

THINKING SCRIPTS
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RESEARCH GROUPS
LOUIS PASTEUR

By
STEVE WILLIAMS

CLASSROOM SCRIPT

Name: _____

Character: _____

School: _____

RESEARCH GROUPS LOUIS PASTEUR

CAST OF SIX READERS

ENQUIRERS

READER 1: JOHN

READER 2: KERRIE

READER 3: LAURA

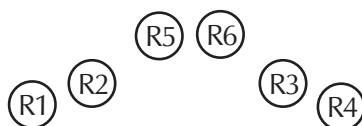
READER 4: DANIEL

SCIENTISTS

READER 5: LOUIS PASTEUR

READER 6: MAX VON PETTENKOFER

If the script is performed for an audience, then I suggest the two scientists sit together in the centre on revolving stools. They have their backs to the audience until their first lines in the script, when they should turn around. After their last lines in the script they turn their backs again to the audience again. The enquirers should sit on stools or chairs – one pair either side of the scientists, slightly sloping upstage. I suggest John and Kerrie as one pair; Laura and Daniel as the other.



PART ONE: PASTEUR'S DISCOVERY

LAURA Our study topic this week is Louis Pasteur.

DANIEL Who was he?

LAURA Why is he important?

KERRIE What's his story?

JOHN Let's read through what we've written so far.

DANIEL Louis Pasteur was a scientist who lived in France more than a hundred years ago. At that time, a disease called anthrax was killing a lot of farm animals.

LAURA Deaths of sheep from anthrax were costing French farmers £100,000 a year. Farmers feared they would catch the disease too. Some humans had died from anthrax.

JOHN It was caused by bacteria. They multiplied very quickly if they got into the blood stream through a cut or a scratch. A few hours after the disease took hold, millions of bacteria turned the blood black. Arteries and veins got blocked. Death followed soon after.

KERRIE At that time, Pasteur was studying another disease called chicken cholera. He was injecting hens with different vaccines and then injecting them with cholera bacteria. None of his vaccines worked. All the hens died.

DANIEL One day some of his cholera bacteria were left in the open air. When he injected hens with these, they didn't die. Pasteur must have thought:

JOHN [Role-playing Pasteur] Leaving the cholera bacteria in the open must have weakened them in some way. The strange thing is that when I injected the same hens again with strong cholera, they survived. I wonder ... does a weakened dose of a disease work as a vaccine against a stronger one. No hens have survived a strong dose before. This is the first time it has happened. There must be a reason.

LAURA He set to work on finding a vaccine for anthrax by leaving anthrax germs in the open air to weaken them.

KERRIE On May fifth 1881 a famous experiment took place to prove or disprove Pasteur's theory. A huge crowd came to watch.

JOHN [Role-playing Pasteur and standing] Ladies and gentlemen, I have been given 60 sheep. I have vaccinated 25 sheep with my weakened dose of anthrax. I will re-vaccinate them 12 days from now. Two weeks after that, they will be injected with a strong dose of anthrax. Another 25 unvaccinated sheep will also be given a strong dose of anthrax. 10 sheep will be left alone. I predict that the vaccinated sheep will still be alive 30 days from now.

LAURA The crowd came back on June the second. Pasteur was proved right. Every one of the unvaccinated sheep was dead or dying. Every one of the vaccinated sheep was alive and well. So were the untouched animals.

DANIEL Pasteur was a hero. That day marked the beginning of the end for many infectious diseases that had killed so many people in the past. That's what it says in the text book anyway.

PART TWO: THEORIES AND EXPERIMENTS

JOHN I have a question. How could Pasteur know for sure that he'd found the right vaccine after trying it on only 25 sheep?

LAURA What do you mean John?

JOHN Well, imagine if a big bin suddenly appeared on the school field. Because I'm brave I get to the bin first. I reach into the bin and pick out 25 things. They are all chocolate bars.

DANIEL Is this a dream you have every night or something?

JOHN Daniel, listen! The first 25 things are chocolate bars. How do I know the 26th thing won't be something else – even a bomb? How did Pasteur know that 25 sheep would be enough to test his vaccine?

- LAURA** But this is different. No sheep had ever survived anthrax before and there must have been thousands of deaths. The vaccinated sheep all survived.
- DANIEL** Laura is right, and on top of that every one of the other sheep who'd been injected with anthrax germs died. There's not much chance of that happening for no reason.
- KERRIE** It fitted in with Pasteur's theory too. He could explain why it happened that way.
- PASTEUR** You ask an interesting question John. Were 25 sheep enough to prove my theory? Make up your own minds. Imagine what it was like trying to persuade a farmer that I could stop his sheep getting anthrax by injecting them with anthrax. I was lucky to get any sheep to work on. But I was famous and that always helps. I'm Louis Pasteur by the way.

