

Bomere and the XI Towns Federation Knowledge Organiser—DT

Topic: Mechanical systems—pulleys and gears

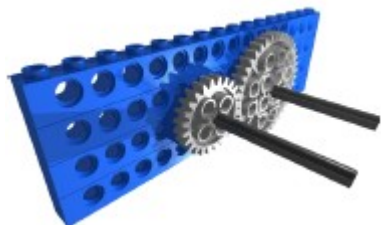
Class/Year Groups: Y5/6

Term: Summer

What you already know?

Prior learning

- Experience of axles, axle holders and wheels that are fixed or free moving.
- Basic understanding of electrical circuits, simple switches and components.
- Experience of cutting and joining techniques with a range of materials including card, plastic and wood.
- An understanding of how to strengthen and stiffen structures.



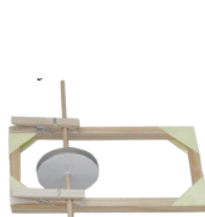
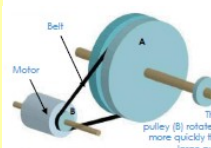
What you will learn:

Designing

- Generate innovative ideas by carrying out research using surveys, interviews, questionnaires and web-based resources.
- Develop a simple design specification to guide their thinking.
- Develop and communicate ideas through discussion, annotated drawings, exploded drawings and drawings from different views.

Making

- Produce detailed lists of tools, equipment and materials. Formulate step-by-step plans and, if appropriate, allocate tasks within a team.
- Select from and use a range of tools and equipment to make products that are accurately assembled and well finished. Work within the constraints of time, resources and cost.



Evaluating

- Compare the final product to the original design specification.
- Test products with intended user and critically evaluate the quality of the design, manufacture, functionality and fitness for purpose.
- Consider the views of others to improve their work.
- Investigate famous manufacturing and engineering companies relevant to the project.

Technical knowledge and understanding

- Understand that mechanical and electrical systems have an input, process and an output.
- Understand how gears and pulleys can be used to speed up, slow down or change the direction of movement.
- Know and use technical vocabulary relevant to the project.

Vocabulary

pulley, drive belt, gear, rotation, spindle, driver, follower, ratio, transmit, axle, motor

circuit, switch, circuit diagram

annotated drawings, exploded diagrams

mechanical system, electrical system, input, process, output

design decisions, functionality, innovation, authentic, user, purpose, design

Glossary

- **Pulley** – a grooved wheel over which a drive belt can run.
- **Gear** – a wheel with teeth around its circumference.
- **Drive belt** – the belt which connects and transfers movement between two pulleys.
- **Gearing up or down** – changing the rotational speed of a product by the use of pulleys or gears. When a small pulley or gear is used to drive a larger one the rotational speed is reduced and the product has been geared down.
- **Mechanical system** – a set of related parts or components used to create movement.
- **Driver** – the gear or pulley that provides the input movement to the system.
- **Follower** – the gear or pulley that provides the output movement to the system.
- **Mesh** – the point where two gears join together and transfer movement.
- **Motor spindle** – the rod on the end of the motor onto which a gear or pulley is attached.



National Curriculum Objectives:

Design 2 use research and develop design criteria to inform the design of innovative, functional, appealing products that are fit for purpose, aimed at particular individuals or groups 2 generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design

understand and use mechanical systems in their products [for example, gears, pulleys, cams, levers and linkages]

select from and use a wider range of tools and equipment to perform practical tasks

