

Making Musical Instruments at Key Stage One

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During the Summer term of 1989 I worked with my class of 28 top infants — 6-7 years old on a topic based on Sound and the reproduction and transmission of sound. I hoped that this topic would develop children's skills in most areas of the curriculum. I saw the topic falling into the following main categories:

Topic Plan

1a Discussion of the meaning of sound

What is sound? How do we use it? Which senses are involved? How would it feel to be deprived of sound stimuli? Have all life forms a sense of hearing? Are some better than others? Could we do some experiments to test whether live things can hear or not? How many different ways of making sounds can we think of? Can we use our own bodies? Can we use other things? What things? Can other than humans or live things produce sound? eg wind, rain, thunder, fire, water, earthquake, volcanos. Man-made artifacts such as windmills, engines, sirens, radio receivers, computers, clocks and infinitum! and so to music or sound for pleasure.

b Listening to sound

We should listen to recordings of different types of sound in the classroom. Can we say what is the difference between sound and musical sound? How do we make musical sounds? Listening to specific musical instruments with (if possible) examples of instruments or pictures while listening. Discuss how sounds are made using musical instruments. We should elicit hitting, plucking, blowing, scraping, shaking. Listening to synthetic music and looking at eg Casio and other forms of electronic music.

c Looking at instruments

We can bring instruments into school and we have a wide variety in school and homes. However, I should like to visit an exhibition of instruments eg at Gabriels Horn House in Portsmouth or visit the musical instrument-making course at West Dean College. (I have to do more research into this — I could check with the Music Advisory Service at Teacher's Centre.) Also

Mechanical Music Collection, Chichester. Particular emphasis should be to elicit from the children how the instruments are made. What materials are needed? Why is measurement important? What does the instrument need to have to make the sound more interesting? (Give example of teacher's whistle compared to eg a recorder.) An elementary discussion of pitch using a violin or guitar, recorder or even water in bottles should follow. The children should be able to observe that pitch difference is related to size or volume. The loudness can also be changed, either by putting in more energy or increasing the volume of air around the sound (sound box).

d Making instruments

The children should now be allowed to experiment on these aspects using materials in the classroom. Musical instruments may be produced and these could be put on display by children who should organise this themselves, used in music-making sessions, recorded, used in a class assembly. All this work should be recorded in a topic book with observational drawings, plans and descriptive writing. We could make a class orchestra with strings, timpani, woodwind, brass, percussion etc.

e Using the computer

We have a good programme on pitch and rhythm quite suitable for this age group. It is called Jolly Jack Tar and teaches rudiments of pitch and rhythm. Some children may follow this up by writing their own simple music.

f Using an oscilloscope

I have access via my husband to an oscilloscope. At this stage it would be useful to see how sound can be visually presented. The oscilloscope can be demonstrated at school.

g Art and craft

The instruments should be made to look good — we have to look at them while listening to music. I should also like to try painting to music ie listening to music and painting what we hear.

h I hope that the planning, recording and making will all be presented in the child's own topic book and work done displayed in the classroom.

I see the topic as encompassing the following areas of the curriculum — *English* — (the discussion and recording of work), *Maths* — (the measurement involved in making; an elementary understanding of pitch and its mathematical implications: ie the concept of ratio; ideas about volume capacity and length). *Art and Craft* — (the drawing, making, painting). *Design* — the designing of instruments, *Technology* — the use of suitable materials in the manufacture of the instruments. *Science* — experimentation with sound and ways to produce sound in non-living things — sound on screen — the oscilloscope. Mechanical and electronic sound — radios, telephones. *P.E. and Drama* — using the body to make sounds — interpreting music through movement. *Computer* — use of computer to teach pitch and rhythm. *Music* — enjoying making music — writing music, listening. *R.E.* — use of music in religious services — hymns. *Environmental Studies* — briefly touching on different types of instruments nationally and worldwide — how we can identify a national music — often by instruments used (local materials). How instruments have developed through history.

