

What this topic covers

In this topic pupils will:

- learn how the Clock Tower was constructed
- use mathematical skills to work out figures linked with the Clock Tower
- apply design and computing skills to create their own design of Memorial Square

Curriculum links

English

- give well-structured descriptions, explanations and narratives for different purposes, including for expressing feelings
- maintain attention and participate actively in collaborative conversations, staying on topic and initiating and responding to comments
- participate in discussions, presentations, performances, role play, improvisations and debates
- learn new vocabulary such as soldier, sacrifice, committee and symbol

Computing

- use technology purposefully to create, organise, store, manipulate and retrieve digital content
- select, use and combine a variety of software (including internet services) on a range of digital devices to design and create a range of programs, systems and content that accomplish given goals, including collecting, analysing, evaluating and presenting data and information

Mathematics

- gain practice of reading and writing numbers up to 1000 in numerals and words
- solve measuring and scaling problems
- practice using the % symbol, using fractions and decimals
- convert from metric to common imperial measurements – inches and pounds

Design and technology

- build and apply a repertoire of knowledge, understanding and skills in order to design and make high-quality prototypes and products for a wide range of users
- generate, develop, model and communicate ideas through talking, drawing, templates, mock-ups and, where appropriate, information and communication technology
- generate, develop, model and communicate ideas through discussion, annotated sketches, cross-sectional and exploded diagrams, prototypes, pattern pieces and computer-aided design
- select from and use a wide range of materials and components, including construction materials, textiles and ingredients, according to their characteristics

What you will need

Resource Sheet G: Memorial Square and the Memorial Clock Tower facts and figures

Teacher's Slides G: Memorial Clock Tower and Memorial Square key facts and figures

Resource Sheet H: Assembly instructions to create your own Clock Tower model. Assembly instructions video.

Teacher's Handout J: Historic development of Memorial Square

Task 1: Memorial Clock Tower facts and figures

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 How long will this activity take? 1 hour

What you will need

Resource Sheet G: Memorial Square and the Memorial Clock Tower facts and figures

Teacher's Slides G: Memorial Clock Tower and Memorial Square key facts and figures

Teacher's Handout J: Historic development of Memorial Square

Learning Activity

Work through Resource Sheet G using the accompanying Teacher's Slides G to teach your pupils some key facts and figures about the Memorial Clock Tower and surrounding Memorial Square.

Areas for discussion include:

- how the place has changed over the years
- why new commemorative tablets and remembrance stones have been added – do any of your pupils have a relative that is commemorated?
- what things have stayed the same and the concept of 'conservation'

(30 mins)

Now ask the pupils to complete a variety of maths questions which relate to the Clock Tower.

You can select from four categories: Time; Money; Measurements; and Bricks and Mortar. Children who are better at maths may be able to complete more than one worksheet during the lesson., or pick and choose from the questions to suit your group or area of maths you wish to study.

Clock Tower maths questions (30 mins):

Task 1: Memorial Clock Tower facts and figures

Maths Questions

Time		
1	There is a clock face on each of the four sides of the Clock Tower – how many total hours does the clock’s big hands rotate in any one 24-hour period?	$4 \text{ faces} \times 24 \text{ hours} = \underline{96 \text{ hours}}$
2.	How many total hours do the clock’s big hands rotate in one week?	$96 \text{ hours} \times 7 \text{ days} = \underline{672 \text{ hours}}$
3	How many total hours do the clock’s big hands rotate in one year?	$672 \text{ hours} \times 52 \text{ weeks} = \underline{34,944}$
4	A working week is 5 days and the Clock Tower took 57 working days to build – how many working weeks is this? Round your answer up.	$57 \text{ days} \div 5 = 11.4 \text{ Rounded up} = \underline{12 \text{ working weeks}}$
5	Now add in two weekend days for each working week and calculate the time it took to build the Clock Tower in months? Round your answer up.	$12 \times 2 = 24 \text{ days} + 57 \text{ (working days)} = 81 \div 30 \text{ (days in month)} = 2.7 \text{ round up} = \underline{3 \text{ months}}$

Weights and volumes		
1	If one brick weighs 3.5kg and there are 57,000 bricks in the Clock Tower - what is the total weight of the bricks used to build the Clock Tower? Now convert this to tonnes and round the answer up] (1000 kg = 1 tonne).	$57,000 \times 3.5\text{kg} = 199,500\text{kg} \div 1000 = 199.5 \text{ round up} = \underline{200 \text{ tonne}}$
2.	To lay 1000 bricks you need use 1 tonne of sand and 250kg of cement, the Clock Tower is built with 57,000 bricks– how many tonnes of sand were used to build the Clock Tower? How many tonnes of cement?	$57,000 \div 1000 = 57 \times 1 \text{ tonne of sand} = \underline{57 \text{ tonnes of sand}}$ $57 \times 250\text{kg of cement} = 14,250 \text{ kg} \div 100 = \underline{14.25 \text{ tonnes}}$
4	If the bricks weigh 200 tonnes, the sand 57 tonnes and the cement 15 tonnes - what is the total weight of the Clock Tower?	$200 + 57 + 15 = \underline{272 \text{ tonnes}}$
5	If 600 litres of water are needed to lay 1,000 bricks and there are 57,000 bricks in the Clock Tower - how many litres of water were needed to build the Clock Tower?	$57,000 \div 1000 = 57 \times 600 \text{ litres} = \underline{34,200 \text{ litres}}$
7	The Clock Tower measures 21m high and each of the four sides is 4m wide – what is the volume of the Clock Tower?	$4\text{m} \times 4 = 16\text{m} \times 21\text{m} = 336\text{m}^3$

