



Communications teacher notes

Key Stage 2

Science:

- Simple circuits
- Light and sound

Key Stage 2

Mathematics:

- Position and movement

Overview

These activities look at different ways of communicating. There are three activities described here:

1. Sending messages using light
2. Signals with circuits
3. Co-ordinates, locations and routes

NOTE: a suitable risk assessment must be performed before carrying out any practical activity.

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Activity 1: Sending messages using light

This activity uses coded sequences of torch flashes. The sender and recipient need copies of the code book which links flashes to movement commands.

Children use a torch and code book to play a game of 'Simon Says.'

This method of communication is a little limited as both the sender and recipient can only use messages in the code book.

Morse code is more flexible as the code for the letters of the alphabet is universally known and can be used to spell out words, rather than relying on predetermined messages. It does however take more time to send a signal as each letter is transmitted individually. Morse code can be sent using light or radio (which give the characteristic sound of a Morse signal).

Preparation

- Torches (one per group)
- 'Simon Says' code book (can be found following these notes)
- Morse code alphabet sheet (extension - attached below)
- Morse code audio sample (extension)

Activity Notes

Children use torches to signal messages across a space and play a game of 'Simon Says.' Use a suitable space such as the hall or playground.

The game can be played in two ways. The teacher instructs which command should be given. One child relays this to the rest of the class using a torch and the code book. Alternatively, children can be split into smaller groups. Each group has a 'signal sender' who uses the torch to flash the commands to the remainder of the group.

Give children a copy of the code book. This lists commands and the corresponding sequence of flashes. Remember to tell children sending the message to pause between the 'Simon says' command and the movement command.

Extension

Children devise their own signals and make their own code book.

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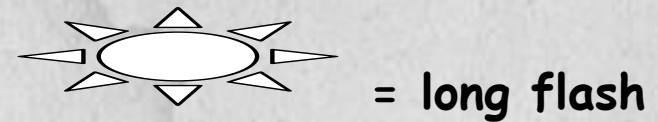
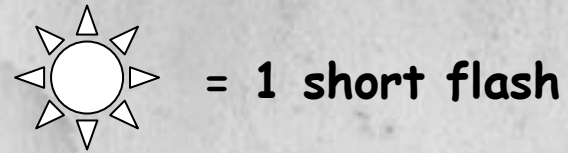
Children investigate Morse code. Use the Morse code alphabet sheet to spell out individual words and send messages. An on-line Morse code translator can be viewed at: <http://morsecode.scphillips.com/jtranslator.html>

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Simon Says Secret code book



Command	Code
Simple Simon Says	
Left hand in the air	
Right hand in the air	
Jump up and down	
Left foot up	
Right foot up	

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

Number	Morse code
1	• — — — —
2	• • — — —
3	• • • — —
4	• • • • —
5	• • • • •
6	— • • • •
7	— — • • •
8	— — — • •
9	— — — — •
0	— — — — —

Morse Code Alphabet

• = short flash or short beep

— = long flash or long beep

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Activity 2: Signals with circuits

This activity introduces the idea of sending signals using electricity and wires.

Preparation

- Wire, switch, battery and bulb to make one circuit per group
- Simon Says and Morse code alphabet sheets (can be found attached to activity 1)
- Signals through circuits activity sheet (attached below)

Activity Notes

Children make electric circuits containing a switch, battery and light bulb and use it to transmit signals. Circuits have the advantage over direct light sources as they do not require line-of-site and can be used over great distances. Link this with the idea of the land-line telephone system.

An alternative can see the use of a buzzer in place of the light.

If space permits (school playground or hall) circuits can be made to transmit the signals over greater distances. This may require larger batteries to supply the necessary power.

Extension

Have children draw circuit diagrams, using appropriate symbols to show their circuit. How could a circuit be made so that if one of the wires were to break, the circuit would still work and the signals still get through? Draw the circuit and test it.

