



Year 3/4 Curriculum Cycle A Autumn 2023

Design Brief: How can I design and build my own model castle? Aspect of DT - Structures Focus - Free standing structures

4 lessons over 5 days (make/create lessons may take 2 days)

Key Learning Skills

Prior learning

Experience of using different joining, cutting and finishing techniques with paper and card.
A basic understanding of 2-D and 3-D shapes in mathematics and the physical properties and everyday uses of materials in science.

Research: Investigate and Evaluate Activities (IEAs)

Children investigate a collection of different castle structures and different model castles. Use questions to develop children's understanding e.g. *What is the purpose of the structure - protecting, containing? What material is it made from? How has it been constructed? Are the materials recyclable or reusable? How has it been created i.e.: folded, corrugated, ribbed, laminated? What size/shape/colour is it? How attractive is the design?*

Evaluate existing products to determine which designs children think are the most effective. Provide opportunities for the children to judge the suitability of the castle structures for their intended users and purposes. Discuss graphics including colours/impact of style— *What do you prefer and why? What features might we want to include in our product to meet users' preferences and its intended purpose? Which is best?*

Designing: Design, Make and Evaluate Assignment (DMEA)

Children discuss and explore the graphics techniques and media that could be used to achieve the desired appearance of their models.

Practise using computer-aided design (CAD) software to design the net, text and graphics for their products according to purposes.

Discuss with the children the uses and purposes of their castle structures e.g. *What does the product need to do? Who is it aimed at? How will the purpose and user affect your design decisions? Agree on design criteria that can be used to guide the development and evaluation of children's products e.g. How will we know that we have designed and made successful products?*

Ask the children to use annotated sketches and prototypes to develop, model and communicate their ideas for the product e.g. *What will you need to include in your design? How can you improve it? What materials will you use? How will you make sure your product works well and has the right appearance?*

Ask children to identify the main stages of making and the appropriate tools and skills they learnt through focused tasks. Encourage the children to work with accuracy, using computer-aided design (CAD) where appropriate.

Generate realistic ideas and design criteria collaboratively through discussion, focusing on the needs of the user and purpose of the product.

Develop ideas through the analysis of existing products and use annotated sketches and prototypes to model and communicate ideas.

Making: Focussed Tasks

Order the main stages of making. Select and use appropriate tools to measure, mark out, cut, score, shape and assemble with some accuracy.

Explain their choice of materials according to functional properties and aesthetic qualities. Children use finishing techniques suitable for the product they are creating.

Children to construct nets. Practise making nets out of card, joining flat faces with masking tape to create 3-D shapes. Experiment with assembling in nets in numerous ways.

Demonstrate skills and techniques of scoring, cutting out and assembling using pre-drawn nets. Then allow children to practise by constructing a simple box. Show how a window could be cut out and acetate sheet added.

Demonstrate how to use different ways of stiffening and strengthening their castle structures e.g. folding and shaping, corrugating, ribbing, laminating. Provide opportunities for the children to practise these and to carry out tests to find out where their structures might need to be strengthened or stiffened.

Evaluating: Design, Make and Evaluate Assignment (DMEA)

Test and evaluate their own products against design criteria and the intended user and purpose.

Evaluate throughout and the final products against the intended purpose and with the intended user, drawing on the design criteria previously agreed.

Technical knowledge and understanding

Develop and use knowledge of how to construct strong, stiff model castle structures.

Develop and use knowledge of nets of cubes and cuboids and, where appropriate, more complex 3D shapes.

Know and use technical vocabulary relevant to the project.

Key Vocabulary

Tier 1: Flag, Castle, Strong, Weak, Strong

Tier 2: 2D shapes, 3D shapes, structure, stable, feature

Tier 3: Net, Recyclable, Scoring, Tab, Facade, Evaluation.