Maths Questions

Measurements		
1	The Clock Tower is built with 57,000 bricks – if two bricklayers lay 500 bricks each a day, how many days in total will it take to build the Clock Tower?	Number of bricks laid per day = $500 \times 2 = 1000$ bricks $57,000 \div 1000 = \underline{57}$ days
2.	Each side of the Clock Tower measures 4m wide x 21m high and in total there are four sides. In 1m ² there are 170 bricks – what is the total number of bricks in the Clock Tower?	Area of one side = $4\text{m} \times 21\text{m} = 84\text{m}^2$ $4 \times 336\text{m}^2 \times 170$ (bricks in m ²) = <u>57,120</u> bricks
3	An imperial brick measures 9 inches long, 4 inches wide and 3 inches deep – if 1 inch = 2.5 cm - What would be the measurements of an imperial brick in centimetres?	Length = $9 \times 2.5 = \underline{22.5\text{cm}}$ Width = $4 \times 2.5 = \underline{10\text{cm}}$ Depth = $3 \times 2.5 = \underline{7.5\text{cm}}$
4	The Clock Tower is 68 feet high – if 1 foot = 30cm - what is the height in metres (rounded up)?	$68 \times 30\text{cm} = 2040\text{cm} \div 100 \text{ cm} = 20.4\text{m} = \underline{21 \text{ m}}$ rounded up
5	Each side of the Clock Tower measures 4m wide and there are four sides – what is the perimeter of the tower measure?	$4\text{m} \times 4 = 16\text{m}$
6	If one side of the Clock Tower is 4m wide and 21m high - what is the area?	$4\text{m} \times 21\text{m} = 84\text{m}^2$

Money		
1	In 1925, £1.00 was worth the same as £57.00 today. The Clock Tower cost £2250 to build in 1925 - so what would that have cost in today's money?	2250 (old pounds) \times $\pounds 57.00 = \underline{\pounds 128,250}$
2.	If one brick costs 90p and there are 57,000 bricks in the Clock Tower – how much do the bricks cost?	$\pounds 0.90 \times 57,000 = \underline{\pounds 51,300}$
3	If sand costs £78 per tonne and there are 57 tonnes used to build the Clock Tower - how much does the sand cost?	$\pounds 78.00 \times 57 \text{ tonnes} = \underline{\pounds 4446}$
4	If cement costs £6.60 for a 25kg bag and there are 14,250kg used to build the Clock Tower – what is the cost of the cement?	$14,250\text{kg} \div 25\text{kg} = 570$ bags \times $\pounds 6.60 = \underline{\pounds 3,762}$

Task 2: Redesign Memorial Square

1

 How long will this activity take? 5 hours

What you will need

Teacher's Slides G: Memorial Square and the Memorial Clock Tower facts and Figures

Teacher's Handout J: Historic development of Memorial Square

SketchUp or other design programme and/or cardboard, paper, paint, glue, other construction/modelling materials

The project

Pupils are asked to reimagine Memorial Square, coming up with model designs which make the space a more attractive community space. The area should retain its core purpose of remembering those who died in the two World Wars.

When they have completed their designs, pupils are asked to present their vision and how they have addressed specific aspects of the brief. They will also create posters or other materials to launch the space, with ideas for a launch event.

The project utilises and develops a range of skills including design, technology, and communication skills, as well as promoting creative problem solving, team-working and negotiation.

Team roles

Divide your class into teams of 4-6 pupils. Within each team there are three elements – pupils must decide whose skills are best suited to these three roles of design (responsible for creating the designs); marketing and communications (developing the presentation and any promotional materials); presenters – presenting their concepts to the 'panel'.

The brief

Redesign Memorial Square (see slide 9) so that it is an attractive space for all ages and abilities within the local community to enjoy.

Consider how the space will be used and what will make it more attractive as a public space.

Key criteria:

- The site is within a conservation area, so you cannot build too high or above the ground
- The Memorial Clock Tower cannot be altered or demolished
- The space is a public right of way – it must remain traffic free
- It must be a community space for all ages and abilities
- It must promote community cohesion
- It must be able to be used through the day and safely at night
- It must be environmentally-friendly
- The designs must include basic measurements

Site Visit

If it can be arranged take small groups of children to Coalville's Memorial Square.

Before the visit use Teacher's Slides G and Teacher's Handout J to give the pupils some background information on Memorial Square, the Memorial Clock Tower and the surrounding area.

Take the historic maps and images with you and ask the pupils to identify buildings that have been demolished, altered or replaced.

Discuss how the area has changed, what is positive and negative and ideas that they would include in their new design.

Task 2: Redesign Memorial Square

Sample Slides

We piloted the project with year 5 and 6 pupils at Belvoirdale Primary School, Coalville and they impressed us with how well they grasped the brief and their creativity. The following provides a snapshot of their ideas by way of example.

Some pupils cleverly incorporated historical images of the Clock Tower into their presentation to show they had grasped its significance as a heritage building.



The theme of community and supporting others is embedded in this group's designs.



Trampolines and playground facilities were popular choices to make the space more appealing to younger visitors, whilst complying with health and safety.

