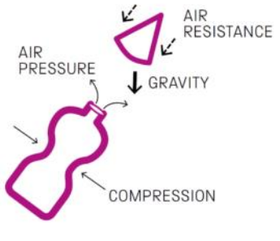
Lacock School C of E Primary School

Medium Term Planning for Science – Oak Class Autumn Term 1 2023-2024

Topic / key question	Scientists and Inventors			
Lesson 1	**Learning Intent:** **To recognise themselves as scientists.** **To understand the skills needed by a scientist.**	**Learning ladder success criteria:** **They understand the importance of learning about and from published scientists.** **Following an investigation, they can think about next steps and further investigating they can do.** **Can formulate a question and decide how to investigate it.** **Can make observations about investigations and try to explain what they see.** **They recognise themselves as a scientist.**	**Starter** Put up a selection of pictures of significant scientists, to include the scientists we are covering this term and a photo of one of the children from the class. Include Thales who believed the world was flat. Can they name and spot the scientist? All the pictures are scientists. **Main teaching activity** Why do we label people as scientists? What is it that they do? What skills do they demonstrate? In learning about scientists who should we choose? What can we learn from scientists of the past? What should we try and demonstrate in our science lessons? Begin a brainstorm of scientific skills. Class demonstration: Begin with a small demonstration of vinegar and bicarb, what can they see happening, if we put in a rocket what will happen and why. https://www.bbc.co.uk/teach/terrific-scientific/KS2/zr63d6f **Bottle rockets** **Independent work (HA / MA /LA or consideration for differing year groups)** Children in mixed ability / mixed year group pairs. Rocket mice: https://learning.sciencemuseumgroup.org.uk/resources/rocket-mice/ What makes your rocket fly? What makes it come down again? What happens if you use different sized milk bottles? Lots of photos for display and to stick a couple in their books. **Extension activities** How could you make your rocket travel higher? How could you make your rocket go more slowly? Can you make your rocket spin as it falls? **Plenary** Give each pair an opportunity to report back about what they discovered. How have they demonstrated that they are scientists? The bottle used as the rocket launcher is not really empty: there is air inside it. Air is elastic (squashy), and when you compress it, it pushes back and the pressure inside increases. In the activity, the sudden increase in air pressure inside the bottle pushes hard on the bottom of the rocket, sending it flying high into the air. There are also two other forces acting on the rocket: air resistance and gravity. Air resistance always pushes in the opposite direction to the rocket's movement, and its strength depends on the rocket's shape and its speed. Gravity always pulls downwards, slowing the rocket's climb but speeding up its descent.  https://www.youtube.com/watch?v=cMDCZWTSZvc How do rockets work?	Notes:

Lesson 2	**Learning Intent:** **To identify scientific evidence that can be used to solve a crime.**	**Learning ladder success criteria:** **I can identify different types of evidence collected at a crime scene.** **I can explain how evidence is used to support or refute claims.** **I can explain how chromatography separates mixtures.** **I can identify a mixture by separating it and observing its parts.**	**Starter** Refer back to our history lesson, we can learn about someone from the evidence they have left behind. Look at an image of a crime scene and discuss what might happen to find out who was responsible. Give the image to each child and they label with evidence which would be collected and any other info they know about solving crimes. LA – word bank available. https://www.youtube.com/watch?v=JgzdhUAJrBA Introduction to CSI **Main teaching activity** Set up idea that a note has been found, we want to identify the pen used as this will help to narrow the suspects. Name whose pen is whose. Initially discuss their ideas. What do they know about chromatography? Demonstrate with a thick coloured felt tip pen. Start write up of experiment with the children, question, equipment, prediction, method etc. **Independent work (HA / MA /LA or consideration for differing year groups)** **In their books each child needs to record the pen with an initial mark, then a piece of the chromatography paper result.** Y4 – record experiment as a cartoon strip, drawing equipment and stages of method. Y5 – give them an investigation format to follow. Y6 – focus on Y6 – expect them to set out own sub-headings and format. **Extension activities** How else might chromatography be used at a crime scene? To identify dyes from clothing fibres / blood samples. **Plenary** Discuss their results, is there a common agreement about the result, if there is not a common result, link this back to a crime scene and what implications it might have for people. Refer to our class topic, finish with a final sentence – Why are CSI investigators examples of scientists?	Notes:
Lesson 3	**Learning Intent:** To learn about and from the lives of significant individuals in the past who have contributed to national and international achievements. Leonardo Da Vinci	**Learning ladder success criteria:** **I take account of variables in my investigation.** **I understand controlled, dependent and independent variables.** **I can test his design for a parachute.** **I can describe why Leonardo is still learnt about today.**	**Starter** Refer back to initial lesson and look at Leonardo Da Vinci – identify who he is, when and where he lived (Tudor period) why is he famous? Artist, inventor, scientist. https://www.youtube.com/watch?v=Rm0qszPJnc8 **Main teaching activity** Look at some of his designs for flight. https://www.youtube.com/watch?v=pxBm7eg37MQ animation bringing his designs to life. Leonardo helicopter 1493 (1939) parachute 1485 (1797) Discuss task to create a parachute using his design. **Independent work (HA / MA /LA or consideration for differing year groups)** First task to create basic parachute – give length of strings and everyone same paper. Draw class back together to look at independent / controlled and dependent variables. What could we vary about this investigation to change our results? Y4 – change one variable – long and short string Y5 – change one variable but multiple options – type of paper used Y6 – As Y5 but expect a results chart. **Extension activities** Design transport of the future. **Plenary** **Reflect on results and their use of variables.** https://www.youtube.com/watch?v=Ng5jIOEq9GM Actual parachute jump using leonardos design. https://www.theguardian.com/uk/2000/jun/28/juliahartleybrewer Information about the above jump. Refer to our class topic, finish with a final sentence – Why is Leonardo an example of a scientist / inventor ?	Notes:

Lesson 4	**To plan an enquiry to test a hypotheses.** **Learning Intent:**	**Learning ladder success criteria:** **I can carry out an enquiry to test the accuracy of the Vitruvian man.** **I can describe what Leonardo's Vitruvian man teaches us about the human body.** **I can describe Leonardo's life and work.** **I can explain what my results show.** **I can record my results.**	**Starter** Get children on to front playground, challenge them to organise themselves by height without talking. If a child is tall does that mean that all their features are longer than the shortest person? **Main teaching activity** Revise what we have learnt about Leonardo Da Vinci – look back at display and our work on his parachute design. Look at an image of a Vitruvian Man. Show each of the measurements Leonardo came up with. Discuss task to test the accuracy of his ideas. If this is going to be done scientifically how should we organise our investigation and how should we write it up? **Independent work (HA / MA /LA or consideration for differing year groups)** Y4 – The length of the outspread arms is equal to the height of a man. Y5 - The length of a hand is one tenth of the height of a man. Y6 - The distance from the elbow to the tip of the hand is one fifth of the height of a man. **Extension activities** Teaching about Leonardo Da Vinci should have no place in the science curriculum 2021. Discuss **Plenary** Discuss results and refer back to topic. Why is Leonardo an example of a scientist / inventor? Give the children some measurements of two children, can they use them to work out their heights? https://www.mos.org/leonardo/activities/mirror-writing fab online activity to create his backwards writing **https://www.rct.uk/collection/themes/exhibitions/leonardo-da-vinci-a-life-in-drawing-0/primary-school-activities**	
Lesson 5	**Learning Intent:** To learn about and from the lives of significant individuals in the past who have contributed to national and international achievements. William Fox Talbot	**Learning ladder success criteria:** **I take account of variables in my investigation.** **I understand controlled, dependent and independent variables.** **I can test objects effect on light sensitive paper.** **I can describe why Fox Talbot is still learnt about today.**	**Starter** Show a selection of photographs of Lacock Abbey which do they prefer, which do they think could win a competition? What do they know about early photograph processes, look at a selection of cameras, how do the children take photographs? **Main teaching activity** **https://www.youtube.com/watch?v=9-uhXnzmVQ8 BBC teach Talbot** **https://www.youtube.com/watch?v=SELNB2xHu3A William Fox Talbot** **Independent work (HA / MA /LA or consideration for differing year groups)** Activity One Create their own camera obscuras – lots of preparation needed to cut up the card, buy credit card magnifiers. Activity Two Visit the abbey to look at their set of cameras. Take our camera obscuras up to the abbey to use. Use the abbey's huge outside camera obscura – go into the photography part of the museum. **Extension activities** Make a light sensitive image. Use the images they create to make greeting cards. Show how to make a light sensitive image, have a selection of objects for them to choose between, which objects will create the most effective prints? Remind about variables and record the Controlled: light sensitive paper, time for exposure, light source. Independent: types of objects Dependent: the darkness of the image **Plenary** **Stick in photos of them using their camera obscura. Design a camera of the future.** **https://www.youtube.com/watch?v=INCmDNC5KJE Detailed look at how Henry Fox Talbot created a Calotype** https://www.youtube.com/watch?v=VSsz0Q6_Sg0 Absolute Genius Fox Talbot – part at Lacock.	Notes:

Lesson 6	**Learning Intent:** **To learn from the life of a significant individual and to use that learning to shape their own practice.**	**Learning ladder success criteria:** **I can use a range of photographic techniques to create an image.** **I can identify a place or object which was significant to Talbot and explain why.** **I can review the scientists we have looked at and use their way of working to reflect on my own.**	**Starter** Look at timeline and history of development of the camera. **Main teaching activity** **L**ook at basic techniques of zoom, angling camera, contrast of roof line against sky line, capturing shadows, using objects (foliage, arches) to frame an image – ask class for their tips. On front playground, ask children to practice these techniques. **Independent work (HA / MA /LA or consideration for differing year groups)** Take ipads, camera obscuras and possibly other cameras?? Tour village to look for Tudor buildings, visit community garden, visit abbey **Extension activities** Try to replicate the window photo which Fox Talbot is famous for. **Plenary** Photography competition / reflect back on whole science topic: What have we learnt from the scientists we have looked at? What have we learnt about ourselves as scientists?	Notes: Ensure ipads are charged up and have storage space available.