

TEACHER NOTES

TUBERCULOSIS AND THE CLEAN AIR OF BANNAU BRYCHEINIOG

Learners consider infectious diseases, what causes them and how they can be cured. They explore how people with TB were treated, e.g. in sanatoria such as Craig y Nos. Learners find out how people's living conditions impacted on the risk of catching TB. They interrogate data about TB in the world today and look at how badgers might be blamed for the spread of bovine TB. Finally, learners carry out surveys of air pollution using lichens as indicators in the local area and compare their findings with those from Bannau Brycheiniog National Park. They use their conclusions to write an online newspaper article to highlight air quality.

CURRICULUM FOR WALES

Areas of Learning and Experience explored:

- Health and Well-being
- Humanities
- Languages, Literacy and Communication
- Mathematics and Numeracy
- Science and Technology

Activity also incorporates aspects of cross-curricular skills outlined in the LNF and DCF.

RESOURCES

Internet enabled device and internet access.
Measuring equipment, e.g. pedometer, large sports tape measure.
Means of carrying out lichen surveys, e.g. tape measure, pencil or waterproof pen, compass, smart phone, camera or tablet.



DOING THE ACTIVITY



- Most tasks require learners to work in pairs or groups.
- Encourage learners to share their ideas, and through open questioning, explain and justify their ideas when possible. Focus questions have been suggested to guide learners through the tasks.
- Some tasks might be more effective if pairs or groups of learners have access to an internet enabled device.
- When taking learners outdoors, it is essential that the [Countryside Code](#) is adhered to and any relevant risk assessments have been carried out with risks mitigated.

TASK 1

WHAT IS AN INFECTIOUS DISEASE?

Explain to learners that in this task they will consider infectious diseases, what causes them and how they can be cured.

Screen 3

Ask learners to discuss the question posed and type their answer in the box.

Focus question

- What does 'infectious disease' mean to you?

Screen 4

Here a definition of infectious disease is given. Ask learners to discuss the questions posed.

Focus questions

- How similar is this to your definition?
- How different is this to your definition?
- Which words in the definition do you not quite understand? How can you find out what they mean?



Screen 5

This screen has information about infection and pathogenic organisms. Ask learners to discuss the questions posed.

Focus questions

- Which infectious diseases do you know about?
- Which infectious diseases have you had? When? What was the disease like? How long did you have the disease for?
- How did you get rid of your infectious disease?

Screen 6

Invite learners to discuss which of the diseases listed are infectious.

Screen 7

Ask learners to think about and discuss the ways in which the spread of infectious diseases might be stopped (given onscreen) and decide who they agree with and why.

Screen 8

This screen gives ways to cure infectious diseases. Ask learners to imagine they have a bad cold and discuss the questions posed.

Focus questions

- How could you try to cure a cold? Why?

Screen 9

Explain to learners that the way we use medicines, such as antibiotics, depends on the type of pathogen that is causing the disease. Then, read the rest of the text and discuss the questions posed.

Focus questions

- What do we use antibiotics for? Why?
- When shouldn't we use antibiotics? Why?
- Why do you think so many lives were saved in World War II by penicillin?

Screen 10

Invite learners to access the webpage: [Causes of death over 100 years - Office for National Statistics](#). Then, to discuss the questions posed.

Focus questions

- What was the top cause of death in males and females in 1915 and 1920?
- How many deaths were there in 1915?
- In which year were there the most deaths? How many deaths were there?
- The antibiotic streptomycin was first used in the UK to cure tuberculosis (TB) in 1942. How can you see its impact in the data?
- What surprised you about the data? Why did it surprise you?

TASK 2

FIGHTING TUBERCULOSIS (TB)

Explain to learners that in this task they will explore how people with TB were treated and how their living conditions impacted on the risk of catching TB.

Screen 3

This screen gives information about Tuberculosis (TB) as a bacterial infection.

Screen 4

Here Craig y Nos Castle (a Victorian, gothic country house in Powys) is introduced as a sanatorium for TB patients from 1922.

Screen 5

Explain to learners that in the early 1900s, TB was endemic in towns and cities killing thousands of people. People who were thought to have TB were placed in sanatoria. Ask learners to discuss the questions posed.

Focus questions

- Why do you think people with TB were put in a sanatorium?
- Why do you think there were many more cases of TB in towns and cities than in the countryside?

Screen 6

A historical source about the living conditions in Merthyr Tydfil in 1850 is given onscreen. Ask learners to discuss the questions posed.

Focus questions

- Why do you think Merthyr was described in this way?
- What industries do you think there were in Merthyr at this time? Why?
- How did these industries pollute the air?
- How might air pollution have made TB worse?

Screen 7

Ask learners to discuss the questions to interrogate the image.

Screen 8

This screen describes living conditions in industrial towns in the late 1800s and early 1900s. Ask learners to discuss the questions posed.

Focus questions

- Why do you think these living conditions helped with the spread of TB?
- How else might people's living conditions been poor? How do you think these poor conditions might have made people ill?

Screen 9

Explain to learners that by 1922, TB was still a significant public health challenge. Craig y Nos was called a sanatorium but it had all the hallmarks of a prison for sick children.

Show the video [Children of Craig-y-nos](#) (just over 5 minutes). Then, ask learners to discuss the questions posed.

Focus questions

- What do you think it was like living in the sanatorium?
- How do you think the children felt? Why?

