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| **THE GREAT VACCINE DEBATE**Teacher Guidance | C:\Users\Felix\AppData\Local\Temp\Temp1_smallpox-logo(2).zip\smallpox-logo.jpg |

# NATIONAL CURRICULUM LINKS (ENGLAND)

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| **Upper KS2 (ages 9-11)** |
| **History**  Understanding how our knowledge of the past is constructed from a range of sourcesConstructing informed responses that involve thoughtful selection and organisation of relevant historical information**Science** Finding things out using a wide range of secondary sources of  information |

# KEY LEARNING OUTCOMES

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| **By the end of this activity children should be able to:** |
| * appreciate that there was a vigorous debate about vaccination in the early 1800s
* use evidence from primary sources to answer the history question ‘Did people support Dr Jenner and vaccination in the early 1800s?’
* use scientific evidence from secondary sources to roleplay the Parliamentary debate about vaccination that took place in 1802
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# Lesson Activities

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| **Key questions** | **History: Did people support Dr Jenner and vaccination in the early 1800s?Science: Did vaccination work and was it safe?** |
| **Overview** | **A history and science activity looking at the early reaction to Jenner’s work** This activity develops children’s ability to use sources to explore history and science questions. Children are presented with a history question and a science question about the early vaccination debate. Children then examine a range of sources from circa 1800 for evidence, noting their findings in a table. They use their tables and discussion work to write an answer to the history question and to roleplay a science-focused debate in Parliament. |
| **Teaching time** | 2 – 3 hours |
| **Key vocabulary** | (primary) sourceevidence | vaccinationexperiment | smallpox cowpox |