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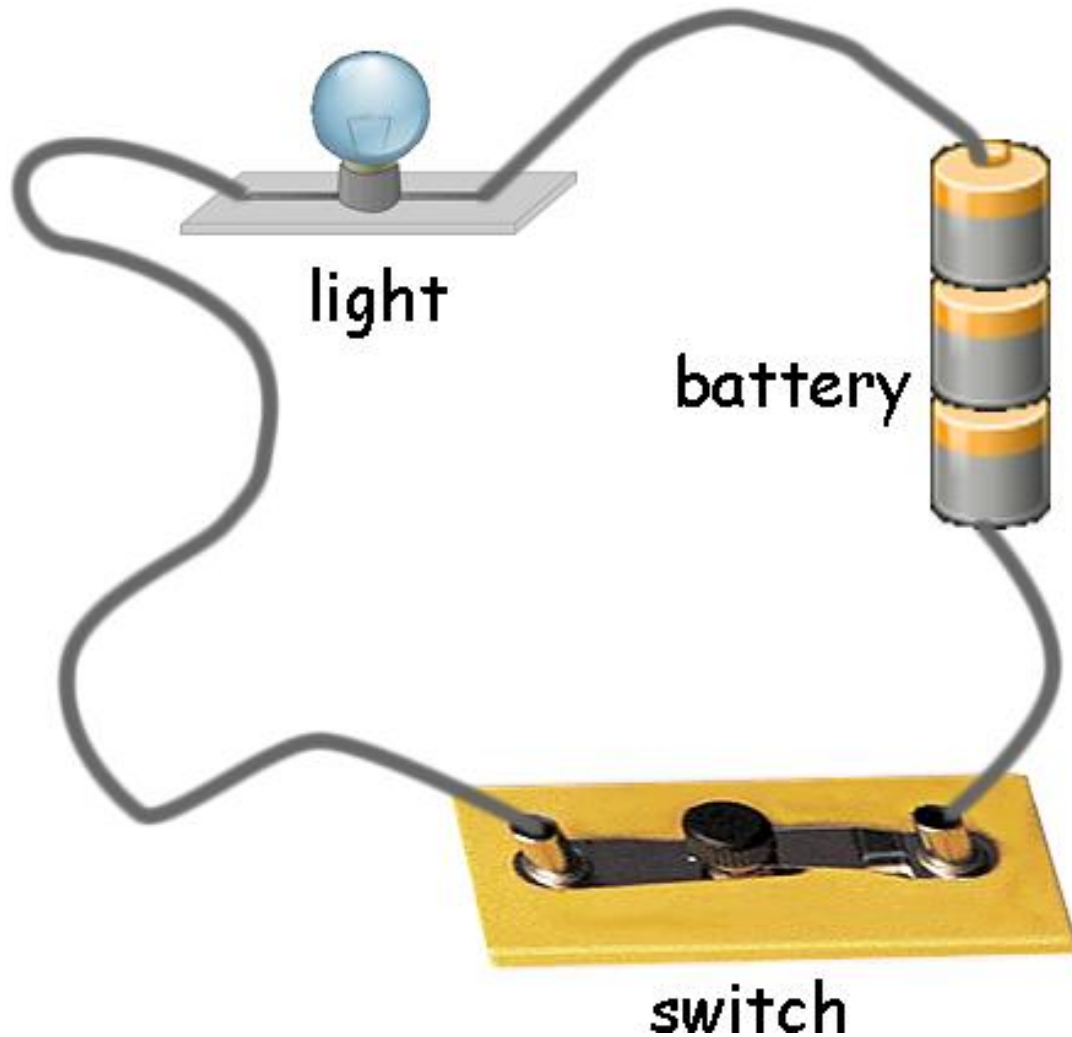
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Signals with circuits

Make this electrical circuit.
Use it to send secret signals to your partner.



You can send signals with electrical circuits like this one.
You could send signals by flashing torches.

Which is best? Torches or circuits?
Explain why one way is better than the other.

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Activity 3: Co-ordinates, locations and routes

Children play a game of 'Battleships' (with a difference) to practise defining locations using co-ordinates from a grid.

Preparation

- Photocopy of the airfield map (found after the activity notes) enlarged onto A3 paper
- Photocopy of Spitfire aircraft silhouettes (attached below)
- Scissors
- Road atlas
- Copy Flight of the bomber and UK Map Grid sheets for the extension activities (found below these notes)

Activity Notes

Children work in pairs.

Each child has a map of their airfield and the silhouettes of the Spitfire aircraft. They position their aircraft on the airfield, out of view of their opponent. In turns, each guesses a position, using the grid references on the map. The winner is the first one to get all of the other's aircraft.

