



Year 1

YEAR 1 — DESIGN TECHNOLOGY CAREERS

Career links are introduced through familiar people, products and places.

WHEELS & AXLES

WE COULD BE...

Vehicle Designers • Automotive Engineers

Explore how vehicles are designed for different users and purposes, and how wheels, axles and movement help products work.

CAREER ENCOUNTER

Vehicle engineer, mechanic or transport worker.

FREESTANDING STRUCTURES

WE COULD BE...

Architects • Structural Engineers • Builders

Explore how professionals design, strengthen and construct structures so that they are stable and fit for purpose.

CAREER ENCOUNTER

Local builder or architect; walk to investigate local structures.

FRUIT & VEGETABLES

WE COULD BE...

Chefs • Food Preparation Workers

Discover how food professionals choose ingredients, work hygienically and prepare appealing food for different users.

CAREER ENCOUNTER

School cook, chef, café or catering worker.

YEAR 1 — DESIGN TECHNOLOGY KNOWLEDGE

Substantive knowledge • Disciplinary knowledge and skills

WHEELS & AXLES

SUBSTANTIVE KNOWLEDGE

- A mechanism makes something move; wheels can rotate around an axle.
- Key parts: wheel, axle, axle holder, chassis and body; axles may be fixed or free.
- Wheel/axle position and fixing affect how successfully a product moves.
- Products are designed for a user, purpose and simple criteria.

DISCIPLINARY KNOWLEDGE & SKILLS

- Investigate and label existing wheeled products; compare number, size, position and fixing of wheels.
- Assemble and test fixed/free axle combinations; make axle holders so axles run freely.
- Mark out, hold, cut, join, shape and finish materials safely.
- Communicate ideas through talk/drawing; make a moving product and evaluate it against criteria.

FREESTANDING STRUCTURES

SUBSTANTIVE KNOWLEDGE

- Structures can be strong/weak and stable/unstable; a base/framework helps a structure stand.
- Material, shape, thickness, folds and joins affect strength and stiffness.
- Key forms include wall, tower, framework and common 2D/3D shapes.
- A structure must be fit for its intended user and purpose.

DISCIPLINARY KNOWLEDGE & SKILLS

- Investigate local structures and identify materials, joins and features that create stability.
- Test materials and construction kits; fold/shape card to make it stronger and stiffer.
- Measure, mark, cut, shape and join new/reclaimed materials.
- Generate simple criteria, make a freestanding structure, test it and adapt it after evaluation.

FRUIT & VEGETABLES

SUBSTANTIVE KNOWLEDGE

- Fruit and vegetables contribute to a healthy, balanced diet.
- Fruit has identifiable parts and sensory qualities: taste, smell, texture and appearance.
- Food preparation requires hygiene and safe use of utensils.
- Processing changes ingredients: washing, grating, peeling, slicing and squeezing.

DISCIPLINARY KNOWLEDGE & SKILLS

- Investigate/taste fruit and use sensory vocabulary to compare preferences.
- Follow hygiene routines and use simple utensils safely.
- Choose ingredients for an intended user and purpose; communicate a simple food design.
- Prepare and present a fruit product, then evaluate it against user preferences and criteria.

Prior learning being retrieved

EYFS choosing resources, joining materials, using tools safely, creating collaboratively and talking about what has been made.

New knowledge / skill introduced

First formal mechanism: wheel, axle, axle holder, chassis and body. Pupils explore fixed/free axles and cut, join and assemble a moving product for a user and purpose.

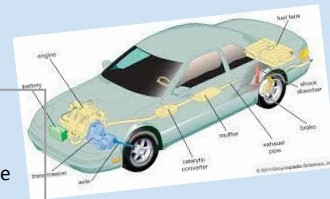
Why this? Why now?

A familiar, concrete mechanism links to toys and vehicles. Children move from exploratory making to understanding that component placement affects function.

What does this prepare pupils for?

Prepares for Year 2 sliders and levers, then Year 3 levers/linkages and Year 5 cams, where mechanisms become increasingly complex.

Design Technology Wheels and Axles



Investigative and Evaluative Activities

L.O. to explore and evaluate a range of existing wheeled products

Explore and evaluate a range of wheeled products such as toys and everyday objects. Through questioning, direct children's observations e.g. the number, size, position and methods of fixing wheels and axles. How do you think the wheels move? How do you think the wheels are fixed on? Why do you think the product has this number of wheels? Why do you think the wheels are round?