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| **Stage/summary** | **Running Notes** | **Resource**  |
| **Introduction** | Explain that in this lesson children are going to imagine themselves in two very different roles to answer two different questions.The first is as a modern-day historian B.F.G. Taylor, who is writing a biography of Edward Jenner.The second is as an MP in the UK Parliament in 1802.As B.F.G. Taylor they will have to write the chapter in the biography that comes after the experiment on James Phipps. The chapter looks at the early reaction to Dr Jenner and his discovery and is called **‘Were people for or against vaccination in the early 1800s?**’ As MPs they will have to take part in a big debate in Parliament that took place in real life on 2nd June, 1802. The question was whether to award Edward Jenner a prize of £10,000 to reward him for his discovery and help pay for his work in spreading vaccination across the country and the world. (The award was equivalent to about a million pounds in today’s money!) Before they vote on the matter they must debate the question **‘Is vaccination safe and does it work?’**.The first question is a **history** question. As B.F.G. Taylor, children will be trying to discover what *other people’s* thoughts and opinions were at the time.The second is a **science** question. What do the children – imaging themselves as scientifically-minded MPs at the time – think themselves?Make sure children understand the questions/roles before continuing. You may decide that you prefer to tackle just **one** of the questions/roles, or do each question/role in separate lessons. |  |
| **Methods of Enquiry / Searching for information** | Now that the children have their questions, they have to think about how they are going to answer them.Start with the history question. Ask the children how they could find out the answer…If children have completed the **History Detective: What Really Happened?** activity, then they should already be familiar with the idea that historians use sources to answer history questions. They search sources for evidence and use the evidence – along with persuasive language – to form convincing opinions.In this activity children will be looking at a number of primary sources written in the early years of the 19th century. (Note that they could also research the answer in secondary sources such as history books and Wikipedia – but in this activity they will just be using primary sources).What about the science question? Ask the children for ideas, imaging themselves in their roles as MPs at the time. Few if any MPs were men of science (and in those days MPs were only men, and science was also almost exclusively an actively for men), so they couldn’t go off and do experiments themselves. They would have to rely on *secondary* evidence – for example, listening to the opinions of doctors and other men of science, looking at scientific publications for experiments done by doctors, and looking at statistics and research. So this is what children will be doing as MPs.(You should be aware that there is a bit of a terminology clash in the history and science curriculums – as historians, the things we will be looking at are called primary sources, but as scientists we are using the same sources for ‘secondary research’. Children don’t have to worry about this; you can use the history term ‘primary sources’ or just the word ‘sources’). |  |
| **Approach to the sources** | There is flexibility in how you explore the sources with children. There are eight sources in total, A – H, some visual, some textual. As they look at each source in turn, children should first decide whether the writer of the source supports Jenner and vaccination or not (in most cases this should be fairly clear). They should then note down any evidence from the source that they think will be useful in answering their two questions. They can also make a note of any doubts they have about the reliability (trustworthiness) of the source. Do they *believe* what the source is saying?Tables (PS1-2) are provided for children to fill in. (Completed tables are also included which you can edit if you prefer. For example, you might prefer a simplified version of this activity where children only fill in the ‘For or against Dr Jenner?’ column and the rest is already filled in for them.)You might choose to discuss the sources in turn as a whole class on the whiteboard, using some of the discussion questions below to guide discussion, and then give children time to complete their tables on their own before moving on to the next source. Alternatively, you could discuss just the first two sources together as examples. For the rest of the sources, either display each source in turn on the whiteboard or give each table an iPad, and let children discuss them in their table groups, guided by some printed-out discussion questions. You can copy and paste from the discussion points below to create your own additional PowerPoint slides, worksheets, etc. | Hand out Pupil Sheets(Evidence tables, **PS1,2**) |
| **Discussion points for the sources**SOURCE **A**  | All the sources are on PowerPoint slides, **TP3-18**The discussion points are designed to point children towards the evidence they need to complete their tables. They are designed with the specific order of the sources in mind.Before looking at the sources, briefly explain that medical understanding was a lot less developed 200 years ago than today and that Dr Jenner’s brand new idea of using an animal disease to try and protect people from a human disease seemed illogical, unnatural and even dangerous to some people at the time. Also, most people were very religious at the time, so the accusation that something was ‘unnatural’ could imply that it went against God’s will.**A quote from Dr Benjamin Moseley** This quote was taken from a medical article by Dr Moseley. (A simplified version of the sentence is also included in TP4).* **Smallpox vaccine was usually made from pus taken directly from the udders of a cow that had cowpox, rather than from the hand of a milkmaid. What does Dr Mosely call a disease that comes from an animal?***A bestial humour.*
* **Which word has he put in italics? How does putting this word in italics imply (suggest) that vaccination is unnatural?***He’s emphasised the word ‘bestial’. He’s implying it’s unnatural to put an animal disease into the human body.*
* **What do you call a question that you ask just to point out how obvious the answer is?***A rhetorical question.*
* **Dr Mosely asks if there is anybody in the world who knows what effect cowpox will have on the human body. Why does he ask this question? Is it because he thinks that someone might be able to tell him the answer, or is he asking to try and point out how obvious it is that there is no evidence about whether vaccination works and is safe?** *No evidence.*
* **Can you think of a person from the time who would have disagreed and said that they *do* have evidence that cowpox vaccine works and is safe? What kind of evidence did this person have?***Dr Jenner – because he did experiments to test if it works and is safe, including the one on James.*

**A picture of a “Cow-poxed, Ox-faced boy”**SOURCE **B** * **What does ‘cow-poxed’ mean?** *That the boy has been vaccinated with cowpox.*
* **What family of animals do oxen belong to?***The cow family (the scientific name for this is Bovidae).*
* **Dr Rowley’s illustration claims to be a real picture of a boy who has been vaccinated with cowpox. What does it claim the cowpox has done to him?***The cowpox vaccination has given him cow-like growths and has made his face look like an ox’s!*
* **How many cases does Dr Rowley claim to have observed where vaccination hasn’t worked or has had nasty side effects?***500. However, it later emerged that many – perhaps all – of these cases were made up.*
* **What do you think Dr Jenner would have said about Dr Rowley’s picture? Would he have agreed that cowpox did that to the boy?***Dr Jenner’s supporters said that the picture was exaggerated or simply made up, or that the growth on the face was not caused by cowpox. Children will know from activities* ***The Speckled Monster*** *and* ***History Detective*** *that Dr Jenner didn’t see any such side effects on James or any of the other people he infected with cowpox.*
* **Why didn’t Dr Rowley take a photo of the boy?***Photography wasn’t invented yet!*
* **Dr Jenner wanted to offer vaccinations to the general public totally free of charge. Can you think of any reasons why an unscrupulous (immoral) doctor at the time might not have wanted free vaccination to be introduced?***Some doctors made a lot of money out of smallpox – e.g. from attending to sick people, variolating them, selling them medicines. Maybe some doctors would also have been jealous of Jenner’s fame and celebrity.*
* **Do you believe Dr Rowley’s picture?**

