

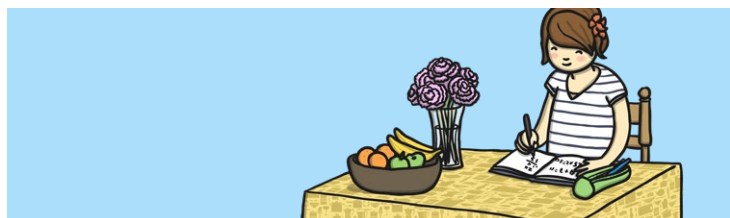
## Introduction

This Marbulous Structures unit gives children opportunities to develop their understanding of more complex free standing structures and how they can be strengthened and reinforced. Children will gain knowledge and understanding about how to join and shape materials. Children will then apply these skills, using an iterative design process, to create their marble runs. Finally, children will test and evaluate their marble runs against design criteria.



## Health & Safety

When carrying out a risk assessment for this unit, teachers will need to consider the materials, tools and equipment being used. Scissor and craft knife safety rules should always be followed. Craft knives should only be used when closely supervised by the teacher or teaching assistant. Take extra care when using marbles with children as these can be a choking hazard.



## Home Learning

**Cereal Box Marble Run:** Ever wondered what to do with those empty cereal boxes? Children will follow these simple and fully illustrated instructions to make a cereal box marble run.

**Making a Marble Run Funnel:** This home learning task firstly explains the use a funnel has when placed in a marble run. There is then a template of a marble run funnel that needs to be cut out and assembled. The finished funnel can then be used in class.

## Assessment Statements

By the end of this unit...

### ...all children should be able to:

- Explore existing free standing structures and explain what gives them strength, reinforcement and stability.
- Select tools and equipment to join card together.
- Design and build a simple marble run.
- Improve their work.

### ...most children will be able to:

- Apply their understanding of free standing structures to help build them.
- Use a wider range of tools and equipment to perform practical tasks accurately.
- Use appropriate cutting and shaping techniques that include cuts within the perimeter of the material such as slots.
- Select appropriate joining techniques.
- Design and build a marble run which incorporates some varied bends.
- Consider the aesthetics when building a marble run.
- Consider the views of others to improve their work.

### ...some children will be able to:

- Build tall free standing structures that are strong and stable.
- Cut materials with accuracy and precision and refine the finish with appropriate tools such as a craft knife.
- Pay close attention to aesthetics when creating joins.
- Demonstrate a clear ability to be creative and imaginative with their ideas when designing and building a marble run.
- Improve their work to ensure it has a high quality finish.

To look at all the resources in the Marbulous Structures unit [click here](#).

To find out more about PlanIt download our [free guide here](#).

# Lesson Breakdown

## 1. Exploring Structures

To investigate and analyse a range of existing products in the context of looking at existing free standing structures.

- I can investigate free standing structures.

To apply their understanding of how to strengthen, stiffen and reinforce more complex structures in the context of strengthening, reinforcing and stabilising a cardboard tube.

- I can apply my understanding of structures.

## Resources

- Cardboard tubes
- Marbles
- Card
- Paper
- A range of joining materials such as PVA glue, masking tape, glue sticks, adhesive tape, double-sided tape
- Scissors, tape measure.



## 2. Marble Run Bridges

To select from and use a wider range of tools and equipment to perform practical tasks (for example, cutting, shaping, joining and finishing), accurately in the context of joining cardboard tubes accurately together.

- I can use a wider range of tools and equipment to perform practical tasks accurately.

- Cardboard tubes
- Marbles
- Card
- Paper
- A range of joining materials such as PVA glue, masking tape, glue sticks, adhesive tape, double-sided tape
- Scissors, craft knives, cutting boards.
- Stopwatches.

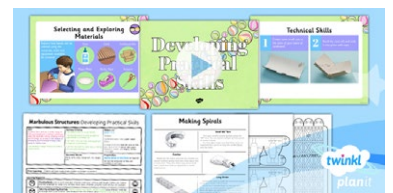


## 3. Developing Practical Skills

To select from and use a wider range of tools and equipment to perform practical tasks (for example cutting, shaping, joining and finishing), accurately in the context of developing practical skills to help make bends in marble runs.

- I can develop a range of practical skills to create bends.

- Cardboard tubes
- Marbles
- Card
- Paper
- A range of joining materials such as PVA glue, masking tape, glue sticks, adhesive tape, double-sided tape.



## 4. Timed Marble Run Challenge

To investigate and analyse a range of existing products in the context of investigating commercially bought marble runs.

- I can investigate free standing structures

- Marble run sets, ideally 3.
- Stopwatches
- Cameras



## 5. Making the Marble Run

To select from and use a wider range of materials and components according to their functional properties and aesthetic qualities in the context of selecting and using materials and components to make a marble run.

- I can select from and use materials and components to make a marble run.

- Cardboard tubes
- Marbles
- Stopwatches
- A range of joining materials
- Scissors, craft knives, cutting boards
- Ask the children to bring in a collection of extra resources they want to use on their marble run such as funnels, pipes, yoghurt pots etc.



## 6. Evaluating and Improving

To evaluate their ideas against their own design criteria and consider the views of others to improve their work in the context of evaluating their marble run against the design criteria set in lesson 5.

- I can evaluate and improve my design and technology work.

- Cardboard tubes
- Marbles
- Stopwatches
- A range of joining materials
- Scissors, craft knives, cutting boards
- Ask the children to bring in a collection of extra resources such as funnels, pipes, yoghurt pots etc.



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