Extension

Use the Flight of the bomber worksheet to use co-ordinates to plot a route. This is the type of plot that would be made to show the paths taken by bombers and pursuing aircraft during air raids over the UK.

In addition to the position of an aircraft, what other information would observers on the ground supply? (Time of observation, identification, altitude, speed and direction of aircraft).

Use the UK grid map to have children write the co-ordinates of flights from RAF Digby to some of the cities marked on the map.

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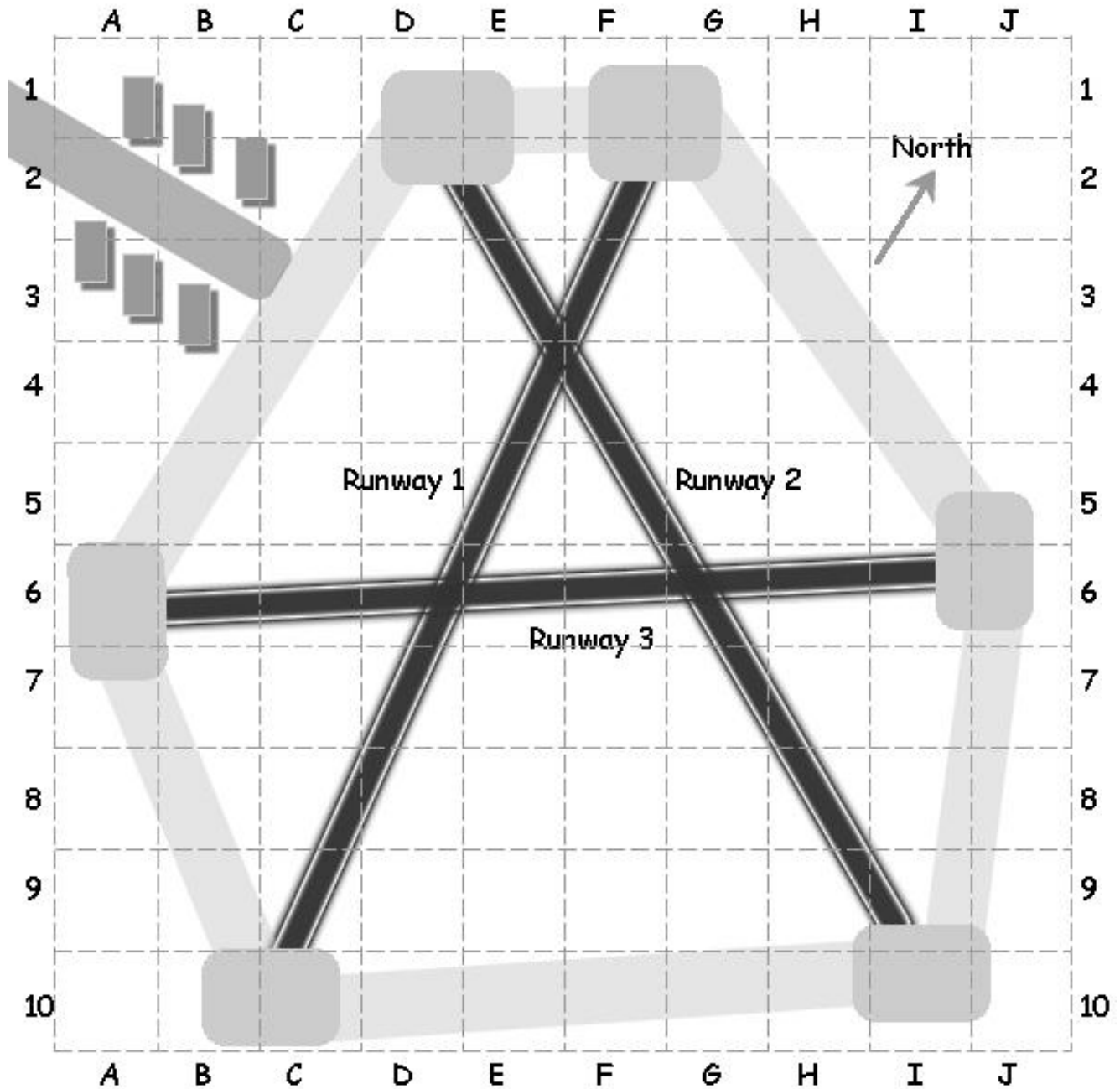
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Airfield map

Park your aircraft on the airfield.

