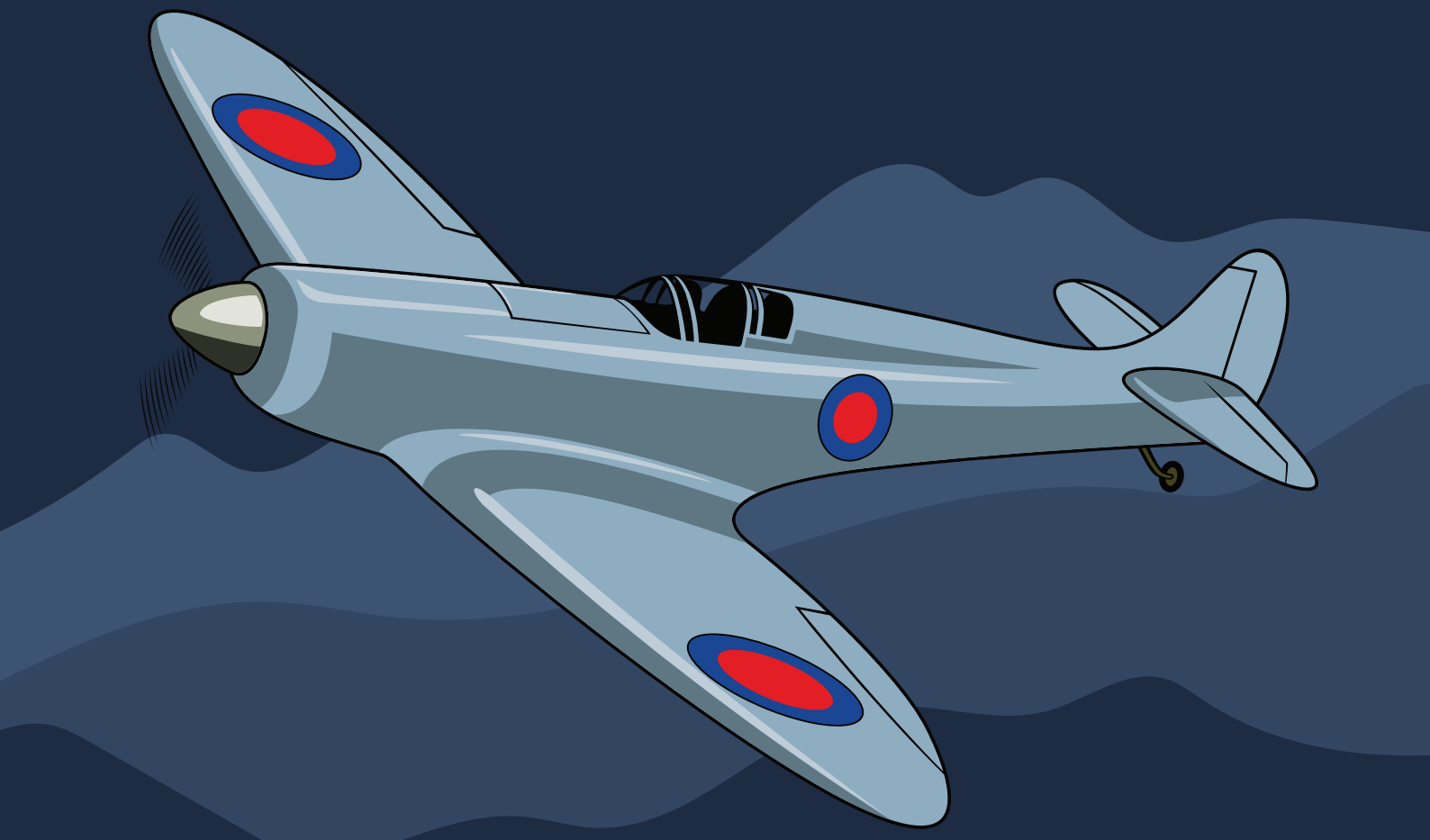
THE HISTORY OF SPITFIRE AA810

ACTIVITY WORKPACK 1



ROYAL AIR FORCE Youth STEM

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SPITFIRE AA810

FOR FACILITATORS / TEACHERS

ABOUT THESE MATERIALS

This resource pack provides students with the opportunity to explore the science and history underpinning the development and deployment of Spitfire AA810 during WWII. The materials form part of a suite of five resource packs exploring a particular area linked to Spitfire AA810. These resources concentrate on **the history of Spitfire AA810**. Curriculum links for KS3 learners are provided below to support embedding the content within your structured delivery or teaching sessions.

