

1. Year Groups Years 4

2. Aspect of D&T Mechanical systems

Focus Levers and linkages

4. What could children design, make and evaluate?

Easter greetings card

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

16. Possible resources

books and other products with lever and linkage mechanisms

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

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 _____ (product) for _____ (user) for _____ (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.

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

3. Key learning in design and technology

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.

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.

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.
- 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?*

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.
- 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.

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.

