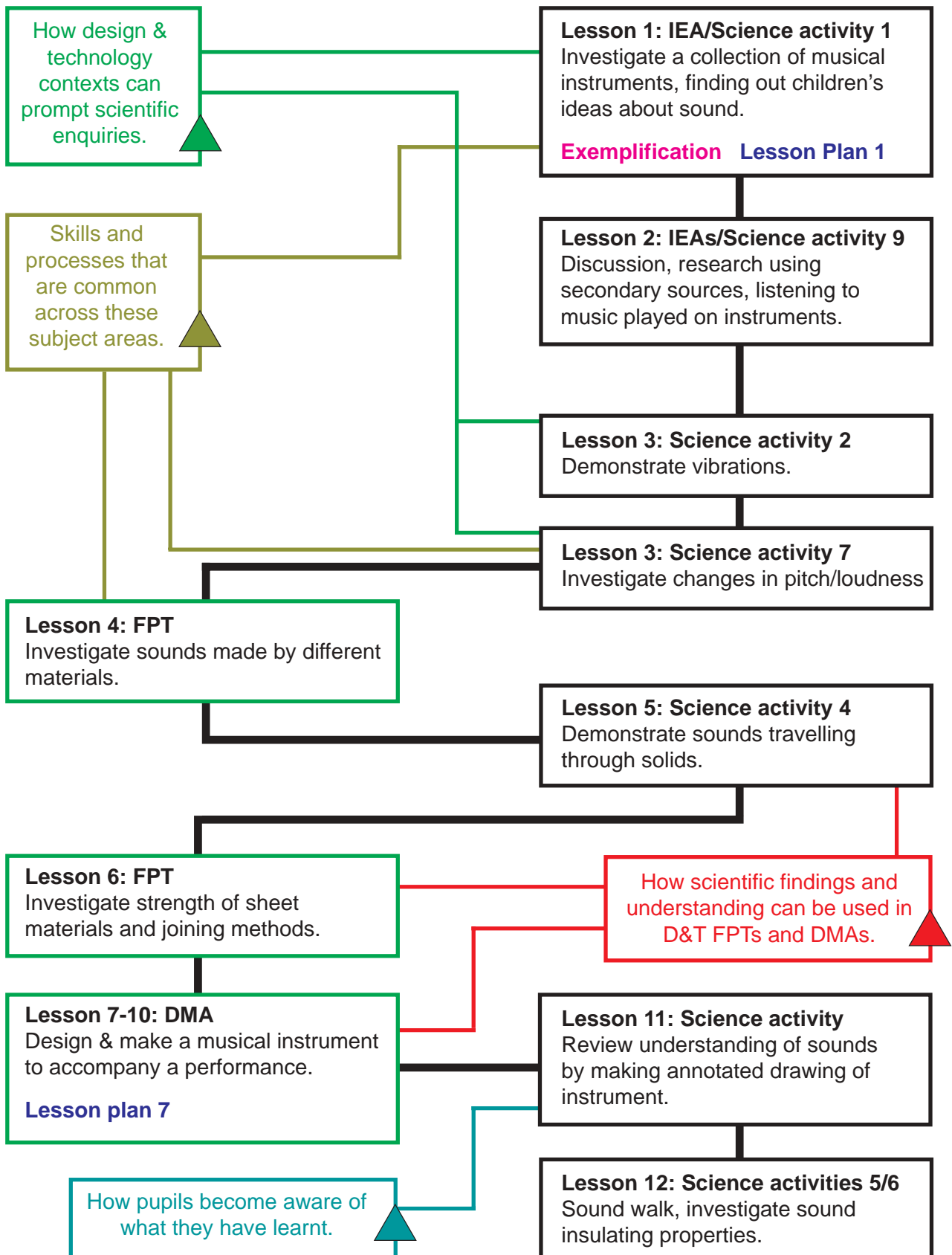
Sc Unit 5F Changing sounds

- 1 Find out existing ideas through ‘circus’ of short activities *e.g. trying out musical instruments which make sounds by banging, shaking, plucking, blowing.*
- 2 Demonstrate a number of examples of sounds associated with visible vibrations.
- 3 Arrange for a loud sound to be made outside the classroom and ask children what it has travelled through.
- 4 Demonstrate, using a ticking clock or buzzer, that sounds can be heard through a variety of materials.
- 5 Walk around the school to see where sounds are loud and where they are not. Discuss sound insulation.
- 6 Investigate sound insulation properties of materials.
- 7 Children demonstrate changes in pitch and loudness using musical instruments (drums, stringed instruments).
- 8 Change the pitch of sounds produced by blowing across the top of a bottle containing different amounts of water.
- 9 Investigate sound and musical instruments through secondary sources.