Screen 10

This screen gives details of how children were tested for TB using 'gastric lavage' or a stomach wash-out. Ask learners to read about this and discuss the questions posed.

Focus questions

- Why do you think children wouldn't like having this test?
- Some of the children in Craig y Nos were as young as 6 months old. How do you think these babies might have felt having this test? Why?

Screen 11

Here information on using guinea pigs to test the stomach washout for TB is given. Ask learners to discuss the questions posed.

Focus questions

- What do you think about using guinea pigs to test for TB?
- What do you think about using animals to test for any human diseases? Why?
- How should we treat animals? Why do you think this?
- What percentage of children tested had TB?
- What should have happened to the children who didn't have TB? Do you think this happened? Why?

Screen 12

Ask learners to imagine they are a child sent to the sanatorium, using what they have found out about TB and life in Craig y Nos. Then, to write a diary or make a vlog about their life before, during and after their time in the sanatorium. Questions on screen should help learners to include relevant details.

Focus questions

- What your life was like before you were sent to the sanatorium? How did you feel? Why?
- What happened when you first heard that you were going to the sanatorium? How did you feel?
- What happened to you in the sanatorium? Why did this happen?
- Were there any really scary moments? What were they? How did you cope?
- How did you feel when you were released from the sanatorium?



TASK 3

TB TODAY

Explain to learners that they are going to interrogate data about TB in the world today, look at how badgers might be blamed for the spread of bovine TB and carry out surveys of air pollution using lichens as indicators.

Screen 3

Explain to learners that Tuberculosis (TB) is still a major global health threat and the second leading cause of death due to an infectious agent worldwide. The screen gives some facts from the World Health Organization (WHO).

Screen 4

Ask learners to access the website [TB profile](#) from WHO and compare data from the UK and an economically developing country. Then, to discuss the questions posed.

Focus questions

- What are the main differences in numbers of TB cases between the two countries?
- Why do you think there is such a difference?
- What is the trend in the number of TB cases in each country?
- How does HIV seem to impact on the number of TB cases? Why do you think this might be?

Screen 5

Explain to learners that in Wales, we monitor the number of TB cases as TB is a 'notifiable' disease. Every year, Public Health Wales research and write a Tuberculosis in Wales Annual Report.

Invite learners to access the 2021 report and read 1.2 Key findings and trends: [Tuberculosis in Wales Annual Report](#). Then, to discuss the questions posed.

Focus questions

- Why does Wales remain within the WHO definition of a low incidence country?
- What is the trend in the number of TB cases?
- How many women had TB in 2021?
- What do you think is meant by a 'social risk factor'?
- How does poverty affect the number of TB cases in Wales? Why do you think this happens?

Screen 6

This screen gives information about cattle and bovine TB and the debate about badgers' role in transmitting bovine TB.

Screen 7

Invite learners to research online to find out more about the controversy about culling badgers to stop the spread of bovine TB. Ask learners to think about the questions posed to help their research.

- What type of sites will be the best to use, why?
- Could the information/data be biased? Why do you think that?
- How reliable do you think the information/data is? How could you find out?

Once learners have carried out their research, ask them to discuss the questions posed.

Focus questions

- What do you think about culling badgers to help stop the spread of bovine TB?
- How well do you think culling badgers will work? Why?

Screen 8

Explain to learners that air pollution has a detrimental effect on TB. It can also weaken the lungs so that people are more likely to catch TB.

In the early 1900s, air pollution was a big problem in industrial Wales. We are going to find out what it is like today.

Screen 9

This screen gives information about lichens and their sensitivity to air pollutants.

Screen 10

Inform learners that they are going to do a lichen survey of two areas to compare air quality. Firstly, they will do a survey near school and then one in Bannau Brycheiniog National Park.

Screen 11

The table given is the simplest way to view lichens and air quality. However a link to an identification guide is also given: [Lichen Identification Guide](#).



Screen 12

Explain to learners the information they will need to collect as they do their lichen survey – as shown onscreen.

Screen 13

Take learners outside to carry out their lichen survey near school.

Screen 14

Pool the class findings. Then, ask learners to discuss the question posed.

Focus questions

- What type of lichen did you find the most of? Why do you think there were more of these? What does this tell you about the air quality?
- Is just counting the number of each type of lichen enough to give you firm conclusions about the air quality? Why? What could you do to ensure you made firm conclusions?
- For each type of lichen, crusty, leafy and bushy:
 - Where did you find the most of them?
 - How were they distributed in terms of compass directions?
 - How were they distributed in terms of the prevailing wind? What does this tell you?
- What conclusions can you draw from your findings in the local area?

Screen 15

Inform learners that they now need to repeat the whole survey in Bannau Brycheiniog National Park – as Screen 12. Then, compare what they found out about air quality in the local area with what they found out in the National Park.

They will use their findings to write an article about air quality for a local online newspaper.

Screen 16

Take learners outside to carry out their lichen survey in Bannau Brycheiniog National Park.

Screen 17

In order to draw their conclusions, ask learners to use the question prompts on Screen 14. Then, to compare the findings from both areas.

Ask learners to use their conclusions to write an article about air quality near school compared with Bannau Brycheiniog National Park. When completed, offer it to a local online newspaper for publication.

The screen gives details as to the types of issues they might have found. It also gives ideas they could include in their article.

If you wish to develop the ideas of air pollution further, you could look at the different gases produced from local industries, how their release is minimised and what effects they could have on the environment.

