



Knowledge and Skills Mind Map (DT) Year 1—Autumn Term

Knowledge - 
Skill - 

Prior Learning (EYFS) Experience of using construction kits to build walls, towers and frame-works. Experience of using of basic tools e.g. scissors or hole punches with construction materials e.g. plastic, card. Experience of different methods of joining card and paper.

1. Can I explore structures in the local area?

- **Vocab:** structure, local area, bridge
- Know local structures e.g. railway bridge on Collingwood Road and bridge on playground equipment (lower fun bus)
- Know that a railway bridge is used for transport (trains)
- Know that playground equipment is used for exercise, playing safely (handrails)
- Know that bridges need a base and supports to be strong and stable

Task: Observe how a bridge is strong and stable. Book—Bridges Tom Percival

- **Evaluating:** Explore a range of existing freestanding structures in the school and local environment e.g. everyday products and buildings.

2. Can I draw bridges based on what I have observed in the local area?

- **Vocab:** observed, local area, structure, metal, brick, construction
- Know that local structures (see previous lesson) are made using metal and brick
- Know the shapes (square, rectangle, cuboid, cube, triangle) that are used in construction

Task: Draw my own version of a bridge. Label using appropriate vocabulary (wall, support, base, joint, metal, brick)

- **Designing:** Generate ideas based on simple design criteria and their own experiences, explaining what they could make.
- **Technical Knowledge:** Know and use technical vocabulary relevant to the project.

3 Can I use construction materials to build a strong and stable structure?

- **Vocab:** construction, materials, strong, stable, structure,
- Know that wooden blocks, interconnecting plastic bricks (multi link) and construction kits are used to build structures.
- Know that a base will be needed to make the bridge strong enough not to fall over.
- Know that a bridge needs to be strong enough to support an object (i.e. train) or a person.

Task: Build a strong and stable bridge using a range of materials (multi-link, wooden blocks, Knex, Lego)

- **Making:** Select new and reclaimed materials and construction kits to build their structures.

4. Can I make a structure stronger?

- **Vocab:** structure, strong(er), material, tape, metal, wood, nuts, bolts, join, fold,
- Know that a sheet of paper is a weak material to build with but by adding joins, folds and tape can strengthen it.
- Know some materials (brick/ metal/wood) are stronger than others (paper/card).
- Know that our local bridge are joined to make them stronger using nuts and bolts.

Task: Evaluate my paper structure and test to see if it can support 3 rubbers without collapsing.

- **Technical Knowledge and understanding:** Explore how paper, through twisting, folding, bending or manipulating, can be made stronger.
- **Evaluate:** Evaluate their product by discussing how well it works in relation to the purpose, the user and whether it meets the original design criteria.

Structures:
Freestanding Structures
*'Design, make and
evaluate a bridge for Billy
Goats Gruff'*

8.Can I evaluate the stability and suitability of my bridge ?

- **Vocab:** structure, engineer, evaluate, stable, stability, design
- Know that a bridge needs to be strong, stable and safe.
- Know that a test needs to be fair so all children will use the same toy to test their product.
- Know that resilience makes great engineers—look at Norman Foster's design of the millennium bridge opening and that changes are not a failure but how to make a successful project.
- Know that reflection is part of learning and improving.
- **Evaluate:** Evaluate their product by discussing how well it works in relation to the purpose, the user and whether it meets the original design criteria.

7.Can I add finishing touches to my bridge?

- **Vocab:** structure, make, design, bridge,
- Know that aesthetics can add value to a design.
- Know that a memorable design can become iconic .

Task: Paint bridge and add any finishing touches to design before testing my product.

- **Making:** Use simple finishing techniques suitable for the structure they are creating.

6 Can I use my design to build my own bridge?

- **Vocab:** structure, design, material
- Know that using my design will help explain my choices.
- Know which materials will make a strong and stable bridge and use them accordingly.

Task: Build a bridge using materials suggested by the children based on their plans from the previous lesson (such as card, string, PVA glue, boxes, masking tape, pipe cleaners, scissors, hole punch, staplers, cello tape) that a small toy can be supported on without the designed bridge collapsing.

- **Making:**
 - Plan by suggesting what to do next.
 - Select and use tools, skills and techniques, explaining their choices.

5.Can I design a simple bridge to suit a specific purpose?

- **Vocab:** structure, design, bridge, purpose,
- Know the purpose of different bridges (train bridge, footbridge)
- Know a structure should stand up on its own and be fit for purpose

Task: Draw an image of their own bridge that a small plastic toy (i.e. Billy Goats) can cross safely.

- **Design:** Generate ideas based on simple design criteria and their own experiences, explaining what they could make.