DT Knowledge Organisers

Autumn One - 2023

Year 1

No DT this term.

Year 2

KS1 D.T: STRUCTURES KNOWLEDGE ORGANISER

Overview

Freestanding Structures

Structures are things that are built for a purpose.

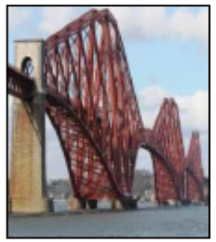
-Structures can be large (e.g. buildings and bridges) or small (e.g. chairs and tables).

-Freestanding structures are structures that can stand up without being attached to something else.

-Freestanding structures need to support their own weight and also the weight of the things/people using them.

So that they can do this, freestanding structures need to be well-designed: strong, rigid and stable.

Example Structures

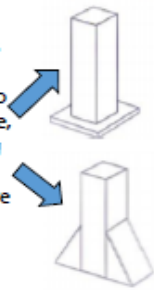
	Name: Burj Khalifa Location: Dubai, United Arab Emirates Height: 828m Floors: 163 Built in: 2010	-The Burj Khalifa is the tallest freestanding structure in the world. -It has an extremely wide base, and is very narrow at the top. -The steps down the sides help to protect the structure from the wind. -It has deep foundations in the ground. -It is made of strong, rigid materials – over 330,000m³ of concrete and 40,000 tonnes of steel reinforcement!
	Name: Forth Bridge Type: Railway Bridge Location: Scotland Length: 2,528m Built in: 1890	-The Forth Bridge is a long railway bridge in Scotland, across the Firth of Forth. -It is made of strong materials: it was one of the first bridges made of steel. The steel frame is built into triangles (a wide base and narrow top. It also has strong, stable concrete arms supporting on either side.

Designing – What makes a strong, stable, rigid structure?

A structure that is stable is less likely to fall over.

-Structures are more stable when they have a wider base.
-Buttresses can also make a structure more stable. A buttress is something that is built against a structure to give it more stability.

The buttress adds width to the base, making the structure more stable.



A structure that is strong and rigid is able to support more weight.

-Some materials are stronger and more rigid (stiffer) than others, e.g. card is stronger and more rigid than paper.

-Structures can also be made stronger and more rigid by making sure that parts and materials are properly joined together, e.g. with glue or tape.

-Folding and layering (adding an extra layer) of materials can also be used to strengthen and stiffen structures.

Key Vocabulary

- Structures
- Freestanding
- Support
- Weight
- Strong
- Rigid
- Stable
- Base
- Materials
- Layering
- Design
- Make
- Evaluate

Making & Evaluating

Making

-Read your plan carefully. Make sure that you are prepared.
-Think about the skills you will need to use (e.g. cutting, assembling sticking) and the tools that you will need for them (e.g. scissors, glue).
-Think about finishing techniques (e.g. adding buttresses/extra layers for strength, or colour to make your structure look well presented!)
-Remember your purpose – does it work?

Evaluating

-How well does your structure work? Does it meet its purpose?
-How did you make your structure stable? How could you make it more stable?
-How did you make your structure strong and rigid? How could you make it more strong and rigid?

Health and Safety

- -Remove any jewellery and tie back long hair.
- -Wear an apron and roll up your sleeves.
- -Walk safely and calmly around the classroom/ workshop.
- Keep your work area and floor area clear – keep your belongings well clear.
- Follow the teacher's cutting instructions carefully.
- Make sure that you are wearing the correct equipment for tasks.
- If you need to move around with scissors, hold around the closed blades, facing down.
- Report all spillages & clean up properly after yourself.

Year 3

LKS2 D.T: FOOD AND NUTRITION KNOWLEDGE ORGANISER

Preparing and Cooking Processes

Preparing Processes

Preparing processes are the different ways that we get food ready to be eaten.

-**Slicing:** cutting food using a knife.

-**Mixing:** to blend ingredients together, using a spoon, blender, or whisk.

-**Weighing/measuring:** to get the right amount of an ingredient, using scales, table/teaspoons

Grating: To peel a layer off something (like carrots or cheese) using a peeler or grater.

-**Serving:** making food look nice on the plate.

Cooking Processes

Cooking processes are the different ways that we heat food before it is eaten.

-**Baking:** to cook food in a heated oven.

-**Boiling:** to cook food in boiling hot water. You can tell it is boiling (100°C) when it bubbles.

-**Frying:** to cook food in a pan of heated oil.

