

Collins



**IDEAS FOR TEACHING
PRIMARY SCIENCE
USING EXAMPLES FROM
THE COVID-19
PANDEMIC**

**HELP YOUR PUPILS MAKE
SENSE OF RECENT EVENTS
AND RE-ENGAGE WITH
SCIENCE LEARNING**

**A FREE PACK FOR
PRIMARY SCHOOLS**

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With thanks to Nicola Beverley,
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collins.co.uk/snapscience





LET'S TALK ABOUT WHAT'S BEEN HAPPENING

MAKING SENSE OF THE CORONAVIRUS PANDEMIC.

The life of every child in the UK in 2020 has been fundamentally affected by the coronavirus pandemic. They couldn't go to school, their parents may have stopped going to work, they couldn't see family and friends. Children will have had many different experiences: the trauma of a family member or close friend being ill or dying from Covid-19; family members working on the NHS front line. Some may have clapped in support of the NHS on Thursday evenings. They will all have seen people wearing masks in shops and on public transport.

Children will have seen news stories about the new disease Covid-19, how it was spreading, and what people needed to do to keep safe. Scientists were on the TV every day, and science made the headlines in every paper and news report. Children will have engaged with scientific ideas about disease and hygiene, and will also have seen at first-hand how science works, with words like modelling, predicting, testing, data, and evidence used in everyday conversations.

It seems more than likely that children will want talk about what's been happening, so that they can make sense of this massive experience. They will have questions about the pandemic that has affected their lives so significantly. This resource has been created for primary teachers to use to stimulate and support those important conversations in classrooms.

There are nine questions which cover different scientific aspects of the coronavirus pandemic. They will provide opportunities to build children's knowledge and understanding of the science that explains the disease and its consequences, with questions to explore further and investigations to pursue. For each question the science is clearly explained for teachers to use, with links to relevant National Curriculum content, other teaching resources and lessons taken from the Snap Science Teaching Framework.

Of course, children will have questions that are not covered in this resource. These should be encouraged. The scientific information on the cards, and the links to other sources of support can be used to support wider discussion and investigation.

WHAT IS PPE?

HOW DOES PPE STOP THE TRANSMISSION OF COVID-19 MICROBES?

Gloves, masks, visors and gowns stop people coming into contact with Covid-19 microbes in the air when people cough or sneeze, or from skin or surfaces. They are a type of filter, filtering air. They also reduce the risk of passing on the virus to someone else by covering the mouth, nose and hands.

CHILDREN CAN MAKE:

- A poster to show different types of PPE in different settings, explaining how they keep people safe.
- A jingle to remind people of a safety message e.g. shoppers to wear a mask.
- Suggestions about how to stop littering: make sure plastics are recycled wear washable / reusable masks.
- Sunglasses for a toy.

CHILDREN CAN INVESTIGATE:

- In school we sometimes wear goggles when doing science. What are the risks? How do goggles keep us safe?
- What other ways do we keep safe when doing science?
- At home we use oven gloves when cooking. What do they keep us safe from?
- What other types of PPE do your family members use at home when doing DIY or gardening?
- How do we keep ourselves safe from the sun?
- What PPE should we wear when we are cycling? How does it keep us safe?
- What PPE do builders use? How does it keep them safe?
- How far does breathed out air travel when we sneeze, cough or talk? Investigate outside with a spray bottle, coloured water and a large sheet of paper. What happens if you put a mask over the nozzle?
- Which material is the best for filtering mixtures in water? Are they good for masks too?
- Why does wearing a mask in a shop keep people safe from Covid-19?
- What type of PPE do doctors and nurses working in hospitals treating patients with Covid-19 need?
- Why is laughter sometimes described as infectious or contagious? What else are these scientific adjectives used to describe?
- What happens to PPE after it has been used? What are the implications of this for the environment?

NC AND SNAP LINKS

Y2 Science: describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene

Year 2 Science: Identify and compare the suitability of a variety of everyday materials, including wood, metal, plastic, glass, brick, rock, paper and cardboard, for particular uses.

Y3 Science: Recognise that light from the sun can be dangerous and that there are ways to protect their eyes

Y4 Science Y4: Recognise that environments can change and that these changes can sometimes pose dangers to living things.

Y2, Snap Module 5, lesson 4 – How can we stay clean?

Y2, Snap Module 3, Lesson 3 Is that a good choice of material?