2. Resources and timescale

Science packs in school on senses. Model or diagram of ear (Teacher's Centre) Recordings of natural and mechanical sounds (in school) Instruments (in school and elsewhere) Visits — possibly West Dean College — instrument makers Mechanical Music collection — Chichester Gabriels Horn House (musical shop) — Southsea Materials for music making — scrap materials and wood, elastic bands etc Cassette Recorder Recordings of different National Music

The Timescale of fifteen weeks in the Summer Term should be ample to cover this Topic very thoroughly. I would envisage 2½ hours per week on this Topic. I should imagine giving three weeks to discussion on sound, preparing of Topic Books, collecting materials and made instruments, listening and experimenting on sound — recording discussions and planning and design of own instrument. (This could be done individually or in groups as I have parent helpers on one afternoon each week.)

The making part of the Topic should take 2-4 weeks depending on complexity of instrument.

The music making part of the Topic could take another 3-4 weeks and some time will be given to visitors and visits, plus a possible class assembly which might take a whole week to prepare.

This will give room for expansion of any of the aspects of the Topic — should the children be needing more time on it, or for a look at the transmission of sound with eg the telephone and radio.

The Topic Review — June 1989

Having covered most of the ground which was planned in the original layout

I now received and evaluated the work. In order to clarify the operations I have decided to itemise the procedures as follows:

- 1 The Preparation and Timescale
- 2 The Timetable
- 3 The Visual Aids and Peripherals
- 4 The Discussions
- 5 The Making of Instruments and Recording
- 6 The Display
- 7 The Visits
- 8 Cross-Curricular Applications
- 9 The Assembly
- 10 Samples of Children's work
- 11 Photographs
- 12 Bibliography

1. Preparation and timescale

Having decided on my topic I made out a Topic Plan as already submitted.

The work actually began on April 3rd and came to an official close on June 8th covering nine week with ½ term break of one week on 29th May — 2nd June. It should be realised that for much of the practical work I was dependent on the help and availability of parents and that if they did not arrive one day then proceedings were accordingly slowed down! Also I had to choose a day (in this case a Wednesday) when other interests or parts of the curriculum did not interfere, when the parent-helpers could keep a regular date which would not interfere with their own arrangements. I have a long-standing arrangement for parents to come in on Wednesday afternoons so this stood. Another parent whose youngest child had just started school offered to help in a more flexible way and came in on request through message-by-child! I should also say that the week of the Assembly I had a helper in the form of a student on the TRIDENT scheme and, as luck would have it she became very involved with the work and was an invaluable helper. It is important to realise that much of the practical work would have been extremely difficult to achieve without the help of non-teaching and in this case voluntary assistants.

Following is a list of materials which I prepared and requested of the parents. I have ticked the items which I duly received. A very high success rate you will agree. I also received two large door-bell chimes.

2. The timetable

Following the timescale for the actual making of instruments. All other activities eg discussion — other art work — work about hearing and sound in general were also going on.

Week 1.

Hanging plant pots
Water in bottles (milk)
Xylophone — hanging
Drums
Bongo — Drums

Week 2.

Claves
Castanets
Xylophone — hanging (continued)
Bongo — Drums (continued)

Week 3.

Xylophone
Bongo — Drums (continued)
Jingle Pole

Week 4.

Closure on the Wednesday

Week 5.

Trip to West Dean College and Mechanical Music Collection

Week 6.

Tubular Xylophone
Jingle Pole (continued)

Week 7.

Visiting teacher on Work Experience for day

Week 8.

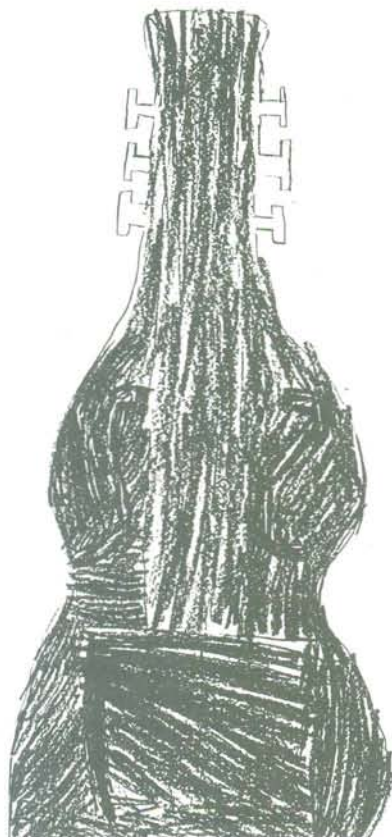
Tubular Chimes

Week 9.

