Pioneer Federation
Medium term plan
UKS2 Cycle 1, Term 1
D.T

Subject: D.T
Key Concept/ Theme: Codebreakers
Prior Learning links: Cycle 1 Cycle 2-
Vocabulary: beam, pillars, truss, suspension bridge, prototype, design brief, structure, compression forces, evaluation, inventors, designers, manufacturers, engineers, specification, reinforce, strengthen.
School specific areas to cover (Add in any local areas of study, trips and people)
You will need: **Lesson 1:** Slides, Worksheets 1A/1B/1C, Paper, card, scissors, glue, sticky tape, sets of weights, toy cars. Testing Pillars (FSD? activity only) **Lesson 2:** Slides Worksheets 2A/2B/2C Truss Patterns Art straws and sticky tape; sets of weights; toy cars; K'NEX, Meccano or similar construction kits **Lesson 3**: Slides, Worksheets 3A/3B/3C, Card, paper, sets of weights, rulers, plasticine, (Challenge Card (FSD? activity only) • Modelling materials (clay/plasticine/play dough/polystyrene/ sponge) (FSD? activity only) **Lesson 4:** Slides, Worksheets 4A/4B/4C , String, scissors, art straws, card, paper, sticky tape, (Photo Cards (FSD? activity only) • Famous Bridges (FSD? activity only). **Lesson 5:** Slides, Worksheets 5A/5B/5C, Art straws, scissors, paper, card, sticky tape, glue. (Challenge Cards (FSD? activity only). **Lesson 6**: Slides, Worksheets 6A/6B/6C, Bridge Evaluation A/B (Bridge Builder Certificate (FSD? activity only). Target Tracker Statements- highlighted in blue

CP	EH	SMV	PM

1.	Prior learning reconnection (year group, cycle & term): LO: **Today I am learning about bridges -To explore ways in which pillars and beams are used to span gaps.**

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	Children will learn about how simple bridges are constructed using beams, pillars or piers, then make and test beam bridge designs. *(Describe the work and ideas of various architects and designers, using appropriate vocabulary and referring to historical and cultural contexts)* Can children use technical vocabulary to explain how beam bridges are constructed? Do children understand the impact better bridge design has had on daily life? Can children investigate and explore the effectiveness of different beam/pillar designs?
2	Reconnection: Can you explain the importance of the different parts of bridge? LO: **Today I am going to explore ways in which trusses can be used to strengthen bridges.** Activity: Children will learn how trusses are used in bridge design to spread out compression forces. They may then either build and test model truss bridges, or use software to explore how truss bridges may be constructed. (*To know how structures are made and reinforced for strength*). Can children use technical vocabulary to explain how truss bridges spread the load of objects travelling across them? Can children apply their knowledge of how to stiffen and strengthen structures? Can children evaluate their models against established design criteria?
3	Reconnection: How do trusses strengthen bridges? LO: **Today I am going to explore ways in which arches are used to strengthen bridges.** Activity: Children will learn how arches are used to spread and redirect compression forces acting on bridges. They will then build and test model arch bridges. Can children use technical vocabulary to explain how arch bridges are constructed? Can children use technical vocabulary to explain how arch bridges work? Can children build and test models to find a strong bridge design?
4	Reconnection: How did arches strengthen bridges? LO: **Today To understand how suspension bridges are able to span long distances.** Activity: Children will learn about how suspension bridges use tension to support bridge decks spanning large distances. They may then either build and test model suspension bridges, or research and write about iconic suspension bridges. *(Research and discuss various architects and designers and discuss their processes and explain how these were used in the finished product).* (*To know facts about a famous architect and their work).* Can children explain how tension and compression forces are distributed by suspension bridges? Can children build a model suspension bridge that will support a given weight? Can children evaluate the designs of others and consider their views?

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5	Reconnection: How do suspension bridges span long distances? LO: **To develop criteria and design a prototype bridge for a purpose.** Activity: Having been presented with a design brief, children must develop criteria for a bridge design that will meet the terms of the brief. They will then either design a bridge according to their criteria, or generate more criteria for a range of given design briefs. (*Follow a design brief to achieve an effect for a particular function)* Can children write design criteria according to a given brief? Can children design a prototype model according to design criteria?(*Refine his/her use of learnt techniques)* Can children work collaboratively to produce a prototype according to an agreed design?
6	Reconnection: Who gives a design brief and why? **LO: To analyse and evaluate products according to design criteria.** Activity: Following on from the previous lesson, children will consider ways in which they might test their bridge design once constructed. They will then build and test their designs. (*Evaluate his/her work against their intended outcome*) (*Adapt his/her own final work following feedback or discussion based on their preparatory ideas)* (*To know how to effectively evaluate work against a design brief using appropriate vocabulary.)* Can children devise tests to analyse a product according to design criteria? Can children evaluate their product according to design criteria? Can children consider the views of others and think of ways to improve their work?

Take photographs of the children testing their designs. They can then annotate the photos with their thoughts and any future adaptions.

End points:

To know a variety of skills and techniques used in construction.

To know how a range of structures have been strengthened building on from previous techniques utilised.

To know which materials will be most effective for different requirements and to know how to evaluate the effectiveness of chosen materials and consider adaptions for future designs.