Y3 Snap: Module 3 Lessons 9 & EL1

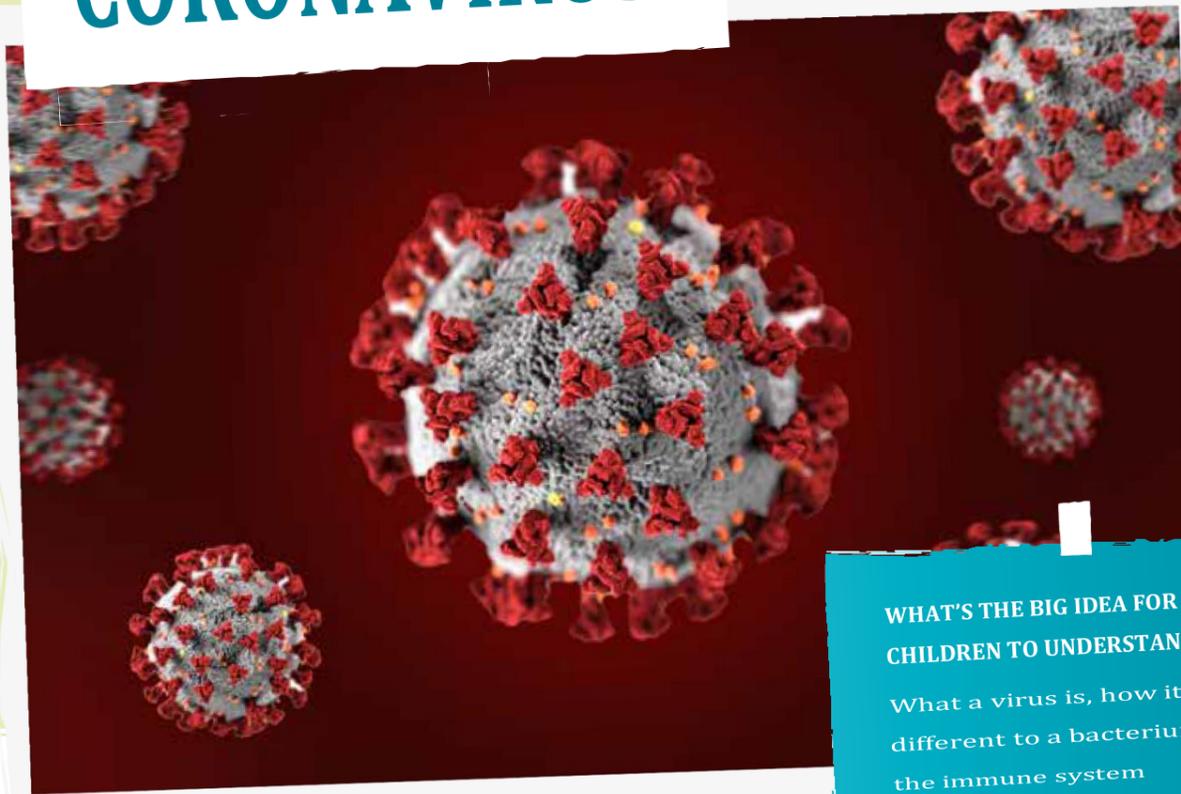
Snap Year 4 Module 4 Human impact lessons 1-6

A video showing PPE used when caring for Covid-19 patients

[children-young-people-and-families/](https://www.ase.org.uk/resources/y2-animals-including-humans-zunaira/)

Annotated examples of Y2 child's work investigating the importance of hygiene <https://www.ase.org.uk/resources/y2-animals-including-humans-zunaira/>

WHAT IS CORONAVIRUS?



WHAT'S THE BIG IDEA FOR CHILDREN TO UNDERSTAND?

What a virus is, how it is different to a bacterium, the immune system

WHAT'S THE SCIENCE?

Viruses and bacteria are tiny microbes that are too small to see. Both can cause infection and illness.

Bacteria are tiny living microorganisms that are made up of a single cell. Bacteria can grow and multiply in almost every environment, including in or on the human body. Many bacteria are useful, for example, there are some bacteria that live inside us and keep our guts healthy. Other bacteria are harmless, but some bacteria can cause infections in humans. These bacteria are called pathogenic bacteria.

Viruses are even smaller than bacteria and they need to live inside another organism. They can only grow and multiply by attaching themselves to the cells of a plant, animal or person. Most viruses cause disease and are specific about the type of plant or animal that they infect, and the cells that they will attach to. For example, certain human viruses may only attack cells in the liver, the respiratory system, or the blood. When a virus enters a

human body, it invades some of the cells, killing them, or making them not work properly. It hijacks the cell to make more copies of itself.

When someone has a bacterial disease, doctors use antibiotics to stop the bacteria from growing and multiplying. Antibiotics do not work on viruses, which is why they are not prescribed for many common illnesses that are caused by viruses, such as colds and flu. There is no treatment for many viral infections. When someone has a viral disease, doctors treat the symptoms, while the body's immune system works to clear the infection. Special cells in the blood make antibodies to fight and destroy virus invaders. After someone's immune system has made **antibodies** to fight a particular type of virus, the antibodies usually stay in the blood, in case the body has to fight the same virus again. That's why someone who is ill with a disease like measles usually won't get ill from it again.

WHAT IS THE CORONAVIRUS COVID-19?

