



DT

LOWER KEY STAGE 2

Substantive and Procedural Knowledge

Let's Go Fly a Kite

Lesson 1: Introduction to Kites and Materials

Substantive knowledge:

Understand what kites are, their purpose, and basic components. Know different materials used for kite making and their properties.

Procedural knowledge:

Identify and select suitable materials for making a kite based on their properties.

Vocabulary:

kite, materials, lightweight, strong, flexible

Greater depth task:

Research and present on different types of kites used around the world and why materials differ.

Lesson 2: Designing a Kite

Substantive knowledge:

Know the importance of a design plan and how structure affects flight.

Procedural knowledge:

Create detailed designs and plans for a kite, considering shape, size, and materials.

Vocabulary:

design, plan, structure, shape, aerodynamics

Greater depth task:

Compare and contrast different kite designs and predict which will fly best and why.

Lesson 3: Making the Kite Frame

Substantive knowledge:

Know how to construct a lightweight but strong frame using sticks and string.

Procedural knowledge:

Measure, cut, and join materials to build the kite frame securely.

Vocabulary:

frame, measure, cut, join, secure

Greater depth task:

Experiment with different frame shapes and materials and test which frame is strongest.



Lesson 4: Attaching the Kite Cover

Substantive knowledge:

Understand how the kite cover affects flight and the importance of secure attachment.

Procedural knowledge:

Cut and attach the cover material to the frame carefully, ensuring it is taut.

Vocabulary:

cover, attach, taut, material, secure

Greater depth task:

Try different materials for the cover and observe the effect on flight performance.

Lesson 5: Adding the Tail and Flying

Substantive knowledge:

Know the purpose of the kite tail for balance and stability.

Procedural knowledge:

Attach a tail to the kite and test fly it, making adjustments to improve flight.

Vocabulary:

tail, balance, stability, adjust, test

Greater depth task:

Design and add a tail with adjustable length and explain how it affects the kite's flight.

Battery Operated Lights

Lesson 1: Investigating Existing Products

Substantive knowledge:

Understand what battery-operated lights are and where they are used in everyday life.

Know that products are designed for specific purposes and users, and that design features can affect functionality and appeal.

Procedural knowledge:

Investigate and compare a range of battery-powered lights.

Identify key components and features. Evaluate their purpose, target audience, and effectiveness.

Vocabulary:

battery, circuit, component, evaluate, purpose

Greater depth task:

Create a comparison table for at least three different battery-powered lights.

Present your findings, explaining which product is most effective and why, based on function, user, and design.

Lesson 2: Exploring Electrical Circuits

Substantive knowledge:

Know that electrical circuits are needed to power lights.

Understand the function of key components: batteries, wires, bulbs, and switches.



Procedural knowledge:

Construct simple circuits using wires, batteries, and bulbs.
Test for working circuits and troubleshoot incomplete connections.

Vocabulary:

circuit, conductor, insulator, bulb, switch

Greater depth task:

Draw and label a complete circuit diagram.
Predict what will happen if one component is removed or disconnected and explain why.

Lesson 3: Understanding Switches

Substantive knowledge:

Know that switches control the flow of electricity in a circuit.
Understand that switches can open or close circuits to turn lights on and off.

Procedural knowledge:

Experiment with different types of switches.
Design and build a simple working switch using everyday materials.

Vocabulary:

switch, open, closed, mechanism, control

Greater depth task:

Design and draw your own switch that could be used in a specific product (e.g. toy, torch). Explain how it works and its advantages.

Lesson 4: Designing a Battery-Operated Light

Substantive knowledge:

Know the elements of a design brief, including function, user, and purpose.
Understand how to select appropriate materials and components for a working product.

Procedural knowledge:

Generate ideas using labelled drawings.
Choose suitable materials and components for a light product. Plan the layout and design based on intended use.

Vocabulary:

design, function, user, sketch, plan

Greater depth task:

Write a short design proposal that explains the purpose of your light, your intended user, and why your materials and circuit layout are suitable.

Lesson 5: Making the Product

Substantive knowledge:

Understand how to safely assemble a product using tools and materials.
Know how electrical components work together in a final product.

Procedural knowledge:

Construct a functioning battery-operated light following a plan.
Safely assemble the casing and insert the circuit.