Draw an example of a wheeled product, stating the user and purpose, and labelling the main parts e.g. body, chassis, wheels, axles and axle holders.

Walk around the school building and grounds, recording how wheels and axles are used in daily life.

Read a story or non-fiction book that includes a wheeled product. Use this to introduce relevant vocabulary and to emphasise user and purpose.

Vocabulary

vehicle, wheel, axle, axle holder, chassis, body, cab

Focused Tasks

Using construction kits with wheels and axles, ask children to make a product that moves.

- Demonstrate to children how wheels and axles may be assembled as either **fixed axles** or **free axles**.

- Show different ways of making axle holders and stress the importance of making sure the axles run freely within the holders.

Ensure that children are taught how to mark out, hold, cut and join materials and components correctly.

- Using samples of materials and components they will use when designing and making, ask the children to assemble some examples of wheel, axle, axle holder combinations. Display the work completed as a reference for their DMEA.

assembling, cutting, joining, shaping, finishing, fixed, free, moving, mechanism

Design

L.O. to discuss and plan what product we will make, identifying its user and purpose

L.O. to draw and/or label a drawing of our design

Discuss with the children what they will be designing, making and evaluating within an authentic context.

- With the children identify a user and purpose for the product and generate simple criteria.
- Ask children to generate, develop and communicate their ideas as appropriate e.g. through talk and drawing. Talk about, evaluate and share ideas with other children/adults.

names of tools, equipment and materials used

Make

L.O. to make a wheel and axle product that moves

L.O. to use simple finishing techniques to enhance our product

Make their wheel and axle product using their design ideas and criteria as an ongoing guide.

Discuss how the children might add finishing techniques to their product with reference to their design ideas and criteria. Direct the children to information and communication technology opportunities such as clip art, word processing, paint or simple drawing programs.

design, make, evaluate, purpose, user, criteria, functional

Evaluate

L.O. to evaluate our finished product

Ask children to evaluate their finished product, communicating how it works and how it matches their design criteria, including any changes they made.

Prior learning being retrieved

EYFS construction, selecting resources, joining materials, experimenting with form/function and using tools with increasing control.

New knowledge / skill introduced

Pupils investigate local structures and learn strong, weak, stable, base and framework. They fold, shape, join and choose materials for a purpose.

Why this? Why now?

Children already build through play; now they ask how and why structures stand up and how they can be made stronger and more stable.

What does this prepare pupils for?

Prepares for Year 3 shell structures and Year 6 frame structures, including stiffening, strengthening, reinforcement and triangulation.

Design Technology Freestanding Structures



Vocabulary:

cut, fold, join, fix

structure, wall, tower,
framework, weak,
strong, base, top,
underneath, side,
edge, surface, thinner,
thicker, corner, point,
straight, curved

metal, wood, plastic

circle, triangle, square,
rectangle, cuboid,
cube, cylinder design,

make, evaluate, user,
purpose, ideas, design
criteria, product,
function

Investigative and Evaluative Activities	L.O. to investigate and evaluate structures found in the local area Go on a walk and/or look at photographs of the local area to explore structures such as playground equipment, street furniture, walls, towers and bridges e.g. What are the structures called and what is their purpose? Who might use them? What materials have been used? Why have these been chosen? How have the parts been joined together? How have the structures been made strong enough? How have they been made stable? Where possible, ask the children to draw or photograph the structures they have been exploring and label with the correct technical vocabulary in relation to the structure, materials used and shapes e.g. wall, tower, framework, base, joint, metal, wood, plastic, brick, triangle, square, rectangle, cuboid, cube.
Focused Tasks	L.O. to investigate a range of materials to determine which are more suitable for the product and why Demonstrate measuring, marking out, cutting, shaping, joining and finishing techniques with a range of tools and new and reclaimed materials that children are likely to use to make their structures. Discuss the suitability of materials for their products according to their characteristics. L.O. to build and explore a variety of freestanding structures Ask the children to build and explore a variety of freestanding structures using construction kits, such as wooden blocks, interconnecting plastic bricks and those that make frameworks e.g. How can you stop your structures from falling over? How they can be made stronger and stiffer in order to carry a load? Children could make models of the structures they have seen in school and the local area. Ask children to fold paper or card in different ways to make freestanding structures, using masking tape where necessary to make joins. Encourage them to think about how folding materials can make them stronger, stiffer, stand up and be more stable e.g. Can they support an object on top of their structures without it falling over or breaking?
Design	L.O. to discuss and plan what structure we will make, identifying its user and purpose. L.O. to draw and/or label diagrams to show what our structure will look like. Discuss with the children what structure they will be designing, making and evaluating e.g. Who will your product be for? What will be its purpose? What materials will you use? How will you make it strong and stable? Generate some simple design criteria with the children e.g. the structure should stand up on its own, it should be strong enough to carry Teddy. Encourage the children to develop their ideas through talking, drawing and making mock-ups of their ideas with construction kits and other materials. As a whole class, plan the order in which the structures will be made.
Make	L.O. to use appropriate materials and tools to build our freestanding structure L.O. to use simple finishing techniques suitable for the structure we have made Children could make their final products from construction kits, new and reclaimed materials or any combination of these, according to their characteristics. Children to add simple finishing techniques such as adding paint to enhance their design.
Evaluate	L.O. to discuss and evaluate our structures Ask children to evaluate their developing ideas and final products against original design criteria.