Coronaviruses are a family of viruses that can cause a range of illnesses, from a mild cold, to more severe respiratory illness. Although very, very small, coronavirus particles can be seen using an electron microscope. They all look like they have a spiky crown or 'corona'. The coronavirus that has made so many people ill this year is a new virus, called SARS-CoV-2, which stands for severe acute respiratory syndrome coronavirus 2. The illness, or disease that the virus causes is known as Covid 19. CO stands for 'corona,' VI for 'virus,' and D for 'disease.' 19 is the year it was discovered, 2019. The SARS-CoV-2 virus can cause a high temperature, cough, difficulty breathing, sore throat, lack of taste and smell, and tiredness. It is very contagious. As far as scientists know, SARS-CoV-2 was a new strain of virus that was capable of infecting people, and so no one who got infected for the first time had antibodies to fight it.

WHY DO SOME PEOPLE WHO GET COVID-19 BECOME MORE ILL THAN OTHER PEOPLE?

Everyone has more than 10 billion different kinds of antibody inside them, and although most people's immune systems can successfully fight Covid-19, some people get really sick. Elderly people, pregnant women or people who already have other illnesses that might make their bodies weaker may not have such strong immune systems. Some people become very sick because their healthy immune systems over-reacts to the virus.

CHILDREN CAN INVESTIGATE:

- Which illnesses are caused by bacteria, and which are caused by viruses?
- Many bacteria are useful. Can you find out about any and what they do?
- Fungi are another type of microbe. What can you find out about them?
- Who was Antonie van Leeuwenhoek?
- What sort of microscope is needed to see a virus?
- How big is a virus?
- What is in blood that helps to fight viruses?

CHILDREN CAN MAKE:

- Blood soup - Snap Y6, Module 2, Lesson 4.
What is in blood?
- Microbes from playdough, using pictures to help <https://e-bug.eu/partners/microbs.html>
- A yeast balloon <https://www.e-bug.eu/language%20packs/english/homeSciencePDPs/Yeast%20Balloon.pdf>
- (Grow) microbes on bread - Snap Y6, Module 1, Lesson 7. How can you grow your own microorganisms?
- A microbe garden <https://www.e-bug.eu/language%20packs/english/homeSciencePDPs/Microbe%20Garden.pdf>

NC AND SNAP LINKS

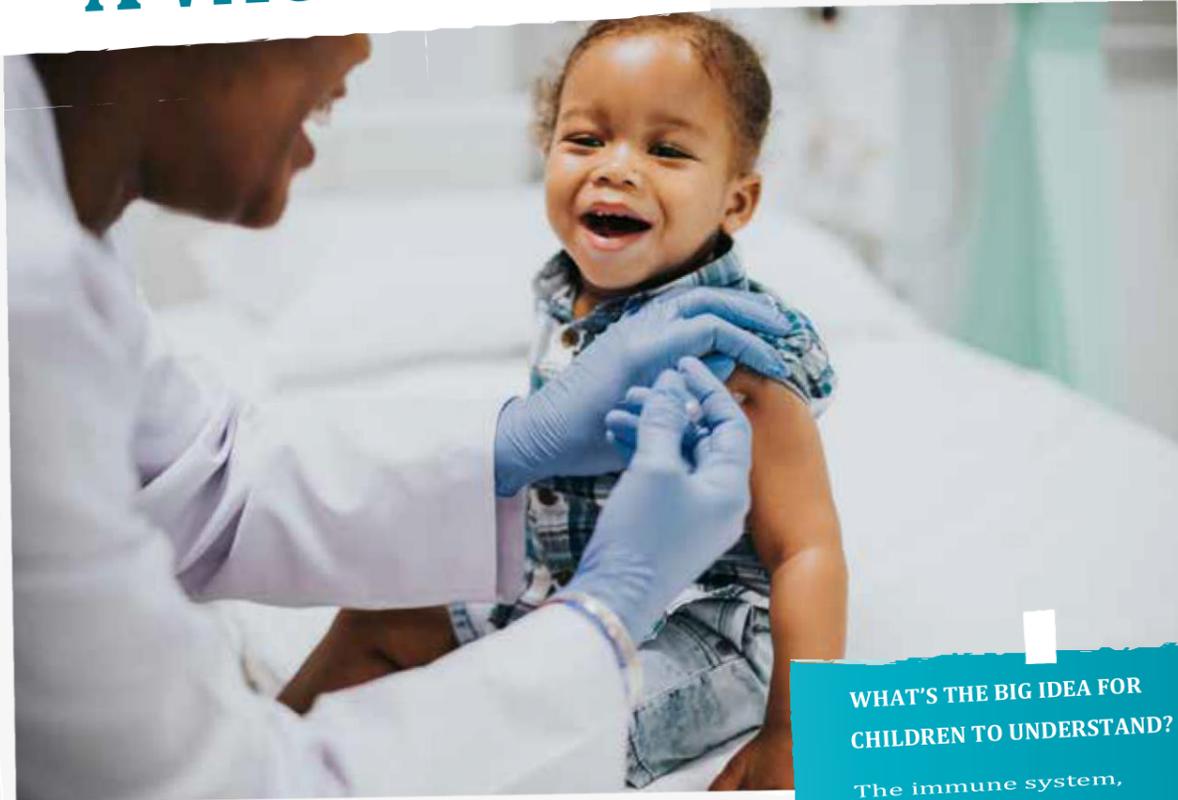
Y6 Science: Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including microorganisms, plants and animals.