Zither
Scrapers
Maraccas
Pan Pipes
ASSEMBLY

3. The visual aids and peripherals

T.V. programme *seeing and doing* — I.T.N. — schools programme suitable for 6-8 years old with emphasis on musical instruments and the way sound is produced in them. I have video-taped this series for future reference as "sound" is to be an infant Science Topic in our long-term plans linked to the National Curriculum. On Tuesday 4th April we were entertained by the Peripatetic Music Staff playing violin, viola, cello and piano. For the sound and hearing part of the Topic I obtained a model of the ear, showing the middle and inner ear, from the Fareham and Gosport Teacher's Centre. I also made a game using 6 tins containing various objects. From a list of the six items the children had to make



their choice and mark it on a score sheet as follows:

	Tina	Sam	Carly
Drawing Pin	4		
Rubber	2		
Marble	1		
Cotton Wool	6		
Rice	5		
Dried Peas	3		

I used a book of *Noisy Poems* — all with “sound” words — many of the children have been memorising them. I read the story of *Buttons* — the hearing dog for the deaf — we discussed ways in which an animal could give visual signals to a deaf person. We wrote Sound Poems (see children’s work) and sound stories. We covered the story of Joshua and the Battle of Jericho and dramatised it. We listened to record of sounds eg traffic, telephones, thunderstorms etc. One of the staff plays the violin and she came and played and talked about how the instrument is made, tuning, etc. I brought my guitar to school and tuned it while the children watched. Also I played while we sang.

4. The discussion and science work

I started the discussion on Sound by asking the children to close their eyes and concentrate on what they could hear. Some heard a blackbird, a creak, rain etc. We discussed sound and how it must travel from its’ source and through the air — we discussed sound waves. How is sound made? We discussed this and then I used a Tasmanian Drum (made from clay with a skin over the base and an open top) resembling a vase — the base of course has been removed before the skin is attached. It makes a beautiful resonant sound. However, if we stood the drum upside-down, so that its’ open end was sealed — the sound became dull. This led into discussion that instruments, not just



our group has made a hanging xylophone. First we had to get some wood and then the biggest bit of we measured to make. the second one was 18 cm the third one 16 cm the fourth one was 14 cm the fifth one 12 cm and the sixth one was 10 cm and after that we had to saw them to the write length. then we tied some string to the wood. but we had to glue the string to the wood. To play the hanging xylophone you run the beater down the hanging xylophone.

drums, need a space in which the sound could resonate and also an aperture for the sound to emerge in order to reach the ear.

At a later date we did some more experiments. The children closed their eyes and we tested direction by taking turns to clap, click, tap etc and guessing in which direction the sound was made. We tried putting cones of paper round our ears, or margarine tubs with bases cut out to see if it made a difference to how well we heard but we noted hardly any difference.

We looked at the model of the ear and soon the children understood how sound is passed through the ear by the vibrating of the ear drum and middle ear bones. We talked about *how* you know what sound you are hearing. Sound sources could be animals or inanimate objects like machines, cars etc or even weather.

Interest level was high during all discussions.

Having also listened to recordings of various sounds eg telephone, thunder, rain, vehicles etc we came to listen to some music. What was the difference? Many answers came up. Eventually pitched, rhythm and being played came and we thought about *how* they were

played. We came up with hitting, plucking, blowing, scraping and shaking.

