

Projects on a Page

A national scheme of work for design and technology at Key Stages 1 and 2

Acknowledgements

This resource was developed by members of the Design and Technology Association's Primary Working group, led by Gareth Pimley and Prof Clare Benson. Our grateful thanks go to them and to all the contributors:

Sally Aston
Bernard Cooper
Rebecca Higgins
Judith Holmes
Dot Jackson
Nerys Jones
Lisa Larham
Dawn McFadyen
Justyna Powrie
Justin Stone

The Design and Technology Association
11 Manor Park
Banbury
OX16 3TB
01789 470007
Website: www.data.org.uk

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Introduction

Welcome to Projects on a Page, a national scheme of work for primary design and technology (D&T). The scheme comprises twenty-one Project Planners designed to help primary schools in England implement the National Curriculum for D&T in an imaginative way. Based on universal principles of effective teaching and learning in D&T, it will also be a valuable resource for schools in other parts of the UK and further afield.

Aims

The scheme of work has four main aims:

a. To enable you to use your creativity and professional judgment to plan and teach successful D&T projects each term.

b. To help schools cover the National Curriculum requirements.

c. To provide helpful sketches, diagrams, tips and techniques that will make teaching D&T easier and more rewarding.

d. To ensure that all the D&T taught in your school enables children to design, make and evaluate functional products with users and purposes in mind.

How is this scheme of work different?

Projects on a Page is different from schemes of work you may have used before in D&T or other subjects. Compared to the widely used QCA scheme of work, Projects on a Page has a number of advantages:

- More flexibility and less prescription – you, in discussion with the children in your class, decide what products they will design and make, who their products will be for and what purposes they will perform.
- Making links to topics and themes – the Project Planners are context-free to make it much easier to link D&T to cross-curricular topics or themes.
- Essentials of good practice in D&T – each Project Planner emphasises the essentials of good practice in D&T to ensure children receive a genuine D&T experience.
- Projects on a page – all the elements or 'building blocks' of a project can be seen together on one side of the Project Planner.
- Instant CPD – on the other side of the Project Planner is user-friendly guidance with sketches, diagrams, tips and techniques.
- Year groups – projects are suitable for single year group classes and mixed-age classes.
- Cross-curricular links – there is more emphasis on making links to other National Curriculum subjects as children carry out their D&T projects.

Raising standards and motivating children to learn

The D&T Association is very aware of the priority that primary schools attach to children's achievement in English and mathematics. The Cambridge Primary Review indicated that primary schools with a broad, balanced and well-managed curriculum often achieve the highest standards in these subjects at the end of Key Stage 2. The Review attributes this to the role of the broader curriculum in providing meaningful contexts for children to develop and apply their learning in these subjects. However, genuine breadth and balance requires depth and quality in the teaching and learning of each subject in the curriculum.

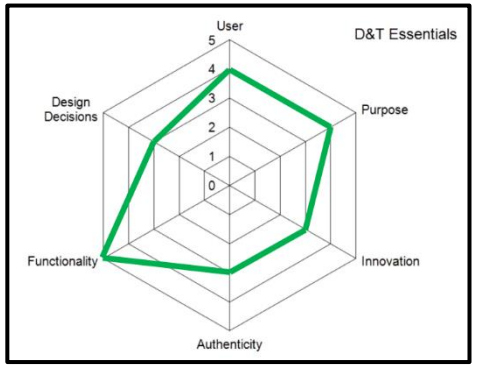
Projects on a Page ensures that D&T makes a high-quality contribution to a broad and balanced primary curriculum, helping to raise standards in English and mathematics. Research suggests D&T is one of primary-aged children's favourite subjects. Projects on a Page maximises their enjoyment by providing scope for teachers to meet children's needs and interests through creative and motivating projects within a range of contexts.

D&T essentials

Projects on a Page is based on the six essentials of good practice in D&T. These need to be in place in teachers' planning to ensure children's learning is genuinely design and technological in nature. They are consistent with the National Curriculum requirements and should be applied whenever children are designing and making products:

- **User** – children should have a clear idea of who they are designing and making products for, considering their needs, wants, interests or preferences. The user could be themselves, an imaginary character, another person, client, consumer or a specific target audience.
- **Purpose** – children should know what the products they design and make are for. Each product should perform a clearly defined task that can be evaluated in use.
- **Functionality** – children should design and make products that function in some way to be successful. Products often combine aesthetic qualities with functional characteristics. In D&T, it is insufficient for children to design and make products which are purely aesthetic.
- **Design Decisions** – when designing and making, children need opportunities to make informed decisions such as selecting materials, components and techniques and deciding what form the products will take, how they will work, what task they will perform and who they are for.
- **Innovation** – when designing and making, children need some scope to be original with their thinking. Projects that encourage innovation lead to a range of design ideas and products being developed, characterised by engaging, open-ended starting points for children's learning.
- **Authenticity** – children should design and make products that are believable, real and meaningful to themselves i.e. not replicas or reproductions or models which do not provide opportunities for children to make design decisions with clear users and purposes in mind.

The six essentials are embedded into the Project Planners, each of which has suggestions for users and purposes, and a list of authentic products that children could design and make. Each Planner has a star diagram that enables you to evaluate the overall potential of the project to ensure each of the D&T essentials has been addressed. Different projects will have a different profile. Schools may wish to evaluate projects in long-term planning to ensure each essential is adequately addressed over the course of a year or key stage.