Y6 Science: Identify and name the main parts of the human circulatory system and describe the functions of the heart, blood vessels and blood.

Snap Y6, Module 1, The Nature Library, Lessons 6 What else in living besides plants and animals? and 7. How can you grow your own micro-organisms?

Snap Y6. Module 2, Body Pump, Lessons 3 What is blood? and 4 What is in blood?.,

WHY DO WE NEED A VACCINE?



WHAT'S THE BIG IDEA FOR CHILDREN TO UNDERSTAND?

The immune system, preventing and treating diseases, vaccines

WHAT'S THE SCIENCE?

Unlike diseases caused by bacteria, which can be treated by antibiotics, there are no medicines that doctors can use to cure many viral infections, including coronavirus.

However, humans have different defence mechanisms to fight disease.

- Skin stops many pathogens (harmful microbes) getting into bodies, and mucus and tiny hairs in the nose trap microbes, and stop them getting into lungs.
- Humans also have an internal defence system to fight viral disease; it is called the immune system. This includes: Non-specific white blood cells (WBC) which try to engulf and kill infection caused by bacteria and viruses.
- Specific white blood cells which target viruses by producing antibodies. All invading viruses have one or more unique molecules on their surface called antigens. Specific white blood cells create **antibodies** to attach to the **antigens** and destroy the disease-causing viruses,

or act to activate other parts of the immune system to come and destroy the pathogen. When all the viruses are destroyed the antibodies stay in the blood in case the body has to fight the same virus again. Everyone has more than 10 billion different kinds of antibody inside them, a sort of biological history of the diseases that humans have fought for a million years or more.

Doctors use knowledge of how antibodies work to create vaccines that prevent viruses and some bacteria making humans ill. Vaccines do not treat infection but prevent it. A vaccine is usually made from weak or inactive versions of the virus or bacterium that causes the disease, or the vaccine may be based on a similar microbe. It is injected into the body, but because it is a very weak version it does not cause illness, but it triggers the white blood cells to create lots of antibodies to destroy it. The next time the harmful microbe enters the body the immune system already has the antibodies ready to fight the microbe before it has time to cause illness.

SARS-CoV-2, the coronavirus that has caused so many people to be ill, was first detected in 2019, and as far as scientists know this was the first time that it started to infect humans, so no one had the antibodies to fight it. Immunologists, scientists who study the immune system, are working very hard to create a vaccine to stop the virus making people ill with Covid-19

Scientists are also working to invent new medicines to help treat people who are ill with Covid-19. They are also working to find other medicines that are already used for other illnesses, which could help with some coronavirus symptoms.

CHILDREN CAN INVESTIGATE:

- Who was Edward Jenner?
- Which other diseases, viral and bacterial, are prevented by vaccines?
- Why is the flu vaccine given every year?
- Why do we need boosters for some vaccines?
- Why are vaccines free?
- Which diseases now almost never occur because people in the UK (and around the world) are vaccinated?

- What do scientists need to find out about a new vaccine before it is given to the general public?
- How are new vaccines tested?

When it is ready, who should be given the Covid-19 vaccine first? This could be a 'conscience corridor' / 'decision alley' activity, or persuasive writing, justifying who should have a vaccine first 'if' the vaccine is scarce, or before enough has been made to vaccinate everyone.

CHILDREN CAN MAKE:

A vaccine diary: which vaccines have they had in their lives? Are the same vaccines used for children in other countries?

NC AND SNAP LINKS

Y6 Science: Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including microorganisms, plants and animals

Y6 Science: Identify and name the main parts of the human circulatory system and describe the functions of the heart, blood vessels and blood

UKS2 Working Scientifically: identifying scientific evidence that has been used to support or refute ideas or arguments.

Snap Y6, The Nature Library, Lessons 6 What else in living besides plants and animals? and 7 How can you grow your own micro-organisms?

Snap Y6. Module 2, Body Pump, Lessons 3 What is blood? and 4 What is in blood?

FURTHER INFORMATION FOR TEACHERS:

A set of resources about the work of Dr Edward Jenner and the impact of vaccinations today:
<http://www.schoolscience.co.uk/whyyoullnevercatchsmallpox>

A vaccination time line: https://www.e-bug.eu/games_home

https://www.e-bug.eu/games_home
https://www.e-bug.eu/games_home

Vaccine schedules in all countries of the European Union: <https://vaccine-schedule.ecdc.europa.eu/>

WHY DID ENGLAND LOCK DOWN ?



WHAT'S THE BIG IDEA FOR CHILDREN TO UNDERSTAND?