CURRICULUM LINKS

History / STEM

- ✓ **Science in Society:** Exploring the role of Hazel Hill's mathematical contributions to increasing the fire-power of the Spitfire, and understanding the intersection of science, mathematics, and societal norms.
- ✓ **Working Scientifically:** Encouraging students to engage in research and critical thinking about historical figures, and effectively communicating their findings.

Physics

- ✓ **Forces:** Investigating the effects of forces on movement, and the physics behind flight.
- ✓ **Energy:** Exploring the energy efficiency of the modified Spitfire AA810, linking to the concepts of energy transfer and efficiency.

ABOUT SPITFIRE AA810

Spitfire AA810 is a famous aircraft from the Second World War. It is known for its important role in taking photographs of enemy areas. This particular Spitfire was used by a special group that flew deep into enemy territory to gather information through aerial photography. Unlike regular Spitfires, AA810 had no guns but instead carried lots of extra fuel and cameras. This allowed it to fly 2,000 miles to complete some of its missions. Today, there is a project to restore Spitfire AA810 so it can fly again. This project helps remember the brave pilots who flew it and it teaches people about their contributions during the war. You can find out all about this by **clicking here**.

FOR FACILITATORS / TEACHERS

GUIDANCE NOTES AND ANSWERS

This pack has been designed so that it can be comfortably delivered in a 1-hour facilitated session with secondary pupils. This pack forms part of a series of resources designed to explore the history and science linked to Spitfire AA810. Each pack in the series contains web-links and QR codes to suitable background and contextual information to inform your delivery of the content. Answers to tasks and activities, where relevant, are provided below:

PAGE 6: Build your own timeline

1941: Spitfire AA810 is constructed and begins service with the Photographic Reconnaissance Unit for the RAF, undertaking critical missions.
1942: During a mission to photograph German battleship Tirpitz, AA810 is shot down over Norway. Pilot, Alastair 'Sandy' Gunn is captured by German forces after escaping the wreckage.
1944: Gunn participates in the "Great Escape" from Stalag Luft III, but is recaptured and executed by the Gestapo.
2018: The wreckage of AA810 is discovered and recovered from a Norwegian peat bog, after 76 years.
2019: Restoration plans for the AA810 are initiated, aiming to restore the aircraft to flying condition and bring awareness to its legacy.
2026: Full restoration of the AA810 is expected to be completed. It will then be based in the Shuttleworth Trust at Old Warden airfield.

PAGE 8: Women in war: the Spitfire mathematician

What were the main contributions that Hazel made and the impact that she made?
Hazel had a huge influence as a result of the calculations she produced. These led to the installation and use of 8 guns on the Spitfire, instead of 4. Her work influenced strategic plans during the War and helped support the victory achieved in the Battle of Britain.

Why may Hazel have faced resistance for the work she was doing?
Equal rights for women were fairly limited in the 1940s. As a result Hazel may have faced resistance in her role as a mathematician due to her being a woman. The work she did went against the gender norms and stereotypes of the time.

SPITFIRE AA810
KEY FACTS

AUG 1941
First parts built

27 AUG 1941
Engine built

17 OCT 1941
Test flight

19 OCT 1941
Into Service

5 MAR 1942
Final flight

20
FLIGHTS

16
MISSIONS

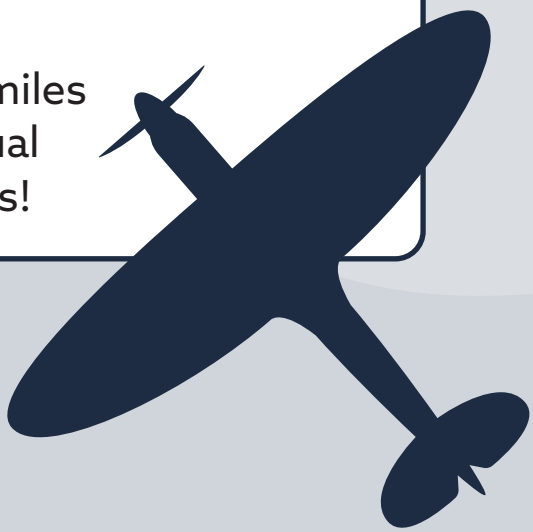
2000
RANGE (MILES)

