

## Design and Technology – Improving Environments.

The following design and make framework for environments is generic. It can be used in a range of different situations depending on what major focus the teacher decides upon. The questions in each session should then be made specific to the context. The following are possible contexts for each of the units in the project box; the list is not definitive but illustrative. The outcomes will be decided by the children and the teacher in discussions linked to the projected improvements.

<p><b>The contexts for linking to Unit 1: Our classroom and school</b> The teacher will need to decide which part of the classroom /school they are going to get the children to evaluate and improve. The following are some indicative areas:</p> <ul style="list-style-type: none"><li>• The role play area</li><li>• The reading corner</li><li>• The classroom itself in its entirety</li><li>• The main entrance</li><li>• Part of the hall</li><li>• The dining hall</li></ul>	<p><b>The contexts for linking to Unit 2: Inside-Outside</b></p> <ul style="list-style-type: none"><li>• The playground – hard surface play areas</li><li>• The school grounds – other areas in the school grounds</li><li>• Entrance porch</li><li>• School Gate area</li><li>• School perimeters</li></ul>	<p><b>The contexts for linking to Unit 3: Our wider world</b></p> <ul style="list-style-type: none"><li>• The recreation area / park</li><li>• Down our street</li><li>• Our shopping areas</li><li>• Our town centre</li></ul>
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**Units 4 and 5** are all about change and improvement as is the following design and technology framework. The knowledge and understanding gained from other curriculum areas on Our changing world and Our Future World can be included as part of the context for the design and making assignments for the children to consider when generating and developing ideas for changing their environments. Sustainability issues would be discussed and considered as part of the teacher-set context. E.g. use of different materials, how we dispose of products (litter), recycling.

## Session 1- Researching our environment

### Getting started

Introduce the children to the idea of improving a particular area within the classroom/school. This could be done by setting the context by telling a story of a particular problem that has arisen or discussing with the children what they believe works well in the environment and what works less well, or through a visit to another part of the school to evaluate that area.

### Main Activity

To help develop children's understanding of all aspects of design and technology questions which help pupils to understand there is always a purpose and users when designing and making products, systems and environments. The following questions are a starting point for this development:

What is the area used for? (Purpose)

Who uses the area? (Client /User)

What shape, size, colours, area is it? (Aesthetics)

What materials have been used? Is it a good material to use in this way? Is it a stiff or flexible material?

Does anything have a moving part? How does it move? Why does it move?(Knowledge of materials and mechanisms)

What things are in the environment? (e.g. playground equipment, seats, playground games, quiet areas, gardens)

What is good about the environment? What could be improved? Could other materials be used? (Evaluating what already exists)

### Pedagogical Commentary for session 1

It is important that time is given to learners to talk about what they see, explaining what they think about, what they are looking at and what they would do to change things to make improvements. The key concept is that pupils identify strengths and weaknesses in the environment and how they perceive it works. The pupils' ideas could be recorded on the interactive white board package and used in later sessions or on large sheets of paper and put up in displays.

### Differentiation

To help some pupils to communicate their ideas the following may be helpful:

- digital photographs of the chosen environments could be used for annotation and evaluation.
- word banks with agreed vocabulary
- working in pairs

### Responses and assessment:

Children working at:

**Level 1** will be able to talk about the environment saying what they like or dislike.

**Level 2** will be able to talk about the environment identifying what is good and what needs to be improved.

**Level 3** will be able to talk about the environment identifying what others might think about it and identifying what needs to be improved

### Teacher reflection

### What comes next?

In the next session – the children will be

- generating ideas for improvement based on their initial evaluation of the environment.
- investigating modelling materials to help communicate their ideas.

### Links to other curriculum areas

#### English

Speaking and listening

Simple annotation and labelling

#### Science

Materials – knowledge of properties and characteristics

#### PSHE

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#### Geography

#### ICT

### Interactive and other displays

The interactive whiteboard and digital photography could be used to remind pupils of what they saw and the teacher to model how to annotate thinking for improvement. Pupils could then do their own annotation on printouts of photographs.

### Activities involving parents/carers

Looking at materials in the home – identifying plastics, wood, metal, fabric, paper, card.

Looking at how materials are used in the home: why some materials are used for some products and not others.

### Resources/ references/ websites

Digital camera, paper for recording ideas and evaluations. A range of materials for exploration – wood strip, dowel, pipe cleaners, straws, fabrics, plastics.