Prior learning being retrieved

EYFS use of small tools, cutlery and observations of the natural world, alongside familiar experiences of fruit and food.

New knowledge / skill introduced

Pupils identify and evaluate fruit, use sensory vocabulary and practise hygiene, washing, grating, peeling, slicing and squeezing.

Why this? Why now?

Fruit is familiar and manageable. It gives pupils a safe first cooking context to learn routines, tool use, choice and evaluation.

What does this prepare pupils for?

Prepares for Year 2 fruit and vegetables and then KS2 healthy and varied diet units using wider ingredients and techniques.

Design Technology Preparing Fruit and vegetables.



Vocabulary

fruit names, names of equipment and utensils

sensory vocabulary e.g.
soft, juicy, crunchy, sweet,
sticky, smooth, sharp,
crisp, sour, hard

flesh, skin, seed, pip,
core, slicing, peeling,
cutting, squeezing,
healthy diet, choosing,
ingredients, planning,
investigating tasting,
arranging, popular,
design, evaluate, criteria

Investigative and Evaluative Activities	L.O. to identify and evaluate a range of fruit Children examine a range of fruit. Use questions to develop children's understanding e.g. What is this called? Who has eaten this fruit before? Where is it grown? When can it be harvested? What are its taste, smell, texture and appearance? What will it look like if we peel it or cut it in half? What are the different parts called? Provide opportunities for children to handle, smell and taste fruit in order to describe them through talking and drawing. e.g. What words can we use to describe the shape, colour, feel, taste? Evaluate existing products to determine what the children like best; provide opportunities for the children to investigate preferences of their intended users/suitability for intended purposes e.g. What do you prefer and why? What might we want to include in our product to meet our user's preferences? Which fruit might be the best for our product to match the occasion/purpose?
Focused Tasks	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? L.O. to use appropriate tools to practice food processing skills Demonstrate how to use simple utensils and provide opportunities for the children to practise food processing skills such as washing, grating, peeling, slicing, squeezing e.g. Do we eat the whole fruit? Why or why not? Which parts do we eat? What might we have to do before eating this? Why do we cut, grate, peel and slice in this way? Discuss different effects achieved by different processes. L.O. to discuss and explain the importance of fruit in our balanced diet Discuss healthy eating advice, including eating more fruit and vegetables; using The eatwell plate model talk about the importance of fruit and vegetables in our balanced diet e.g. Why is it good to eat fruit and vegetables? How many pieces of fruit/vegetables do you eat per day? Why is it important to wash fruit/vegetables before we eat them?
Design	L.O. to discuss and plan what product we will make, identifying its purpose and intended user L.O. to draw and label diagrams to show what our design will look like. Set a context for designing and making which is authentic and meaningful. Discuss with the children the possible products that they might want to design, make and evaluate and who the products will be for. Agree on design criteria that can be used to guide the development and evaluation of children's products e.g. Who/what is the product for? What will make our product unique/different? How will we know that we designed and made a successful product? Use talk and drawings when planning for a product; ask the children to develop, model and communicate their ideas e.g. What will you need? What fruit/vegetable will you need? How much will you need? How will you present the product?
Make	L.O. to work safely and hygienically using appropriate tools, techniques and ingredients to make a fruit salad/skewer Talk to the children about the main stages in making, considering appropriate utensils and food processes they learnt about through IEAs and FTs.
Evaluate	L.O. to discuss and evaluate our product Evaluate as the children work through the project and the final products against the intended purpose and with the intended user, drawing on the design criteria previously agreed.