

# Sir Lawrence Arthur Pattinson

The story of a  
First World War pilot

In Autumn 2019, Year 9 and 10 children from two Northumberland schools explored the letters of local man, Sir Lawrence Pattinson to find out what it was like to be a pilot during the First World War. Using Sir Lawrence's sketches of First World War aircraft as inspiration, the students looked at the advances in technology and the development of aviation during this period and took on the role of engineers, designing, building and testing their own model aircraft.



## Sir Lawrence Arthur Pattinson

The Pattinson (Sir Lawrence) archive is held at Newcastle University. It predominantly comprises letters written by Sir Lawrence to his family, while he served as a pilot during the First and Second World Wars.

Born in 1890 in Newcastle Upon Tyne, and later getting his degree from Cambridge University, Pattinson enlisted in the Royal Flying Corps (the air arm of the British Army) when the First World War broke out in 1914. He served as a scout fighter pilot on the Western Front, being awarded a military cross and promoted firstly to Officer Commanding No.57 Squadron in June 1915 and then to Flight Commander RFC Temporary Captain of the Royal Flying Corps in October of that year. He remained with the squadron for three years, during which time he led scouts (fighter aircraft), photographic reconnaissance and bombing. He went on to have a distinguished career in the RAF, ultimately becoming Air Officer Commanding-in-Chief of Flying Training Command during the Second World War. Upon his retirement he moved back to the North East of England where he died in 1955, aged 64.

## USING THE PACK

This teacher's pack contains a range of ideas for you to use the Pattinson archive creatively with your learners. The first section has a History focus and the second section has a Science, Technology, Engineering and Maths (STEM) focus. The activities are designed to give your learners an insight into aviation during the First World War and the experiences of pilots at this time. They also encourage your learners to think like engineers and be creative in solving practical problems.

The activities are aimed at Year 9 and 10 students but can be re-worked for use with younger students.

### Section 1: History

**Activity 1:** Introducing the First World War

**Activity 2:** The War in the Air

**Activity 3:** What it was like to be a pilot during the First World War?

**Activity 4:** The Fallen of Armstrong College

### Section 2: Science, Technology, Engineering and Maths

**Activity 1:** The Principles of Flight

**Activity 2:** Build a First World War Aeroplane Challenge

## SECTION 1: HISTORY

### Activity 1: Introducing the First World War

This activity will help you find out what your students already know about the First World War and enable them to fill in any gaps in their basic knowledge about the conflict.

Divide the class into small groups and get each group to complete a 5Ws exercise:

**WHO** was involved in the First World War?

**WHAT** was the First World War called at the time?

**WHEN** did the war start and end?

**WHERE** did the fighting take place?

**WHY** did the First World War break out in 1914?

If they need some help, you may wish to direct the students to these Key Stage 3 revision materials from the BBC: <https://www.bbc.co.uk/bitesize/guides/z4n4jxs/revision/1>

Get each group to share what they know, or have found out, about one of the 5Ws.

### Activity 2: The War in the Air

After completing Activity 1, students should be aware that fighting took place on land, at sea and in the air during the First World War.

This activity will introduce them to the role played by aircraft during the First World War.

Explain to the students that First World War was the first major conflict when aircraft were used on a large scale and that aviation developed rapidly in this period due to the demands of war.

Show the students this video clip (approx. 7 minutes) from BBC Bitesize: <https://www.bbc.co.uk/bitesize/clips/z34tn39>

As they watch, get the students to make a note of what planes were used for during the First World War and anything else interesting they can learn from the film about aircraft at this time. Discuss.

You may wish to arrange a visit for your students to a military museum to enhance their learning. The students taking part in our project went on a visit to the North East Land, Sea and Air Museum, Sunderland (<https://www.nelsam.org.uk/default.htm>) where they saw a replica First World War aircraft - the Morane-Saulnier - and found out about its pilot, Claude Ridley.





### Activity 3: What was it like to be a pilot during the First World War?

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This activity helps your students to find out what it was like to be a pilot during the First World War through engagement with primary sources.

All of the sources used in this activity are extracts from letters written by Sir Lawrence Arthur Pattinson whilst he was a pilot during the First World War.