Lesson 1

After learning the features of a castle, children design one of their own, deciding which 3D shapes they need to create it

Learning Objectives

To identify features of a castle

I can identify different features of castles

I can design my own castle

I can label the features of my castle

Lesson 2

Children follow a design specification to create a castle, labelling their drawings with the shapes and subsequent nets and recycled materials they will use to make it

Learning Objectives

To design a castle

To know the features of a castle

I can add two design points to the Design Specification to appeal to the person/purpose of my castle

I can draw the design of my castle using 2D shapes, labelling the 2D shapes that will create the features of the castle

(materials I need and colours I will use)

Lesson 3

Children construct their nets to make 3D shapes to use in the construction of their castles in Lesson 4

Learning Objectives:

To construct 3D nets

I know that a net is what a 3D shape would look like if it were opened out flat

I can construct a range of 3D geometric shapes using a net by:

Cutting along the bold lines. Folding along the dotted lines. Keeping the tabs the correct size

Making crisp folded edges. Constructing the net using glue to make a geometric shape.

Lesson 4

After creating the curtain walls of their castles, children make and attach the specific features of their designs, decorating and adding facades to complete the project.

Learning Objectives:

To construct and evaluate my final product

I can construct my castle to meet the requirements of my brief by:-making neat 3D shapes using nets-

stacking shapes and recyclable materials to make the structures of my castle-creating a castle base to

secure my structures to-adorning my castle with

facades and other decorative features

I can evaluate my work and the work of others



Year 3/4 Curriculum Cycle A Spring 2024

Design Brief: How can I create my own cushion?

Aspect of DT - Textiles Focus - 2D shape to 3D product- cushions

Key Learning Skills

Prior learning

- Have joined fabric in simple ways by gluing and stitching.
 - Have used simple patterns and templates for marking out.
- Have evaluated a range of textile products.

Research: • Investigate and evaluate activities (IEAS)

Children investigate a range of textile products that have a selection of stitches, joins, fabrics, finishing techniques, fastenings and purposes, linked to the product they will design, make and evaluate. Think about products from the past and what changes have been made in textile production and products e.g. the invention of zips and Velcro.

Give children the opportunity to disassemble appropriate textiles products to gain an understanding of 3-D shape, patterns and seam allowances.

Use questioning to develop understanding e.g. *What is its purpose? Which one is most suited to its purpose? What properties/characteristics does the fabric have? Why has this fabric been chosen? How has the fabric been joined together? How effective are its fastenings? How has it been decorated? Does its decoration have a purpose? What would the 2-D pattern piece look like? What are its measurements? How might you change the product?*

Designing Design, Make and Evaluate Assignment (DMEA)

Generate realistic ideas through discussion and design criteria for an appealing, functional product fit for purpose and specific user/s.

Produce annotated sketches, prototypes, final product sketches and pattern pieces.

Children to create a design brief, supported by the teacher, set within a context which is authentic and meaningful. Discuss the intended user, purpose and appeal of their product. Create a set of design criteria.

- Ask children to sketch and annotate a range of possible ideas, constantly encouraging creative thinking. Produce mock-ups and prototypes of their chosen product.
- Plan the main stages of making e.g. using a flowchart or storyboard.

Making: Focussed Tasks

- Plan the main stages of making.
 - Select and use a range of appropriate tools with some accuracy e.g. cutting, joining and finishing.
- Select fabrics and fastenings according to their functional characteristics e.g. strength, and aesthetic qualities e.g. pattern.
- Demonstrate a range of stitching techniques and allow children to practise sewing two small pieces of fabric together, demonstrating the use of, and need for, seam allowances.
- Allow children to use a textile product they have taken apart to create a paper pattern using 2-D shapes.
 - Provide a range of fabrics – children to consider whether fabrics are suitable for the chosen purpose and user. The fabrics also can be used for demonstrating and testing out a range of decorative finishing techniques e.g. appliqué, embroidery, fabric pens/paints, printing.

Evaluating

- Investigate a range of 3-D textile products relevant to the project.
- Test their product against the original design criteria and with the intended user.
- Take into account others' views.
- Understand how a key event/individual has influenced the development of the chosen product and/or fabric.

Technical knowledge and understanding

- Know how to strengthen, stiffen and reinforce existing fabrics.
- Understand how to securely join two pieces of fabric together.
- Understand the need for patterns and seam allowances.
- Know and use technical vocabulary relevant to the project.

Lesson 1

The children are introduced to cross stitch and the decorative sewing technique appliqué and experiment with trying these stitches independently.