Prior to the practical work we talked about various ways in which we could make eg a hitting instrument and how we could make beaters — what materials would be best and the strongest way to make things. We also talked about using tools eg saws and drills and how to use them safely. (I must say I was rather wary, not having used saws before with an infant class!) I am happy to report that we had no accidents at all as the children felt very privileged to be using tools and took it all very seriously. I had intended to take some photographs of the children working but I always got so involved personally that I either forgot or did not have time!

5. Making of instruments and recording the work

I decided to keep to a structure where the method of playing as in hitting or tapping was the predominant factor. So we choose from the many resources we had what each group would like to make. The basic idea was on the work card or in the book but the children came up with modifications or ideas of their own with surprising ease. Because of limitations in availability of materials I had to pre-choose what we would make on a

Friday 5th May 2k Marcus Pond

On Wednesday we went to a musical work shop. And Roger rose told us the difference between a Viol and a Violin. A Viol has a straight back. And a Violin has a carved back. And they put the wood in a mold. And made it really hot and made the right shape. and we went to the Mechanical Music and Doll collection. and they played some of the Mechanical boxes. I liked the music

certain day. On the first day of making we had a choice of flowerpot chimes, drums and beaters, bongos, hanging xylophone or bottle chimes.

All of these were completed on the day except for the bongos which were made from a papier-mache mould and took several weeks to complete. Interestingly, because the bongos took so long to make, the children found it difficult to record the procedures they had gone through. Also, we struggled to secure a plastic skin on the paper because it tended to bend and buckle with the elastic. We even tried bracing the base with dowel. Eventually a child turned them over and found they sounded better if you tapped the 'bases' so we did not bother to put a skin on them.

The groups consisted of five or six children

Week 1.

Flowerpot chimes — made from clay pots of various sizes — painted in bright designs, left to dry (powder paint) and hung with flex from a broom handle suspended horizontally. Pots had to be graded for size. Pitch varied with size but not as you would expect. Quality of clay must have had an effect — some pots were dead sounding but I could find no cracks.

2. Drums — base made from various cylindrical containers; skins were plastic sheeting from a pram hood. Beaters made with dowel and corks, conkers etc.

3. Bongo Drums — took three weeks to complete (a glue gun would have been useful to do some of the fixing eg the wedge-shaped piece of wood to join the two drums together was difficult for small children). Papier-mache bases around a mould were very successful.

4. Hanging Xylophone — here measurement was involved. Children had to decide on lengths of pieces of wood. Standard measures were used and after the longest piece was decided the children worked out how much shorter each other piece had to be. Bench hooks and saws were used. Sanding the ends and tying with string.

5. Bottle chimes — very easy to set up. Interestingly the resonance was better when the part with liquid was tapped than when the part with the air was tapped.

Helpers on this session were two parents and a floating teacher so four adults in all.

Week 2.

Claves — pieces of broom handle cut to same length (measurement involved). Some of the handles were already painted. Sanding of ends.

2. Hanging Xylophone — attaching to string to hang very difficult.

3. Castanets — we made finger castanets with bottle tops and loops of ribbon to hold them onto fingers.

4. Bongo Drums — continuing.

Some of the children are now writing and discussing the making that they have done. They often need help to be reminded of how to record their work. I have said it is like a recipe in cooking. (They have a cooking session every week if it their group's turn.) We have to write down the ingredients or materials used, then how we made it — finished it — and finally how to play it and how it sounded. They most often forgot this latter part! However, with some persistence the writing did improve and some of it is very good quality and much better than some of their 'news' or 'story' work.

Week 3.

Xylophone — wooden lengths on a painted shoe box with an aperture in the lid. The pieces of wood are resting on pieces of draught-excluder spaced according to the required distance.

2. Bongo Drums — continued.

3. Jingle Pole — another broom handle, beer bottle tops are painted then loosely tacked to the pole. A door stop is nailed onto the bottom of the pole. The pole is banged on the floor to make a jingle sound.

Week 6.

Tubular Chime Bar — one large piece of metal tube is set on a painted shoe box with lid and aperture. Also seven graded lengths as above.

2. Jingle Pole — continued.

Other groups are recording the making they have done.

Week 8.