### Further suggestions

## Session 2 – How could we change our environment

### Main Activity

The main aim of this session is to:

- allow children to suggest possible improvements to the environment based on what they identified as strengths and weaknesses in session 1. (recorded main ideas used to help remind them of these). Children to talk about and communicate ideas through talk and simple sketches.  
(a) generate ideas
- help children to know how to join and manipulate a range of materials ( b) focused practical tasks)

**Generating ideas:** The following are some questions to help children come up with possible improvements

How would you change the environment? Why?

How could you make it better?

How would you make it more attractive?

Who uses the environment? What do you think they would want? How could we find out? What would we ask them?

What materials could we use?

What ideas do you have for making the environment better? How would you do it?

### Focused Practical Tasks

#### Designing skills

Show children how to make simple sketches linked to Art – mark making.

Use sorting rings to help children to sort materials according to their properties e.g flexible materials /rigid materials (This activity links to NC Thinking skills - Information Processing)

Use digital images of environment for pupils to highlight features for change. (Where appropriate)

#### Making Techniques

Through direct teaching demonstrate how to join different materials – e.g. using card triangle to join wood strip together, using pipe cleaners to join plastic straws, how to join fabric with simple stitching (the practical tasks will be aligned to the focus of improving the environment).

It is important to show children how to measure, cut, join and finish materials. (The materials will be specific to the context for the DMA). See Web site links for help with techniques in resources section.

### Pedagogical Commentary for session 2

It is important that skills for both **designing** and making are taught to the children. Communicating ideas and possibilities is as complex as being able to compose prose. Communicating through drawing, sketching and modelling with materials is crucial in helping children to externalise their ideas. These activities are the tools for doing this. The making tasks are important for children to make good decisions for selecting methods for constructing.

### Differentiation

Design sheets and recording sheets can be focused for specific pupils –

Some children will identify their ideas through talk and simple sketches

Most pupils will use a framework for recording their ideas and make simple annotation on their sketches.

### Responses and assessment:

Children working at:

**Level 1** use pictures and words to describe what they want to do and explain what they are making.

**Level 2** will be able to use models, pictures and words to describe their designs and can explain in some detail why they have chosen to alter the environment in the way they have

**Level 3** will be able to talk their ideas for the environment identifying what others might think about the changes and are able to clarify their ideas using information from others and their own opinions.

### Teacher reflection

#### What comes next?

In the next session – the children will be

- developing one idea for improvement based on their initial evaluation of the environment.
- Planning their actions to realise their idea
- Making their improved environment..

#### Links to other curriculum areas

**English** - Speaking and listening, Simple annotation and labelling.

**Maths** – Sorting and setting using criteria selected by teacher and self

**Art** – Mark making

#### Science

Materials – knowledge of properties and characteristics

**ICT** – use of digital camera, scanner for recreating self made maps (from Geography) for use in designing environment.

#### PSHE

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#### Interactive and other displays

Displays of pupils' ideas to help remind them of possibilities including the annotated digital photographs.

#### Activities involving parents/carers

Asking parents/carers to discuss children's ideas and suggestions.

#### Resources/ references/ websites

Staffordshire LEA D&T section, Datafile. Helpsheets for techniques – [www.sln.org.uk](http://www.sln.org.uk)

DATA Helpsheets – Techniques sheets that support the QCA Scheme, choose sheets that is closest to work undertaken e.g. textiles use Puppets or Joseph's Coat sheet for techniques for joining, pattern making and adding colour.

#### Further suggestions

## Session 3/4 - Modelling our ideas

### Main Activity

The main aim of this session is to:

- help children to know how to join and manipulate a range of materials (focused practical tasks)
- to develop one of their ideas into a design which they will realise, using appropriate materials, matching their design to what needs to be done and the purpose for which it is going to be used.

### Focused Practical Tasks

What materials are you going to use? How will you measure and cut them? How will you join them together? Will you need any other parts? (components).

How will you finish it? (Aesthetics)

### Design and make:

Recap on what was discussed about possible changes to the environment. Ask children to decide: What are you going to make? Who will use it? (Client/User) What do they want it to do? (Criteria for making) Why do we need it? (Purpose) What do you want it to look like? (Aesthetics)

Encourage the children to communicate their ideas

- about what their environment needs to be like (identify criteria for making)
- through talk, pictures and modelling with materials.
- about which materials and techniques they will use to make their environment.
- how will they will make it? (Planning) What will you need to do first? What next? At the end? How will you make sure your product will do all the things you want it to?