How viruses spread, keeping people safe, predicting based on scientific evidence

WHAT'S THE SCIENCE?

Viral illnesses like coronavirus are **transmitted** when an infected person touches or exchanges body fluids with someone else, and they breathe in the virus or it gets into their mouth. If infected people keep away from other people then they can't pass the virus on, and fewer people get ill. If the virus cannot pass from person to person in a particular area, it will die out there.

In March 2020 the number of people in England becoming very ill with Covid-19 was growing very fast. More and more people were becoming ill every day and people were dying. **Epidemiologists**, scientists who study how disease spreads, knew how the virus was transmitted from person to person, and they also knew that not everyone who had the virus in their bodies was becoming ill. At that time, it was not easy to test quickly to see if someone had Covid-19, and with some infected people having no

symptoms it was hard to know who had the virus and could pass it on to someone else. The epidemiologists looked both at what had happened in other countries, and looked to the past, when new viruses had spread, **and they then used all this evidence to predict** how many people could become ill if people kept getting together in places where the SARS-CoV-2 virus could be transmitted. The Government was worried that there were not enough hospitals to look after all the people who might become very ill, including the doctors and nurses, if the virus kept spreading.

To stop Covid-19 spreading even faster, and to keep people safe, on 23rd March 2020 the Government ordered everyone to stay at home if they could. This was called **lockdown**, and meant that lots of shops and offices closed, restaurants, playgrounds and sport centres were closed,

lots of children didn't go to school and most people stayed in their own homes. Many people, including most school children, worked at home.

The epidemiologists kept a record of how many people became ill, and around the country the numbers of people who were tested for Covid-19 was increased, so that the scientists could **measure** how fast and where the disease was spreading. In July, when the evidence showed that the

virus was not spreading so fast anymore, the Government allowed most of the places that had closed to reopen, and said that people could visit other people in their homes. But everyone had to follow **social distancing** rules, make sure that they washed their hands frequently and properly, and that they wore face masks in shops and on public transport.

CHILDREN CAN INVESTIGATE:

- Did schools close in other countries?
- Why have there been 'local lockdowns'?
- How does social distancing keep people safe?
- What other things should people do to keep safe?
- How did people keep in touch with their families and friends during lockdown?
- How did people's jobs change? Think of some examples.
- What did the Derbyshire village of Eyam become famous for nearly 350 years ago?
- Why is it important to test as many people as possible for Covid-19?
- Who is it most important to test?

CHILDREN CAN MAKE:

A chart for a week to show how many people each member of their household would be near to each day in lockdown, and before lockdown.

NC AND SNAP LINKS

Y6 Science: Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including microorganisms, plants and animals

UKS2 Working Scientifically: identifying scientific evidence that has been used to support or refute ideas or arguments.

Snap Y6, Module 1, The Nature Library, Lessons 6 The Nature Library, Lessons 6 What else in living besides plants and animals? and 7. How can you grow your own micro-organisms?

FURTHER INFORMATION FOR TEACHERS:

About Eyam the plague village; <https://www.historic-uk.com/HistoryUK/HistoryofEngland/Why-Is-Eyam-Significant/>
<http://www.schoolscience.co.uk/whyyoullnevercatchsmallpox> The Speckled Monster section in looks at how smallpox was transmitted in a village through contact with others and community transmission; possibly closing places where people gather is considered in Measles Alert.



WHY DO THE RULES KEEP CHANGING?



WHAT'S THE BIG IDEA FOR CHILDREN TO UNDERSTAND

Scientific knowledge is subject to change based on new evidence or on new interpretations of existing evidence

WHAT'S THE SCIENCE?

Since Covid-19 was first officially identified in Wuhan in China in November 2019 the Government has worked with **epidemiologists**, scientists who study how disease spreads, to make **new rules and provide guidance** to help make sure that people are kept as safe as possible. There have been rules about where people can go, whom they can meet, how close they can be to other people and what PPE they should wear. These rules and guidance

have changed in **response to new evidence** about Covid-19 and how it spreads. This is because scientific knowledge changes when there is new evidence, or **new interpretations of existing evidence**. Scientific knowledge has always developed in this way, with scientists often disagreeing with each other's interpretations of evidence, and setting up tests to prove or disprove an idea.

CHILDREN CAN INVESTIGATE:

- Why do you think scientists were asked to stand next to the politicians when they told everyone about new rules?
- Who should make the rules - politicians or scientists?
- What are the problems when the rules keep changing?
- As well as scientific evidence about how Covid-19 was spreading, what other factors did politicians have to consider when they made the rules?
- Can you remember any of the slogans that were used to help people remember the rules? Why were there slogans?
- What examples can you find of how scientific ideas about disease prevention have changed over time?

- For example, preventing cholera by recognising that it came from contaminated water, and not from bad air. Other examples include linking malaria to mosquito bites, the discovery of microbes and their association with disease, and the link between surgical hygiene and disease prevention.
- What examples can you find that show how other scientific ideas, perhaps those about evolution, or space, have changed over time?
- How has scientific evidence been used to make and change rules in school, for example, about playtime snacks?
- How has scientific evidence has been used to make and change laws, for example, laws about about smoking?

