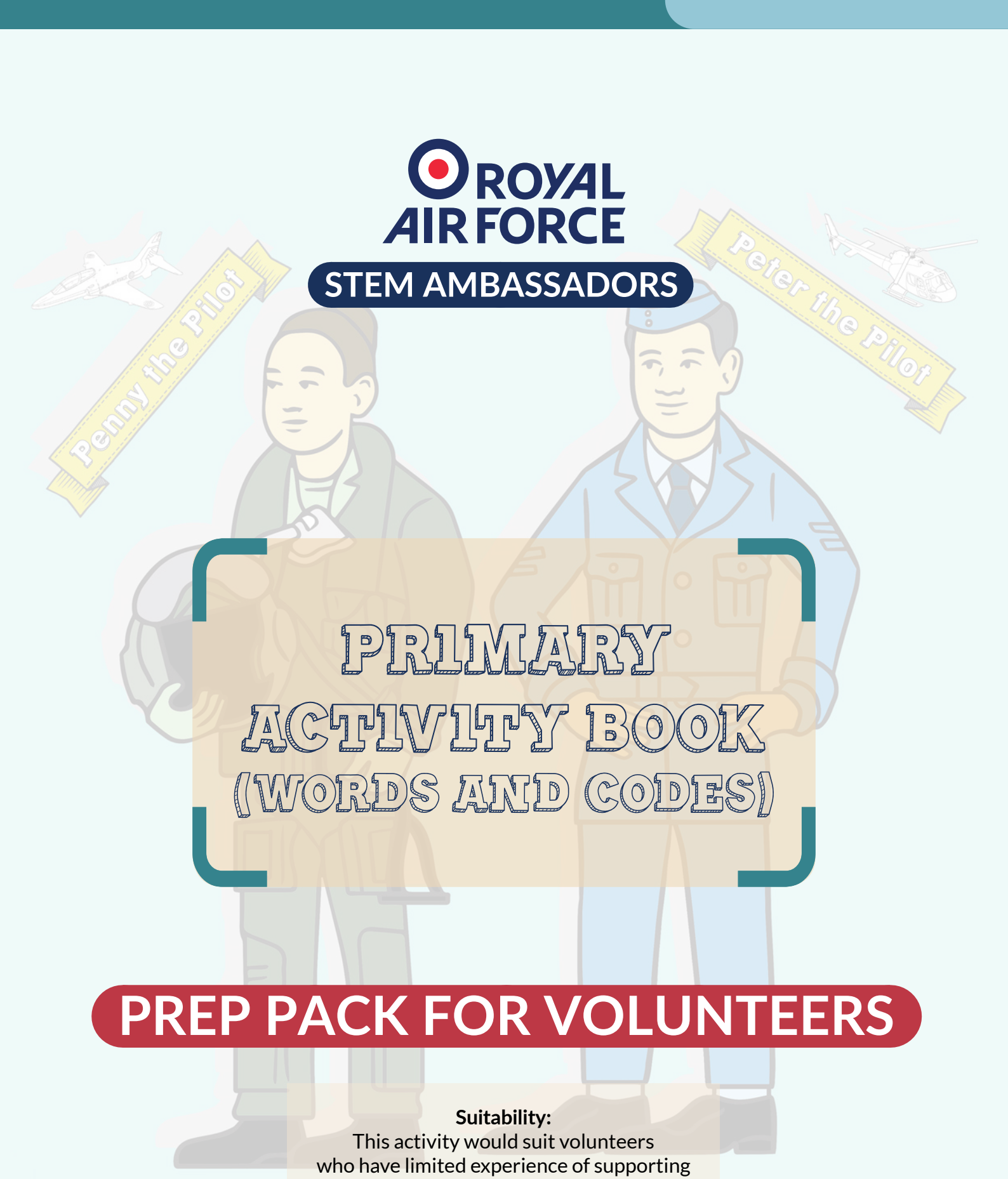
ROYAL AIR FORCE

STEM AMBASSADORS



PRIMARY ACTIVITY BOOK (WORDS AND CODES)

PREP PACK FOR VOLUNTEERS

Suitability:
This activity would suit volunteers who have limited experience of supporting STEM sessions in schools.

BEGINNER

★

Objective

The object of this activity is to **introduce codes and signals and show how they are used to communicate.**

Information to share with teachers

This session reinforces aspects of the KS2 National Curriculum around:

- Scientific investigation
- Problem solving
- Reasoning
- Making connections
- Reporting
- Evaluation

National Curriculum: science KS2

Promoting links between the school and the RAF (things to say)

- How the activity can help dispel myths about the RAF and illustrate available opportunities.
- Broaden horizons about careers and options.
- Help to enthuse and engage students.
- Raise teacher awareness of what the RAF do.
- Demonstrate how this activity can help the school develop closer links with RAF volunteers.