I can use cross stitch
I know how to appliqué
I can reflect on techniques used

Lesson 2

Pupils design their own cushions, adhering to set design criteria, which includes the use of cross stitch and appliqué.

I can design a cushion
I can use a paper template
I can cut fabric accurately

Lesson 3

Using appliqué and cross-stitch, pupils decorate their cushions in accordance with their designs .

I can follow a design criteria
I can use cross stitch
I can add appliqué

Lesson 4

Children complete their cushions, sewing the edges, stuffing them and using the decorative pieces of materials from the previous lesson.

I can use stitches to join fabrics
I can leave space for a seam
I understand why some products are turned inside out after sewing

Key Vocabulary

Tier 1: zip, weakness, button, strength, cushion,
Tier 2: sketch, design, model, pattern pieces, fastening, sketch, stitch
Tier 3: compartment, aesthetics, templates, prototype, applique



Year 3/4 Curriculum Cycle A Summer 2024

Design Brief: How Can I Create a Toy with a Pneumatic System?

Aspect of DT - Mechanisms Focus - pneumatic systems

Key Learning Skills

Prior learning

Explored and used mechanisms such as flaps, sliders and levers.
Gained experience of basic cutting, joining and finishing techniques with paper and card.

Research: Investigative Activities (IEAs)

Children investigate, analyse and evaluate other products which have a range of pneumatic mechanisms.
Use questions to develop children's understanding e.g. *Who might it be for? What is its purpose? What do you think will move? How will you make it move? What part moved and how did it move? How do you think the mechanism works? What materials have been used? How effective do you think it is and why? What else could move?*

Design: Design, Make and Evaluate Assignment (DMEA)

Develop a design brief with the children within a context which is authentic and meaningful.
Discuss with children the purpose of the products they will be designing and making and who the products will be for. Ask the children to generate a range of ideas, encouraging creative responses. Agree on design criteria that can be used to guide the development and evaluation of the children's products.
Using annotated sketches and prototypes, ask the children to develop, model and communicate their ideas.
Ask the children to consider the main stages in making before assembling high quality products, drawing on the knowledge, understanding and skills learnt through IEAs and FTs.

Making (focused tasks FTs)

- Order the main stages of making.
 - Select from and use appropriate tools with some accuracy to cut, shape and join paper and card.
- Select from and use finishing techniques suitable for the product they are creating.
Demonstrate a range of lever and linkage mechanisms to the children using prepared teaching aids.
Demonstrate the correct and accurate use of measuring, marking out, cutting, joining and finishing skills and techniques.
Children should develop their knowledge and skills by replicating one or more of the teaching aids.

Evaluating

Investigate and analyse books and, where available, other products with lever and linkage mechanisms.
Evaluate their own products and ideas against criteria and user needs, as they design and make.
Evaluate the final products against the intended purpose and with the intended user, drawing on the design criteria previously agreed.

Technical knowledge and understanding

- Understand and use lever and linkage mechanisms.
- Distinguish between fixed and loose pivots.
- Know and use technical vocabulary relevant to the project.

Vocabulary

Tier 1: tape, glue, stick, move, blow, air, push, tube
Tier 2 motion, mechanism, decoration
Tier 3: input, exploded diagram, linkage, pneumatic system, thumbnail sketch, net

Lesson 1

In this practical lesson, children investigate and explore different pneumatic systems
I know that mechanisms are a system of parts that work together to create motion
I know that a pneumatic system can be used as part of a mechanism
I know that pneumatic systems are used in a range of everyday objects
I know that a pneumatic system can force air over a distance to create movement

Lesson 2

The children use their understanding of pneumatics to design their own pneumatics toys through thumbnail sketches and exploded diagrams
I can develop design criteria from a design brief
I can generate suitable ideas using thumbnail sketches and exploded diagrams
I know that there are three different types of pneumatic systems that I can use to design my toy and I can use recycled household objects to make it
I know that different types of drawings are used in design to explain ideas clearly.

Lesson 3

Children create a working pneumatic system and casing for their toys
I can create a pneumatic system to create a desired motion
I can build secure housing for a pneumatic system
I know that syringes and balloons can be used to create different types of pneumatic systems
I know how to use these components to make a functional and appealing pneumatic toy.

