

Task theme Mastering Morse

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	●-●		

Task title

How can you use light to send messages?

Learning outcomes

- To design and build a Morse Code transmitter which uses light to send signals.

EHoM link



SYSTEMS THINKING

To construct an object or tool requiring the successful interaction between components and subsystems.



APAPTING

To embrace an iterative approach alternating between plan (doesn't have to be written) and create.

EDP link



Key Stage/Year Group UKS2 – Year 6

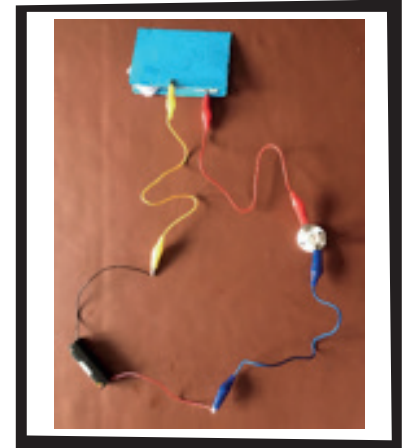
Resources required

It is suggested that for this activity, children work in groups of 3 or 4. The resources listed below are per group:

- 1 x AA (1.5V) cell
- 1 x Battery holder
- 1.5V bulb and bulb holder
- 3 x Crocodile leads
- Push button switch (made in previous activity)
- Morse code key – copy and enlarge above image

How to run the task

1. Engage the children in getting the bulb to light using the circuit components provided. This will be a good assessment of previous learning in Year 4 and will elicit their knowledge.
2. Support if necessary, by giving the following instructions for constructing the circuit:
 - Use the first crocodile lead to connect one side of the bulb holder to the positive wire of the battery holder.
 - Connect the second crocodile lead to the foil on one half of the switch. Make sure that the metal of the crocodile clip is firmly connected to the foil.
 - Connect the remaining end to the other side of the bulb holder.
 - Connect the third crocodile lead to the foil on the opposite side of the switch and the other end to the negative wire of the battery. The circuit is now complete.
3. Press down on the switch. The bulb should light up. If not check the wiring and that the bulb is functioning.
4. Explain that in the Morse Code table you have given them, the symbols are called “dots” and “dashes”. For example, the code to send the letter “A” is “dot dash.” The dots are the short signals, and the dashes are long signals. So, to send the letter “A”, you would send a short flash of light followed by a long flash of light.
5. Encourage the children to explore their Morse Code machine by using the push button switch to create short and long flashes. These imitate the Morse Code messages sent during war times. Ask them to try sending “SOS.” As the table shows, SOS is three short flashes, then three long flashes, then three short flashes.
6. Ask the children to elaborate by sending different letters to their group to see if they understand. The same circuit can be used to send a signal back to indicate whether they understood the letter you sent:
 - One flash back from them means “I understood what you sent”
 - Two flashes: “send that letter again”
7. Using this learning, extend the task by challenging the children to send a whole word successfully? How about a whole sentence?
8. Can their friends work out what has been sent and generate a reply?



Top Tips

- Support: have a prepared, working circuit available for children who are struggling.
- Elaborate: try replacing the crocodile leads with different materials such as strips of foil, binder clips or metal buttons.
- To create a brighter effect, use 2 x 1.5V cells and a 2.2V bulb (readily available from TTS).
- Download the App ‘Morse-it’ on to iPads for children to see Morse code in action:
<https://apps.apple.com/gb/app/morse-it/id284942940>

Evaluate learning

- If you change the order of the components in this circuit, will the bulb still light?
- Is there anything that you must keep the same?
- Can you send a whole word successfully to your partner?
- Is it possible to distinguish between a short and long flash of light?
- Would using a buzzer be easier? Why do you think this?

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As a practising teacher, Julie has written these 12 tasks to encourage more children to engage in engineering in primary schools. They have been stimulated by real-world engineering and inspirational ideas shared by others. They are linked to the Tinkering for Learning research and development project run by SEERIH.



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