PART THREE: A DEBATE ABOUT THE CAUSES OF ANTHRAX

- LAURA** Are you a ghost?
- PASTEUR** Lets just say a voice from the past.
- VON PETTENKOFER** Can I say something Louis?
- KERRIE** An who are you?
- VON PETTENKOFER** Max Von Pettenkofer – a German scientist. I lived at the same time as Louis Pasteur.
- PASTEUR** Max didn't believe that bacteria caused disease. He even drank a glass of water full of cholera bacteria to show his faith.
- VON PETTENKOFER** And I survived. Doesn't that prove something?
- PASTEUR** It proves you were very lucky. Haven't you kept in touch with the world since you died Max? Scientists agree that bacteria and other kinds of germs do cause diseases. Vaccines can help to stop diseases spreading.

VON PETTENKOFER I was wrong in some ways, but in some ways I was right. It depends what we mean by that word 'cause'. Why don't you tell them about the worms Louis and why one field was deadly to sheep but another was harmless.

PASTEUR What are you getting at Max?

VON PETTENKOFER Let's hear the story. Then I'll explain.

PASTEUR One day I was walking in a field of sheep. I noticed that the ground in one part of the field was a different colour to the rest. As I got closer, I noticed lots of worm casts – the soil worms push out as they tunnel along. I asked the farmer about this and he told me a few of his sheep had died of anthrax. He buried them in the field. I guessed that the worms had been feeding off the dead sheep. They brought the anthrax bacteria to the surface and the live sheep ate grass with the bacteria on it. But the anthrax could have been passed on in other ways. Sheep with cuts and scratches sometimes rubbed against other sheep with the disease.

VON PETTENKOFER So was anthrax caused by the bacteria or by the farmer burying the dead sheep in the field or both? And did the farmer keep his sheep healthy enough? What do your young friends think about that?

JOHN A cause always comes just before the thing it causes. The bacteria getting into the sheep was the last thing to happen before they got ill so I think the bacteria is the cause.

KERRIE But if the farmer hadn't buried the dead sheep with anthrax in the same field, the anthrax might not have spread. That set off the chain of events that got the anthrax into all the live sheep.

LAURA Maybe there are more causes than one. These could both be causes in different ways.

DANIEL Grass might be the cause. It wouldn't have happened without grass.

KERRIE Daniel, what do you mean?

DANIEL If there wasn't grass Kerrie, the sheep wouldn't have eaten it – so no deadly bacteria.

- KERRIE** They would just have died of starvation.
- LAURA** Anyway, all sheep eat grass but not all sheep get anthrax. I think a cause must be something that doesn't happen all the time.
- PASTEUR** We could go on saying it couldn't have happened except for this or that but the thing is it did. We needed a quick way to stop the disease spreading. Our methods worked. They've worked for many other diseases too.
- VON PETTENKOFER** You'll never get rid of all the germs in the world Louis. And even you have to admit that some vaccines don't work very well. There are other ways to stop germs spreading – by taking better care of ourselves and our animals. When people are able to keep clean and well-fed we see less disease; when they aren't we see more. We also know that healthy people and healthy animals can survive serious diseases – like I survived my drink of cholera. So in a way I was proved right.
- PASTEUR** I agree Max, but we still need vaccines for times when things go wrong, and for people who are not strong and healthy.
- VON PETTENKOFER** Maybe you are right. But at least our young friends have plenty to think about. Goodbye Louis.
- PASTEUR** Goodbye Max. You know, Max and I had one thing in common. We always asked questions, and asking good questions is the way to make discoveries. That will never change.

PART FOUR: EXPERIMENTS ON ANIMALS

- KERRIE** I'd like to ask Mr. Pasteur a different kind of question.
- PASTEUR** What is that?
- KERRIE** (To Pasteur) Wasn't it wrong for you to inject all those poor sheep with that terrible disease?
- JOHN** No way!