Using the scheme to meet National Curriculum requirements

Projects on a Page has been written to help primary schools implement all aspects of the National Curriculum programmes of study for KS1 and 2:

Structure of the programmes of study
The National Curriculum for D&T has a 'purpose of study' statement which explains what the subject is about and why it is important for children's learning. This is followed by four broad 'aims' that set out the goals for learning over the course of Key Stages 1 to 3. 'Subject content' sets out what should be taught at each key stage. In D&T there are two strands of subject content: designing and making, and cooking and nutrition. As well as addressing the subject content for KS1 and 2, Projects on a Page reflects the purpose of study and meets the aims in a way that is appropriate to children's ages.

Process and breadth
At the heart of Projects on a Page is the designing and making process in the programmes of study. The scheme of work ensures children design, make and evaluate products using the broad range of materials and components specified in the statutory requirements. These include construction materials, textiles, food, mechanical components and, in Key Stage 2 only, electrical components. Each Project Planner lists a range of possible resources to use including tools, equipment and materials which you should adapt as appropriate. This will also help you meet the needs of the children in your class and ensure you comply with health and safety policy and guidance.

Coverage and progression
Projects on a Page provides progression and coverage of the NC programmes of study for KS1 and 2. For each planner, National Curriculum coverage is indicated in Key Learning in D&T, setting out what children should have previously learnt and summarising what they will learn through the project. This provides more detail than the programmes of study to indicate an appropriate expectation for children's learning according to their ages.

Three types of D&T activities
The programmes of study state what should be taught in KS1 and 2, but do not provide detail on how it should be taught. Building on current good practice, each Project Planner includes three types of activity:

- **Investigative and Evaluative Activities** (IEAs) where children learn from a range of existing products and find out about D&T in the wider world;
- **Focused Tasks** (FTs) where they are taught specific technical knowledge, designing skills and making skills;
- **Design, Make and Evaluate Assignment** (DMEA) where children create functional products with users and purposes in mind.

For children to understand the context for their project, it is advisable to give them an overview of what they will be designing, making and evaluating before they undertake any activities.

Through IEAs and FTs children are equipped with the knowledge, understanding and skills to engage successfully and with increasing independence in a DMEA. IEAs and FTs do not have to be followed in sequence and it is good practice to dip in and out of these activities to meet children's needs.

More than the National Curriculum
The programmes of study set out only the essential, core knowledge, understanding and skills. To promote best practice in schools, Projects on a Page includes some important, additional elements which are not in the statutory requirements (e.g. planning the sequence in which products are made). It also adds to the list of non-statutory examples (e.g. imaginary contexts in KS1).

Food technology
In Projects on a Page, designing and making, and cooking and nutrition are linked in children's learning. This means that as part of their food technology projects they will apply the principles of nutrition and healthy eating, learn how to prepare dishes at KS1 and prepare and cook dishes at KS2. The food technology Project Planner in KS1 requires them to prepare dishes with fresh fruit and vegetables without using a heat source. In the KS2 projects, children prepare and cook dishes, using a wider range of ingredients, using a heat source where appropriate.

Curriculum content
Projects on a Page incorporates these elements of the programmes of study:

- using design criteria at KS1
- encouraging innovative designing at KS2
- ensuring the process of designing and making is iterative in both key stages
- using cross-sectional and exploded diagrams at KS2
- learning about key events and individuals in design and technology at KS2
- applying computing at KS2 to programme, monitor and control products
- using computer-aided design at KS2
- understanding and using the concept of a system at KS2
- working within a range of relevant contexts such as domestic, local and industrial in both key stages
- understanding and applying principles of a healthy and varied diet
- understanding where food comes from at KS1
- at KS2, understanding seasonality and where and how a variety of ingredients are grown, reared, caught and processed.

Through www.data.org.uk the Design and Technology Association will be providing more detailed guidance on specific areas of the requirements, such as programming, monitoring and control, and key events and individuals in D&T.

Health, safety and hygiene
The National Curriculum programmes of study do not include references to safety and hygiene. When using Projects on a Page schools should ensure that practice in the subject is healthy, safe and hygienic. Children should be taught to work safely, using tools, equipment, materials, components and techniques appropriate to the task. Risk assessments should be carried out prior to undertaking D&T projects. In food technology identify whether there are any children who are not permitted to taste or handle any food ingredients or products. School and local authority policy and guidance on health and safety should be followed.

The Association's 'Make it Safe! - Health and Safety guidance for the teaching of Design and Technology in primary schools' covers the range of things likely to be encountered in D&T classrooms and allows teachers to work with confidence with D&T activities.

Using the project planners

Build your own projects
Side one of each Project Planner provides the kit of essential 'building blocks' that should be included to achieve good practice in D&T. The planners come to life in the classroom when teachers engage with them by highlighting, completing or adding to the text as appropriate. There are twenty blocks of text to consider and edit as required. This is a relatively quick and straightforward process, particularly with the electronic versions, with lots of helpful ideas to choose from.

The building blocks for each planner are numbered so that you follow a logical procedure from point 1 to point 20, leading to high quality projects that are customised to meet local needs and interests. The highlighted and annotated example shows that there is plenty of detail and many options to choose from. The idea is to tailor it so that it works for you and your class.

The procedure for each project planner is the same:

1. Year groups – referring to the school's D&T long-term plan, select a Project Planner appropriate to the year group(s) you teach.