SOURCE **C** **A monstrous cow symbolising the effects of vaccination**Political **cartoons** were very popular at the time, appearing in newspapers and magazines. They were usually humorous in tone but had serious messages underneath (this is called **satire**).There’s a great deal to explore in this source, with lots of symbolism and little details contained in it. The link on the PowerPoint slide leads to a really useful version of the picture that lets you zoom in to explore the details.wellcomelibrary.org/player/b11598803#?asi=0&ai=0&z=0.7174%2C0.0695%2C0.2009%2C0.1734* **The cow-monster is being used to produce cowpox pus to make vaccine.****What is being poured into the cow-monster’s mouth, and what is coming out the other end?***Healthy babies are being fed to the cow… and dead babies or babies with cow horns are coming out the other end*!
* **Who do you think the first man pouring in the babies might be?***It is Dr Jenner.*
* **Can you think of TWO reasons why the cartoonist has shown this man with horns and a tail?***To say that cowpox will turn you into a cow, but also to say that Dr Jenner is like the devil!*

If you zoom in to the side of the cow, can you see the names of different horrible diseases written on it? People like Dr Rowley thought cowpox vaccination would give you these diseases instead of protecting you from smallpox. * **It also says “Pandora’s Box”. What was Pandora’s Box? Why does the cartoonist think that vaccination is like opening Pandora’s Box?***Pandora’s Box is from Greek mythology. It was said to contain all the evils of the world, including death and all diseases. When Pandora opened the box, she released all this into the world. The expression is often used when someone thinks they are doing a good thing but in fact it will have very bad consequences.*
* **The men in the background have initials on their shields.** **Can you match the initials up to the names on the obelisk (pillar)? Do you recognize any of the names? Who are these men? Why do you think they have swords and shields?***They are Moseley, Squirrill, Rowley, Birch, and Lipscomb – Dr Jenner’s most vocal opponents in the medical community. Children met Dr Moseley and Dr Rowley in Sources A and B. In fact, Dr Rowley used this cartoon as the frontispiece (front cover) of the publication that featured the ox-faced boy. In the picture, their swords say ‘truth’ above them and their shields represent how they are trying to protect the world from Jenner and vaccination.*
* **What is the cartoonist saying vaccination will do to you?**It will either kill you, turn you into a cow, or give you a horrible disease like leprosy.

SOURCE **D** The Wonderful Effects of the New Inoculation!* **What is happening to the people in the cartoon who have been vaccinated?** *Horns and even little cows are growing out from their bodies!*
* **This humorous cartoon is actually *supporting* vaccination. How can that be?!***At first sight, it looks to be against vaccination. But actually the cartoonist is making fun of the preposterous, unscientific fears of the anti-vaccinationists and the gullible people who believed them.*

**A poem**SOURCE **E**This **poem** was written by William Howard, a tailor from Buckinghamshire whose wife and two of his three children caught smallpox even though they had been vaccinated. His wife sadly died.* **Who does William blame for his wife’s death?***Dr Jenner.*
* **William’s wife believed that she had been vaccinated and therefore was immune to smallpox. Why might such a false sense of security lead her to catch smallpox?***Because she thought she was immune, she might not have taken precautions in an outbreak such as staying away from infected people.*
* **What does William mean by telling Dr Jenner to “hide your head / Or blush in crimson like the Sun”?** *He should hide his head in shame or turn bright red with embarrassment for misleading everyone about vaccination and endangering their lives.*
* **Why do you think William chose the imagery of a crying orphan in his poem?***Because his wife died of smallpox and if he had died too then his children would have become orphans. He wants us to feel very sad and sorry for the orphans in the poem, to evoke strong emotions against Dr Jenner.*

Dr Jenner’s supporters argued that the doctor who had tried to vaccinate William’s wife and children must not have done it properly, so they weren’t really vaccinated and that is why they caught smallpox.* **Do you think that Dr Jenner is to blame for the death of William’s wife and children?**