Commentary and guidance on sequencing activities

Design & Technology

Science



Guidance

Combine science activity **1** with the first investigative and evaluative activity (IEA). Then continue with the remaining IEAs before looking at how vibrations occur in different musical instruments (e.g. drum, guitar – science activity **2**).

Activity **7** would fit in well here – looking at how these instruments produce different pitches. Research from internet and CD ROM would combine the final IEA with science activity **9**.

Next move to the first focused practical task (FPT) (which could alternatively be combined with science activity **1**) and discuss the sounds made by different materials (acoustic properties). These could be further investigated through science activity **4**.

Continue with the remaining FPTs, looking at strengthening materials with particular focus on the stress points of different instruments, e.g. where the neck of a guitar joins to the body, before launching into the design and make assignment (DMA) which would be meaningfully undertaken as part of a music unit, e.g. unit **18** *Journey into Space*. Discuss what children have learned so far about vibrations, loudness and pitch, together with the types of materials they could use to design their instruments.

Once the instruments have been designed, made and tested as part of the performance, children could review their learning about sound by producing an annotated drawing of their instrument demonstrating how it produces sounds of different loudness and pitch.



How design & technology contexts can prompt scientific enquiries

Once children have looked at and thought about how their instrument produces sounds (IEA/science activity **1**) they can be led into science activity **2** which makes vibrations visible through a demonstration. For some instruments they could then find evidence of vibration (e.g. by examining a string with a hand lens, or putting a grain of rice on a sound board).

Showing how their instrument produces notes of different pitch could then lead into an investigation to relate the frequency (pitch) produced by a string or tube (e.g. a straw 'clarinet') to its vibrating length.



How scientific findings and understanding can be used in D&T FPTs and DMAs

Through investigating sound travelling through different solid materials (science activity **7**) children should find that harder materials are better conductors of sound. This finding should inform their selection of materials to practice strengthening and joining in the following FPT and for the subsequent DMA musical instrument.

Wood, including plywood and balsa, plus stiff card and corrugated plastic are likely to be chosen.



Skills and processes that are common across these subject areas

Complex process skills such as 'investigation' occur in both D&T and science, but for different purposes. For example, in D&T pupils are investigating how musical instruments produce sound in order to gain appreciation of the principles on which they have been designed and constructed, thus feeding into their own designs. In science such investigation has the purpose of developing understanding of the concepts of vibrations, pitch and loudness.

Likewise investigating the acoustic properties of materials in an FPT has the purpose of selecting those most appropriate for making a musical instrument, whereas the same activity has the scientific outcome of understanding how sound travels through solids.



How pupils become aware of what they have learnt

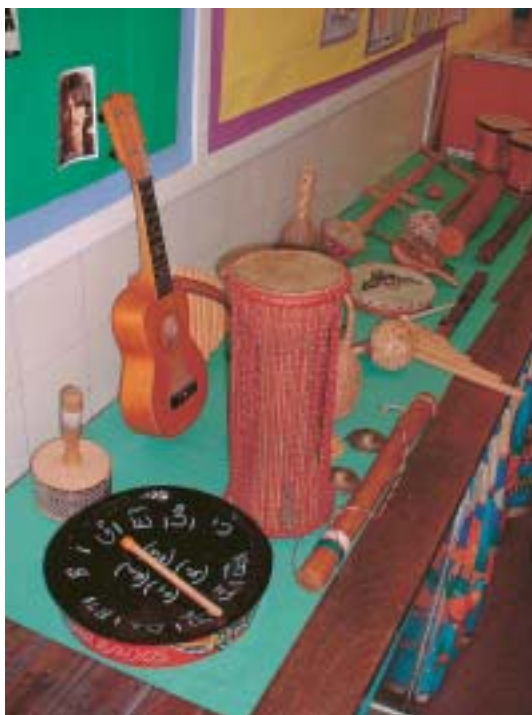
Review activities as part of the plenaries of all lessons will help children reflect on their learning, but in particular Lesson **11** should enable them to communicate their understanding about vibrations, sound travelling, pitch and loudness for the instrument they have made.

Activity description

The teacher introduced the unit by talking about his encounter with a musician and craftsman in India, whom he had met walking along a road playing a stringed instrument. When he enquired about where he could buy one, the musician gave him the one he was playing.