2. Aspect of D&T and Focus – this clearly states what aspect of D&T is being covered and the focus for children's learning according to their age.

3. Key learning in D&T – this starts by stating what children should have previously learnt, then summarises the key learning within designing, making, evaluating and technical knowledge and understanding, including what is covered in the programmes of study. You may need to adapt this if prior learning has been missed or if more challenge is required to move children's learning on.

4. What could children design and make? This is where you select from the range of products recommended or suggest an alternative that is consistent with the key learning for the project.

5. Intended users – you select the intended user or users for the children's products from the list or suggest an alternative.

6. Purpose of products – you select a purpose for the children's products from the list or suggest an alternative.

7. Links to topics and themes – when selecting what children might design and make, think about what would fit well with your termly or half termly topic or theme. Select from one of the topics or themes listed or add your own.

8. Possible contexts – select the broader context or contexts that children will work in when carrying out the project.

9. Project title – on the basis of all the above, you decide upon and complete the title for the project, including in general terms what children will design and make, who it will be for and what purpose it will fulfil.

10. 12. 14. IEAs, FTs and DMEA – having established the key learning, context, purpose and user, you need to consider the main D&T activities suggested and annotate these to suit what children will be designing and making.

11. 13. 15. Related activities in other subjects – you make selections from the list of possibilities or suggest your own.

16. Possible resources – these are possible resources for the project, not a definitive list.

17. Key vocabulary – this is a list of the key technical vocabulary, not a complete list.

18. Key competencies – select from those which children are likely to develop through the project.

19. Health and safety – a general reminder about risk assessment and health and safety.

20. Overall potential of project – here you rate the project prior to carrying it out to ensure that each of the D&T essentials has been adequately addressed.

1. Year Groups

Years 3/4

2. Aspect of D&T

Mechanical systems

Focus

Levers and linkages

3. Key learning in design and technology

Prior learning

- Explored and used mechanisms such as flaps, sliders and levers.
  [Check if the children have done this in KS1]
- Gained experience of basic cutting, joining and finishing techniques with paper and card.

Designing

- Generate realistic ideas and their own design criteria through discussion, focusing on the needs of the user.
- Use annotated sketches and prototypes to develop, model and communicate ideas.

Making

- 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.

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.

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.

4. What could children design, make and evaluate?

story book poster class display
greetings card information book
storyboard other – specify

5. Intended users

themselves younger children older children
teenagers parents grandparents
visitor to school friends other – specify

6. Purpose of products

celebration event information
pleasure interests hobbies campaign
educational other – specify

7. Links to topics/themes

Festivals and Celebrations Favourite Books
history-based topic geography-based topic
science-based topic
other – specify

8. Possible contexts

home school leisure culture
enterprise environment local community
other – specify

9. Project title

Design, make and evaluate a **greetings card** (product) for **family and friends** (user) for **Christmas** (purpose).

To be completed by the teacher. Use the project title to set the scene for children's learning prior to activities in 10. 12 and 14.

10. Investigative and Evaluative Activities (IEAs)

- Children investigate, analyse and evaluate books and, where available, other products which have a range of lever and linkage mechanisms.
- Evaluate a range of greetings cards.
- 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?*
  Which of the moving pictures will appeal to younger children, older children, adults, grandparents?

11. Related learning in other subjects

- **Spoken language** – participate in discussion and evaluation of books and, where available, other products with moving pictures. Ask relevant questions to extend knowledge and understanding. Build technical vocabulary.

12. Focused Tasks (FTs)

- Demonstrate a range of lever and linkage mechanisms to the children using prepared teaching aids.
- Use questions to develop children's understanding e.g. *Which card strip is the lever? Which card strip is acting as the linkage? Which part of the system is the input and which part the output? What does the type of movement remind you of? Which are the fixed pivots and which are the loose pivots?*
- 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.

13. Related learning in other subjects

- **Mathematics** – use the vocabulary of position, direction and movement. Use a ruler to measure to the nearest cm, half cm or mm.
- **Spoken language** – ask relevant questions to extend knowledge and understanding. Build their technical vocabulary.
- **Art and design** – use colour, pattern, line, shape.

14. Design, Make and Evaluate Assignment (DMEA)

- Develop a design brief with the children within a context which is authentic and meaningful.
  i.e. greetings cards for family and friends.
- 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.
- Evaluate the final products against the intended purpose and with the intended user, drawing on the design criteria previously agreed.

15. Related learning in other subjects

- **Spoken language** – ask relevant questions to extend knowledge and understanding. Build technical vocabulary. Consider and evaluate different viewpoints.
- **Computing** – digital graphics and text could be incorporated into final products as the background or moving parts.
- **Art and design** – use and develop drawing techniques. Use colour, pattern, line, shape.

16. Possible resources

books and other products with lever and linkage mechanisms

greetings cards

lever and linkage teaching aids

card strips, card rectangles, paper, masking tape, paper fasteners, paper binders, stick glue

left/right handed scissors, cutting mats, card drill, finishing media and materials

17. Key vocabulary

mechanism, lever, linkage, pivot, slot, bridge, guide

system, input, process, output

linear, rotary, oscillating, reciprocating

user, purpose, function

prototype, design criteria, innovative, appealing, design brief

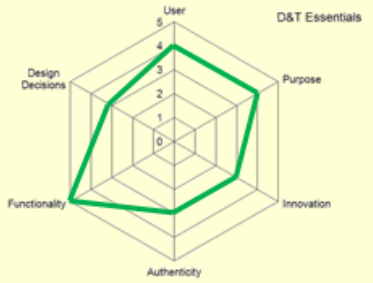
18. Key competencies

problem-solving teamwork negotiation
consumer awareness organisation motivation
persuasion leadership perseverance
other – specify

19. Health and safety

Pupils should be taught to work safely, using tools, equipment, materials, components and techniques appropriate to the task. Risk assessments should be carried out prior to undertaking this project.

