*Institute for Research in Schools*KS3 Covid-19 Lessons

These lessons are aimed at KS3 students. The lessons are produced by the Institute for Research in Schools in partnership with the University of Bristol.

The lessons aim to help students apply their studies to the Covid-19 pandemic, discovering important STEM career possibilities and applying mathematical principles to better understand the Covid-19 data available.

Staff leading the sessions should be sensitive to the possibility that students may have been affected directly by illness or bereavement due to Covid-19.

Lesson 2 delves deeper into the data that is available on Covid-19 and asks students to interpret and analyse the data to come up with a strategy for managing the spread of COVID-19.

Lessons comprise a broad lesson plan, an accompanying PowerPoint and all other necessary materials. They can be carried out in the classroom, as a lesson over virtual platforms such as MS Teams, or they can be set for independent study.

**Lesson 1:**

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| Slide 1 | Titles |  |
| Slide 2 | Outcomes:   * Know what a coronavirus is * Find out about some of the scientists who are helping us to learn more about COVID-19 * Be able to explain what the R-number is * Model disease spread at different R-numbers * Be able to explain how mathematical modelling of disease spread can be useful | Introduction of outcomes. These fit with the GCSE curriculum  (5 mins) |
| Slide 3 | How can scientists help during a pandemic?  What is a pandemic?  Which scientists help during a pandemic? | This can be discussion that is teacher-led, either in person or on an online platform, or students can do this independently, making their own notes on the lesson. Encourage students to think more deeply than frontline medical staff; the outcomes should have hinted that the response of scientists goes a lot further than that.  (10 mins) |
| Slide 4 | Scientists who help in a pandemic. | Students may have thought of additional scientists who help during a pandemic – there are many more. Encourage discussion about this to broaden out their assumptions about jobs in STEM.  (10 mins) |
| Slide 5 | What is an epidemiologist? | Can students think of examples of how they have seen these people work in the past year? Examples include the modelling of the spread of Covid-19 that was used by Professor Chris Whitty on the televised Covid-19 updates. Infection control epidemiologists will have advised on what Personal Protective Equipment (PPE) was required to minimise the spread of the virus.  (5 minutes) |
| Slide 6 | What is Public Health England (5 mins)  Why are bodies like PHE useful? (5 mins) | Students are asked what they would do if they were a GP who had identified a new illness. They should come round to the idea that there needs to be a coordinated system of reporting such diseases (and others, known as ‘notifiable’ diseases) so that monitoring of the population can be carried out, and steps taken to identify and limit the spread of any new disease. They may already be familiar with the organisation called ‘Public Health England’ who are responsible for preparing for and responding to public health emergencies.  (10 minutes) |
| Slide 7 | Covid as a disease caused by a virus | There are three key points here – COVID-19 is the disease caused by the novel coronavirus SARS-CoV2; there are several coronaviruses already known, including the one that causes the common cold; SARS-CoV2 is new to us – we haven’t seen it before.  (5 minutes) |
| Slide 8 | What is the R number and why is it important? | The ‘R’ number is the reproduction number of a disease. It refers to how many people an infected person passes the disease on to, on average. With an R number of 1, each person passes the disease onto one other person on average. This means that the number of cases in the population stays pretty much the same. If the R number is over 1, on average each person is spreading the disease to more than one other person, and the amount of the population who have the disease will increase. The bigger the R number, the faster the population becomes infected.  The R number is important because it gives an idea of how many people are likely to become ill over what period of time. It lets organisations like Public Health England and the Government know when it is time to take action to reduce the rates of infection.  The R-rate does not just depend on the disease, it also depends on our behaviour. The R-number can be reduced by cutting down the number of people that each person mixes with, staying further apart and washing hands. It can also be reduced if anyone infectious stays away from other people. |
| Slide 9 | Worksheet KS3.1  R-number activity |  |
| Slide 10 | Review of outcomes   * Know what a coronavirus is * Find out about some of the scientists who are helping us to learn more about COVID-19 * Be able to explain what the R-number is * Model disease spread at different R-numbers * Be able to explain how mathematical modelling of disease spread can be useful |  |