You can download and print the sources here: <https://www.ncl.ac.uk/library/services/education-outreach/resources/sir-lawrence-pattinson>

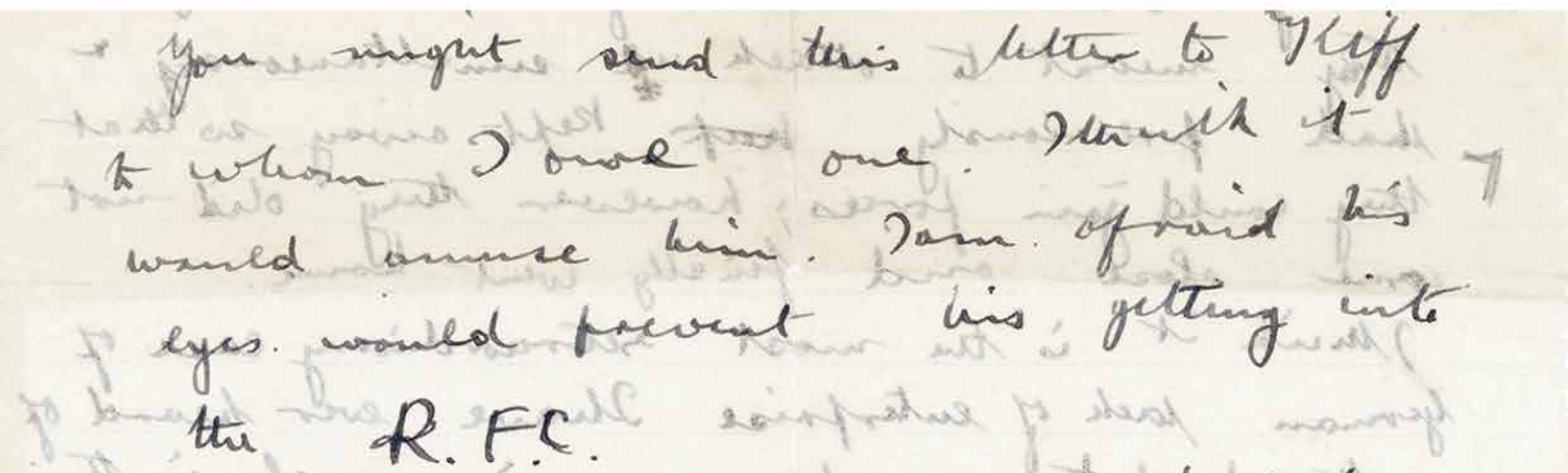
Get the students to work in pairs or threes and give each group a different source (Sources 1-11)

Ask the students to read their extracts and answer the following questions:

- 1) What is this extract about?
- 2) What can you learn from this source about what it was like to be a pilot during the First World War?  
(Write down at least 2 adjectives - they may be words used by Sir Lawrence in his letter or words you think describes what it was like - make sure you can explain why these words are appropriate).
- 3) What (if anything) can you learn from this source about aircraft in the First World War?

Get each pair to tell the rest of the class about their source and record the adjectives they have come up with on the whiteboard.

Also make a note on the whiteboard of anything we can learn from the sources about aircraft during the First World War (e.g. Source 2- aircraft were covered in fabric, Source 3 - at first aircraft didn't have mounted guns, Sources 4 and 6 - aeroplane engines were unreliable etc.)





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## Activity 4: The Fallen of Armstrong College

This activity enables your students to find out about some individuals associated with Newcastle University who served, and lost their lives, in the Royal Flying Corps (the precursor to the Royal Air Force) during the First World War.

Firstly, show the students the following video (approx. 7 minutes) which will give them some information about Armstrong College and the war memorial which commemorates the students, former students and staff of Armstrong College who lost their lives in the First World War:

<https://www.youtube.com/watch?v=ZNk-atleq8I>

Get the students to work in pairs and to log on to this website: <http://memorial.ncl.ac.uk/>

Ask them to use the website to find someone from Armstrong College who served with the Royal Flying Corps and who died during the First World War (they should be able to find information about 13 individuals from Armstrong College who lost their lives during the First World War whilst serving in the Royal Flying Corps).