20. Overall potential of project



Instant CPD

Side two of each planner provides Instant CPD in a helpsheet format to support you in teaching the project in the classroom. It includes sketches and diagrams, teaching tips and techniques, suggestions on class organisation, links to resources and a glossary of technical terminology related to the project. It also provides an example of how children might engage in an 'iterative' designing and making process, which is a requirement of the programmes of study in KS1 and 2. During an iterative process children's ideas are communicated and clarified through action. In contrast to a rigid design-make-evaluate process, in an iterative process thought leads to action, resulting in further thought and action as children create their products.

Years 3/4

Mechanisms
Levers and linkages

Instant CPD

Tips for teachers

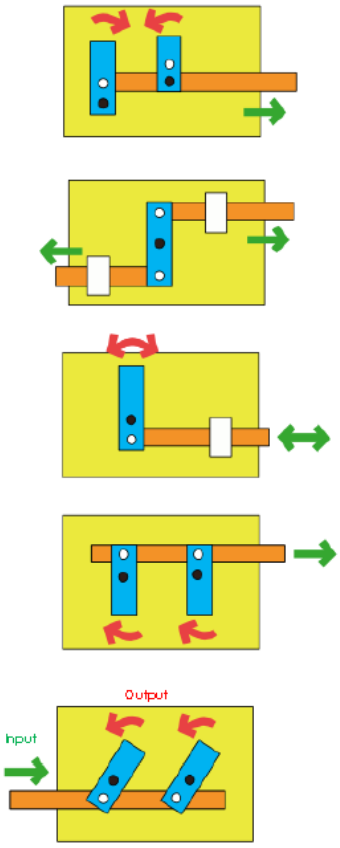
- ✓ Give children the opportunity to make examples of lever and linkage mechanisms though focused tasks.
- ✓ Preparing a plentiful supply of card strips can be useful to speed up the process.
- ✓ Card from recycled packaging is a cost-efficient way of providing enough material for children to experiment with different arrangements and to make mock-ups and prototypes.
- ✓ When working with thin card, a hole can be made for the paper fastener pivot by pressing a pencil through the card on to a piece of Plasticine or Blu Tack.
- ✓ A picture can be drawn on and cut out from another piece of card and glued on to the output levers.
- ✓ Windows can be cut out of the backing sheet or extra pieces added so that the picture on the output lever is hidden and then revealed.
- ✓ The backing sheet can be shaped to suit the picture.
- ✓ Guides/bridges can be made using strips of card fixed with masking tape e.g. white card on diagrams.
- ✓ Display technical vocabulary and encourage the children to use it when discussing mechanisms and when designing and making.
- ✓ Make sure the existing books children investigate include moving pictures that are similar to the teaching aids.

Useful resources at www.data.org.uk

- Levers and linkages - Poster and Support Pack
- Mechanisms with a message
- Moving history book

Teaching aids to demonstrate levers and linkages

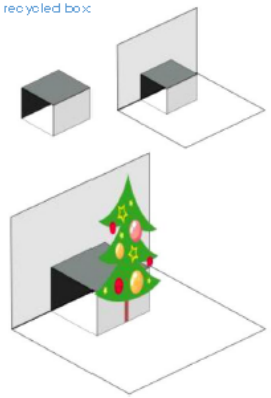
● Fixed pivot
○ Loose pivot



When you push the card strip (input movement), the two levers move (output movement).

Pop-up mechanisms can be added to children's moving pictures as an enhancement. However, to build on work with simple levers and sliders in KS1, it is important to focus children's learning during this project on levers and

Making a pop-up from a small section of a recycled box



1. Cut a slice off a small box.
2. Glue two sides to the paper.
3. Stick a picture to pop up on the front.

Lever and linkage mechanisms usually produce oscillating or reciprocating movement:

- Linear – in a straight line
- Reciprocating – backwards and forwards in a straight line e.g. a slider
- Rotary – round and round e.g. a wheel, cam, pulley, gear wheel
- Oscillating – backwards and forwards in an arc e.g. a lever

Designing, making and evaluating a greetings card with moving parts for family or friends

An iterative process is the relationship between a pupil's ideas and how they are communicated and clarified through activity. This is an example of how the iterative design and make process *might* be experienced by an individual pupil during this project:

THOUGHT	ACTION
What sort of greetings card shall I make and who will it be for? What part will move? How will it appeal to the user?	Discussing ideas, drawing annotated sketches, generating design crite
How will it move?	Discussing ideas, mode possible lever and linka mechanisms.
Which lever and linkage mechanism will work best for my greetings card?	Discussing and evaluati mock-ups and prototyp against design criteria.
What media and materials will I use?	Discussing, exploring and trialling media and materials.
Who will I work with? How long will it take? What order will I work in? What tools and techniques will I use?	Negotiating, developing and agreeing a plan of action.
More thoughts ... appraising, reflecting, refining.	More actions ... building, testing, modifying.
Will the greetings card meet the needs of the user and achieve its purpose?	Evaluating the greetings card with the intended user and against design criteria.

