1. Year Groups

Years 3/4

2. Aspect of D&T

Mechanisms

Focus

Levers and Linkages

4. What could children design and make?

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

5. Intended users

themselves younger children older children teenagers parents grandparents friends other - specify

6. Purpose of products

celebration event information pleasure interests hobbies campaign educational other - specify

7. Links to topics and themes

to be completed by the teacher

8. Possible contexts

home school leisure culture enterprise environment local community

9. Project title

to be completed by the teacher

16. Resources

books with lever and linkage mechanisms

lever and linkage teaching aids

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

scissors, cutting mats, finishing media and materials

17. Vocabulary

mechanism

lever, linkage, pivot, slot, bridge, guide

user, purpose, function

system, input, process, output

linear, rotary, oscillating, reciprocating

prototype

design criteria

innovative

appealing

design brief

3. Key learning in design and technology

Prior learning

- Understand and use mechanisms such as flaps, sliders and levers
- Experience of basic cutting, joining and finishing techniques with paper and card

Designing

- Generate initial ideas and design criteria through discussion
- Use sketches and prototypes to develop, model and communicate ideas

Making

- Use appropriate tools with some accuracy to cut, shape and join paper and card
- Use finishing techniques suitable for the product they are creating

Evaluating

- Investigate and analyse books with lever and linkage mechanisms
- Evaluating their own products against criteria, intended purpose and user

Technical knowledge and understanding

- Understand and use lever and linkage mechanisms
- Distinguish between fixed and loose pivots

10. Investigative, Disassembly and Evaluative Activities (IDEAs)

- Children investigate, analyse and evaluate books which have a range of lever and linkage mechanisms.
- Use questions to develop children's understanding e.g. *What do you think will move in the picture? How will you make it move? What part of the picture moved and how did it move? How do you think the mechanism works? What else could move in the picture? How effective do you think it is?*

11. Related learning in other subjects

- English - participate in discussion and evaluation of books with moving pictures
- English - asking questions to check understanding, develop vocabulary and build knowledge

12. Focused Practical Task (FPTs)

- 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 safe 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 - using the language of position and direction to describe movement
- English - ask relevant questions to extend their understanding and build vocabulary and knowledge
- Mathematics - using a ruler to measure to the nearest cm, half cm or mm
- Art and design - using 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.

14. Design and Make Activity (DMA)

- 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 innovative 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 their knowledge, understanding and skills learnt through IDEAs and FPTs.
- 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

- English - ask relevant questions to extend their understanding and build vocabulary and knowledge
- Computing - digital graphics and text could be incorporated into final products as the background or moving parts
- Art and design - using and developing drawing techniques
- Art and design - using colour, pattern, line, shape

20. Overall potential of project