- KERRIE** I was asking Mr. Pasteur.
- PASTEUR** I'd like to hear what you think ... what you all think.
- JOHN** His discovery saved a lot of lives.
- KERRIE** Yes. By killing lots of sheep!
- JOHN** Pasteur saved lives. He even saved sheeps' lives. Saving the lives of animals is a good thing isn't it? What about the thousands of sheep that were dying of anthrax. Only the vaccinated sheep survived in his experiment. Remember?
- KERRIE** But so did the ones he left alone. The ones that died only died because he injected them with germs. That's just wrong.

PART FIVE: ANIMALS, PESTS AND PROPERTY

- PASTEUR** Before you go on, I'd better tell you about the Australian rabbits.
- JOHN** What rabbits?
- PASTEUR** Listen, and then see what you think about me saving animals' lives. Europeans started to make homes in Australia over a hundred years ago. There were no rabbits in Australia at the time but one man brought them to his farm from Europe. Rabbits liked Australia, but Australia didn't like the rabbits. You see rabbits have lots of babies very often. In twenty years, there were millions of rabbits. They ate farmers' crops and the grass meant for cows and sheep.
- LAURA** What did the farmers do?
- PASTEUR** I was invited to go to Australia and kill all the rabbits using the chicken cholera bacteria I had been working with.
- KERRIE** What? That's horrible.
- PASTEUR** Well, that's part of what I want to say. Farmers owned animals like any other property and they protected their property. To do that they sometimes had to kill other animals. It might seem horrible to you now

Laura but it wasn't thought so then. The way we think about what things are right and wrong can change with the times.

KERRIE I think that is wrong and has always been wrong.

LAURA What happened, did all the rabbits die?

PASTEUR No. In the end, the Australians didn't believe the chicken cholera would work. I returned to France. The problem with rabbits got worse and in 1950 another disease, myxomatosis, was used to kill millions of them.

KERRIE So they were murdered.

PASTEUR Murder is a strong word Kerrie. You will have to decide for yourselves if it fits. I worked on saving sheep in France and killing rabbits in Australia. I did the best job I could and I thought both jobs helped people. It's up to people at the time to decide what they think animals are for and how they should be treated. It's up to you. Goodbye – and keep asking questions.

KERRIE I know what I think.

JOHN Hang on Kerrie. Last year there was an ants' nest under our house. Every morning our kitchen was crawling with ants. They were trying to get at our food. We put poison down and the ants disappeared. Does that make us murderers?

KERRIE I don't know.

DANIEL Kerrie likes cuddly bunny wabbits. Ants aren't so pwitty.

KERRIE Shut up Daniel.

PART SIX: PURPOSE, ANIMALS AND PEOPLE

DANIEL I don't think things have changed much since Pasteur's time. Animals are there for humans. Pets are there to keep us company. Sheep are raised to give us food and wool. That's their purpose in life.

- KERRIE** What do you mean by purpose?
- DANIEL** I suppose a purpose is how something is used.
- LAURA** And do people have a purpose or only animals?
- JOHN** I think we do but we don't know what it is.
- DANIEL** Isn't our purpose what we do, like my dad's a mechanic and my mum works in the supermarket. My aunty looks after her kids. Giving wool and being eaten is what sheep do.
- KERRIE** My dad's unemployed, what's his purpose then?
- JOHN** I'm not sure we can say we have a purpose, and if we do, it's got to be more than just what we get paid for. My dad is always saying he hates his job, but he's a good dad; he makes me laugh.
- LAURA** I agree. Your dad's purpose isn't just what use he is to his boss. If we only think of what use people are to us, we aren't treating them like human beings. In the old days some farmers owned slaves and treated them like animals. They tried not to think about them as people because they only wanted to use them without it troubling their consciences.
- KERRIE** Maybe we should think of animals more like people then, if we want them to be treated better. We already give them names. Maybe we should give them rights too. My purpose is whatever I set my mind on. Animals should have a right to decide on their own purpose.
- DANIEL** Have you thought how many chickens supermarkets throw away because they are past their sell-by date? Those chickens' lives are wasted.
- KERRIE** Only if their purpose is to feed us. They might prefer to walk the earth pecking and clucking.
- DANIEL** But animals and people are different. Animals can't think or make choices like we can. It's natural that we use animals, just like animals use plants and plants use the soil. Anyway, it says in the Bible that God gave man dominion over nature.

KERRIE Okay, so we've got power but do we use it well?

DANIEL I think it's okay to use animals if it's for a good purpose.

JOHN Kerrie, you keep saying 'we' have power. I don't think I have much power. Maybe scientists have power, farmers have power, teachers have power. But I don't – do I? Only adults have power.

LAURA We have the power to try and think for ourselves. That's a good start.