Glossary

- **Mechanism** – a device used to create movement in a product.
- **Lever** – a rigid bar which moves around a pivot. Levers are used in many everyday products. In this project children will use card strips for levers and paper fasteners for pivots.
- **Linkage** – the card strips joining one or more levers to produce the type of movement required. The term 'linkage' is also used to describe the lever and linkage mechanism as a whole.
- **Slot** – the hole through which a lever is placed to enable part of a picture to move.
- **Guide or bridge** – a short card strip used to keep lever and linkage mechanisms in place and control movement.
- **Loose pivot** – a paper fastener that joins card strips together.
- **Fixed pivot** – a paper fastener that joins card strips to the backing card.
- **System** – a set of related parts or components used to create an outcome. Systems have an input, process and an output. In a lever and linkage mechanism, the 'input movement' is where the user pushes or pulls a card strip. The 'output movement' is where one or more parts of the picture move.

Long term planning

To ensure that children receive the breadth of learning required by the National Curriculum and that they increase their knowledge, understanding and skills over time, it is essential to devise a long-term plan. When revising or developing the plan, it is advisable to consider the principles illustrated in the example plan:

- To ensure that the requirements of the programmes of study are met effectively, aim to complete one project per term or six projects in KS1 and twelve in KS2.
- As long as projects are covered within the two-year block (e.g. Early Key Stage 2), they can be taught in any order. This means that projects can be matched with termly topics or themes and links can be made with related learning in other subjects, such as science, mathematics or art and design.
- Ensure that each term's project addresses a particular aspect of the subject. At KS1, these are mechanisms, structures, food and textiles, and at KS2 mechanical systems, electrical systems, structures, food and textiles.
- To ensure coverage with mixed-age classes, use a two-year rolling programme or cycle, where all children in KS1 and 2 complete Year A, and then Year B, at the same time. Where the whole of KS2 is taught in one class, consider using a four-year rolling programme.
- Identify the focus for children's learning in each project you are undertaking e.g. the focus for the Y1/2 Project Planner on textiles is 'templates and joining techniques'.
- Teach two mechanisms projects in KS1 – one on sliders and levers, and the other on wheels and axles. This will ensure the necessary prior learning for mechanical systems projects in KS2 on lever and linkages, and pulleys or gears.
- Build the requirements for 'cooking and nutrition' in each key stage into projects on food. These requirements have been incorporated into each of the Project Planners on food.
- There are twenty-one Project Planners in total, with five for Y1/2, eight for Y3/4 and eight for Y5/6. This means that there are opportunities across KS1 and 2 where schools can carry out an additional project. To comply with the 'cooking and nutrition' requirements that children should 'prepare dishes' (i.e. more than one dish) in KS1 and a 'prepare and cook a variety of predominantly savoury dishes' (i.e. several dishes) in KS2, schools may wish to reuse the food Project Planners to carry out an additional project with food in Y1/2, Y3/4 and Y5/6, identifying different products, user and purposes. This is particularly advisable if no additional, standalone food preparation and cooking activities have been planned.

Example long-term plan

Key Stage 1

Y1 or A	**Mechanisms** Sliders and levers	**Structures** Freestanding structures	**Food** Preparing fruit and vegetables (including cooking and nutrition requirements for KS1)
Y2 or B	**Mechanisms** Wheels and axles	**Food** Preparing fruit and vegetables (including cooking and nutrition requirements for KS1)	**Textiles** Templates and joining techniques

Early Key Stage 2

Y3 or A	**Structures** Shell structures (including computer-aided design)	**Food** Healthy and varied diet (including cooking and nutrition requirements for KS2)	**Textiles** 2-D shape to 3-D product
Y4 or B	**Mechanical Systems** Levers and linkages	**Electrical Systems** Simple circuits and switches (including programming and control)	**Food** Healthy and varied diet (including cooking and nutrition requirements for KS2)

Late Key Stage 2

Y5 or A	**Structures** Frame structures	**Food** Celebrating culture and seasonality (including cooking and nutrition requirements for KS2)	**Electrical Systems** More complex switches and circuits (including programming, monitoring and control)
Y6 or B	**Textiles** Combining different fabric shapes (including computer-aided design)	**Mechanical Systems** Pulleys or gears	**Food** Celebrating culture and seasonality (including cooking and nutrition requirements for KS2)

Cross-curricular links

As well as having its own body of knowledge, understanding and skills, D&T can helpfully draw on learning from a range of other subjects.

Cross-curricular long-term planning
At the long-term planning stage it is important to identify and map major connections between D&T and other subjects so that opportunities to enhance children's learning are not missed.

Children's knowledge and understanding in science is often closely related to D&T projects. An example in KS1 is using children's knowledge of the simple physical properties of materials to help select the textiles they will use for a coat for Teddy and in KS2, using their understanding of electricity to help design and make a battery-powered night light. Where there are significant links of this type, it would be advisable to move the D&T project into a term which capitalises on the equivalent learning in science. Similarly, some D&T projects have a particular bias towards mathematical understanding (e.g. 2-D and 3-D shapes when creating packaging), art and design (e.g. finishing techniques when creating bags) and computing (e.g. programming, monitoring and control of alarm systems).