See if your partner can use co-ordinates to find your aeroplanes.



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Spitfire Squadron

Cut around your Spitfires.

Park your aircraft on the airfield. You can't park on the runways.

See if your partner can use co-ordinates to find your aeroplanes.



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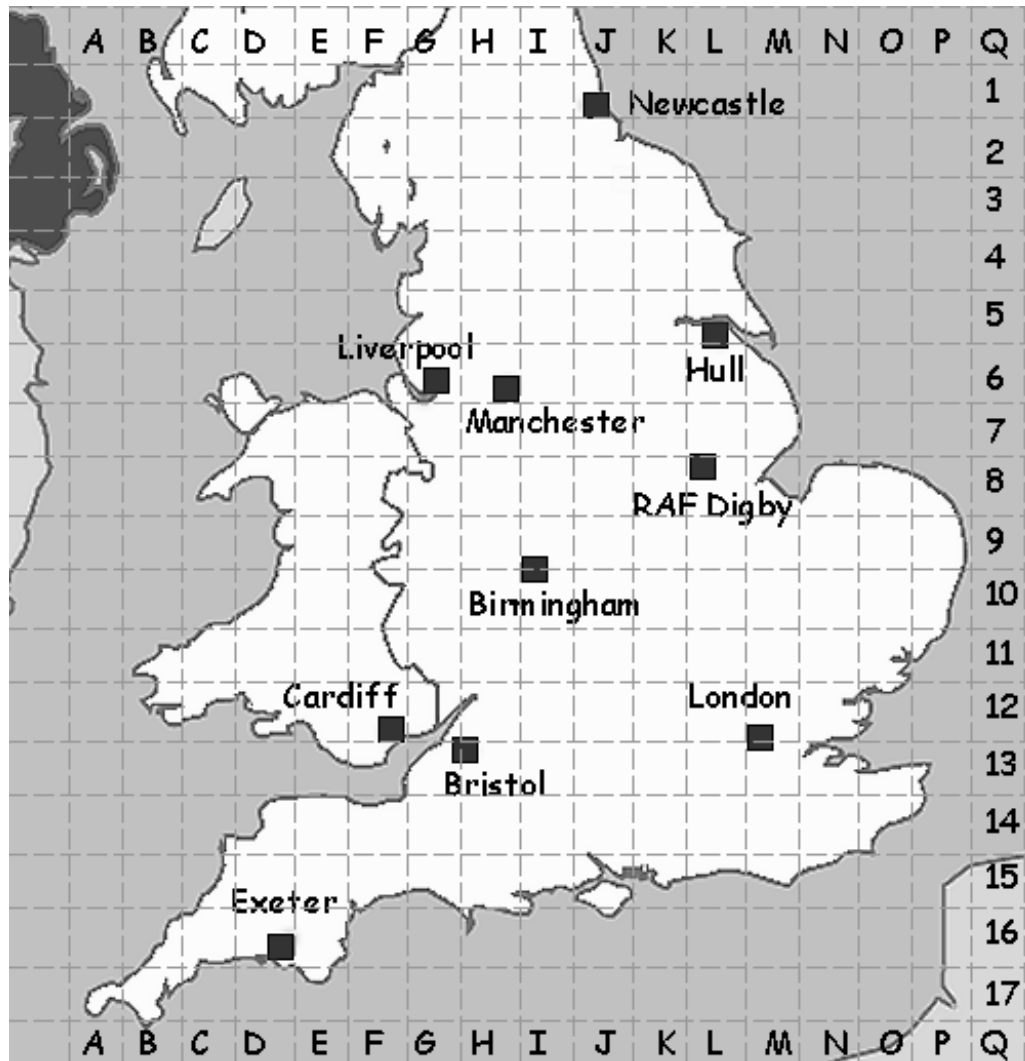
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Flight of the bomber

A German bomber plane flew over the UK during the war. Observers on the ground reported its position. These reports were used to plot where it went.

Use the reports below to plot the route of the bomber plane.



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Report	Location
1	Q8
2	P7
3	O6
4	N5
5	M5
6	L5

Report	Location
7	K6
8	J7
9	J8
10	J9
11	J10
12	K10

Report	Location
13	L10
14	M10
15	N11
16	O12
17	P13
18	Q14

UK grid map

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