Activities in schools

Preparing to run the activity in a school

Typically teachers work to a lesson plan. Lesson plans detail the basic structure of the session, timings for each section and contingency plans for more and less able pupils. An example lesson plan is included in this pack.

Preparing yourself and agreeing timings, level of involvement for the school, for you and your colleagues

Make sure you get to the school in good time, allowing plenty of time for preparation and setting the room and your materials out. Check with your school link on what materials are provided and what you need to bring. If you require worksheets or photocopying, agree this with your school link well in advance of the session. Allow plenty of time to clear up at the end and make sure you have thought about a contingency plan if anything goes wrong. Identify the year group and level to pitch the activity at.

Most STEM Ambassador activity would typically be with years 5 – 9 (ages 9 – 13) and would cover aspects of the National Curriculum for Key stages 2 and 3.

The school science curriculum, part of the National Curriculum is detailed and schools would not expect you to know about this. However, you might like to take a look at some of its content to familiarise yourself with the areas covered.

National curriculum in England: science programmes of study

Schools run dedicated 'Career Day' events. You may be asked to incorporate a STEM session into these events. Take along career-linked resources where possible to hand out after the activity.

Planning this activity

The purpose of this activity is to introduce codes and signals and show how they are used to communicate.

This activity requires limited planning other than familiarising yourself with pages 18,19, 20 and 21 of the RAF Primary Activity Book.

RESOURCES REQUIRED

Pages 18-21 of the RAF Primary Activity Book
Semaphore flag print-out

+Pencils.
+Papers.
+Rubbers.

Powerpoint presentation 'Primary Activity Book' that accompanies this Prep Pack.

Although not essential for this activity, you can also access the complete Activity Book and accompanying Teacher Guide.

RAF Primary Activity Book
RAF Primary Activity Book: Teacher notes

Assessing risks associated with the activity

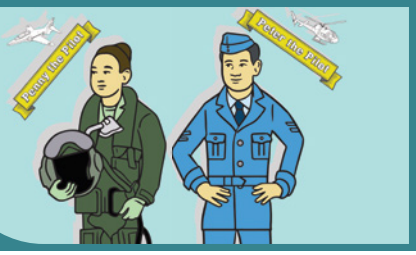
The organiser (typically the school or other host organisation) of the activity is responsible for the health and safety of the young people on their site or property. However, because you as the STEM Ambassador also have a duty of care you may be asked by the teacher or organiser to contribute to their risk assessment. Discuss the activity with the organiser (school) and ask them to provide a copy of their risk assessment.

Risk assessment examples

Your school contact should be aware of other risk assessments used for activities in school, which could be adapted for this activity. If they are unsure of the risks involved in running practical STEM activities in school you could direct them to relevant resources produced by experts in the field. STEM Learning have lots of resources/templates and guidance on this. The link below provides details of actions they can take to manage risk in their school, along with some templates for STEM-related activities.

A balanced approach to risk

As this STEM Ambassador Prep Pack details your activity and all the resources required, the school may find the pack useful in helping them to construct an appropriate risk assessment.



ID on the day

Visitors to schools may be asked for their current DBS Certificate or the corresponding Certificate Number. Schools may also ask for some form of current photo identification if a DBS Certificate is not produced. Schools will typically issue a visitor ID at reception for each separate visit to the school. Visitor ID if issued, must be worn at all times whilst on site. You should always expect to be working alongside a member of school staff where children are involved. It is not good practice for a visitor to be left alone with a group or individual children. STEM Ambassadors are reminded that the use of student personal data, photographs, videos or other information about students is not permitted and must not be put on social media.

Differentiation for more able and less able pupils:

More able

In pairs to develop own codes.
Lexicography/shapes and symbols.

Less able

Work through worksheets.
Create a sentence/phrase using basic code.
Simple letters/codes in group using torch light/ Morse code.

Logistics

Schools are secure sites and access may be restricted. Ask your school contact before you visit about getting onto the site, where to park and where to report to. Schools may not provide lunch so it may be advisable to bring your own refreshments and snacks.

Parking at some schools can be difficult. Check with your schools contact about the availability of visitor parking.

Handouts for pupils

Pages 18-21 of the RAF Primary Activity Book
Semaphore flag print-out

Additional resources

If you are interested in adapting or enhancing this activity we've identified some additional online resources to help you with this. Click the weblinks below to find out more.

