Medium Term Plan: Supporting Implementation of LTP/Progression Grid

Subject: DT – Mechanisms Making a Moving Monster
Year: 2

NC/PoS:

- Design purposeful, functional, appealing products for themselves & other users based on design criteria.
- Generate, develop, model & communicate their ideas through talking, drawing, templates, mock- ups &, where appropriate, information & communication technology.
- Select from and use a range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining & finishing).
- Select from and use a wide range of materials & components, including construction materials, textiles & ingredients, according to their characteristics.
- Explore & evaluate a range of existing products.
- Evaluate their ideas & products against design criteria.
- Build structures, exploring how they can be made stronger, stiffer & more stable.
- Explore & use mechanisms [for example, levers, sliders, wheels & axles], in their products.

Prior Learning (what pupils already know and can do)

- Identify whether a mechanism is a side-to-side slider or an up-and-down slider and determine what movement the mechanism will make.
- Clearly label drawings to show which parts of their design will move and in which direction.
- Make a picture that meets the design criteria, with parts that move purposefully as planned.
- Evaluate the main strengths and weaknesses of their design and suggest alterations.

End points (what pupils MUST know and remember)

- Identify the correct terms for levers, linkages and pivots.
- Analyse popular toys with the correct terminology.
- Create functional linkages that produce the desired input and output motions.
- Design monsters suitable for children, which satisfy most of the design criteria.
- Evaluate their two designs against the design criteria, using this information and the feedback of their peers to choose their best design.
- Select and assemble materials to create their planned monster features.
- Assemble the monster to their linkages without affecting their functionality.

Key Vocabulary

Axle, design criteria, input, linkage, mechanical, output, pivot, wheel.

Session 1: Pivots, levers and linkages
To look at objects and understand how they move.

Explain that we will design and make a moving monster toy for children using levers and linkages.

Show chn mixed toys which have simple mechanisms: Toy car (wheels and axle).
Can opener (gears).
Hole punch (lever).
Interactive greetings card (sliders) & those which are non mechanical: teddy, ruler, pencil, doll, chair.

Discuss:

- ✔ What is a mechanism? (A collection of parts that work together to create a movement, for example, a bicycle.)
- ✔ What is an input and an output? (An input is something that starts a system, for example: pushing a bicycle; an output is the result of the input, for example, bicycle wheels turning.)
- ✔ What is a lever? (Something that turns on a pivot, for example, a door handle.)
- ✔ What is a linkage? (A system of levers, for example, a skeleton.)
- ✔ What are levers and linkages used for?
- ✔ Can you identify a lever or a linkage?
- ✔ Can you name any products that use levers and linkages? (Scissors; seesaw; wheelbarrow)
- ✔ What is a pivot? (A central point from where something can turn, like your elbow.)

Inform the children of the design brief for this project: design and make a moving monster toy for children using levers and linkages
Explain to the children that they will investigate levers, linkages and toys in more detail before they start. Show chn mixed objects from start of lesson & explain their task:
To sketch their favourite toy & identify 3 things they like about it & 1 thing they wish they could improve.

Explain to the children that **design criteria** are a set of instructions for a project. Ask the children what three things should be included in the design criteria for their moving monster toys. Take suggestions from the class: for example, they should be fun, colourful and interactive.

Record the design criteria on the Activity: Design criteria template and keep it for the children to evaluate and assess their work during the design, making and evaluation stages

Vocab: axle, design criteria, input, linkage, mechanical, output, pivot, wheel.

Session 2: Making linkages.
To look at objects and understand how they move.

Practical lesson making different linkages!
Explain to the children that they will experiment with making different linkage systems. Show Pupil Video to model how to create a linkage. Using the *Activity: Linkage diagram*, strips of pre-cut card, split pins and uncut card, the children can experiment with making the linkages independently.

Ensure children recognise how they are focusing on Linkage 1 & 2 only which they will then use

to create their monster in next lesson.

Explain how they can experiment with them by varying their materials and the levers' measurements, altering the card's width and length. Explain that, if needed, the card can be made sturdier by sticking two pieces together.

Vocab: input, linkage, mechanical, output, pivot.

Session 3: Designing my monster.
To explore different design options.

Explain that we're going to be designing our monsters before we make them. Discuss what monsters look like, their features & any famous monsters they know (Loch Ness Monster). Display the *Presentation:Moving monster examples* and remind the children that they will only be designing the monster's face. Recap the design criteria that the class agreed on in 1st lesson and explain that the children will follow these design criteria in their designs. Children are to also add 1 more criteria for their monster – note the DC on IWB for children to refer back to.

Children to now complete their design ensuring that they are:

1. Sketching two different design ideas for their monsters and colouring them in.
2. Adding arrows to their designs to indicate the parts that move and the direction of movement.
3. Drawing a diagram of the linkage systems they have chosen based on the parts they want to move and the direction of movement.

Children to complete their designs then ask children on their table which on they prefer as a survey tally then note these as a tally to use as their final design

Vocab: design criteria, input, linkage, mechanical, output, survey, pivot.

Session 4: Making a moving monster.
To make a moving monster.

Children will make their moving monster in this lesson, recap on linkages. Model how to use the *Activity:Monster head and jaw template* as a rough outline to base their monster around. Explain that the children can draw above and below the template to add teeth, spikes, scales or fins to make their monster as planned in their design brief. Show Pupil Video & hand out design briefs from previous lesson to remind children of their task. Emphasise to children how they do not need to use the template if they do not want to. Encourage those who have their own ideas to make their head and jaw pieces and their linkage system from scratch using pre cut thick card for linkages & thinner card for head & jaw.

Upon completion, children to evaluate their design against the design criteria eg has it met the points?

Vocab: design criteria, evaluation, linkage, mechanical, pivot.

Future learning this content supports:
KS2 (Y4) – Mechanical cars.