CHILDREN CAN MAKE:

An investigation to test a scientific prediction, for example, that heavy things fall faster than light objects. How does the evidence change their understanding?

NC AND SNAP LINKS

UKS2 Working Scientifically: identifying scientific evidence that has been used to support or refute ideas or arguments.

UKS2 Working Scientifically: reporting and presenting findings from enquiries, including conclusions, causal relationships and explanations of and degree of trust in results.

Snap Y5, Module 7, Feel the Force, Lesson 2

Snap Y5, Module 8, Earth and Beyond, Lesson 1

Snap Y6, Module 1, The Nature Library, Lessons 8 and 9

Snap Y6 Module 3, Body Health, Lesson 8

Snap Y6, Module 4, Everything Changes, Lessons 9 and 10

FURTHER INFORMATION FOR TEACHERS:

To present learners with their own misconceptions and generate discussion, argument and evidence collection use Concept Cartoons in Science <https://www.millgatehouse.co.uk/product/science-concept-cartoons-set-1/>

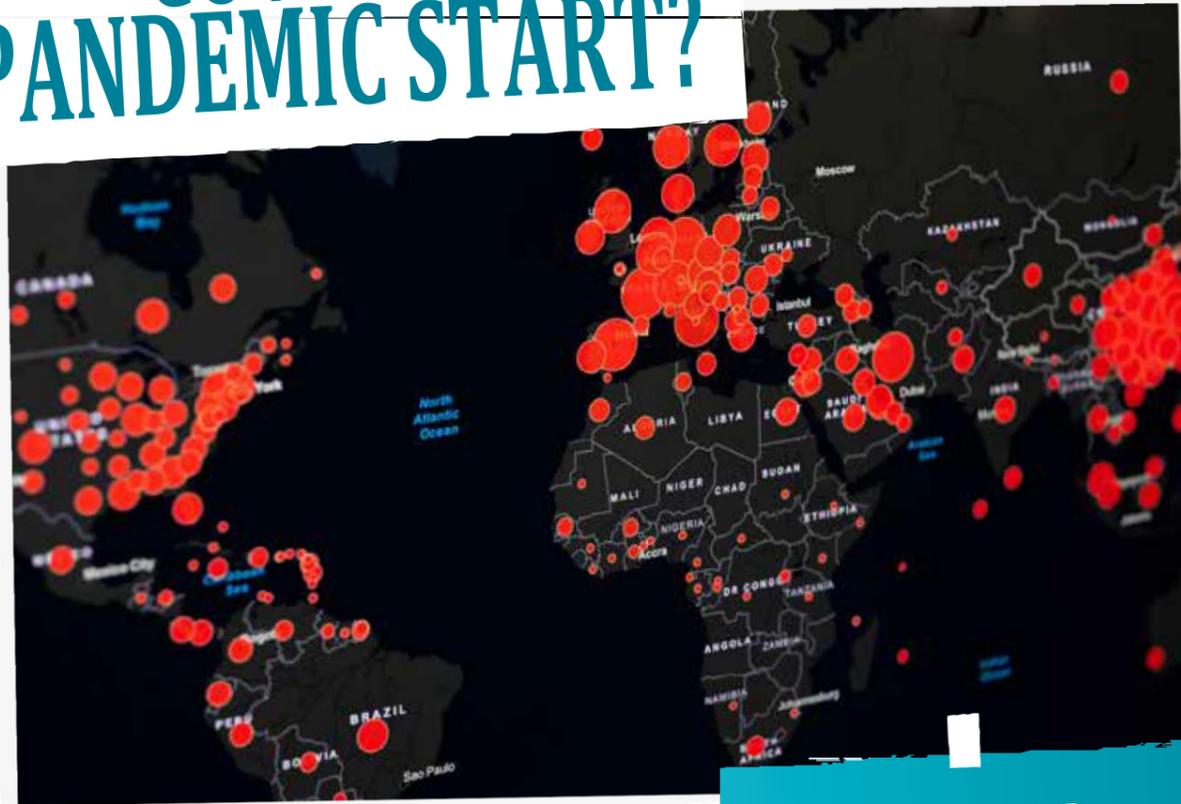
An article by Jim Al-Khalili about why doubt is essential for science <https://www.theguardian.com/commentisfree/2020/apr/21/doubt-essential-science-politicians-coronavirus?CMP=Share>

<https://www.theguardian.com/commentisfree/2020/apr/21/doubt-essential-science-politicians-coronavirus?CMP=Share>

Philosophy for children <https://p4c.com/>



HOW DID THE COVID-19 PANDEMIC START?



WHAT'S THE BIG IDEA FOR CHILDREN TO UNDERSTAND?

How viruses spread

WHAT'S THE SCIENCE?