The teacher used this story to emphasise that many of the people who had made the instruments in the collection were poor materially, but rich in other ways. He asked the children to think about the origins of music, and how it had come to be so important world-wide. Some of the children then spoke about the origins of the instruments they had brought in and the whole class considered the skilful use of materials and decoration in the collection. He emphasised the need for care when handling instruments before distributing them for investigation by pairs of children. He had provided a prompt sheet of questions to help children consider the design features of the instruments, but asked them to make notes initially rather than begin answering the questions.

Five minutes were allowed for making sounds with the instruments, then each pair was asked to discuss their thoughts about the visual language of colours, symbols and patterns.



Activity objectives

- to investigate and evaluate a range of musical instruments in order to learn how they function
- to relate the way things work to their intended purpose, how materials and components have been used, and people's needs and cultures

Commentary

These pupils considered the patterns on the maracas, and the arrangement of holes, which both reinforced the pattern and helped to let the sound out.



These pupils looked closely at the arrangement of symbols on the steel drum, and decided that they were related to the pitch produced when you hit different parts of the pan. They also commented on the party atmosphere suggested by the painted decoration around the circumference.



LESSON 1 INVESTIGATING MUSICAL INSTRUMENTS

1 hour

Learning objectives/outcomes – children should learn:

- D&T**
- to investigate and evaluate a range of musical instruments in order to learn how they function
 - to relate the way things work to their intended purpose, how materials and components have been used, people's needs and cultures (**D&T: 4d**)
- Science**
- to draw conclusions about sounds from their observations (**Sc4: 3e**)

Vocabulary	Instrument	Sound box	Skin	Sounding board
	Finger board	Stem, arm	Source	Vibration

Resources Collection of musical instruments (10+), ideally of different types and from different cultures. Some could be contributed by children. Background information on as many as possible would aid evaluation. Structured evaluation sheet. Dorling Kindersley *Musical Instruments* CD ROM.

Teaching and learning activities

Introduction – whole class – 15 minutes

Explain that pupils will be looking carefully at musical instruments in order to design and make one (see **lesson 7**). Select an instrument to tell a story about, e.g. how you came to buy it, how you have seen it used. Try to give the human context for its use. Ask any children who have brought instruments in to tell similar stories. Discuss with children why music is so important around the world and why musical instruments are often objects of beauty. Demonstrate careful handling and introduce terms for parts of the instrument.

Hands-on activity (IEA) – pairs – 30 minutes

Distribute instruments to pairs and encourage them to look and discuss for 5 minutes. Then distribute evaluation sheet and talk through it, asking children for examples of what they would write in each section. Remove instruments not handled carefully!

Differentiation

Some children may need support reading and writing on evaluation sheet. They could be invited to draw the instrument carefully and label any parts they know. Early finishers could produce an annotated drawing showing how they think the instrument produces sounds.

Science-focussed plenary – whole class – 10 minutes

Select pairs to hold up and describe their instrument. *How does it make sounds? How do we hear the sounds?*

'Vibration' could be introduced if not already mentioned by children. This will feed into lesson 2.

Assessment opportunities

- Note children who are actively examining and discussing the instruments.
- Check children's annotated drawings for understanding of vibrations, sound travelling.
- In plenary, note children who are able to give explanations of how their instrument works.

LESSON 7 STARTING TO DESIGN AND MAKE A MUSICAL INSTRUMENT

1 hour

Learning objectives/outcomes – children should learn:

D&T

- To identify a purpose for their instrument
- To apply what they have learnt about how sounds are made and the acoustic properties of materials
- To select appropriate materials, tools and techniques
- To develop a clear idea of what has to be done, planning how to use resources

Vocabulary

Instrument	Sound box	Skin	Sounding board
Finger board	Stem, arm	Source	Vibration
Pitch	Volume	Strong	Rigid

Resources

Temporary models from FPT. Findings from science activities. Wide range of reclaimed items: strong cardboard boxes, shapes, plastic containers, rice, sand, gravel, glasspaper, stripwood, dowel, string, elastic, material to stretch over 'drum', paper, coloured card, paper mache, copper pipe, pipe cutter, double sided and clear tape, pva glue, low melt glue gun, range of tools for cutting and shaping.
See: DATA helpsheet [[2.4/5A Helpsheet.pdf](#)]

Teaching and learning activities

Introduction – whole class – 15 minutes

The brief for the DMA should have been introduced in lesson 1 (see above). Remind children that they are going to design and make a musical instrument for a particular purpose (e.g. a play or group performance). Recap their learning about how instruments make sounds; changing loudness and pitch; acoustic properties of different materials. Agree on a set of criteria that the instruments should meet (e.g. types of sound, durability, attractive finish).