Within each Project Planner ongoing opportunities for related learning in other subjects have been suggested. Spoken language is included in every project as it is fundamental to the development, communication and evaluation of children's design ideas, their ability to use technical vocabulary, ask and answer questions about a range of existing products, state who and what their products are for, and explain how they work.

When to make the link
Think carefully about when to establish a link between D&T and other subjects. If you can answer 'yes' to each of the questions below then it is probably a link worth making!

Does the link:

- enhance children's ability to design, make and evaluate products?
- provide a natural overlap in children's learning?
- maintain the distinctive nature of D&T?
- match learning in the same year groups in both D&T and the other subject?
- make sense to children?

Building on the Early Years Foundation Stage

The statutory Early Years Foundation Stage (EYFS) framework for England clearly identifies the role of design and technology in young children's learning and the subject is specifically named in the area of learning 'Expressive Arts and Design'. It is therefore extremely important to build on children's prior learning in the EYFS when planning D&T projects in KS1.

D&T in the EYFS
The early learning goals for Expressive Arts and Design indicate what children should know, understand and be able to do by the end of the reception year. A significant proportion of this learning should be delivered through high quality D&T experiences and activities, enabling children to 'safely use and explore a variety of materials, tools and techniques, experimenting with colour, design, texture, form and function' and 'use what they have learnt about media and materials in original ways, thinking about uses and purposes'. D&T also makes an important contribution to young children's learning across the remaining six areas of the EYFS framework, including Understanding the World, Physical Development, Literacy, Mathematics, Personal, Social and Emotional Development, and Communication and Language.

Identifying prior learning
Children's experience of D&T in the EYFS may have included some or all of the following elements:

- Designing by talking about what they intend to do, are doing and have done.
- Saying who and what their products are for.
- Drawing what they have made, with some children drawing their ideas before they make.
- Opportunities to make their own choices and to discuss the reasons for these.
- Learning procedures for safety and hygiene.
- Developing practical skills and techniques using a range of materials including food, textiles and construction materials.
- Developing their knowledge and understanding in relation to mechanisms, structures, food and textiles.
- Exploring and using a range of construction kits.
- Asking questions about a range of existing products.
- Exploring the designed and made world through the indoor and outdoor environment, and through roleplay.
- Learning and using appropriate technical vocabulary.

The Y1/2 Project Planners specifically identify what children should ideally have learnt in the EYFS before carrying out the project. Early years teachers will have used the flexibility available in the EYFS framework to ensure curriculum content is appropriate to young children's developmental needs. Y1/2 teachers may therefore need to adjust the pitch of Project Planners – either where prior learning from EYFS has not been covered or where more challenge is required in KS1 to move children's learning on.

Assessment and progression

Projects on a Page enables you to check what children have learnt and determine whether they are on track to meet National Curriculum expectations by the end of each key stage.

Using the Project Planners
Building a picture of what children know, understand and can do in each D&T project is essential for moving their learning forward. Each planner lists the 'key learning' in designing, making, evaluating and technical knowledge and understanding that most children should develop as they undertake the project. This addresses and extends National Curriculum requirements at KS1 and 2 and is consistent with the Progression Framework.

The knowledge, understanding and skills specified in key learning should form the basis of learning objectives for each D&T session and should be used to help focus your discussions with children and inform your observations. The information you gather during projects about the performance of individual children and groups will enable you to provide carefully tailored feedback, questioning, explanation and support, according to their needs. When each project has been completed, it is important to think about those children whose progress is markedly different from the expectations in the Project Planner. You may wish to make a note of these children and use this information to offer them additional support or challenge, as required, in the next project they carry out.

Using the Progression Framework
The Progression Framework provides a series of developmental steps intended to help schools with curriculum planning. It may also help schools to assess whether children are on track to meet end of key stage expectations in the National Curriculum. The Framework comprises age-related expectations across KS1 and KS2, with specific expectations for early KS2 (Y3/4) and late KS2 (Y5/6). Importantly, the framework also includes elements of D&T which are not included in the programmes of study which are considered by the Design and Technology Association to be fundamental to children's learning in KS1 and 2.

The Framework works most effectively if a cumulative approach to progression is adopted. This means that, where appropriate, children's learning from KS1 is revisited in early KS2 and their learning from KS1 and early KS2 is revisited in late KS2, each time using the knowledge, understanding or skills in a more sophisticated way. This is particularly relevant for aspects of learning that are only mentioned once but would need to be re-visited e.g. using mock-ups only appears in KS1 but should also feature in children's learning in KS2.

National Curriculum 2014 – statements which are either derived directly from the programmes of study for D&T or provide an age-related interpretation of the requirements are shown in regular font.
School Curriculum – statements which are additional to the programmes of study for D&T are shown in italic font.

A clickable version of the progression framework with extended features is available and is free to members of the Association.