Tubular Chimes — as tubular chime bar but using several copper pipes of graded lengths. They had to be sawed with help from an adult. These were suspended from a wooden frame.

Week 9.

Zither — shoe box painted and reinforced with plywood glued into lid. Aperture made at home by me. Screw eyes and guitar strings used to make a tuned, plucked instrument.

2. Maraccas — squeeze lemons, wash-up liquid bottles — glued, paper and painted. Filled with stones or seeds. Dowel pushed into openings and sealed for handles.

3. Scrapers — children chose pieces of wood or cane and cut nicks in them. One chose corrugated cardboard and mounted it on a piece of wood.

4. Pan Pipes — tubes of cardboard cut to graded lengths and mounted in various ways onto card or board with card, decorated. One interesting one was mounted on a detergent bottle.

I have selected some of the written work of the children and the main feeling I get from looking at this is that the children had to be much more precise and systematic in their writing than they have previously had to be. Samples of written work can be found in the Class 2K Book — 'Musical Instruments'.

6. The display

The display in the classroom gradually built up as the instruments were completed. However, we had other aspects of the topic to explore. The various agencies of sound could be investigated and so paintings of mechanical objects which can produce sound — such as aeroplanes were contrasted or compared to live objects which produced sound such as a person shouting, clapping etc. Good paintings were produced and displayed. Later on we made up or thought of sound 'words' and used letter templates to cut out letter shapes and made sound words to hang up from the ceiling.

One child brought in a musical box (after the visit to the mechanical music collection) and after observing its workings we made an attractive display of musical boxes in the classroom for a short time.

I drew a large diagram of the ear and its internal features and the children

coloured and labelled it, this also formed part of the classroom display.

The instruments were always a focus of interest and constantly handled and played by the children when they came in after play or at other times when they were free to play. The flowerpot chimes were the only instruments subject to damage and two of them got broken.

The doorbell chimes brought in by a parent were also hung on the back wall and made a lovely sound showing the size of the tube made a difference to pitch.

The cloakroom was decorated with work about the trip to West Dean College and the Mechanical Music Collection.

Eventually the best parts of the display were moved to the school entrance hall and stayed there until the end of term.

Photographs of these displays can be seen in the additional book by 2K — 'Musical Instruments'.

7. The visit

In the fifth week of the term we made a visit to the West Dean College where courses in early musical instruments take place. The main part of their work is the making of violas and the Director of the department very kindly showed the children the various aspects of instrument making starting with the types of materials used and the procedures gone through to achieve the very beautiful looking instruments on display. We were actually in a workshop with tools and materials easily observed. Many questions were asked by children and accompanying parents and I was surprised at the detail recalled when writing was done over the following few days. We stayed here for about an hour and after lunch visited the Mechanical Music Collection near Chichester. This too was an enlightening experience as well as entertaining as many instruments were made to play for us.

The flavour of these two visits can be appreciated better by reading the children's writing and looking at the pictures they made. These can be found in the book — Musical Instruments by 2K.

8. Cross-curriculum applications

Science

The exploration of sound, this topic fulfils A.. 14 National Curriculum.

Level 1 — Pupils should: know what sounds can be made in a variety of ways.

Level 2 — Know what sounds are heard when the sound reaches the ear.

— be able to explain how musical sounds are produced in simple musical instruments.

Level 3 — Know what sounds are produced by vibrating objects and can travel through different materials.

— be able to give a simple explanation of the way in which sound is generated and can travel through different materials.

The topic also goes some way towards A.T. 1 — the general approach to exploration and science.

A.T. 2 — The Variety of Life.

A.T. 3 — Processes of Life.

Maths

Measuring using standard measures, simple ideas of ratio (the pitching of size). Counting and sorting. Estimating before making. Simple concepts of volume, capacity and length.

English

The discussion, writing and reporting. The poems, stories, sound words. Vocabulary — words used to name parts of musical instruments — words used to describe sounds.

History and Geography

Very briefly — the early musical instruments and pictures of people and the costumes they wore.

Some discussions of places from whence wood to make violas and bows came.