Coronaviruses are a family of viruses that cause illness in animals. In November 2019 virologists, scientists who study viruses, discovered a new coronavirus that was making humans very ill in a town called Wuhan in China. They think the virus came from a market where animals were sold, and that the virus was able to make the jump from animals into humans. **Virologists** named the new virus SARS-CoV-2.

SARS-CoV-2 spread quickly from human to human because, like other viruses, it doesn't make people ill as soon as they are infected. People in Wuhan passed this new coronavirus to other people before they knew they had been infected. It spread quickly in Wuhan, and although many people who were infected with SARS-

CoV-2 did not get ill at all, or were only mildly ill with Covid-19, they still passed the virus to other people, some of whom became very ill. Because SARS-CoV-2 it was a brand new virus to humans no one had antibodies in their immune system to fight it.

When a viral disease spreads to lots of people in an area or country it is called an **epidemic**. By March 11th 2020 there was a Covid-19 **pandemic** because the virus had spread to up to 114 countries. On 2nd April 2020, 19 weeks after the first case was confirmed, the number of people in the world confirmed with Covid-19 reached one million. The second million cases appeared just two weeks later. Numbers stopped growing at this very fast rate once peoples' behaviour changed.

CHILDREN CAN INVESTIGATE:

- How did Covid-19 spread from country to country?
- What other viral epidemics and pandemics have there been?
- Why did this pandemic happen so fast?
- How can countries work together to prevent pandemics?
- How do pandemics end?

CHILDREN CAN MAKE:

- A map of the world to show where Covid-19 has spread.
- A graph to show the number of cases in the world and in England each week from

NC AND SNAP LINKS

Y6 Science: Describe how living things are classified into broad groups according to common observable characteristics and based on similarities and differences, including microorganisms, plants and animals

Snap Y6, Module 1, The Nature Library, Lessons 6 The Nature Library, Lessons 6 What else in living besides plants and animals? and 7. How can you grow your own micro-organisms

FURTHER INFORMATION FOR TEACHERS:

The Virus Ben Martynoga 2020



WHAT WAS THE IMPACT ON THE ENVIRONMENT OF LOCKDOWN?



WHAT'S THE BIG IDEA FOR CHILDREN TO UNDERSTAND?

Human impact on our world

WHAT'S THE SCIENCE?

Humans have a negative impact on their natural environment through different types of pollution, for example, litter, chemical, air, or noise. The global environment is affected through pollution by carbon emissions from cars, planes and coal-fired power stations. In response to this, and among many other actions taken by individuals and by communities, primary schools take action to reduce air pollution and noise from cars, and to reduce litter from food packaging. Environmental activists campaign to reduce pollution and carbon emissions, with millions of school children across the world joining forces with Swedish activist Greta Thunberg in 2019 to protest about the climate crisis.

The lockdown that was imposed to slow transmission of the SARS-CoV-2 virus resulted in traffic-free roads, plane-free skies and an overall fall in demand for energy globally, as people stayed at home and industries closed down. This has significantly reduced both air and traffic pollution, which has had monumental, positive effects. Air pollution levels in cities across the world were reduced, lowering the amount of harmful substances in air and improving air clarity. Fewer people being out and about has resulted in much less litter, and wildlife has returned to many habitats that have previously been negatively affected by human impact.

Lockdown enforced massive changes in behaviour across the world, and slowed the transmission of SARS-CoV-2. This has saved many people from becoming ill with and dying from Covid-19. Lockdown showed how communities could work together to protect the world's population. Long-term lockdown is not viable for economic and social

reasons, and the positive impact on the environment will not be sustained when society and industry return to pre-pandemic practices. But many people are asking what we can learn from the lockdown experience that could minimise how humans impact negatively on our world.

CHILDREN CAN INVESTIGATE:

- What changes did your family make during lockdown that helped the environment?
- Which of these changes might you continue? What would the long-term impact be?
- What changes would you like to continue in your local area?
- There were lots of reports that people helped each more during lockdown. Did you experience that? How can we encourage people to keep working together to improve our communities and environment?

CHILDREN CAN MAKE:

- A collection of images to show famous sights pre and during lockdown. Can they explain the differences?
- A survey of car journeys made in an average week by your family during lockdown and pre-lockdown. What has

NC AND SNAP LINKS

Science Y4: Recognise that environments can change and that these changes can sometimes pose dangers to living things.

Science Working Scientifically LKS2 Identifying differences, similarities or changes related to simple scientific ideas and processes.

Snap Y4, Module 4, Human impact, Lessons 1-6

FURTHER INFORMATION FOR TEACHERS:

A short film describing changes and asking what could happen next <https://www.bbc.com/future/article/20200422-how-has-coronavirus-helped-the-environment>



WHY IS IT IMPORTANT TO WASH OUR HANDS ?



WHAT'S THE BIG IDEA FOR CHILDREN TO UNDERSTAND?

Hygiene, how disease spreads

WHAT'S THE SCIENCE?

