

invent something...

SAM'S MORSE CODE TORCH

COMPUTER SCIENCE, SCIENCE, MATHEMATICS

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Morse code revolutionised long-distance communication prior to inventions such as the telephone and emails. This project on morse code is to get pupils thinking about how technology can be used to develop solutions and create codes.

SUBJECTS

Computer Science, Science, Mathematics

GRADE LEVEL

KS 2

LEARNING OBJECTIVES

- Invent SAM's Morse Code Torch
- Learn about Morse code and explore a different communication system
- Practise teamwork and collaborate to navigate through problems
- Reflect on and review the process, the product and that of their peers

LEARNING OUTCOMES

To learn about an alternative form of communication and how it works

RECOMMENDED PRIOR KNOWLEDGE

- Basic understanding of SAM apps
- Basic understanding of Morse code

GROUP SIZE

2-3 students

COMPUTATIONAL THINKING FRAMEWORK

AL, EV, AB

TIME REQUIRED

-  5 minutes to set up
-  35 minutes to create and communicate
-  15 minutes to reflect, peer review and plenary
-  5 minutes for classroom clean-up

MATERIALS REQUIRED

- Scissors, cardboard, coloured paper, glue
- SAM LED Light
- SAM Button
- Camera to record stages and progress

ACTIVITIES

- Storyboard and build SAM's Morse Code Torch.
- Create a message to communicate with the rest of the group.
- Take a photo of each stage of the process.
- Peer review and teacher feedback on the final product/results.
- Student reflection: strengths, weakness, difficulties, suggested modifications.
- Plenary, including other ways this system can be used.



STAGE 1

Gather the materials.

STAGE 2

Make a rectangular prism for SAM's Morse Code Torch, ensuring a SAM LED Light can fit at the end. Include tabs and remove one end of the prism.

STAGE 3

Open SAM Space Education app.
Turn on and drag the SAM Button and SAM LED Light onto the canvas.
Connect the SAM Button to the SAM LED Light.

STAGE 4

Fit the SAM LED Light into the small base of the rectangular prism and attach the SAM Button to the top.

STAGE 5

Write out the message on a piece of paper.

A •—	J •—	S •••
B —•••	K —•—	T —
C —•—•	L ••••	U ••—
D —••	M —•—	V ••••
E •	N —•	W —•—
F ••—•	O —•—	X —•••
G —•—	P ••••	Y —•—
H ••••	Q —•—	Z —•••
I ••	R —••	

STAGE 6

Communicate the message, which should be recorded by another team member.

STAGE 7

- Students report back to the class on their task to determine whether the message was communicated accurately.
- Additional peer review.
 - Were there any difficulties encountered during the making SAM's Morse Code Torch?
 - Were there any difficulties communicating in Morse code?

DIFFERENTIATE

Develop a new code for communication (eg. using colours).

TEACHER FEEDBACK AND PLENARY

Successes - weaknesses - future modifications

Please contact SAM Labs at:
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APPENDIX

COMPUTER SCIENCE, SCIENCE, MATHEMATICS

NATIONAL CURRICULUM EDUCATIONAL STANDARDS

COMPUTER SCIENCE

KS2

Design, write and debug programmes that accomplish specific goals, including controlling or simulating physical systems; solve problems by decomposing them into smaller parts.

Use sequence, selection, and repetition in programs; work with variables and various forms of input and output.

Use technology safely, respectfully and responsibly; recognise acceptable/unacceptable behaviour; identify a range of ways to report concerns about content and contact.

http://www.computingatschool.org.uk/data/uploads/primary_national_curriculum_-_computing.pdf



NATIONAL CURRICULUM EDUCATIONAL STANDARDS

SCIENCE

KS2

Electricity

Construct a simple series electrical circuit, identifying and naming its basic parts, including cells, wires, bulbs, switches and buzzers.

Recognise that a switch opens and closes a circuit and associate this with whether or not a lamp lights in a simple series circuit.

Reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results, in oral and written forms such as displays and other presentations.

http://www.gov.uk/government/uploads/system/uploads/attachment_data/file/335174/SECONDARY_national_curriculum_-_Science_220714.pdf



NATIONAL CURRICULUM EDUCATIONAL STANDARDS

MATHEMATICS

KS2

Geometry

Draw 2-D shapes and make 3-D shapes using modelling materials; recognise 3-D shapes in different orientations and describe them.

https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/335158/PRIMARY_national_curriculum_-_Mathematics_220714.pdf



PROGRESSION PATHWAYS/ COMPUTATIONAL THINKING CONCEPT

Programming and Development

Creates programs that implement algorithms to achieve given goals. (AL)

Declares and assigns variables. (AB)

Information Technology

Uses technology with increasing independence to purposefully organise digital content. (AB)

Shows an awareness for the quality of digital content collected (EV)

Hardware and Processing

Knows that computers collect data from various input devices, including sensors and application software (AB)

<https://community.computingatschool.org.uk/resources/1692>

Computational Thinking Concept: AB = Abstraction; DE = Decomposition; AL = Algorithmic Thinking; EV = Evaluation; GE = Generalisation