-**Grilling:** to cook food by putting it under a hot grill (like a radiator in a cooker).

A Healthy and Varied Diet

Food Groups

You should now know how much to eat of each food group

-**Fruit and vegetables** – Eat lots! About 5 portions per day.

-**Carbohydrates** – Eat lots! Include in every meal.

-**Proteins** – You should eat about 2-3 portions per day.

-**Dairy** – You should eat about 2-3 portions per day.

-**Fats and Sugars** – Only eat occasionally and in small amounts.

A Varied Diet

--In order to stay healthy, it is important that we eat a balanced diet of foods from each of the five food groups. Too much of any one food group is not healthy for us.

-You should know that within each group, some foods have different benefits (e.g. fish has less fat than red meat).

-You should be able to design your own plate - think about foods that go well together, and promote a balanced diet.

Where Food Comes From

Grown, Raised, Caught

You should know that food source is the place where a food comes from, and that food comes from plants and animals.

You should also know that in order for us to get food, we need to grow it, raise it, or catch it.

- In order for us to get pork, we need to raise pigs. Pork is the meat that we get from pigs.
- In order for us to get eggs, we need to raise chickens. Eggs are laid by female chickens.
- In order for us to get cucumbers, we need to grow a cucumber plant. Cucumbers grow on the vines of cucumber plants.
- In order for us to get tuna, we need to catch the tuna-fish. Tuna is the fish that we get from the tuna-fish.

Making Bread

-You should know how some foods are made from ingredients.

1. Grain is a food that is grown. It is ground into flour (using large stones).
2. The flour is mixed with water and a product called yeast, to create dough.
3. This is covered and left for 1 hour – this is called proving. In this time, the yeast makes the dough rise.
4. The dough is then shaped and put into the oven, where it bakes into bread.

Key Vocabulary

- Food Group
- Balanced Diet
- Healthy Plate
- Slicing
- Measuring
- Grating
- Serving
- Boiling
- Frying
- Import
- Export
- Traditional Dish
- Health & Safety

Food from Around the World

You should already know that some of our food is produced locally, whilst some may come from elsewhere in the world. Sometimes, foods can be easily made in lots of different countries. However, sometimes the conditions in a country make it perfect for producing certain foods.

When we trade in foods from another country it is called **importing.** When we trade out foods to another country it is called **exporting.**

Many places have their own **traditional dishes.**

-In the UK, traditional dishes include fish and chips and the Sunday roast.

-In Mexico, traditional dishes include burritos, tacos, fajitas & guacamole.

What other traditional dishes do you know?

Health and Safety

-Remove any jewellery and tie back long hair. Ideally, wear a hair net.	-Wear an apron and roll up your sleeves. Tie your apron securely.	-Wash your hands with hot water and antibacterial soap, for at least 20 seconds.	Washing your hands should be done before, during and after preparing food.	Use different chopping boards and knives for raw meat & other foods. This stops bacteria spreading.	Use a food thermometer to check that food is cooked through.	Check the dates on food, and check for allergies & diet e.g. vegetarian, vegan.	Make sure that you clean up properly after yourself.

Year 4

No DT this term.

Year 5

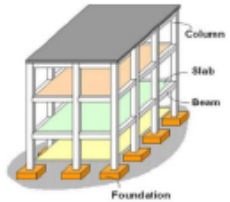
No DT this term.

Year 6

UKS2 D.T: STRUCTURES KNOWLEDGE ORGANISER

Overview

Frame Structures



You should already know that structures are things that are built for a purpose, for example to support something or hold something.

-Frame Structures are rigid support structures that use beams, columns and slabs to hold large forces of gravity and weight.

-Frame structures give shape, and are useful for support & weight bearing.

-Unlike shell structures, frame structures have joints, which are formed according to the design requirements and materials being used.

-Some examples of man-made objects that use frame structures are houses, skyscrapers, bridges, scaffolding, tables, and roller coasters!

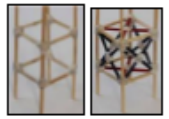
-The system of beams and columns in a frame structure can be further strengthened through the use of other features, e.g. foundations, bracing.

Designing – How do I design a strong, stable, secure frame structure?

-Remember your prior learning, a wider base can help a structure to be more secure.
-Frames should be able to stand on their own, providing a 'skeleton structure.'
-You may wish to consider a foundation/ anchoring system, where appropriate.