They can do this by clicking on 'Explore', 'Browse and Search' and then using 'Advanced Search' to filter the list of servicemen by 'Service' (they should select 'Air') and 'University Affiliation' (they should select 'Armstrong College, Newcastle Upon Tyne'). Alternatively, you may wish to give them the name of one of these 13 servicemen which they can just type directly into the search bar.

Ask the students to make a note of the following:

**Name**

**Age**

**Date of death**

**Age at time of death**

**Circumstances of death**

**Any other interesting information**

Get each pair to feed back what they have found out about their individual – draw out that they were all in their teens or twenties, that they served in a variety of places (many in France but also, UK, Greece, the Balkans, Egypt) and were killed in a variety of circumstances (some were shot down, including by 'the Red Baron', some crash landed, some died in accidents).



## SECTION 2: SCIENCE, TECHNOLOGY, ENGINEERING AND MATHS

### Activity 1: The Principles of Flight

This activity introduces your students to the basic principles of flight and gets them to consider the importance of aircraft design features such as wing shape.

Get the students to log on to the following website:

<https://www.bbc.co.uk/bitesize/topics/zvb76v4/articles/zbmkbk>

Use the information on this website to find out the following:

- What 4 forces are required for an aeroplane to fly?**
- Which part of the aircraft generates 'lift'?**
- What is the ideal shape for a wing?**
- What causes 'lift'?**

You may wish to demonstrate weight, lift, drag and thrust by either demonstrating or getting the students to have a go at the following simple experiments:

#### Experiment a):

#### Weight (Hammer and Feather Experiment)

You will need a rubber mallet and a feather for this experiment.

Hold up the rubber mallet and the feather.

Ask the students, what will happen if you let go of them?

Why? Discuss Gravity.

Ask them which will hit the ground first? Why? Get a student to let go of them both at the same time to see if their prediction is correct.

Explain that for many years people believed the 4th century Greek Philosopher, Aristotle who said that heavier objects fell faster than lighter ones. However, in the late 16th century this theory was disproven by the Italian scientist Galileo who dropped 2 cannon balls, one heavier than the other, from the leaning Tower of Pisa and found that they hit the ground at the same time.

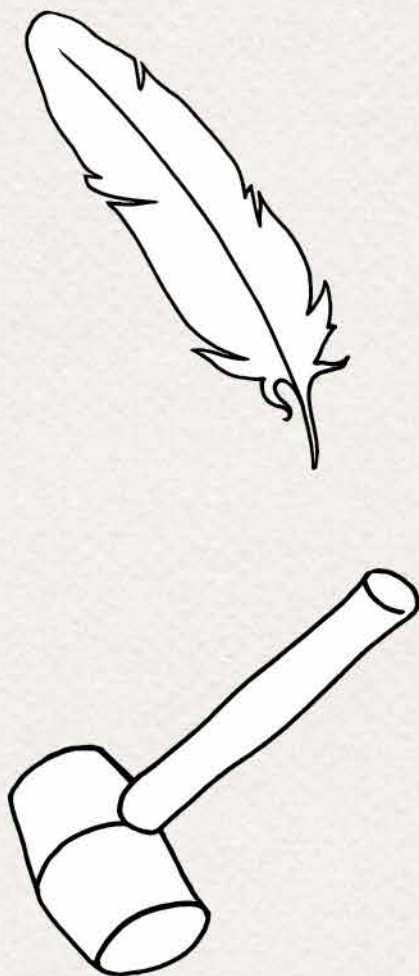
Ask the students what they think would happen if they tried the hammer and feather experiment on the moon? Why?

Tell them that this experiment was actually done on the moon in 1970 and show them the film of this experiment from NASA.

<https://www.bbc.co.uk/teach/terrific-scientific/KS2/zd9r2sg>

Ask the students why the feather fell at the same rate as the hammer on the moon, but more slowly on earth?

Discuss air resistance (drag), how there is no air resistance on the moon and how air resistance affects different shapes in different ways.



## Activity 1: The Principles of Flight

### Experiment b):

#### Drag (Flying Fish and Helicopters Experiment)

##### Flying Fish

You will need paper and scissors for this experiment.

