PENTECOST TERM 2 DESIGN AND TECHNOLOGY – Year 4 - Medium Term Planning – Structure and Mechanism Design and build a lifting mechanism		
LESSON 1	**LESSON 2**	**LESSON 3**
MECHANISMS **LEARNING INTENTION:** To know that a pulley is a mechanism that lifts a heavy object. **Disciplinary Knowledge:** • Use levers, **pulleys** and linkages to create movement. **Aim:** Develop the creative, technical, and practical expertise to perform everyday tasks confidently and to participate successfully in an increasingly technological world.	**MECHANISMS** **MAKE** **LEARNING INTENTION:** To know that a simple machine uses a mechanism to perform a function. Recap Y2/3) **Disciplinary Knowledge:** • Select most appropriate tools / techniques. • Assemble, join and combine materials and components with some accuracy. **Aim:** Develop the creative, technical, and practical expertise to perform everyday tasks confidently and to participate successfully in an increasingly technological world.	**MECHANISMS** **MAKE** **LEARNING INTENTION:** To know that simple machines can be combined to make complex, compound machines. **Disciplinary Knowledge:** • Select most appropriate tools / techniques. • Use levers, **pulleys** and linkages to create movement. • Assemble, join and combine materials and components with some accuracy. **Aim:** Develop the creative, technical, and practical expertise to perform everyday tasks confidently and to participate successfully in an increasingly technological world.
Key Vocabulary:	**Key Vocabulary:**	**Key Vocabulary:**

pulley, mechanisms, lift, upward force, strength, function, smoothness	lever, inclined plane, screw, wheel and axle, pulley, **simple, machines, strength, force**	lever, inclined plane, screw, wheel and axle, pulley, **machine**, **compound, complex, simple**
Recap & retrieval	**Recap & retrieval** • Pulleys are often used to lift heavy objects.	**Recap & retrieval** • Pulleys are often used to lift heavy objects. • Simple machines make physical jobs easier by changing the strength or direction of a force.
Key Knowledge: **Child:** • Pulleys are often used to lift heavy objects. • Pulling down on one end of the rope creates an upward pull at the other end. **Teacher:** • Pulleys are made by looping a rope over one or more wheels. • Looping the rope over more wheels increases the upward force.	**Key Knowledge:** **Child:** • Simple machines make physical jobs easier by changing the strength or direction of a force. • There are six simple machines: pulley; lever; wheel and axle; wedge; inclined plane; and screw. **Teacher:** • Mechanisms can be used to add functionality to a model.	**Key Knowledge:** **Child:** • Compound machines use a combination of simple machines. **Teacher:** • A wheelbarrow is a compound machine because it combines a lever with a wheel and axle. • Mechanisms can be used to add functionality to a model. • For example, sliders or levers can be used in moving pictures, storybooks or simple puppets; linkages in moving vehicles or puppets; gears in motorised vehicles or spinning toys; pulleys in cable cars or transport systems and cams in 3-D moving toys or pictures.

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LESSON 4	**LESSON 5**	**LESSON 6**
DESIGN **MECHANISMS** **LEARNING INTENTION:** To know that a design needs to meet specific criteria for a usable product. **Disciplinary Knowledge:** • Show design meets a range of requirements and is fit for purpose. • Include an annotated sketch. • Explain how product will work. **Aim:** Build and apply a repertoire of knowledge understanding and skills in order to design and make high quality products for a wide range of users.	**MAKE** **MECHANISMS** **LEARNING INTENTION:** To know that design ideas need to be followed and amended when making a product. **Disciplinary Knowledge:** • Select suitable tools and equipment, explain choices in relation to required techniques and use accurately. • Work through plan in order. • Assemble, join and combine materials and components with some accuracy. **Aim:** Build and apply a repertoire of knowledge understanding and skills in order to design and make high quality products for a wide range of users.	**EVALUATE** **LEARNING INTENTION:** To know that finished products can be compared with design criteria and can be improved. **Disciplinary Knowledge:** • Use criteria to evaluate product. • Begin to explain how they could improve original design. **Aim:** Critique, evaluate and test their ideas and products and the work of others.
Key Vocabulary:	**Key Vocabulary:**	**Key Vocabulary:**

design, machine, complex, **compound**, measure, **sketch**, **criteria**, prototype	design, machine, complex, **compound, measure,** sketch, **criteria, prototype**	**evaluate**, positive, negative, analyse, **improve,** compare, **test**
Recap & retrieval • Pulleys are often used to lift heavy objects. • Simple machines make physical jobs easier by changing the strength or direction of a force. • Compound machines use a combination of simple machines.	**Recap & retrieval** • Pulleys are often used to lift heavy objects. • Simple machines make physical jobs easier by changing the strength or direction of a force. • Compound machines use a combination of simple machines. • The mechanism needs to complete two functions to make it a complex, compound machine.	**Recap & retrieval** • Pulleys are often used to lift heavy objects. • Simple machines make physical jobs easier by changing the strength or direction of a force. • Compound machines use a combination of simple machines. • The mechanism needs to complete two functions to make it a complex, compound machine. • A prototype is a first example of a machine or product, which is created to see if a design will work.
Key Knowledge: **Child:** • The design criteria are a set of criteria the design needs to meet. • The mechanism needs to complete two functions to make it a complex, compound machine. **Teacher:** • Pulleys are made by looping a rope over one or more wheels. • There are six simple machines: pulley; lever; wheel and axle; wedge; inclined plane; and screw. • Mechanisms can be used to add functionality to a model.	**Key Knowledge:** **Child:** • A prototype is a first example of a machine or product, which is created to see if a design will work. • It is important to modify a design as you work to ensure success. **Teacher:** • The mechanism needs to complete two functions to make it a complex, compound machine. • Testing a design as the prototype is made helps to evaluate.	**Key Knowledge:** **Child:** • Evaluation also includes suggesting improvements and explaining why they should be made. • Evaluation can explain what changes were made and why during the making process. **Teacher:** • The design criteria are a set of criteria the design needs to meet. • Evaluation can be done by considering whether the product does what it was designed to do and whether it has an attractive appearance.
Assessment		

Cumulative quiz. Retrieval practice.