DMA – individuals or pairs – 50 minutes

Arrange children in performance groups and give them time to plan what range of instruments they will need. They could then be re-grouped so that children making similar instruments are seated together to share ideas. Ask children to:

- list criteria for their own instrument
- use information sources, including ICT, in their designing
- refer back to FPT and science tasks
- sketch design ideas and plan intended stages of making
- select main materials and tools in consultation with teacher

Differentiation – some children could be encouraged to try pitched instruments.

Clear away and Plenary – whole class – 10 minutes + 15 minutes

Ask each child/pair to describe the instrument they will make, how it will make sounds (of different pitches?) and the materials and tools needed.

Assessment opportunities

- Check children's design sketches and making plans for evidence that they have identified a clear purpose and made use of prior D&T and scientific learning.
- In plenary, note children who are able to give a clear reason for making their instrument and realistic ideas about how to combine materials and use tools.

Introduction

Through this unit children will learn about the structural construction of a range of musical instruments. They will investigate a range of instruments, and experiment with a variety of ways of making sounds. They will then design and make a working instrument for a particular purpose. The unit offers strong links with several subjects including music and science.



Gather together a collection of musical instruments for the children to investigate. Do stress the importance of looking after them.

Hidden from the children, sounds could be made using several of the instruments. They can then use a proforma to record details such as what instrument they think is being used.

- What is the correct name for the instrument?
- How old do you think the instrument is?
- Which part of the world does the instrument originate from?
- What materials are used to make the instrument?
- What is the structure of the instrument?
- How are the parts joined together?
- What type of surface decoration is used?
- What part makes the noise?
- How do you make different notes?

Sound	What is it?	How was it made?
1		
2		
3		
4		
5		
6		
7		
8		
9		
10		
11		
12		
13		
14		
15		
16		
17		
18		
19		
20		



Organise a series of activities which will allow the children to experiment with making sounds. Activities could include shakers, scrapers, beating and using string type instruments.

Questions to ask include:

- How does the material used affect the sound?
- Which sounds do you like best? Why?
- Which sounds don't you like? Why?
- Are some of the sounds similar to those of real instruments?

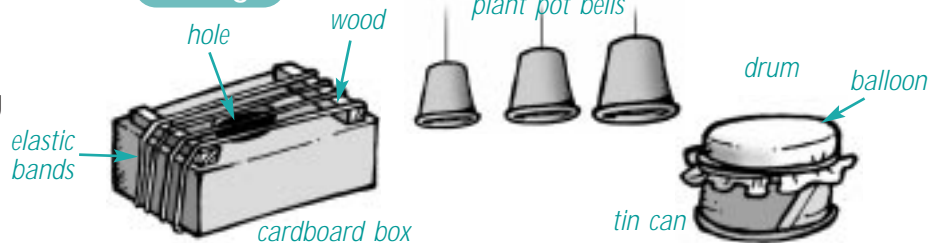
Children should be taught how to join some of the items in temporary ways (e.g. making beaters with cotton reels and dowel joined with masking tape or plastic tube).



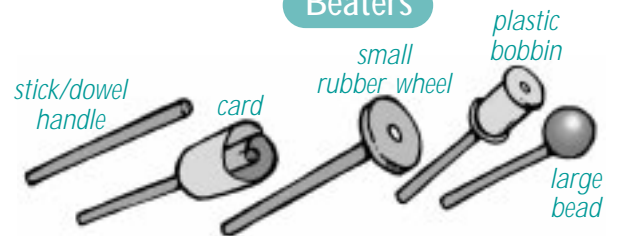
Shakers



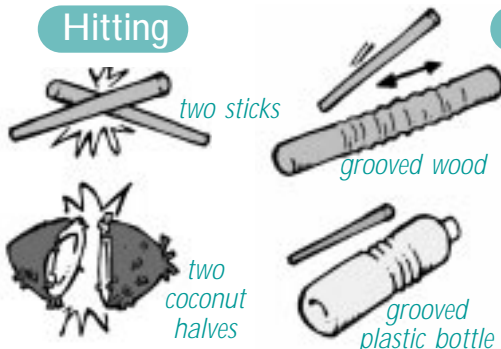
Strings



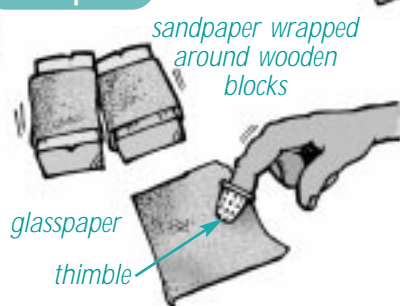
Beaters



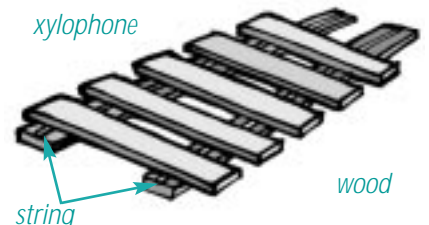
Hitting



Scrapers



xylophone





Ensure that the children are aware of the resources available for them to use.