Vocabulary:

construct, assemble, join, connect, safety

Greater depth task:

Document your making process with photos or diagrams and captions.

Reflect on any changes you made during the construction phase and why.

Lesson 6: Evaluating the Final Product

Substantive knowledge:

Know how to evaluate a product based on criteria such as effectiveness, appearance, and suitability for purpose.

Understand how to suggest improvements.

Procedural knowledge:

Test and assess your finished product against your original design brief.

Collect feedback from peers and suggest improvements.

Vocabulary:

evaluate, feedback, improve, criteria, reflect

Greater depth task:

Create a written or visual presentation

Juggling Balls

Lesson 1: Investigating Fabric Products

Substantive knowledge:

Understand that many products are made from textiles and are designed for specific purposes.

Know that fabrics have different textures, strengths, and uses.

Procedural knowledge:

Explore and evaluate existing textile products (e.g. toys, bags).

Identify materials used and comment on their properties and suitability.

Vocabulary:

fabric, textile, product, material, purpose

Greater depth task:

Compare two fabric products designed for different users (e.g. baby toy vs sports item). Present reasons for material and design choices.

Lesson 2: Exploring and Practising Stitching

Substantive knowledge:

Know that stitches are used to join fabrics together.

Understand that different stitches (e.g. running stitch, over stitch) serve different purposes.

Procedural knowledge:

Practise basic hand-stitching techniques.

Sew using even stitches to join fabric pieces.

Vocabulary:

needle, thread, stitch, running stitch, join



Greater depth task:

Create a mini fabric square using a decorative stitch pattern and evaluate its appearance and strength.

Lesson 3: Investigating and Choosing Materials for a Juggling Ball

Substantive knowledge:

Know that juggling balls must be strong, soft, and durable.

Understand the qualities that make some fabrics more suitable than others.

Procedural knowledge:

Test a range of fabrics for softness, stretch, durability, and ease of stitching.

Select suitable materials for the juggling ball based on findings.

Vocabulary:

durable, soft, flexible, suitable, test

Greater depth task:

Create a comparison chart of 4 fabric types. Recommend the best one for the juggling ball and justify your choice.

Lesson 4: Designing a Juggling Ball

Substantive knowledge:

Understand the importance of designing for a user.

Know how to include practical and decorative features in a textile design.

Procedural knowledge:

Draw a labelled design for a juggling ball.

Plan fabric choices, colours, filling, and stitching techniques.

Vocabulary:

design, label, feature, pattern, user

Greater depth task:

Annotate your design with alternatives (e.g. "if I use felt, it will be softer but harder to stitch"). Consider the impact of design choices.

Lesson 5: Making a Juggling Ball

Substantive knowledge:

Know how to assemble a textile product using stitching.

Understand the importance of accurate sewing and safe use of tools.

Procedural knowledge:

Cut fabric accurately, use stitching to join, and fill the ball with suitable material (e.g. rice, beans).

Follow safety guidelines with needles and scissors.

Vocabulary:

assemble, fill, sew, cut, accurate

Greater depth task:

Keep a step-by-step photo diary of your making process. Reflect on what went well and what was tricky.



Lesson 6: Evaluating the Juggling Ball

Substantive knowledge:

Know how to evaluate a textile product based on design criteria and user needs.
Understand the importance of appearance and function.

Procedural knowledge:

Test the juggling ball for strength, usability, and appeal.
Gather peer feedback and suggest one improvement.

Vocabulary:

evaluate, function, feedback, appearance, improve

Greater depth task:

Present your juggling ball to a small group, explaining its features. Record responses and write a paragraph proposing a version 2 design with improvements.

The Great Bread Bake Off

Lesson 1: Investigating Breads from Around the World

Substantive knowledge:

Know that bread is a staple food made in many different ways across cultures.
Understand that different types of bread have different ingredients, textures, and flavours.

Procedural knowledge:

Taste and evaluate a range of breads.
Describe appearance, texture, flavour, and origin. Identify key ingredients in each.

Vocabulary:

bread, evaluate, ingredient, texture, flavour

Greater depth task:

Create an illustrated world bread map showing 4–6 breads from different countries.
Compare ingredients and suggest reasons for variations.

Lesson 2: Understanding the Ingredients in Bread

Substantive knowledge:

Know the basic ingredients in bread (flour, water, yeast, salt).
Understand the role each ingredient plays in bread-making.