1941
Original frames and systems built in East Cowes

2022
GKN Aerospace apprentices help restore AA180

ALL ABOUT SPITFIRE AA810

- Spitfire AA810 was a variant of the 'Supermarine Spitfire' – it lacked armament to make it lighter and faster for high-altitude flights.
- Part of the Photo Reconnaissance Unit, Spitfire AA810 was specifically used for missions that required detailed aerial photographs of enemy supplies, personnel, and ships.
- Gathered vital intelligence for the Allied Commanders to plot war strategy.
- On March 5, 1942, Spitfire AA810 was shot down over Norway while photographing a German battleship: Tirpitz. The pilot on that flight was Alastair "Sandy" Gunn – who escaped the crash but was later captured and murdered by the German army.
- The wreckage from Gunn's aircraft was not recovered until 2018. It had spent 76 years in a peat bog on a Norwegian mountain.
- Spitfire AA810 could fly almost 2,000 miles as a result of its modifications. The usual range of a Spitfire aircraft was 575 miles!



Scan the QR code or click here to find out more about this amazing aircraft.

BUILD YOUR OWN TIMELINE!

Using the information we have provided on Spitfire AA810, and through your own research, cut out the key events (next page) and make your own timeline by adding the event to the correct year.

1941

1942

1944

2018

2019

2026

During a mission to photograph German battleship Tirpitz, AA810 is shot down over Norway. Pilot, Alastair 'Sandy' Gunn is captured by German forces after escaping the wreckage.

Full restoration of the AA810 is expected to be completed. It will then be based in the Shuttleworth Trust at Old Warden airfield.

Spitfire AA810 is constructed and begins service with the Photographic Reconnaissance Unit for the RAF, undertaking critical missions.

The wreckage of AA810 is discovered and recovered from a Norwegian peat bog, after 76 years.

Gunn participates in the "Great Escape" from Stalag Luft III, but is recaptured and killed by the Gestapo.

Restoration plans for the AA810 are initiated, aiming to restore the aircraft to flying condition and bring awareness to its legacy.

WOMEN IN WAR: THE SPITFIRE MATHEMATICIAN

- Hazel Hill was an instrumental figure in increasing the fire-power of the Spitfire in the lead up to the Battle of Britain.
- Daughter of Captain Fred Hill. He had the idea to improve the efficiency of the Spitfire by doubling the number of guns it could carry, but couldn't figure out how to do this.
- Hazel Hill, when she was 13 years old, worked on these problems by doing calculations on the kitchen table.
- She eventually calculated out how to add 8 guns instead of 4.
- Her ingenuity and determination to find a solution was a large factor in military victory.

Scan the QR code or click here to watch this interview with some of the relatives of Hazel.

Now that you have carried out some research on Hazel, answer the questions about her on the next page.

What adaptations to the Spitfire did Hazel work on? What impact did her work have on the war effort?

Why may Hazel have faced resistance for the work she was doing?

BUILD YOUR OWN MINI SPITFIRE AA180 MODEL!

R.J Mitchell famously designed the Spitfire, and now you can build your own mini model! Arguably the most famous fighter aircraft of the Second World War, the Spitfire first flew in 1936. With its powerful Merlin engine, and R.J Mitchell's distinctive elliptical-wing design, the Spitfire soared through the air with remarkable speed.

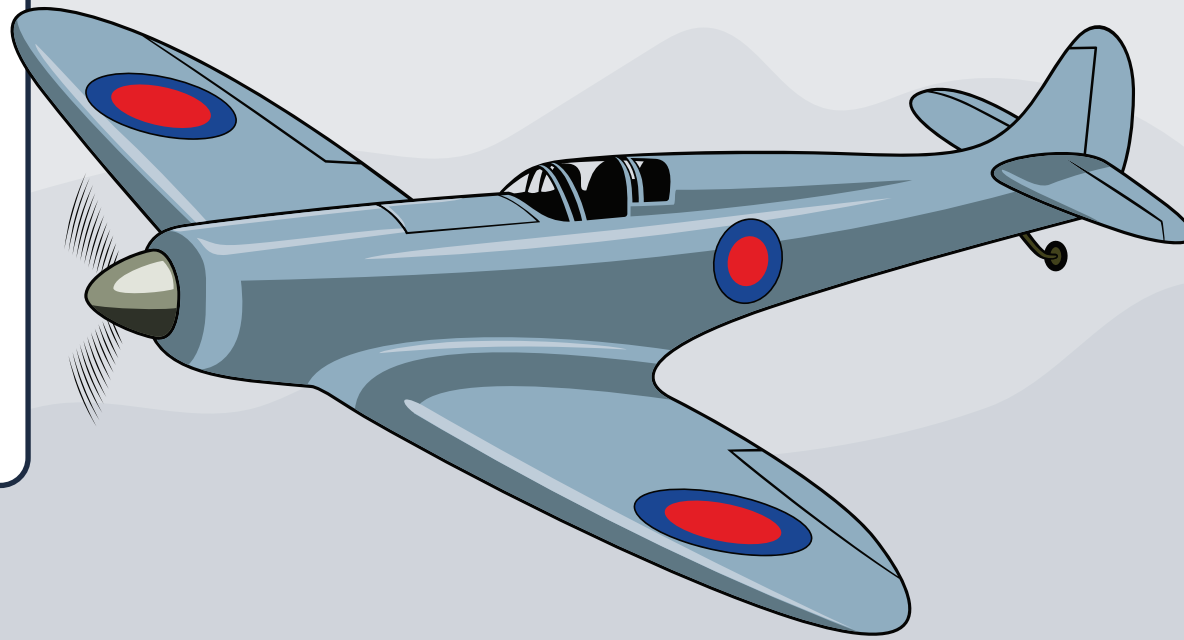
Put your engineering skills to the test and print out the templates and follow the instructions to build a replica of a Spitfire!