How code breakers work
Aiming for awesome: code breaking

Running the activity: lesson plan

Session length: 50 minutes

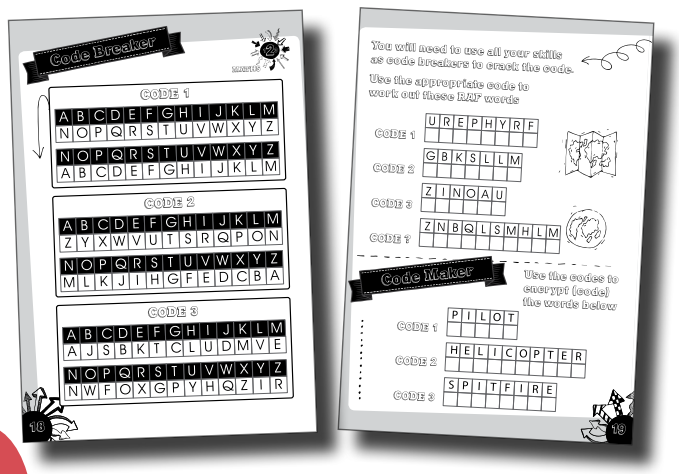
10 minutes

Introduction to codes and signals and how they are used. Ask pupils to suggest examples of codes or why we might use them.

Emojis are a form of code! Ask pupils to identify what these four mean.

30 minutes

Tell group that today we are going to work as code breakers! Distribute page 18 and 19 from Primary Activity Book.



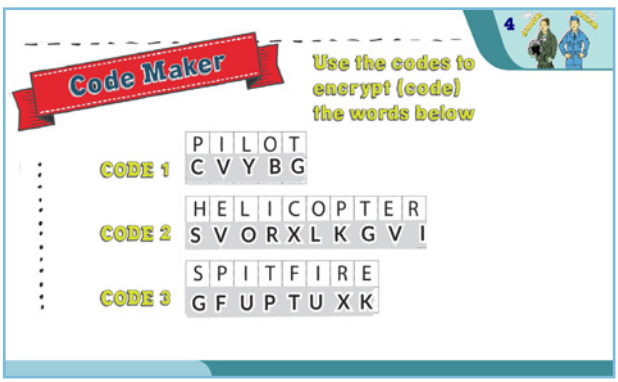
Provide a few examples of using the code, such as:

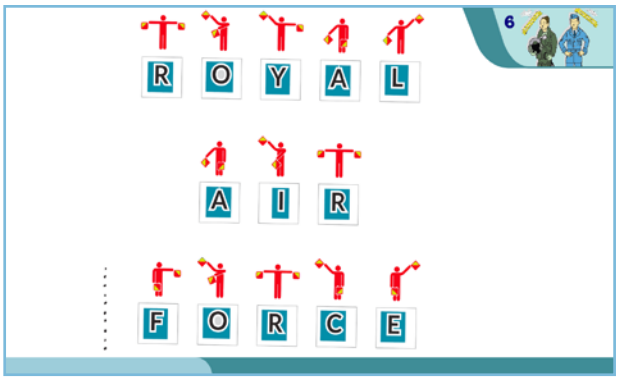
What is the code for letter A?
Answer = N in Code 1.
Answer = Z in Code 2.
Answer = A in Code 3.

What is the code for letter D?
Answer = Q in Code 1.
Answer = W in Code 2.
Answer = B in Code 3.

- ★Hercules and Typhoon are two aircraft that are used by the RAF.
- ★Runway is used by aircraft to take-off and land.
- ★Amy Johnson is the first woman to fly solo from the UK to Australia (doing it in 1930 - almost 90 years ago!

Allow time for pupils to work through the 3 code breaking activities.

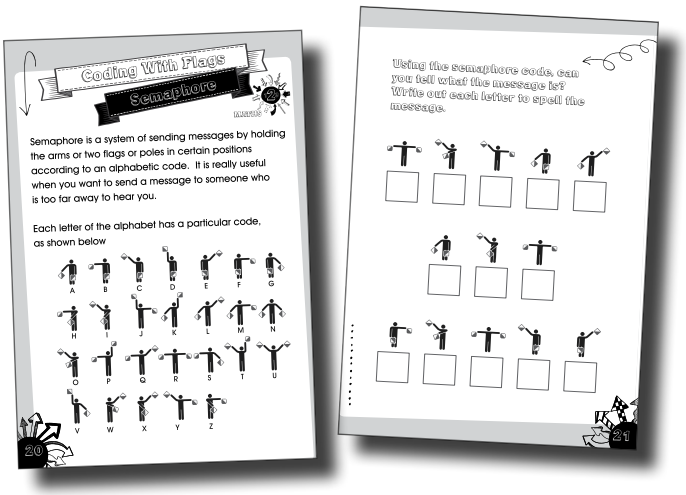




There are lots of other codes that people use. Ask the group to say why they think flags might be a useful code to send messages (answers might include that it enables communication when you can't hear each other easily).