Procedural knowledge:

Handle and describe individual ingredients.
Observe how they interact, particularly how yeast causes bread to rise.

Vocabulary:

flour, yeast, rise, dough, mix

Greater depth task:

Predict what might happen if an ingredient (e.g. yeast or salt) is left out of a recipe.
Test and record findings with a simple dough mix.

Lesson 3: Developing Bread Design Criteria

Substantive knowledge:

Know that bread can be designed for different users and occasions.



Understand how to create criteria for a food product (taste, texture, look, purpose).

Procedural knowledge:

Generate ideas for a new bread product.

Establish clear design criteria for the intended user and purpose.

Vocabulary:

criteria, design, user, purpose, features

Greater depth task:

Create two contrasting design briefs (e.g. a sweet bread for a picnic vs a savoury bread for a café). Consider how ingredients and shapes will differ.

Lesson 4: Designing a Bread Product

Substantive knowledge:

Know How to plan a bread product based on chosen ingredients, design criteria, and intended user.

Understand importance of hygiene in food preparation.

Procedural knowledge:

Create a step-by-step plan and labelled diagram for your bread design.

Choose shape, flavour, and optional additions (e.g. seeds, herbs).

Vocabulary:

plan, design, ingredient, flavouring, hygiene

Greater depth task:

Write a persuasive paragraph explaining why your bread would be popular with your target audience (e.g. children, athletes, party guests).

Lesson 5: Making Bread

Substantive knowledge:

Know how to combine, knead, and shape dough to make bread.

Understand the importance of accurate measuring and hygiene.

Procedural knowledge:

Follow a recipe and design plan to make a bread product.

Knead, shape, and bake with adult supervision.

Vocabulary:

knead, shape, bake, measure, hygiene

Greater depth task:

Adapt your recipe by adding an optional ingredient (e.g. cheese, herbs, dried fruit) and compare the result to your original design.

Lesson 6: Evaluating Bread Products

Substantive knowledge:

Know how to evaluate a finished product based on the original criteria.

Understand how appearance, taste, and texture influence appeal.

Procedural knowledge:

Taste and assess the finished bread.

Gather feedback from others and reflect on what worked well and what could be improved.



Vocabulary:

evaluate, taste, feedback, improve, texture

Greater depth task:

Create a poster advertising your bread product. Include its features, who it's for, and how it could be improved or developed further.

Edible Garden

Lesson 1: What is Seasonal Food?

Substantive knowledge:

Know what seasonal food is and why different fruits and vegetables grow at different times of the year. Understand the benefits of eating seasonally and locally.

Procedural knowledge:

Sort fruits and vegetables into seasons using research or visual prompts.
Discuss where food comes from and how this affects the environment.

Vocabulary:

seasonal, harvest, local, import, environment

Greater depth task:

Create a seasonal food calendar for fruits and vegetables grown in the UK. Include pictures and descriptions of at least two items per season.

Lesson 2: Tasting and Evaluating Salads

Substantive knowledge:

Know that salads can include a range of ingredients, textures, and flavours.
Understand how ingredients contribute to nutrition, taste, and presentation.

Procedural knowledge:

Taste a variety of salad ingredients.
Describe appearance, flavour, and texture using descriptive vocabulary.
Record preferences and reasons.

Vocabulary:

taste, texture, ingredient, salad, evaluate

Greater depth task:

Create a salad scoring chart for ingredients based on texture, colour, and taste.
Use it to decide which ones you'd use in your own recipe.

Lesson 3: Designing a Salad

Substantive knowledge:

Know how to design a dish for a specific user and purpose.
Understand how to combine flavours and textures in a salad.

Procedural knowledge:

Plan a salad using a design sheet.
Choose seasonal ingredients and explain why they are appropriate (e.g. colour, taste, availability).

Vocabulary:

design, seasonal, texture, flavour, ingredient



Greater depth task:

Create two different salad designs for different purposes (e.g. a child's lunch vs. a summer party). Justify your ingredient choices.

Lesson 4: Food Preparation Skills

Substantive knowledge:

Know how to prepare food safely and hygienically.

Understand basic food preparation techniques such as chopping, peeling, and grating.

Procedural knowledge:

Practise food preparation skills using safe cutting and hygiene procedures.

