Medium Term Plan **Subject D&T** **Year Group: Year 6** **Term: Summer**

Topic: Mechanical systems – Automata toys

National Curriculum Objectives which are covered in this unit:

Design

Pupils should be taught to:

- 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.
- Generate, develop, model and communicate their ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design.

Make

Pupils should be taught to:

- Select from and use a wider range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing], accurately.
- Select from and use a wider range of materials and components, including construction materials, textiles and ingredients, according to their functional properties and aesthetic qualities.

Evaluate

Pupils should be taught to:

- Understand how key events and individuals in design and technology have helped shape the world.
- Evaluate their ideas and products against their own design criteria and consider the views of others to improve their work.

Technical knowledge

Pupils should be taught to:

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

Lesson sequence - include the key concept, L.O. and brief description of lesson

WALT: create design criteria to meet a user's needs. Creating a design brief and measuring, marking and cutting materials. Success criteria • I can pick out the key points from the design brief to create design criteria. • I can suggest achievable design criteria. • I can measure card and wood accurately. • I can cut components using appropriate tools. **Pupils with secure understanding indicated by:** measuring, marking, sawing and cutting out the components and supports with a varying degree of accuracy to the intended measurements; following health and safety rules and taking care when using the equipment; suggesting appropriate and achievable design criteria which fulfil the design brief. **Pupils working at greater depth indicated by:** cutting out the components and supports with a consistent degree of accuracy to the intended measurements; confidently providing advice to others.	**WALT: use an exploded diagram to assemble a frame.** Using exploded diagrams to assemble components. Success criteria • I can discuss why diagrams are important in the design process. • I can identify how an exploded diagram matches my components. • I can assemble a frame and join it together. • I can create a design idea using design criteria as a guide. **Pupils with secure understanding indicated by:** discussing why designers use diagrams; partially assembling their frame using the exploded diagram; developing a design idea with limited or descriptive notes. **Pupils working at greater depth indicated by:** understanding and using the exploded diagram to assemble their frame without the need for the teacher's demonstration; developing one or more design ideas with detailed annotation on how a particular element has met a design criteria point.	**WALT: explore a mechanism to inform a design decision.** Exploring the relationship between cam profiles and follower movement to inform a design decision. Success criteria • I can describe the way a follower moves for a specific cam. • I can create cams by cutting and glueing. • I can test cams using my automata frame. • I can decide which cams to use based on my design ideas and design criteria. **Pupils with secure understanding indicated by:** exploring the cam profiles and choosing three for the follower toppers; explaining their choices and how they link to the theme; creating neat, decorated follower toppers with some accuracy. **Pupils working at greater depth indicated by:** tinkering with customised cam profiles of their design; explaining in detail their choices and how they link to the theme; creating neat, decorated follower toppers with a high-quality finish.	**WALT: evaluate a completed design.** Designing and fixing the housing frame to finish an automata. Success criteria • I can measure and cut panels to conceal a mechanism. • I can finish and decorate my automata so it meets the design brief. • I can describe the successes of my finished product. • I can reflect on how my product meets the design brief. **Pupils with secure understanding indicated by:** measuring and cutting panels that fit to the frame to conceal the inner workings of the automata; decorating and finishing the automata to meet the design criteria and brief; evaluating the finished product, making descriptive and reflective points on the function and form. **Pupils working at greater depth indicated by:** verbally explaining possibilities and ideas with the automata as a shop display window (e.g. how it might be arranged with others like it); explaining their solutions to problems they faced during production of their design. **WALT:**
Prior learning *List year groups and topics with connected learning*	Year 4 Making a slingshot		
Future learning *List year groups and topics with connected learning*			
Key vocabulary to be explicitly taught	Accurate automata axle bench hook cam, cam profile, component, cross-sectional diagram, diagram, dowel, evaluate, exploded diagram, follower, form, frame, function, housing, mechanism		

Cross-curricular links	
Enrichment *Give visit/visitor/first hand experience and focus*	
Useful websites/resources	