They will need to identify what they are going to use their instruments for (e.g. sound effects, school assembly).

Questions to ask could include:

- What sound are we going to make?
- What could we use to make the sound?
- What resources could we use?
- How could they be assembled?
- Is it going to be possible to tune the instrument in some way?
- What finishing techniques could be used?

Children could record their design ideas in a variety of ways. It may be helpful for them to list what materials they are going to use together with identifying the intended stages of manufacture.

It is important for the children to consider the quality of the finished appearance of their products, particularly if reclaimed materials have been used.



Find information from reference sources about different types of musical instruments.

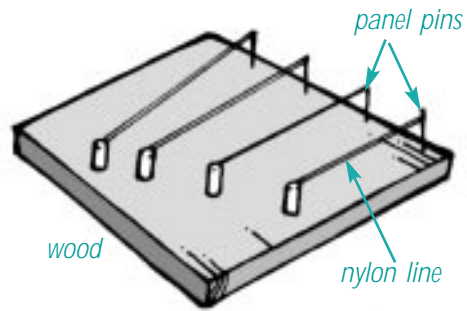
Listen to music and keep a record of which musical instruments they have heard.

Talk to someone who has a musical instrument and find out how it is played.

Ask the children to collect and bring in photographs of musical instruments from magazines, newspapers and catalogues.



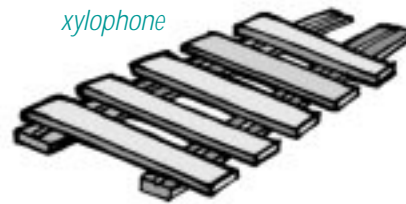
- ✓ Write to parents/guardians to explain details about the project. They may be able to help with gathering together suitable reclaimed resources, as well as having musical instruments which could be investigated.
- ✓ Collections of unusual musical instruments can frequently be borrowed from places such as multi-cultural centres and museums.
- ✓ Keep the items required for the focused practical tasks in labelled trays or cardboard boxes. This will help when rotating the activities and with storage.
- ✓ The IDEAs and FPTs could be set up as a circus of activities which groups of children could rotate around.
- ✓ The children could show and use their completed instruments in a school assembly.



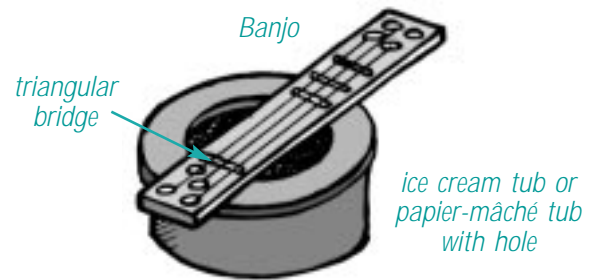
Tambourine



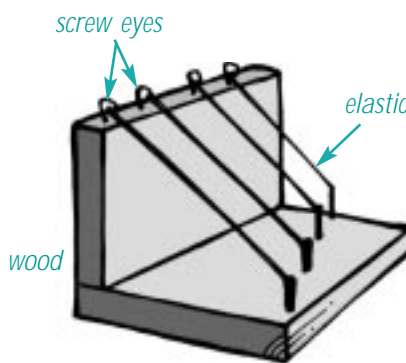
xylophone



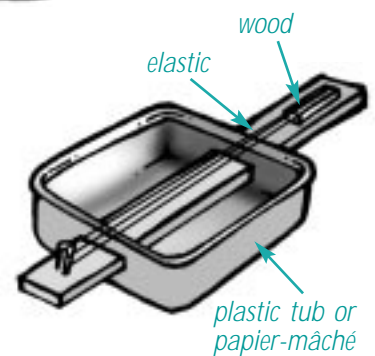
Banjo



screw eyes



wood



Glossary

Mouldable material – a material which can be shaped, such as plasticine, clay or papier-mâché.

Structure – a framework made to contain or support something.

A frame structure is based on a framework of hollow or solid section material e.g. tube, rod.

A shell structure is constructed from a layer of sheet material e.g. card, fabric, papier-mâché.

Texture – surface quality of being hard, soft, smooth or rough.