SOURCE **F****15,000 vaccinations in April**This is a quote from a medical article written by Dr Georg Balhorn, a Swiss doctor who worked in London.* **How many people does Dr Balhorn claim were vaccinated in London in one month? There are 30 days in April. So how many people were vaccinated each day? For a real challenge, try doing this without a calculator!**

$$\frac{15,000}{30}= \frac{15 ×1,000}{15 ×2}=\frac{1,000}{2}=500$$* **What does this suggest about the general public’s feelings about vaccination? Were they generally happy to be vaccinated or were they scared of it?***Lots of people were happy to be vaccinated. Or maybe they were just a lot less scared of vaccination than they were of smallpox! However, many people refused to vaccinate themselves or their children.*
* **What percentage of people who were vaccinated were exposed to smallpox afterwards to see if they immune to smalllpox?***⅓**of people were tested after being vaccinated, which is 33.3%.*
* **Who else had done experiments like this before Dr Balhorn?***Dr Jenner. This is like the experiment he did on James and others after him.*
* **Can you think of one big difference between the set of experiments that Dr Jenner wrote about in his publication and the set of experiments that Dr Balhorn did? *Hint – roughly how many people did Dr Jenner test in his experiments?****Dr Jenner tested about 20 people in his original experiments. Dr Balhorn tested 5,000 people.*

SOURCE **G** SOURCE G – **A testimonial** A ‘testimonial’ is a tribute given to someone for their achievements. This document was signed by 112 doctors at Guy’s Hospital, London.* **Why do you think these doctors felt it was important to announce their conviction (strong belief) that vaccination works and is safe?***Because they think vaccination could save millions of lives but other doctors like Dr Rowley are telling people that it’s dangerous.*

SOURCE **H** SOURCE H –  **A letter from the President**Note that the full letter is available in the Pupil Sheets (PS5). You might like to show the full letter to the more confident readers in the class (or give it to these children as homework) as an enrichment exercise. * **Look up the word “extirpated” in a dictionary. What prediction is the President making about the “loathsome smallpox”?** “*Extirpated” = removed or destroyed completely; he predicts that smallpox will one day be eradicated.*

Enrichment questions for the whole letter in PS5: * **What evidence about the discovery of vaccination do you think Dr Jenner sent the President?***Perhaps his publication of his experiments on James Phipps and others. Perhaps also the publication of Dr Balhorn’s experiments and the testimonial from the doctors at Guy’s hospital…*
* **Why do you think Jenner sent the President this evidence? Who did the President recommend vaccination to?***The President is a very influential person. He recommended vaccination to all the American people.*
* **According to the President, who owes Dr Jenner “a tribute of gratitude”?***The whole human race!* **`**
* **Imagine you become a doctor when you grow up. What amazing medical discovery might you make that would get a personal letter of thanks like this from the President of the United States of America?!**
 | **TP1-8** |
| **Answering the history question** | At this point you might like to lead a quick whole-class discussion about what the children have found out, sharing their ideas. Children of all abilities should be confident in at least saying whether the writer of each source is for or against Dr Jenner and vaccination.Children should appreciate now that some people were opposed to vaccination and some people supported it. In fact, there was a very vigorous debate at the time about vaccination. (When an issue splits opinion like this it is called a **polemical issue**.)Children now use the **evidence** in their tables, along with their discussion work, to write the chapter in B.F.G. Taylor’s biography: **Did people support Dr Jenner and vaccination in the early 1800s?**(You might prefer to set this as a homework exercise.)The best answers will probably group together the ‘for’ examples and the ‘against’ examples in two separate paragraphs. It might be helpful to prompt pupils:

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| **Some people supported Dr Jenner and vaccination. For example …** |
| **However, some people were opposed to Dr Jenner and vaccination. For example…**  |