Lesson 4

Pupils add decorations and assemble the final components to complete their pneumatic toys.
I can remember that materials are selected due to their functional and aesthetic characteristics
I know how to manipulate materials to create different effects by cutting, creasing, folding, weaving, etc.



Year 3/4 Curriculum Cycle A Summer 2024

Design Brief: Who can design, make and evaluate a healthy snack to eat at break time? (Or have a picnic on the field) Aspect of DT - Food Focus - Healthy and Varied Diet

Key Learning Skills

Prior learning

- Know ways to prepare ingredients safely & hygienically
- Have some basic knowledge and understanding about healthy eating and *The eat well plate*
- Have used some equipment and utensils and prepared and combined ingredients to make a product

Designing

- Generate and clarify ideas through discussion with peers and adults to develop design criteria including appearance, taste, texture and aroma
- Use annotated sketches and appropriate information and communication technology, such as web-based recipes, to develop and communicate ideas.

Making

- Plan the main stages of a recipe, listing ingredients, utensils and equipment.
- Select and use appropriate utensils and equipment to prepare and combine ingredients.
- Select from a range of ingredients to make appropriate food products, thinking about sensory characteristics.

Evaluating

- Carry out sensory evaluations of a variety of ingredients and products. Record the evaluations using e.g. tables and simple graphs.
- Evaluate the on-going work and the final product with reference to the design criteria and the views of others.

Technical knowledge and understanding

- Know how to use appropriate equipment and utensils to prepare and combine food.
- Know about a range of fresh and processed ingredients appropriate for their product, and whether they are grown, reared or caught.
- Know and use relevant technical and sensory vocabulary

Investigative & Evaluative Activities (IEAs)

- Children investigate a range of food products e.g. the content of their lunchboxes over a week, a selection of foods provided for them, food from a visit to a local shop. Link to the principles of a varied and healthy diet using *The eat well plate* e.g. What ingredients have been used? Which food groups do they belong to? What substances are used in the products e.g. nutrients, water and fibre?
- Carry out sensory evaluations on the contents of the food from e.g. a variety of bought food products such as a range of wraps or sandwiches. Record results, for example using a table. Use appropriate words to describe the taste/smell/texture/appearance e.g. How do the sensory characteristics affect your liking for the food?
- Gather information about existing products available relating to your product. Visit a local supermarket and/or use the internet.
- Find out how a variety of ingredients used in products are grown and harvested, reared, caught and processed e.g. Where and when are the ingredients grown? Where do different meats/fish/cheese/eggs come from? How and why are they processed?

Focused Tasks (FTs)

- Learn to select and use a range of utensils and use a range of techniques as appropriate to prepare ingredients hygienically including the bridge and claw technique, grating, peeling, chopping, slicing, mixing, spreading, kneading and baking.
- Food preparation and cooking techniques could be practised by making a food product using an existing recipe.
- Discuss basic food hygiene practices when handling food including the importance of following instructions to control risk e.g. *What should we do before we work with food? Why is following instructions important?*

Design, Make & Evaluate Assignment (DMEA)

- Discuss the purpose of the products that the children will be designing, making and evaluating and who the products will be for.
- Develop and agree on design criteria with the children within a context that is authentic and meaningful. This can include criteria relating to healthy eating and a varied diet e.g. *What do you need to consider to make it part of a balanced diet? How do we select the ingredients? How could we make it appealing to eat?*
- Ask children to generate a range of ideas encouraging realistic responses.
- Using discussion, annotated sketches and information and communication technology if appropriate, ask the children to develop and communicate their ideas.
- Ask children to consider the main stages in making the food product, before preparing/cooking the product including the ingredients and utensils they will need.
- Evaluate as the assignment proceeds and the final product against the intended purpose and user, reflecting on the design criteria previously agreed. Consider what others think of the product when considering how the work might be improved.

Key Vocabulary

- Tier 1: taste, sweet, hot, spicy, sour, smell, cook, fresh,
- Tier 2: edible, processed, harvested, appearance, greasy, varied diet, caught, reared
- Tier 3 utensils, hygienic, harvested, ingredients