

Year 6 - DT Electronic Games Computer-aided Design

Lesson	Order of Study -
1	<u>LI: I understand the purpose of my product (know what is meant by 'fit for purpose')</u> <u>LI: I can gather images and information about existing children's toys</u> Recap and review: Before starting this unit, you might want to check that children can recall: • An electrical system is a group of parts (components) that work together to carry electricity around a circuit. • What a bulb, battery, battery holder and crocodile clips are. • A battery contains stored electricity that can be used to power products. • Series circuits only have one direction for the electricity to flow. • A switch can be used to complete and break an electrical circuit, and if there is a break in a series circuit, all components will turn off. Display slide 1 of the <i>Presentation: Form follows function</i> and discuss the origins and meaning of 'form follows function'. Show slides 2 and 3 to read the definitions for 'function' and 'form' and explain a lemon squeezer's key function and form as an example. Display slide 4 to discuss Philippe Starck's 'Juicy Salif' lemon squeezer design and ask the children for their opinion of the lemon squeezer. Review all the points that make the Juicy Salif a 'form over function' product displayed on slide 5. Explain to the class that many people now buy this lemon squeezer as a decorative feature for their home rather than for its function. Use slide 6 to explain that when a product or service does what it is supposed to, it is considered 'fit for purpose'. Discuss the lemon squeezer displayed on the slide and each feature that makes it functional. Ask the children for their opinion on the design of the lemon squeezer and whether it looks as appealing as Philippe Starck's Juicy Salif design. Task: Give the children pictures of toys. Ask the children to choose two toys from their research. For each toy, they will need to think about the following: • Form. • Function. • Whether the product is fit for purpose. Can a toy (product) have more than one function? (If they are struggling with functions in toys, choose another product coupled with a prompt, e.g. 'Can a smartphone have more than one function – can they only make and receive phone calls?') Does the form of a toy (product) matter? (Encourage the children to think about points to agree and disagree with.) Are the toys you have chosen in your research fit for purpose? (For example, a jigsaw puzzle might be solved once and never again.)
2	<u>LI: I can create a design that reflects the design brief and specification</u> <u>LI: I understand the purpose of my product (know what is meant by 'fit for purpose')</u> What is a design brief? What is a specification? What should be included in the specification? Share: <u>Brief:</u> To design and make an electronic maths game for a year 4 pupil. <u>Specification:</u> • 17cm x 17cm • Must include electronics • Linked to Maths • Must contain bright colours • Needs a name (title) • Include at least 5 maths facts

	Show examples from last year. Discuss how they fit the brief and include all things on the specification. Tell children about the use of CAD (explain what this is) and Primary Design. Tell them when designing that it is important to avoid too complex designs as creating this on Primary may be difficult. Show children how the program works so that they can see how they will create their designs on the computer. Create a design page with 4 initial ideas. Think about: composition of the game, colourways, Title, shapes/theme, maths questions to be included. Share ideas with the class – use the visualiser. As a class give feedback on how well the initial design ideas meet the brief and specification. Create a final designs page where the children draw 2 designs that are complete.	
3	<u>LI: I can use Primary Design to create my game using shapes, letterings and numbers.</u> <u>LI: I can decorate the game to a high-quality finish.</u> Model to children how to use Primary Design again. Show the children how to draw accurately, with the cm lock on to draw the square to size. Model how to draw shapes, fill with colour, lettering, how to move/resize the shapes and lettering. Allow children chance to have a go at this at each stage before starting their design. Discuss adaptations to designs that may be needed.	
4	<u>LI: I can name the main components required.</u> <u>LI: I can make and test a circuit and incorporate it into my game.</u> Ask them how to build a circuit and allow them to consider whether they want a bulb or a buzzer for their game. Create a simple circuit and then ask the children how to add a switch. Model how to do this. Ask the children to discuss what they would need to do to this circuit to make it work within their Maths game. Show the split pins, which will act as the connection on the top of the game, and a piece of wire that will be used to connect the correct answer to the question on the back. Remind the children that wire can be sharp, so they will need to work carefully with it. Model how to use the pliers to shape the wire. The children should try to bend or curl the ends of the wire around the split pin to make a good connection and to avoid sharp edges. Connect up to circuit. Link a question to the correct answer – if buzzer sounds the question has been answered correctly. Ask: Can you describe the function of each component in the circuit? (Buzzers make a noise, or bulbs make light when the circuit is closed; batteries supply the electricity to the circuit; wire conducts electricity through the circuit.) How can you make the buzzer sound or make the bulb light up?	
5	<u>LI: I can test my own and others game, identifying WWW and make suggestions for improvement</u> Evaluate their game against specification and brief. Which part was the most difficult? Did they adapt their design? Why? What would they change if they could do it again? How well did their design meet their original design/plan? Share their game with a year 4 child. Did they like it? Why? How could it have been improved?	
Key Vocabulary	• assemble • battery • battery pack • benefit • bulb • bulb holder • buzzer • circuit • circuit symbol • insulator • user	• component • conductor • copper • design • design brief • specification • evaluation • fit for purpose • form • function • Computer-aided design