You will need:

- Printed templates (page 12 & 13)
- Scissors
- Glue stick

DID YOU KNOW?

The spitfire fighter aircraft was designed by R.J. Mitchell and first flew in 1936. It entered RAF service in 1938, just in time for World War 2. K5054 was the very first Spitfire prototype.



BUILDING INSTRUCTIONS – SPITFIRE AA180

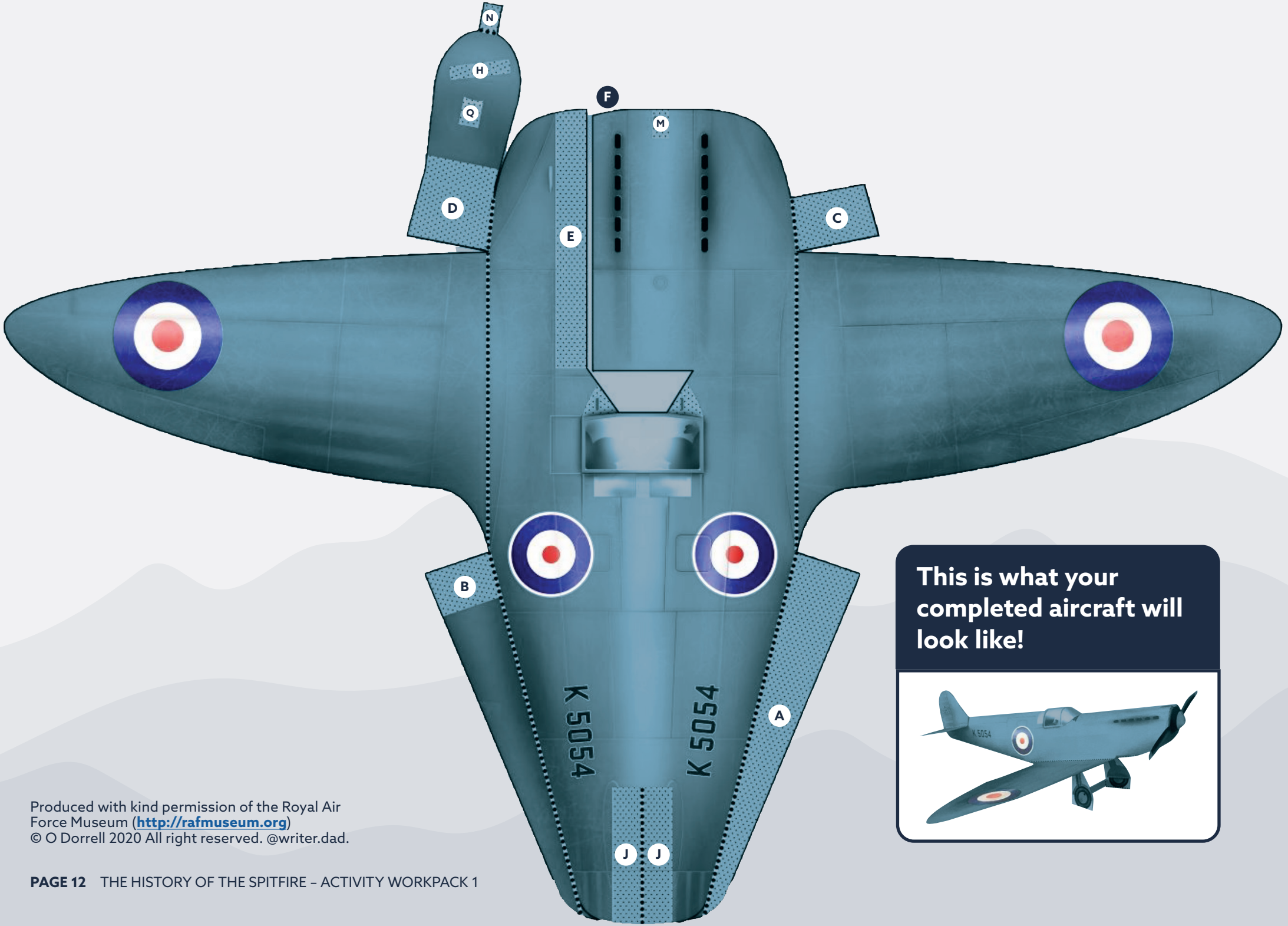
How do I make it?