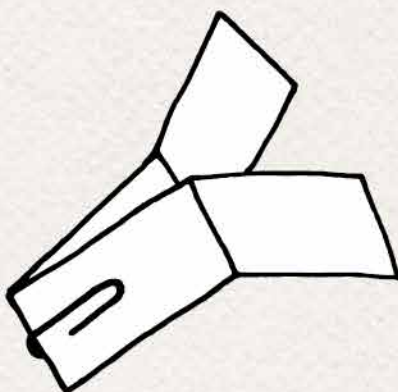
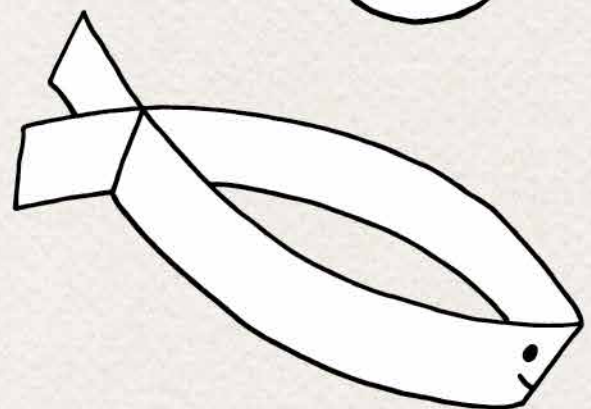
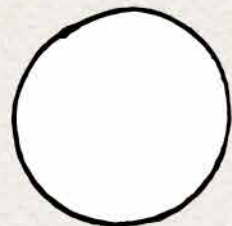
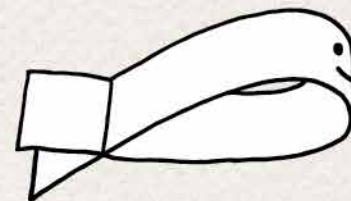
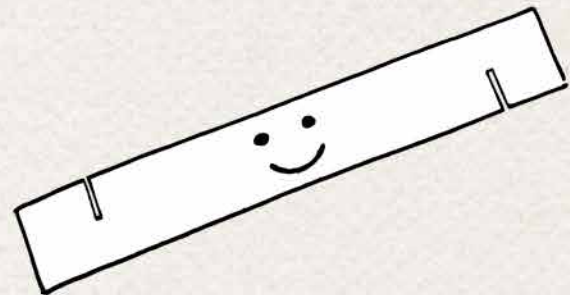
Cut 3cm-wide strips of paper in various lengths e.g. 300mm, 200mm, 100mm. Fold in half to find the middle. Draw a face over the fold (optional but fun!). Make scissor cuts 2cm from each end, halfway through but opposite as shown by the pencil lines above. Link the two opposite scissor cuts to make the fish.

First drop a ping pong ball and discuss in terms of gravity. Include other examples of gravity in action all around us. The ball drops down in a straight line.

Now try the fish – it spins on the way down and does not fall in a straight line. Why? Discount 'wind blowing it off course' etc. Compare shapes, ball vs fish. Discuss symmetry. There is smooth airflow around the ball.

Explain that because of its shape the fish behaves partly like a parachute and partly like a propeller. The air pushes (force applied) against the surfaces of the fish as it falls. The forces are uneven so there is a bias one way or the other which does two things: slows the fish down (Drag) and causes it to spin.

Get the students to predict and then test a medium sized fish with a smaller one and a larger one.



##### Helicopters

You will need paper, scissors and paper clips for this experiment.

Cut 3cm-wide strips of paper in various lengths e.g. 300mm, 200mm, 100mm.

Fold the strip of paper in half but stagger to create a 'v' shape, then fold each limb opposite ways to create a 'w' shape. Next, bend the outer limbs up to create the shape above (like a symmetrical letter 'y'). The paper clip makes sure it falls vertically, keeping the correct orientation. Try varying the length of the outer limbs or wings so as to design the helicopter which takes the longest possible time to reach the ground. Think of wing area.

## Activity 1: The Principles of Flight



### Experiment c):

#### Lift (Paper Lift Experiment)

You will need paper, sticky tape and a hairdryer for this experiment.

Stick a sheet of paper to the edge of a desk so that it hangs over the end of the desk. Use a hairdryer to blow air over the top of the desk. The paper lifts to the horizontal. This shows that moving air over a surface can generate LIFT.

### Experiment d):

#### Thrust (Balloon Experiment)

You will need a sausage shaped party balloon, a paper clip, sticky tape, a drinking straw, a length of wire or kite string, 2 wooden chairs.