If the SARS-CoV-2 virus gets into people's mouths or noses it can make them very ill. The virus multiplies very fast, but is much too small to be seen. Not everyone who is infected with virus will get ill. This means that the only way to be sure if someone has the virus is to test them. This is commonly done using a test that can identify the specific SARS-CoV-2 molecules, or antigens in their saliva, for example. If someone is infected with SARS-CoV-2, they might transfer the virus onto their hands when they touch their nose or mouth. If they then use the contaminated hand to shake someone's hand or give them a hug, or they touch something like a door handle or a fork that someone else touches soon afterwards, the virus could be passed on to the other person. When that person then touches their own face, the SARS-CoV-2 virus can

get into their mouth or nose, and they may then become infected. Whether they get ill or not, they could still pass the virus on to someone else.

Keeping hands clean by washing them often and thoroughly with hot water and soap, means that the SARS-CoV-2 virus is washed safely away, down the plughole. Because of their structure, soaps molecules (the smallest units of soap) can dissolve the virus's shell and loosen it from hands. Soap is much more effective than hand sanitizer and antibacterial wipes; but only if hands are rubbed together with soap for at least 30 seconds. Hands should be washed on arriving home, or at school, and after nose blowing, sneezing or coughing, and before eating or handling food.

CHILDREN CAN INVESTIGATE:

- How many times do you touch your face in one minute?
- Who was Dr Ignaz Semmelweis?
- Why do you need soap and water to wash your hands? Fill a shallow bowl with warm water, not to the very top, and sprinkle some pepper on the surface. It should float on top. Dip your finger into the centre of the water and watch what happens to the pepper. Dry your hand, and then dip your finger into some liquid soap.

Dip your soapy finger into the water. What happens to the pepper?

- Can you try this experiment? <https://www.learning4kids.net/2015/04/08/colour-changing-milk-experiment>
- What other diseases does hand washing prevent from spreading?
- Why should we wash our hands after going to the toilet? After touching animals? After gardening? Before we touch small babies? When we visit someone in hospital?

CHILDREN CAN MAKE:

A poster to remind people when to wash their hands.

A jingle to sing for 30 seconds while hand washing.

NC AND SNAP LINKS

Y2 Science: describe the importance for humans of exercise, eating the right amounts of different types of food, and hygiene

Snap Y2, Module 5, Lesson 4, How can we stay clean?

FURTHER INFORMATION FOR TEACHERS:

Annotated examples of Y2 child's work investigating the importance of hygiene <https://www.ase.org.uk/resources/y2-animals-including-humans-zunairah>
https://www.who.int/infection-prevention/campaigns/clean-hands/WHO_HH-Community-Campaign_finalv3.pdf?ua=1

WHO ARE KEY WORKERS?



WHAT'S THE BIG IDEA FOR CHILDREN TO UNDERSTAND?
Survival

WHAT'S THE SCIENCE?

Human beings need food, water, air, and shelter to survive. Lockdown meant that most people stayed at home to stop SARS-CoV-2 spreading, but they still needed food to eat, water to drink and to keep them clean, for their homes to be heated and lit, and their rubbish collected. They also needed to know how to keep safe, so they had to be kept up to date with the news on TV, radio and podcasts. They needed to receive post, and for the police and fire service to keep them safe in emergencies. They also needed doctors and other medical staff, including paramedics, to look after them if they became ill with Covid-19 or other illnesses, or if they suffered accidents.

Key workers are people whose jobs helped people to survive and be safe during lockdown. Because their jobs were so important, these people kept going to work during

lockdown. Bus and train drivers were key workers because they took other key workers to work, and teachers were keyworkers because schools were kept open to teach the children whose parents were key workers and couldn't stay with them at home.

Many keyworkers use science. These people aren't just the medics, paramedics, physiotherapists and other people who help with treatment and recovery, or the research scientists working on new vaccines and drugs. They are also the chemists who make hand sanitisers, the engineers and technicians who design and make PPE, ventilators and other hospital equipment, and the builders who constructed the Nightingale hospitals.

CHILDREN CAN INVESTIGATE:

- Who were the key workers who made sure everyone had enough food?
- Who else were key workers? Why was their work vital?
- Why were key workers tested for Covid-19?
- How were homeless people kept safe during lockdown?
- How were keyworkers thanked by people at home?
- What did you miss most during lockdown?
- Did it make you think differently about what was important in your life?

CHILDREN CAN MAKE:

- A chart to show whose household members were key workers.
- A poster to show key workers who use science in their jobs.

NC AND SNAP LINKS

Science Y3: Identify that animals, including humans, need the right types and amount of nutrition, and that they cannot make their own food; they get nutrition from what they eat

Snap Y3, Module 5, Lesson 1, What would you need to survive?

FURTHER INFORMATION FOR TEACHERS:

<https://www.gov.uk/government/publications/coronavirus-covid-19-maintaining-educational-provision/guidance-for-schools-colleges-and-local-authorities-on-maintaining-educational-provision>