Using printed semaphore flags (x2) present some example letters to the group so that they can become familiar with identifying letters.

Distribute page 20 and 21 from Primary Activity Book. Ask pupils to work out the semaphore code.



10 minutes

Plenary – recap what we have learned.

Code Breaker

CODE 1

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

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

CODE 2

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

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

CODE 3

A	B	C	D	E	F	G	H	I	J	K	L	M
A	J	S	B	K	T	C	L	U	D	M	V	E

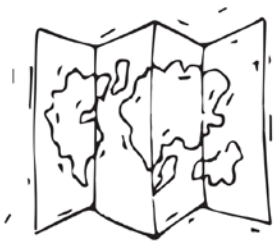
N	O	P	Q	R	S	T	U	V	W	X	Y	Z
N	W	F	O	X	G	P	Y	H	Q	Z	I	R

You will need to use all your skills as code breakers to crack the code.

Use the appropriate code to work out these RAF words

CODE 1	U	R	E	P	H	Y	R	F

CODE 2	G	B	K	S	L	L	M



CODE 3	Z	I	N	O	A	U

CODE ?	Z	N	B	Q	L	S	M	H	L	M

Code Maker

Use the codes to encrypt (code) the words below

CODE 1	P	I	L	O	T

CODE 2	H	E	L	I	C	O	P	T	E	R

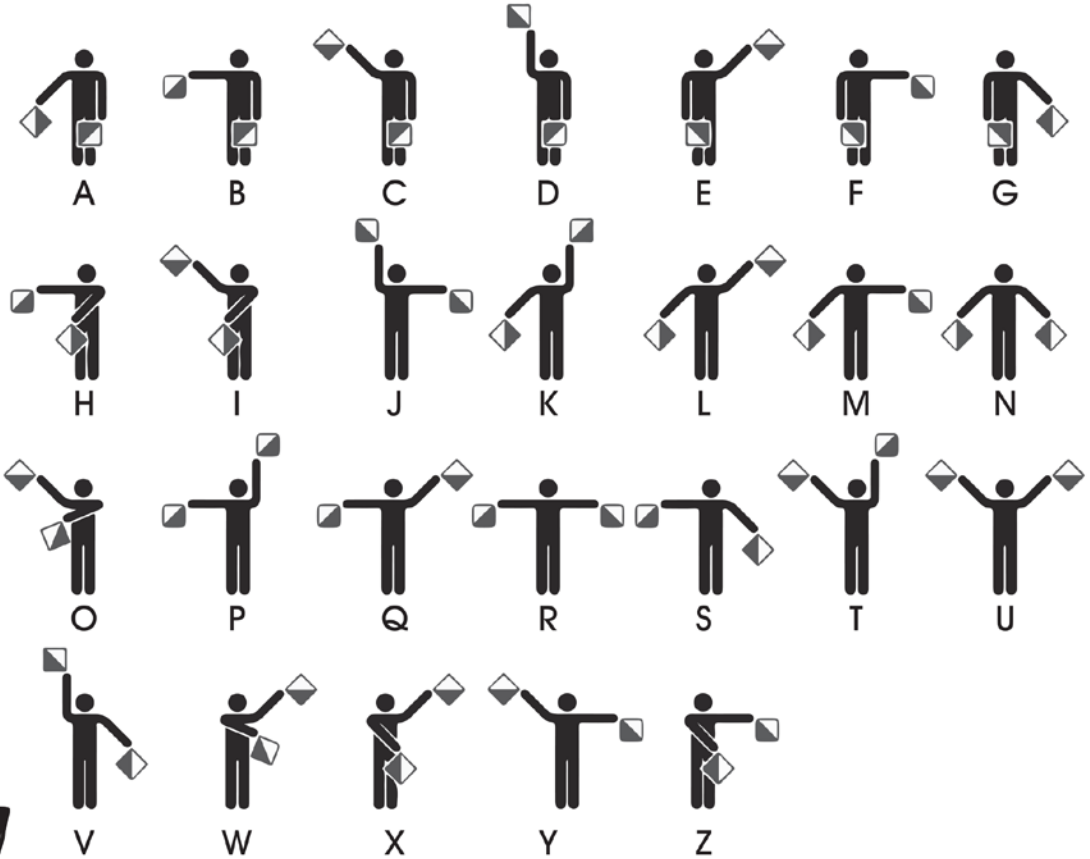
CODE 3	S	P	I	T	F	I	R	E

Coding With Flags

Semaphore

Semaphore is a system of sending messages by holding the arms or two flags or poles in certain positions according to an alphabetic code. It is really useful when you want to send a message to someone who is too far away to hear you.

Each letter of the alphabet has a particular code, as shown below



Using the semaphore code, can you tell what the message is? Write out each letter to spell the message.