Technology

A.T. 1 *Identifying Needs and Opportunities*

The need to make musical instruments and to produce musical sound for enjoyment. Levels 1,2.

A.T. 2 *Generating a Design Proposal*
To produce a realistic, appropriate and achievable design.

Level 1 & Level 2

The designs were from a choice of pre-designed instruments but many modifications were achieved.

A.T. 3 *Working to a Plan — Make an Artefact, System or Environment*

Level 1, Level 2 & Level 3

I see this area as the strongest in this topic and also most relevant to the age group.

Appraising

A.T. 4 — Pupils should be able to develop, communicate and act constructively upon an appraisal of the process, outcomes and effects of their own design — also the design from other times and cultures.

Level 1, Level 2 & Level 3

These aspect of the topic are also strongly featured.

The weakest feature of the work, from a design point of view was that children may not have been given sufficient opportunity to design their own instrument and I see this as a challenge for the future when I shall be doing this topic again as part of the *Science* scheme of rolling topics related to attainment targets right through the primary age range in the school. See *science topics sheet at end*.

Music

Appreciation of instruments — pitch and why instruments look the way they do. Unfortunately we did not get time to do much music making on the instruments as time just disappeared. However, there will be time for that in the future and I hope to make some recordings. We did use a computer programme about pitch very successfully.

Art and craft

The instruments were made to look aesthetically pleasing. Instruments have to be seen when being played before a live audience. Paintings of sound-producing things.

Drawing of instruments.

Illustrations on Sound Poems.

P.E. and drama

Using the body to produce sound and rhythm. Listening and moving to mechanical, electronic and natural sounds eg thunderstorms, rain, windy weather etc.

R.E.

Briefly discussed musical instruments used in religious festivals or of different cultures.

9. Assembly

After the half-term break we had three days to prepare an Assembly for the Thursday morning when parents were invited. I should have liked longer to prepare the children as they seemed to lack confidence on the day of the Assembly and I did not feel it did justice to all the hard work they had put in.

However here is an outline of the Assembly:-

1. Hymn — 'He Made Me'.
2. Sound words marched silently across stage.
3. Talking about sound and hearing with large diagram of ear to help.

black group made a drum.
my drum is plastic and it is.
made out of a plastic pot with a plastic.
cover over it and it's colourd in with,
red and yellow. with a elastic band a
round the plastic cover and it made
a noise like a bang with a stick



4. Talking about the sound tins game with graph to show peoples' guesses.
5. Reading out sound poems composed by themselves.
6. Showing pictures and talking about the Visits.
7. Showing the instruments and telling how they were made.
8. Telling story of Joshua and Battle of Jericho.
9. Reading from Noisy Poems.
10. Reading of child's own prayer about the gift of hearing.
11. Final Hymn — 'I Listen'.

Bibliography

I am grateful to the School's Library Service who found most of the following books for me — having had advance warning of the Topic. These were ready for me when the Library Van visited the school after Easter.

School resources

Lively craft cards set 2 — *Making musical instruments* — Mills and Boom

Make Music and *Making more music* by Richard Addison — Holmes McDougall

The sense of hearing — science 5-13 — stages 1 and 2 — MacDonald

Schools Library Service

Buttons — Linda Yeatman — (Hearing dogs for deaf)

Making musical instruments — Margaret McLean, MacMillan

Making musical sounds — Mary Southworth, Studio Vista

Experimenting with sound — Alan Ward, Dryad

Musical instruments in colour — Gammond, Blandford Press

Your nose and ears — Joan Iveson-Iveson, Wayland

What happens when you listen? — Joy Richardson, Hamish Hamilton

Hearing — Mary Gribbib, MacDonald

Hearing — Henry Plunkrose, Franklin Watts

Music Maker — Robina Beckles Willson, Viking Kestrel

Scrape rattle and blow — Chris Desphonde, A and C Black

Hearing — Ed Catherall, Wayland

The Pied Piper of Hamelin — Robert Browning, Spencer

Alarm bells — John Escott, Hamish Hamilton

Noisy Poems — Jill Bennett, Oxford