CROFTON
BEAM ENGINES

Escape Room – Crofton Addition

Focus

Imagine you've been to Crofton Beam Engines for a lovely day out, only to discover as you get ready to leave that the gate has accidentally been locked! To unlock it, you need to collect the nine-digit code for the lock, travelling around the station and solving nine questions, which cover National Curriculum standards, to gain the code.

Overview

In this escape room style game, children work in small groups to solve a series of nine questions. Each question is related to a different area of the National Curriculum (English, History, Geography, Science and Maths) and is also connected to Crofton Beam Engines or the canal.
Each question takes about ten minutes to solve and generates a number to unlock the code. The session is tailored for Key Stage 1, Lower Key Stage 2, Upper Key Stage 2 or Key Stage 3, and different groups can take part simultaneously.

National Curriculum Links

English

Pupils should be taught to:

- develop pleasure in reading, motivation to read, vocabulary and understanding by being introduced to non-fiction books that are structured in different ways. (Year 1/2)
- develop positive attitudes to reading and understanding of what they read by listening to and discussing non-fiction. They should identify main ideas from more than one paragraph. (Year 3/4)
- maintain positive attitudes to reading and understanding of what they read by continuing to read and discuss non-fiction. They should understand what they read by summarising the main ideas drawn from more than one paragraph, identifying key details that support the main ideas. (Year 5/6)
- understand increasingly challenging texts through learning new vocabulary, relating it explicitly to known vocabulary and understanding it with the help of context; making inferences and referring to evidence in the text; and knowing the purpose, audience for and context of the writing and drawing on this knowledge to support comprehension. (KS3)

Geography

Pupils should be taught to:

- use simple compass directions (North, South, East and West) and locational and directional language to describe the location of features and routes on a map. (Year 1/2)
- locate the world's countries, using maps to focus on Europe (including the location of Russia). They should be taught to name and locate counties and cities of the United Kingdom. (Year 3/4)
- use maps to locate countries. (Year 3/4)
- use four-figure grid references, symbols and key (including the use of Ordnance Survey maps) to build their knowledge of the United Kingdom and the wider world. (Year 5/6)

- interpret Ordnance Survey maps in the classroom and the field, including using grid references and scale. (KS3)

History

Pupils should be taught about:

- events beyond living memory that are significant nationally or globally. (KS1)
- significant historical events, people and places in their own locality (KS1)
- a local history study (KS2)

Maths

Pupils should be taught to:

- Count to and across 100 (Year 1)
- Count, read and write numbers to 100 in numerals (Year 1)
- Interpret and construct simple pictograms, tally charts, block diagrams and simple tables (Year 2)
- Ask and answer simple questions by counting the number of objects in each category and sorting the categories by quantity (Year 2)
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- Record and compare time in terms of seconds, minutes and hours; use vocabulary such as o'clock, a.m./p.m. (Year 3)
- Compare durations of events (Year 3)
- Solve problems involving converting from hours to minutes (Year 4)
- Use place value, known and derived facts to multiply and divide mentally (Year 4)
- Recognise and use factor pairs and commutativity in mental calculations (Year 4)
- Interpret and present data using pictograms (Year 3)
- Solve one-step and two-step questions using information presented in pictograms (Year 3)
- Solve comparison, sum and difference problems using information presented in pictograms (Year 4)

- Solve problems involving addition, subtraction, multiplication and division and a combination of these (Year 5/6)
- Multiply and divide numbers mentally drawing upon known facts; multiply and divide whole numbers and those involving decimals by 10, 100 and 1000 (Year 5)
- Multiply proper fractions and mixed numbers by whole numbers (Year 5)
- Solve problems which require knowing decimal equivalents of ½, ¼ (Year 5)

<u>KS3</u>

- Select and use appropriate calculation strategies to solve increasingly complex problems.
- Interpret when the structure of a numerical problem requires additive, multiplicative or proportional reasoning.
- Develop their mathematical knowledge, in part through solving problems and evaluating the outcomes, including multi-step problems.
- Develop their use of formal mathematical knowledge to interpret and solve problems, including in financial mathematics.
- Use the four operations, including formal written methods, applied to integers, decimals, proper and improper fractions, and mixed numbers, all both positive and negative.
- Derive and apply formulae to calculate and solve problems involving volume of cylinders.

Science

Pupils should be taught to:

- Identify and name a variety of common animals including fish, amphibians, reptiles, birds and mammals. (Year 1)
- Describe and compare the structure of a variety of common animals. (Year 1)
- Identify and name a variety of everyday materials, including wood, plastic, glass, metal, water and rock. (Year 1)

- Compare and group together a variety of everyday materials on the basis of their simple physical properties. (Year 1)

- Compare and group materials together, according to whether they are solids, liquids or gases. (Year 4)
- Observe that some materials change state when they are heated or cooled, and measure or research the temperature at which this happens in degrees Celsius. (Year 4)
- Identify the part played by evaporation and condensation in the water cycle and associate the rate of evaporation with temperature. (Year 4)
- Recognise that living things can be grouped in a variety of ways. (Year 4)

- Identify the effects of air resistance, water resistance and friction, that act between moving surfaces. (Year 5)
- Demonstrate that changes of state are reversible changes. (Year 5)

- The properties of the different states of matter (solid, liquid and gas) in terms of the particle model, including gas pressure. (KS3)
- Changes of state in terms of the particle model. (KS3)
- Forces as pushes or pulls, arising from the interaction between two objects. (KS3)
- Using force arrows in diagrams, balanced and unbalanced forces. (KS3)

Clue Locations:

This gives you an idea of how a group might travel around the station. Larger classes can be divided into two smaller groups, with two different starting points. Children tend to work in small groups of 3 on a problem.

	Sparrows (Year 1/2)	**Moorhens (Year 3/4)**	**Red Kites (Year 5/6)**	**Grey Herons (KS3)**
Clue 1	Driving Platform – Science	Coal Yard – Geography	Upper Lawn – Art	Side Boiler House - English
Clue 2	Upper Lawn – Art	Boiler House – Maths	Lower Lawn – Science	Boiler House for volume - Maths
Clue 3	Lower Lawn – Maths	Boiler House – Maths	Side Boiler House – English	Boiler House for Budget - Maths
Clue 4	Side Boiler House – English	Cylinder Head – History	Side Boiler House – Maths	Cylinder Head - History
Clue 5	Side Boiler House - Maths	Beam Gallery – Logic	Boiler House – Maths	Beam Gallery -Logic
Clue 6	Boiler House – Science	Launder – English	Cylinder Head – History	Launder -Geography
Clue 7	Cylinder Head – History	Driving Platform – Science	Beam Gallery – Logic	Driving Platform - Science
Clue 8	Beam Gallery – Logic	Upper Lawn – Art	Launder – Geography	Upper Lawn - Art
Clue 9	Launder - Geography	Lower Lawn - Science	Driving Platform - Science	Lower Lawn - Science

For further information or to discuss the specific needs of your class, please contact us at lceo.crofton@katrust.org.uk.