### Pedagogical Commentary

FPTs – It is important that the children are shown how to manipulate materials so they can use this knowledge in their design decisions. By using the materials and components in a restricted way they become familiar with what the materials can do and how they work.

Design and make: It is very important that the children make their own decisions about their making. The knowledge skills and understanding from the previous sessions will help them make appropriate decisions based on their vision. It is important that the children should explore their ideas choosing one that they think is the most suitable to improve the environment. Communicating what they need their environment to have is important for clarifying their own thoughts and helps to identify possible problems before they start making.

This session could be two whole sessions depending on how long it takes the children to construct and finish their models.

### Differentiation

Design sheets and recording sheets can be focused for specific pupils

Some children will identify their ideas through talk and simple sketches

Most pupils will use a framework for recording their ideas and make simple annotation on their sketches.

### Responses and assessment:

Children working at:

**Level 1** Will be able to use pictures and words to describe what they want to make. They will be able to explain what they want to do and which tools they will be using. They will be able to use tools and materials with help where needed.

**Level 2** Will be able to plan what to do next, based on their experience of working with materials and components. They will be able to use models, pictures and words to describe their design. Are able to select appropriate tools, techniques and materials, explaining their choices. They use tools and assemble, join and combine materials and components in a variety of ways.

**Level 3** Will generate ideas and recognise that their designs have to meet a range of different needs. They make realistic plans for achieving their aims. They will be able to clarify their ideas when asked and use words, labelled sketches and models to communicate the details of their designs. They think ahead about the order of their work, choosing appropriate tools, equipment, materials, components and techniques. They will be able to use tools with some accuracy to cut and shape materials and to put components together.

### Teacher reflection

### What comes next?

In the next session – the children will be evaluating how well they have made their new environment.

### Links to other curriculum areas

**English** - Speaking and listening, Simple annotation and labelling. Simple lists and instructional text.

**Maths** – Measuring accurately

**Art** – drawing

### Science

Materials – knowledge of properties and characteristics

### PSHE

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### Interactive and other displays

Displays of pupils' ideas to help remind them of possibilities including the annotated digital photographs.

### Activities involving parents/carers

Asking parents/carers to come into the classroom to support with the making activities.

### Resources/ references/ websites

Staffordshire LEA D&T section, Datafile. Helpsheets for techniques – [www.sln.org.uk](http://www.sln.org.uk)

DATA Helpsheets – Techniques sheets that support the QCA Scheme, choose sheets that are closest to work undertaken e.g. textiles use Puppets or Joseph's Coat sheet for techniques for joining, pattern making and adding colour.

### Further suggestions

## Session 4/5- How well does it work

### Main Activity

The main aim of this session is to:

- help children identify strengths and possible improvements to their product based on their own criteria for making.
- help children use criteria for making critical evaluations of their own work.

How well does the environment match your criteria for making? Why did you make any changes? What do others think of your environment? Did you use the best materials? If not why not?

### Pedagogical Commentary

It is important for the children to use the criteria they identified as improvements to be used to evaluate their own work. It is also important to get the children to explain why they changed things in the making as it progressed. This can be done through talk and /or writing. Charts and different methods for recording their evaluations can be used such as ranking and rating charts.

### Differentiation

Ranking rating charts for children to colour in to record their evaluations.

Frameworks for writing against their criteria can be used for those children who are more skilled in writing.

### Responses and assessment:

Children working at:

**Level 1** – Will be able to talk about their own work and say how well it works.

**Level 2** – Will be able to recognise what they have done well as their work progresses and suggest things they could do better.

**Level 3** – will be able to identify where evaluation of the design and make process and their product has led to improvements.

### Teacher reflection

### Links to other curriculum areas

**English** - Speaking and listening, writing non fiction report

**Maths** –

**Art** – drawing

### Science

Materials – knowledge of properties and characteristics

### PSHE

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### Interactive and other displays

Displays of pupils ideas to help remind them of possibilities including the annotated digital photographs.

### Activities involving parents/carers

Asking parents/carers to come into the classroom to support with the making activities.

### Resources/ references/ websites

### Further suggestions