Place the 2 wooden chairs facing away from each other about 5 metres apart. Tie one end of the wire/kite string to one of the chair backs.

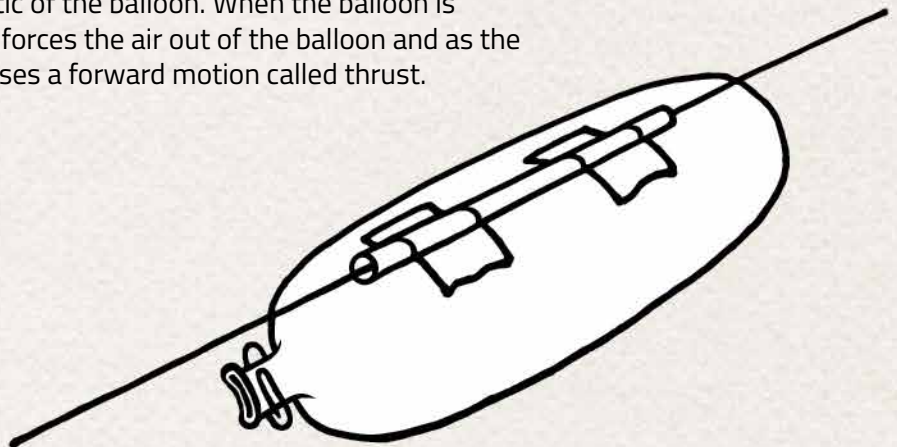
Put the other end of the wire/kite string through the drinking straw, pull it tight and tie the other end of the wire/kite string to the other chair back.

Inflate the balloon, but don't tie it (instead secure it with a paper clip).

Tape the balloon to the straw.

Remove the paperclip and watch the balloon zoom along the wire.

Explain that energy is stored in the compressed air inside the balloon. Energy is also stored in the stretched elastic of the balloon. When the balloon is released, the elastic of the balloon forces the air out of the balloon and as the air rushes out of the balloon, it causes a forward motion called thrust.







## Activity 2: Build a First World War Aeroplane Challenge

This challenge requires your students to work in teams to think and act like engineers. It will take at least 2 hours for the students to complete this challenge. It works well as a full day event when combined with Activity 1 (above). A Design and Technology classroom is an ideal space for this challenge to take place.

A large space such as a school hall is needed for testing the aeroplanes.

The students we worked with benefitted from having a STEM practitioner running the challenge (<http://technologytom.com/>) but it could easily be run by a Design and Technology teacher.

The students we worked with used their work towards a CREST Discovery Award

<https://www.crestawards.org/crest-discovery>.

### You will need the following materials to complete this challenge:

**Thick foam**

**Foam board**

**Thin balsa**

**Medium balsa**

**Thick balsa**

**Straws**

**Card**

**Paper**

**Corriflute**

**Thin dowels**

**Sticky tape**

**Hot glue guns**

**Sandpaper**

**Felt tipped pens**

**Pencils**

**Pens**

**Hole punch**

**Sticky tack**

**Mini hacksaws**

**Scissors**

**£1 coins**

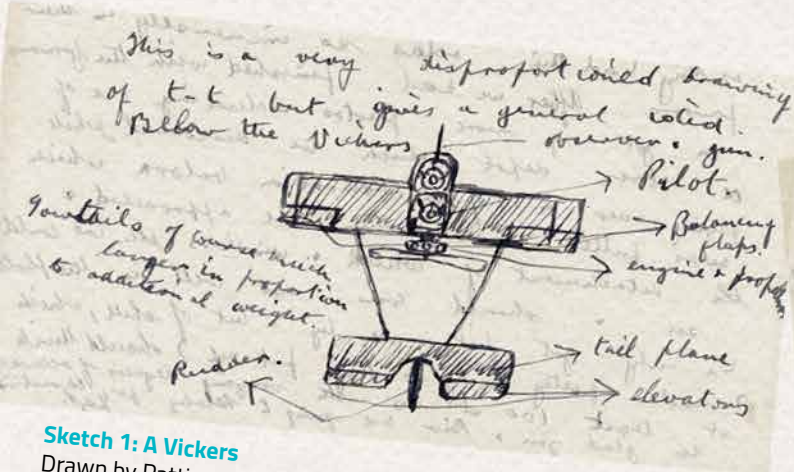
If you decide to run the challenge as a competition, you will also need prizes.

