Year 2 – Fire Engines

National curriculum:

Design

- design purposeful, functional, appealing products for themselves and other users based on design criteria

generate, develop, model and communicate their ideas through talking, drawing, templates, mock-ups and, where appropriate, information and communication technology.

Make

- select from and use a range of tools and equipment to perform practical tasks [for example, cutting, shaping, joining and finishing]
- select from and use a wide range of materials and components, including construction materials, textiles and ingredients, according to their characteristics.

Evaluate

- explore and evaluate a range of existing products
- evaluate their ideas and products against design criteria

Technical knowledge

- build structures, exploring how they can be made stronger, stiffer and more stable
- explore and use mechanisms [for example, levers, sliders, wheels and axles] in their products

Vocabulary:
Fire, engines, wheels, design, drawing, cutting, shaping, joining, finishing, materials, axles. Wheel, axle, chassis, body, cab, wooden, plastic

Snapshot overview

Technical knowledge:
Looking at fire engines, fixing wheels, looking at mechanisms.
Cutting
Design criteria

→

Design
Materials
Drawing
Joining
Teamwork
Functions
Purpose
Communication.

→

Make
Tools
Cutting, shaping, joining, finishing.
Materials, construction.

→

Evaluate
Exploring with real life.
Communication.
Evaluate against success criteria

Year 2 – Fire Engines

DT Medium Term Planning

Year Group: 2 **Term:** **Topic: DT- Fire Engines**

	Learning Objective	Input (including key questions and vocabulary)

Year 2 – Fire Engines

Technical Knowledge	I can investigate different types of vehicles.I can talk about the different parts that make up a vehicle. I can work in a pair or as part of a team to build a wheel base, using an axle and wheels. I can talk about which methods were best and why.	Tell chn that they are going to make a model vehicle. Discuss different types of vehicles and name their uses. Powerpoint. – vehicles 1 in Public/Teacher's Only/Year 2 Planning/English 2016-2017 The powerpoint contains discussion points. Ask chn to identify different parts of a vehicle wheel, axle, chassis, body, cab. (http://resources.hwb.wales.gov.uk/VTC/wheels_axles/eng/Introduction/default.htm) You tube -Wheel and Axle - Simple Machines | Mocomi kids http://www.mikids.com/SMachinesWheels.htm Chn make a simple drawing and label parts appropriately. Look at models/toys e.g cars, trucks, vans fire engines etc. Look at how toy wheel attach - Lego, duplo, mobile etc. Chn could find ways of sorting and classifying models or pictures e.g by number of wheels, shape, size, use **Activity:** the children will draw a vehicle of their choice and label the parts e.g. tank, bus Discuss and outline with chn the role of chassis, wheels and axles. Demonstrate the two methods of attaching wheels and axles to a model vehicle. See help sheets (either the wheel is attached tightly to the axle and the axle is free to rotate or the axle is fixed with the wheel free to rotate around it) Show chn the different ways to attach axles and wheels (see help sheets in teacher's file) e.g. axle supports using pegs or stiff triangle card, straws/tubing or holes directly into the chassis or body. How we can join the wheels> Ask the children to work in teams to create a model with wheels and axles using different methods, sizes and materials. You could use large and small boxes/bottles, an assortment of wheels (wooden, card, plastic lids, small large, with holes not central) as the base and compare the process and method used. (the parts can be dismantled after use and reused.) If dry test vehicles outside on the playground. Evaluate which methods and materials were best and why? **Useful questions for evaluation** Who's goes fastest? Which is the strongest? Which was the easiest/hardest to build? Why? What is the best material to use? Were there any difficulties? What did you enjoy about it? What do you like about another team's model vehicle? Are everybody's the same. How are they different?

Year 2 – Fire Engines

Design	I can draw and label a design for a model fire engine/machine. **Resources** Powerpoint - fire engines throughout history Sketch books Pencils, colouring pencils, word bank. Photos of children's work from previous years. Models for chn to observe.	**Teach** Explain to the children that they are going to design and make a model fire machine and that this can be a new or old fire engine. Show powerpoint – Fire engines throughout history/ Fire engines in other countries. Discuss - how vehicles have changed. How are they different? Compare and contrast the different vehicles. Chn will need to decide whether they are going to make a modern fire engine or older fire engine? Will it have a pump, will it be horse drawn, two wheels or 4? Discuss and list with design criteria- (see separate sheet for further detail) What must it do? It must include apparatus to help put out fires, it must be able to move (i.e not fixed wheels) Does it have to have a moving part as well as the wheels/? E.g. pump/ladder (more able?) Who is it for? Chn must think about the needs of the user. <u>Questioning –</u> Children to explain the effects/uses of the different components and justify their choices. What type of wheels and chassis and axels will they use? Why? How will they attach them? How will they make a moving part? E.g. the handles /pump go up and down? or a ladder hinge up or extend? Show pictures of models from previous years. Demonstrate how to draw a design with labels that show what wheels and axles, chassis they will use. Chn to draw and label a design for either a new or old fire engine. Chn must include what sort of axle support and wheels they intend to use.

Year 2 – Fire Engines

Make	I can follow my design and use tools safely to make a fire engine. Preferably a longer blocked session	Chn to follow their design and construct either a new or old fire engine using design criteria. Children to use sketch book as a guide. Show chn how to turn a box inside out and draw their design first and then glue back together. Shown chn how to measure a piece of dowel for the axle and how to cut it using the hack saw and clamp. Discuss health and safety – children to explain effects of not sawing as instructed. Ensure chn are supervised when they cut their piece of dowel.
Evaluate	I can finish fire engine and evaluate my work. I can evaluate my finished work against the design criteria. I can talk about the strengths and weaknesses of mine own and others' work.	Chn to finish their changing machine Chn could add steps or a ladder, doors that open. Use finishing techniques with paint, pen, pipecleaner, collage etc… Chn fill in evaluation sheet. Chn to evaluate their work according to the design criteria, thinking about what they liked about their product and considering how they could improve their design. Chn fill in evaluation sheet. What do you like about your design/finished work? How does it work? How well does it meet the design criteria? Does it work/move? What don't you like? What would you change next time? Did you find anything difficult? Did you have any problems? How could you make it better improve it? Could you add anything else? What do they like best about another child's work? Can they justify their choices?

This topic is expected to last approximately 4 sessions.

Year 2 – Fire Engines

Impact:

All children will be able to design a fire engine based on real life information.
All children will be able to join an axle and wheel to their fire engine.
All children will be able to evaluate their fire engine using a success criteria.