Designing	Key Stage 1	Key Stage 2
Understanding contexts, users and purposes	Across KS1 pupils should: • work confidently within a range of contexts, such as imaginary, story-based, home, school, gardens, playgrounds, local community, industry and the wider environment • state what products they are designing and making • say whether their products are for themselves or other users • describe what their products are for • say how their products will work • say how they will make their products suitable for their intended users • use simple design criteria to help develop their ideas	Across KS2 pupils should: • work confidently within a range of contexts, such as the home, school, leisure, culture, enterprise, industry and the wider environment • describe the purpose of their products • indicate the design features of their products that will appeal to intended users • explain how particular parts of their products work In early KS2 pupils should also: • gather information about the needs and wants of particular individuals and groups • develop their own design criteria and use these to inform their ideas In late KS2 pupils should also: • carry out research, using surveys, interviews, questionnaires and web-based resources • identify the needs, wants, preferences and values of particular individuals and groups • *develop a simple design specification to guide their thinking*
Generating, developing, modelling and communicating ideas	Across KS1 pupils should: • generate ideas by drawing on their own experiences • use knowledge of existing products to help come up with ideas • develop and communicate ideas by talking and drawing • model ideas by exploring materials, components and construction kits and by making templates and mock-ups • use information and communication technology, where appropriate, to develop and communicate their ideas	Across KS2 pupils should: • share and clarify ideas through discussion • model their ideas using prototypes and pattern pieces • use annotated sketches, cross-sectional drawings and exploded diagrams to develop and communicate their ideas • use computer-aided design to develop and communicate their ideas In early KS2 pupils should also: • generate realistic ideas, focusing on the needs of the user • *make design decisions that take account of the availability of resources* In late KS2 pupils should also: • generate innovative ideas, drawing on research • *make design decisions, taking account of constraints such as time, resources and cost*
Making	**Key Stage 1**	**Key Stage 2**
Planning	Across KS1 pupils should: • *plan by suggesting what to do next* • select from a range of tools and equipment, *explaining their choices* • select from a range of materials and components according to their characteristics	Across KS2 pupils should: • select tools and equipment suitable for the task • *explain their choice of tools and equipment in relation to the skills and techniques they will be using* • select materials and components suitable for the task • explain their choice of materials and components according to functional properties and aesthetic qualities In early KS2 pupils should also: • *order the main stages of making* In late KS2 pupils should also: • *produce appropriate lists of tools, equipment and materials that they need* • *formulate step-by-step plans as a guide to making*
Practical skills and techniques	Across KS1 pupils should: • follow procedures for safety and hygiene • use a range of materials and components, including construction materials and kits, textiles, food ingredients and mechanical components • measure, mark out, cut and shape materials and components • assemble, join and combine materials and components • use finishing techniques, including those from art and design	Across KS2 pupils should: • follow procedures for safety and hygiene • use a wider range of materials and components than KS1, including construction materials and kits, textiles, food ingredients, mechanical components and electrical components In early KS2 pupils should also: • measure, mark out, cut and shape materials and components with some accuracy • assemble, join and combine materials and components with some accuracy • apply a range of finishing techniques, including those from art and design, with some accuracy In late KS2 pupils should also: • accurately measure, mark out, cut and shape materials and components • accurately assemble, join and combine materials and components • accurately apply a range of finishing techniques, including those from art and design • *use techniques that involve a number of steps* • demonstrate resourcefulness when tackling practical problems

Evaluating	Key Stage 1	Key Stage 2
Own ideas and products	Across KS1 pupils should: • talk about their design ideas and what they are making • make simple judgements about their products and ideas against design criteria • *suggest how their products could be improved*	Across KS2 pupils should: • identify the strengths and areas for development in their ideas and products • consider the views of others, including intended users, to improve their work In early KS2 pupils should also: • refer to their design criteria as they design and make • use their design criteria to evaluate their completed products In late KS2 pupils should also: • critically evaluate the quality of the design, manufacture and fitness for purpose of their products as they design and make • *evaluate their ideas and products against their original design specification*
Existing products	Across KS1 pupils should explore: • what products are • who products are for • what products are for • how products work • how products are used • where products might be used • what materials products are made from • what they like and dislike about products	Across KS2 pupils should investigate and analyse: • how well products have been designed • how well products have been made • why materials have been chosen • what methods of construction have been used • how well products work • how well products achieve their purposes • how well products meet user needs and wants In early KS2 pupils should also investigate and analyse: • who designed and made the products • where products were designed and made • when products were designed and made • whether products can be recycled or reused In late KS2 pupils should also investigate and analyse: • how much products cost to make • how innovative products are • how sustainable the materials in products are • what impact products have beyond their intended purpose
Key events and individuals	Not a requirement in KS1	Across KS2 pupils should know: • about inventors, designers, engineers, chefs and manufacturers who have developed ground-breaking products
Technical knowledge	**Key Stage 1**	**Key Stage 2**
Making products work	Across KS1 pupils should know: • about the simple working characteristics of materials and components • about the movement of simple mechanisms such as levers, sliders, wheels and axles • how freestanding structures can be made stronger, stiffer and more stable • *that a 3-D textiles product can be assembled from two identical fabric shapes* • *that food ingredients should be combined according to their sensory characteristics* • *the correct technical vocabulary for the projects they are undertaking*	Across KS2 pupils should know: • how to use learning from science to help design and make products that work • how to use learning from mathematics to help design and make products that work • that materials have both functional properties and aesthetic qualities • *that materials can be combined and mixed to create more useful characteristics* • that mechanical and electrical systems have an input, process and output • *the correct technical vocabulary for the projects they are undertaking* In early KS2 pupils should also know: • how mechanical systems such as levers and linkages or pneumatic systems create movement • how simple electrical circuits and components can be used to create functional products • how to program a computer to control their products • how to make strong, stiff shell structures • *that a single fabric shape can be used to make a 3D textiles product* • *that food ingredients can be fresh, pre-cooked and processed* In late KS2 pupils should also know: • how mechanical systems such as cams or pulleys or gears create movement • how more complex electrical circuits and components can be used to create functional products • how to program a computer to monitor changes in the environment and control their products • how to reinforce and strengthen a 3D framework • *that a 3D textiles product can be made from a combination of fabric shapes* • *that a recipe can be adapted by adding or substituting one or more ingredients*
Cooking and nutrition	**Key Stage 1**	**Key Stage 2**
Where food comes from	Across KS1 pupils should know: • that all food comes from plants or animals • that food has to be farmed, grown elsewhere (e.g. home) or caught	Across KS2 pupils should know: • that food is grown (such as tomatoes, wheat and potatoes), reared (such as pigs, chickens and cattle) and caught (such as fish) in the UK, Europe and the wider world In late KS2 pupils should also know: • that seasons may affect the food available • how food is processed into ingredients that can be eaten or used in cooking
Food preparation, cooking and nutrition	Across KS1 pupils should know: • how to name and sort foods into the five groups in The eatwell plate • that everyone should eat at least five portions of fruit and vegetables every day • how to prepare simple dishes safely and hygienically, without using a heat source • how to use techniques such as cutting, peeling and grating	Across KS2 pupils should know: • how to prepare and cook a variety of predominantly savoury dishes safely and hygienically including, where appropriate, the use of a heat source • how to use a range of techniques such as peeling, chopping, slicing, grating, mixing, spreading, kneading and baking In early KS2 pupils should also know: • that a healthy diet is made up from a variety and balance of different food and drink, as depicted in The eatwell plate • that to be active and healthy, food and drink are needed to provide energy for the body In late KS2 pupils should also know: • *that recipes can be adapted to change the appearance, taste, texture and aroma* • that different food and drink contain different substances – nutrients, water and fibre – that are needed for health