You should be able to consider the most appropriate materials for your frame structure, considering a number of properties (e.g. weight, toughness, malleability, strength and presentation) depending upon the nature of your project.
-You should also be able to consider restraints, for example time and cost.

Triangulation can help to make structures stronger. This is important to consider when creating stable joints (see the making section below for this).
-Triangulation is also important when bracing. When force is applied to one point on the triangle, the pressure is shared amongst the other two points, which provide a secure wide base. Using bracing, you can create triangular shapes, can therefore make your structure more rigid from different angles.



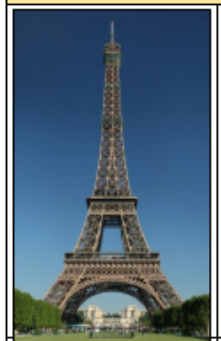
Triangulated bracing adds to rigidity.

Design stage should include: step-by-step plan, annotated sketches, listing tools & materials.

Key Vocabulary

- Structures
- Frame Structures
- Rigid
- Beam
- Column
- Slab
- Joints
- Foundations
- Triangulation
- Bracing
- Malleable
- Horizontal
- Diagonal
- Vertical

Example Structures



Name: The Eiffel Tower

Location: Paris, France

Height: 324m
Built in: 1889

Purpose: Observation/ Broadcasting Tower

Materials: Wrought Iron

-The Eiffel Tower is one of the most famous structures in the world. The main architect who designed the Eiffel Tower was Stephen Sauvestre, whilst Gustave Eiffel was the chief engineer.
-The wrought-iron structure is based of four huge arched legs, set on masonry piers that curve inward.
- The material used to make this tower is wrought iron which has is tough, malleable (can be pressed into shape without cracking) & corrosion-resistant.
-Sauvestre and Eiffel wanted to prove that the metal could be as strong as stone, whilst lighter.
-It uses a diagonal bracing structure throughout, to prevent side-to-side movement in the wind.

Name: Gazebos/ Tents

Purpose: Shelter/ Temporary Habiting Space

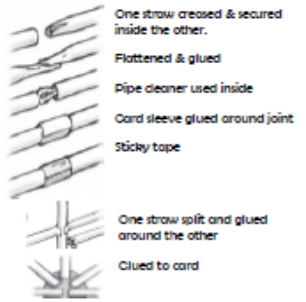
Materials: Wood, iron or aluminum & canvass.

-Tents and gazebos are shelters made up of sheets of fabric/material, draped over a frame structure.
-The frames are often made of iron or aluminium poles (lightweight, which make them easy to transport/ erect/ deconstruct) or wood.
They can range in size, from simple 'bivouac' structures for one person, to huge circus tents for thousands of people.
-Rather than foundations, hooks or pegs are ordinarily used to anchor tents to the ground.

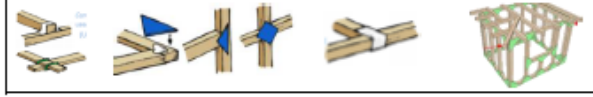
Making & Evaluating

Making

Using Straw/Rolled Paper
-When using straw, rolled paper, a number of adhesives can be used – e.g. sellotape, different types of glue.
-However, these structures are not as strong/ stable as wooden structures.
-Creating a rigid frame requires the creation of secure joints.
-These can be made using the methods shown on the right.



Using Wood
-When using wood, PVA glue is most appropriate. Joints should be securely clamped together to allow for drying time.
-Card strips can be used to create secure joints.
-Card triangles can be used to create secure corner joints.
-One suitable alternative is elastic bands, which can be securely fastened around beams and columns, in order to create secure joints.



Evaluating

-How well does your structure work? Does it meet its purpose?

-How did you make your frame structure strong and rigid?

-How could you make it more strong and rigid?

-Which materials did you use? Why did you make these choices?

What restraints did you have? How would you have changed your product without these restraints?

-How did you cover your frame? Was this the best material? Why or why not?

-How does your product look? How could it look more appealing?

Health and Safety

-Remove any jewellery and tie back long hair. Keep belongings clear.

-Wear an apron where necessary and roll up your sleeves.

-Walk safely and calmly around the classroom/ workshop.

Keep your work area and floor area clear – regularly tidy up to avoid accidents.

Follow the teacher's cutting/ machinery instructions carefully.

Make sure that you are wearing the correct equipment for tasks, including safety goggles.

Should you need to move around with sharp objects, hold them appropriately.

Report and clean all spillages & other potential hazards.