- 1) Divide the students into teams of 4 or 5.
- 2) Issue them with their challenge (See printable Instructions sheet, below).
- 3) Give the teams a set time to work on their challenge.  
(N.B you may wish to divide the challenge into smaller tasks to help them stay on track.)
- 4) Hold a competition (optional) to see which plane:
  - a) Glides the furthest.
  - b) Looks most like a First World War aeroplane.
  - c) Glides the furthest whilst carrying a £1 coin.
- 5) Get the students to reflect on the things they have learned and the skills they have used whilst completing this challenge.

# Build a First World War Aeroplane Challenge Instructions

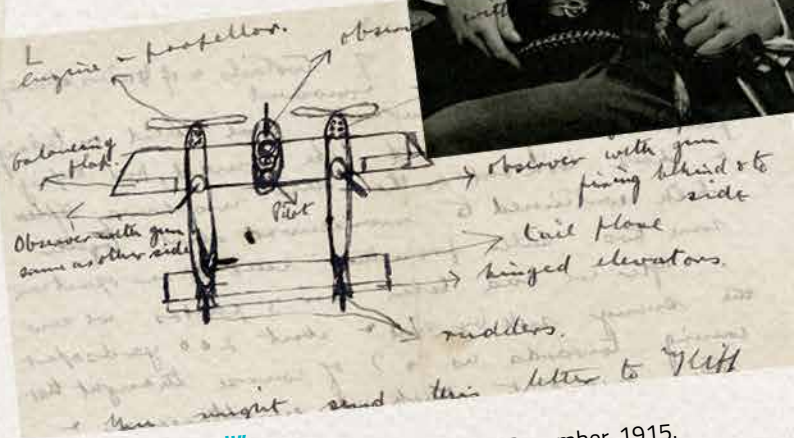
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Your challenge is to work in teams to design, build, test and improve a model First World War aeroplane inspired by the sketches of Sir Lawrence Arthur Pattinson, drawn whilst he was serving as a pilot during the First World War.



**Sketch 1: A Vickers**

Drawn by Pattinson in a letter to his mother, 19 December, 1915  
LAP 1-2-12, Newcastle University Special Collections GB 186



**Sketch 2: A "Two Tail"**

Drawn by Pattinson in a letter to his mother, 19 December, 1915.  
LAP 1-2-12, Newcastle University Special Collections GB 186

Points to note:

- 1) Your aeroplane must:
  - a) Glide when thrown or launched
  - b) Look like an aeroplane from the time of the First World War.
  - c) Glide whilst carrying a £1 coin
- 2) You should begin by carrying out some research into First World War aircraft (you may find this website useful: <https://spartacus-educational.com/FWWair.htm>) before sketching a design for your plane. When you are happy with your design, you can have a go at building it. Once it's built you'll need to test it, and then make some changes to improve it.

3) You can use the following materials for your aeroplane:

Thick foam	Card	Sandpaper	Mini hacksaws
Foam board	Paper	Felt tipped pens	Scissors
Thin balsa	Corriflute	Pencils	£1 coins
Medium balsa	Thin dowels	Pens	
Thick balsa	Sticky tape	Hole punch	
Straws	Hot glue guns	Sticky tack	

- 4) Once you have completed your challenge, discuss the following questions with the rest of your team and write down your answers:
  - a) What have you learned about First World War aeroplanes whilst completing this challenge?
  - b) Do you think you worked well as a team? Why / why not?
  - c) What are the most important skills you had to use to complete the challenge?
  - d) What is the most interesting thing you learned from completing this challenge?



## Sir Lawrence Arthur Pattinson

The story of a First World War pilot

We hope you enjoyed using this education pack.  
Please do get in touch to let us know what you thought of it.

<https://www.ncl.ac.uk/library/services/education-outreach>

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This education pack has been developed by Newcastle University Library Education Outreach Team based on work delivered with two local secondary schools. It has been inspired by and makes use of material (including images) from the Pattinson (Sir Lawrence) Archive, Newcastle University Special Collections, GB186.

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