1. Cut-out all 9 pieces (don't forget the cut into THE SPINNER!)
2. Fold all the dotted lines, to match the picture of the finished model.
3. Glue **A** under **B**. Glue **C** under **D**. Glue **E** under **F**.
4. Glue THE PROPELLER (**G**) onto **H**.
5. Glue THE WINDSCREEN corners onto **I**.
6. Glue THE TAILPLANE together (but not the wings!) and glue it each side of **J**.
7. Glue **K** onto **D**. Glue **L** onto **B**
8. Now glue the LOWER WINGS under the upper ones.
9. Fold both engines together and glue them closed.
10. Glue the SMALL ENGINE onto the middle of the BIG ENGINE
11. Glue the BIG ENGINE under the **M** area.
12. Glue **N** onto **M**
13. Glue THE SPINNER together over **O** to make a cone.
14. Glue **P** onto **Q**. Glue **R** onto **N**.
15. Glue **S** onto **T**. Glue **U** onto **V**, Glue **W** onto **X**.
16. Glue THE UNDERCARRIAGE **(Z)** onto **Y**.

Cut

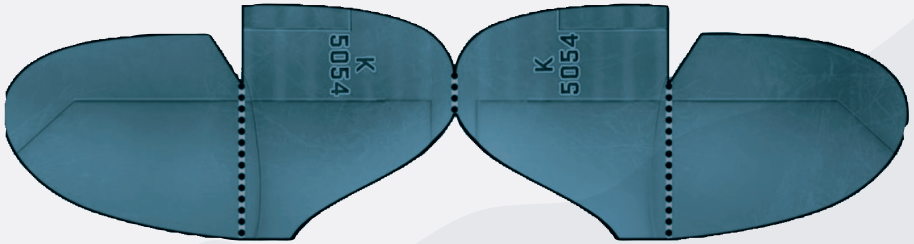
Fold

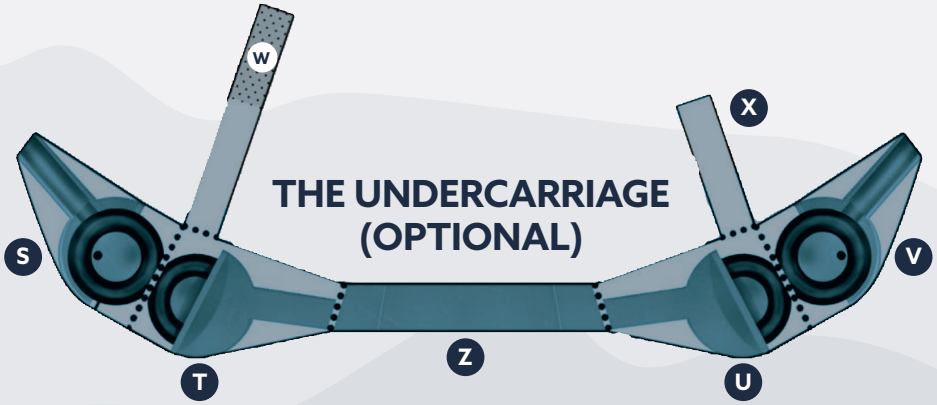
Glue



This is what your completed aircraft will look like!

THE TAILPLANE



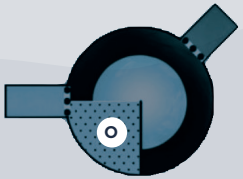


THE UNDERCARRIAGE (OPTIONAL)

HOW TO FLY YOUR SPITFIRE!

To fly your spitfire hold the model at its nose between your first finger and thumb, then gently throw it like a dart.

THE PROPELLER



THE SPINNER

THE WINDSCREEN