Prepare salad ingredients ready for combining.

Vocabulary:

chop, peel, grate, hygiene, preparation

Greater depth task:

Create a step-by-step photo guide or video script for teaching someone else how to safely prepare salad ingredients.

Lesson 5: Making a Salad

Substantive knowledge:

Understand the importance of accurate preparation in creating an appealing dish.
Know that presentation can influence a food's appeal.

Procedural knowledge:

Follow a plan to prepare, assemble, and present a salad.

Work safely and hygienically throughout the process.

Vocabulary:

assemble, prepare, recipe, presentation, safety

Greater depth task:

Decorate your salad using garnishes and arrange it attractively on the plate. Write a short explanation about how your presentation improves appeal.

Lesson 6: Evaluating the Salad

Substantive knowledge:

Know how to evaluate a finished product based on original design criteria.
Understand the role of feedback in improving future dishes.

Procedural knowledge:

Taste and evaluate the salad based on flavour, texture, and appearance.

Record personal reflection and peer feedback.

Vocabulary:

evaluate, flavour, feedback, texture, improve

Greater depth task:

Write a restaurant-style review of your salad, including positives and areas for improvement.

Suggest one change for a future version.



Mechanical Posters (Levers and Linkages)

Lesson 1: Exploring Existing Mechanical Posters

Substantive knowledge:

Know that some posters use mechanisms (levers and linkages) to create movement. Understand that moving parts can make a product more engaging.

Procedural knowledge:

Explore and evaluate a range of moving posters.

Identify where movement occurs and how the mechanism is hidden or integrated into the design.

Vocabulary:

mechanism, movement, poster, lever, linkage

Greater depth task:

Compare two different moving posters. Analyse how each mechanism works and how it enhances the message or appeal of the poster.

Lesson 2: Investigating Levers and Linkages

Substantive knowledge:

Know that levers and linkages are types of mechanisms that can create movement in a product. Understand how fixed and moving pivot points affect motion.

Procedural knowledge:

Make simple lever and linkage examples using card, split pins, and paper fasteners. Observe how movement changes with different pivot placements.

Vocabulary:

pivot, fastener, lever, linkage, mechanism

Greater depth task:

Design and label two different linkage systems and explain how each creates a different kind of movement (e.g. side-to-side, up-and-down).

Lesson 3: Exploring Design Criteria

Substantive knowledge:

Understand the purpose of a design brief. Know how to develop design criteria to meet the needs of the user and the message of the product.

Procedural knowledge:

Decide on the theme and purpose of your poster (e.g. environmental message, event promotion).

Write a simple design brief including audience and message.

Vocabulary:

design brief, purpose, criteria, audience, theme

Greater depth task:

Write two design briefs for different audiences (e.g. children vs adults). Explain how the content, imagery, and movement would differ.



Lesson 4: Designing a Mechanical Poster

Substantive knowledge:

Know how to plan a product using sketches and labelled diagrams.

Understand how levers and linkages can be positioned to achieve a desired effect.

Procedural knowledge:

Draw a poster design that includes labelled mechanisms.

Plan the layout, message, and type of movement (e.g. animal waving, door opening).

Vocabulary:

design, diagram, label, mechanism, movement

Greater depth task:

Create two alternative layout designs for your poster, showing different ways the mechanism could be integrated. Explain which you'll choose and why.

Lesson 5: Making the Mechanical Poster

Substantive knowledge:

Know how to safely cut, assemble, and join materials to create a working mechanism.

Understand how to test and adjust as you go.

Procedural knowledge:

Follow the design plan to construct the poster.

Use scissors, hole punches, and split pins to create and attach the mechanisms.

Vocabulary:

assemble, cut, attach, join, construct

Greater depth task:

Keep a construction log recording what worked, what was changed, and why. Reflect on how your changes improved the outcome.

Lesson 6: Evaluating the Mechanical Poster

Substantive knowledge:

Know how to assess a finished product against its design criteria.

Understand the importance of evaluating both appearance and function.

Procedural knowledge:

Test and evaluate the poster.

Check whether the mechanism works smoothly and the design communicates the intended message.

Vocabulary:

evaluate, function, improve, feedback, success

Greater depth task:

Film or write a short advert explaining how your poster works and why it's effective. Include reflection on improvements for future versions.