You might like to challenge more able pupils to write a concluding paragraph, ‘**Overall, I think that most people…** ‘ about whether they think more people supported Jenner and vaccination or more people were against. They should try to make their opinion convincing with some kind of reason and/or evidence from the sources. To help them you can discuss with them which source they would pick if they could only pick the one that contains the best (the most convincing) evidence. For example, they might conclude that most people supported Dr Jenner and vaccination and use Source G as evidence because it was signed by over 100 doctors.  | TP9 |
| **The Parliamentary Debate** | Now the children switch roles to become MPs in the UK Parliament in the year 1802.The question for debate is: **‘Does vaccination work and is it safe?’**The following is a suggestion on how you might like to conduct the debate:Divide the class into two. Half will argue that vaccination works and is safe, half the opposite.Divide the children again into groups of about 3. Allocate each group one of the Sources A-H and also allocate one group Jenner’s publication of his experiments, which children will have explored in **The Speckled Monster** activity. If they have done the **History Detective** activity, they can use their evidence sheet from that as well to help them.Within each group, one child takes on the role of the author of the source (e.g. Dr Moseley for Source A, Dr Jenner for his publication). This child will act as a witness before Parliament and answer questions. One child in the group will read a statement presenting the evidence in their own source. The third child will ask a question to one of the other characters. To make numbers work you can add extra questioners to some groups, or double up the groups on Source G (the doctors from Guy’s hospital), or even add James Phipps as a witness.Each group prepares its opening statement together, thinks about what questions the opposition might ask to challenge their evidence, and thinks up questions they can ask to attack the opposition’s witnesses. Children then arrange themselves on the two sides of the House of Commons (put up TP9 on the whiteboard to set the scene). Go through each source in turn. With each source, start with the opening statement, then pick a child from a group on the opposite side who hasn’t spoken yet to cross-examine the witness. Before beginning, remind MPs that this is an **evidence-based debate!** Children should be encouraged to try and use persuasive language and to back up their opinions with evidence from their tables as much as possible. You might want to act as Speaker of the House and interject if one of the MPs or witnesses veers away from the evidence.If there is time after you’ve cycled through all the sources you can open up the floor to a general debate. (You can also start this way if you are pressed for time). The teacher, as Speaker, makes sure only one person speaks at a time and everyone participates. Remind children that people felt extremely passionate about this debate, because lives were at risk – but shout ‘Order!’ if things get too unruly! Finish with the vote on the question of whether Dr Jenner should be awarded £10,000. Children should vote on what they would have done in real life if they were MPs, not just which side they were on in the debate.  | TP9 |
| **Conclusion and further questions** | In real life, Parliament voted **unanimously** to award Jenner the £10,000. This shows that, despite a large number of doubters, the tide of opinion was firmly in favour of Dr Jenner and vaccination.Gradually, as vaccination began to significantly reduce the number of smallpox cases, more and more people were won over, although bitter opposition remained. Eventually, in 1853, the UK Parliament voted that vaccination for infants under three months would be made **compulsory**. This infuriated the anti-vaccinationists, who saw it as a loss of personal liberty.(You might like to have a discussion with the class on the ethics of compulsory vaccination. Vaccination isn’t currently compulsory in the UK – but should it be for some diseases? However, you might like to have this debate after doing the **Measles Alert** activity).Much of the evidence of the anti-vaccination doctors such as Roweley was discredited. Certainly nobody ever turned into a cow! However, some of Jenner’s supporters were just as guilty of confecting evidence.So was vaccination totally safe and did it work perfectly?Well, not quite… towards the end of the 19th century it was discovered that the vaccine’s protection faded with time and that booster inoculations were required to keep people safe. Jenner had always denied that this was the case, which might have been one of the reasons why some people claimed vaccination didn’t work.Today, with so many vaccines protecting us from a range of diseases, very few people are opposed to vaccination – although sadly some doubters still persist!**Follow up questions in other Why You’ll Never Catch Smallpox resources:**Dr Jenner tested the vaccine on about 20 people, Dr Balhorn on about 5,000 people. It took people over sixty years to realise that a booster jab was needed.**So how many people do you need to test a vaccine on, and for how long, before you can be sure it works and it’s safe?🡪 Dr Edwina Jenner, Immunologist****How successful was the smallpox vaccine in stopping people catching smallpox?Were vaccines found for other diseases?🡪 Why You’ll Never Catch Smallpox – Thank you Dr Jenner!****What is the role of vaccination in keeping us healthy today?🡪 Measles Alert!** |  |

Image credits:

**Wellcome Images**Benjamin Moseley, stipple engraving after R.M. Paye
The cow-pock - or - the wonderful effects of the new inoculation! by James Gillray
Cow Poxed, Ox Faced Boy - illustration to "Cow-Pox Inoculation No Security Against Small-Pox Infection" by W. Rowley
Engraving of Guy’s Hospital, London
Testimonial to the efficacy of vaccination, signed by 112 members of the Physical Society, London

**Wikipedia**Detail of painting by Sir George Hayter of the House of Commons
William Pitt addressing the House of Commons by Karl Anton Hickel