Useful Resources

Clickable Progression Framework
Enables teachers to click on expectations that need further exemplification, bringing up a link to a 'vignette' which provides a commentary on what each expectation means, with examples of what children might say or do to meet the expectation and/or how teachers might support children's learning in the classroom

Primary Planning Links
Links the Projects on a Page planners to additional resources and guidance.

Recording Children's Progress in Primary D&T
A slimmed-down, focused way of recording children's progress in the subject.

Make it Safe!
Health and Safety guidance for the teaching of Design and Technology in primary schools

Are you really teaching D&T? and D&T Principles guidance
To help you decide whether the projects you are teaching are really D&T and help you evaluate your planning in relation to each of the 'D&T principles': User, Purpose, Functionality, Design Decisions, Innovation and Authenticity.

Primary Subject Leaders' File
A comprehensive set of materials addressing all the major aspects which subject leaders are expected to address in their work.

Annotated Programme of Study – Key messages, advice and explanatory notes for schools
The Association's detailed advice and support to help members implement the NC requirements.

Designer's Toolkit for Children
A guide to applying designing tools and prompting pupils to ask the right questions during the creative process of designing.

Minimum requirements for effective practice in KS1 and KS2
A set of twelve minimum requirements for KS1 and KS2 which schools may wish to consider when they are reviewing and developing their provision in D&T.

Primary D&T Food Guidance
Produced in association with the British Nutrition Foundation to help primary schools implement the requirements for food within the National Curriculum.

Are you Teaching Food in Primary D&T?
Two presentations that explain the skills and teaching tips for those working with children aged 7-11 years and how to teach a selection of food skills.

Primary D&T National Curriculum 2014 – Myths and Facts
A useful set of FAQs to dispel any myths and misunderstandings that teachers may have about the NC's content and implementation.

A to Z of D&T
A pictorial dictionary of D&T terminology presented as PowerPoint presentations which may also be printed as classroom display cards.

Working with Materials
A guide to a wide range of tools and materials in use in primary schools.

Butterflies in My Tummy
Helps children develop the skills and attitudes needed for risk taking and innovation.

Applying Computing in D&T at KS2 and KS3
Explains how computing and design and technology are related and focuses on programming and control of physical systems in KS2 and KS3.

Full list of 21 planners

Key Stage 1

- Year 1/2 Mechanisms – Sliders and levers
- Year 1/2 Structures – Freestanding structures
- Year 1/2 Food – Preparing fruit and vegetables
- Year 1/2 Textiles – Templates and joining techniques
- Year 1/2 Mechanisms – Wheels and axles

Early Key Stage 2

- Year 3/4 Mechanical Systems – Levers and linkages
- Year 3/4 Mechanical Systems – Pneumatics
- Year 3/4 Structures – Shell structures using computer-aided design
- Year 3/4 Electrical Systems – Simple programming and control
- Year 3/4 Textiles – 2-D shape to 3-D product
- Year 3/4 Food – Healthy and varied diet
- Year 3/4 Structures – Shell structures
- Year 3/4 Electrical Systems – Simple circuits and switches

Late Key Stage 2

- Year 5/6 Food – Celebrating culture and seasonality
- Year 5/6 Textiles – Combining different fabric shapes
- Year 5/6 Structures – Frame structures
- Year 5/6 Electrical Systems – More complex switches and circuits
- Year 5/6 Mechanical Systems – Pulleys or gears
- Year 5/6 Mechanical Systems – Cams
- Year 5/6 Textiles – Using computer-aided design in textiles
- Year 5/6 Electrical Systems – Monitoring and control