Lesson 1 – Do scientists treat animals with respect?



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| **Subject**  Science – being a moral scientist | **Class**  Year 7 | **Date and period**  September 2015 | | | **Attainment of students (grade/ levels etc)**  Mixed | | | **SEN/EMA:** | | |
| **Prior Learning/Context:**  Students will have a basic awareness of what a scientist does for a living and the use of animals in research | | | | | | **Bloom’s taxonomy**   * Knowledge * Understanding * Application | | | | * Analysis * Synthesis * Evaluation |
| **Learning Objectives:**   * Students to have the ability to discuss and reflect upon the morals of using animals in scientific research * Students to understand why animal research is done and is often necessary | | | | | | | | | | |
| **Activity**  **Task 1**  Students shown two video clips of primates used in scientific research. Beforehand, they are asked to think about whether or not the scientists are showing respect for the animals in the videos.  Video 1:  <https://www.youtube.com/watch?v=XRix_vuAmrM>  Video of chimpanzees being tested on their memories in Asia. Chimpanzees kept in good conditions.  Video 2:  <https://www.youtube.com/watch?v=e5I6d_vq-Cc>  Video of Harlow’s rhesus monkey experiments where monkeys were harmed by taking them from their mothers and raising them in isolation.  Discuss answers with person next to them and field two or three responses from the class. Ensure individual thinking time is given after watching the videos to reflect on the question.  **Task 2**  Students are given numbers 1-3 and given corresponding information sheets to read and answer questions on post-it notes (information and questions attached on PowerPoint)   1. Nim Chimpsky notes – chimp who was raised as a human and struggled with attachments 2. Notes on primates used in cosmetics testing 3. Notes on primates used in the discovery of the AIDS virus   **Task 3**  Students meet in groups of 3 and discuss what they have read (1 minute each). They then have to rank the research in accordance with the prompts on the PowerPoint  **Task 4**  One person in each group acts as an envoy and goes to another group to discuss where they have ranked each study on each prompt, ensuring they explain why each time.  **Task 5**  In their original groups of 3, students produce 2 rules that scientists must abide by when working with animals.  Answers can be shared with the class and one pupil might write these on the board for reference in the final task.  **Task 6**  Open-ended plenary task where students produce a letter to one of the researchers from today’s lesson who is planning to replicate their research. The letter must explain the rules they should abide by and why these rules are important.  To extend their letters students may want to discuss:   * How to reduce suffering to the animals in the research * Why it is important that primates are treated with respect * An explanation of why scientists are seen as trustworthy and respectful people | | | | **What will the students learn from the activity?**  Begin thinking about respect and why animals are used in scientific research  Reasons why animals are used in research  How animals are used in research  The scientific discoveries that have resulted from animal research  How to communicate their moral stance  How to support their arguments with justified evidence | | | | | **Assessment & Feedback**  **Class discussion**  **Teacher circulation**  **Peer assessment**  **Class discussion**  **Books handed in at the end of the lesson and marked in accordance with school marking policy** | |
| *Reminder: The above plan should include sufficient challenge & support for all abilities* | | | | | | | | | | |
| **Home Learning:**  **Optional – research how animals were used in treating people with diabetes and/or asthma** | | | **Role of TA:** | | | | **Resources:**  **PowerPoint attached with information sheets on slides which can be printed out separately on A4 and laminated for use in Task onwards**  **Post-its** | | | |

Lesson 2 – Do scientists treat humans with respect?



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| **Subject**  Science – being a moral scientist | **Class**  Year 7 | **Date and period**  September 2015 | | | **Attainment of students (grade/ levels etc)**  Mixed | | | **SEN/EMA:** | | |
| **Prior Learning/Context:**  Students will have a basic awareness of what a scientist does for a living and the use of humans in research | | | | | | **Bloom’s taxonomy**   * Knowledge * Understanding * Application | | | | * Analysis * Synthesis * Evaluation |
| **Learning Objectives:**   * Students to have the ability to discuss and reflect upon the morals of using humans as participants in scientific research * Students to understand why animal research is done and is often necessary | | | | | | | | | | |
| **Activity**  **Task 1**  Mini-whiteboards/Socrative (ipad app) task:  Students shown a series of different scientific experiments and they have to answer whether they think humans should take part in the experiment, rats should take part in the experiment or whether neither should take part in the experiment.  Probe questions about why there is a difference between what animals like rats should be subjected to and what humans should be subjected to  **Task 2**  Students shown a video of the infamous Little Albert experiment where a young boy is conditioned to fear a white rat by pairing the rat with a loud bang. Students asked to describe, using 3 adjectives, how Albert must have felt during the research.  <https://www.youtube.com/watch?v=FMnhyGozLyE>  Class discussion to prompt further thinking.  Conclusion of the research given and students asked answer on mini-whiteboards (or Socrative) on ipads whether or not they think the study was worthwhile.  Directed questioning can be used to explore answers and prompt students to justfy their decisions.  **Task 3**  Students shown a video of a woman whose fear of feathers is treated using cognitive behavioural therapy, a direct result of what the Little Albert experiments taught us.  <https://www.youtube.com/watch?v=lMZ5o2uruXY>  Students are given a series of questions to discuss in groups of 3-4 regarding whether or not the Albert study could be justified using this information.  Class discussion used to discuss whether distress in science can be justified by the findings.  **Task 4**  Students given a scenario of a drug trial using 100 cancer patients. Their task is to write either (or both, depending on time and ability):   1. A reasoned plea asking for access to participants for the trial, explaining that the unknown nature of the drug can be justified by the potential benefits of the drug 2. A letter explaining why the drug trial cannot use humans as participants unless more is known about the drug (this is a more difficult task)   Students can be given guidance on peer assessment and swap books. Share at least one answer from each side, if time allows. | | | | **What will the students learn from the activity?**  Acknowledging the use of humans in scientific research and establishing their position on whether or not they should be treated differently to animals  How humans have been used without due care in scientific research  How the possible benefits of scientific research can be used to justify compromising respect for participants  How to reflect on their own opinions on respect and dignity, as well as how to write a reasoned and evidenced argument. | | | | | **Assessment and feedback**  **AfL on whiteboards/Socrative**  **Class discussion**  **AfL**  **Peer assessment and class discussion** | |
| *Reminder: The above plan should include sufficient challenge & support for all abilities* | | | | | | | | | | |
| **Home Learning:**  **Optional – research another way in which humans have participated in scientific research and explain why it can be justified** | | | **Role of TA:**  **n/a** | | | | **Resources:**  **PowerPoint with videos embedded**  **Post-it notes**  **Mini-whiteboards or iPads with the Socrative app** | | | |

Lesson 3 – How do scientific discoveries affect other people?



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| **Subject**  Science – being a moral scientist | **Class**  Year 7 | **Date and period**  September 2015 | | | **Attainment of students (grade/ levels etc)**  Mixed | | | **SEN/EMA:** | | |
| **Prior Learning/Context:**  Students have looked at the use of animals and humans in research, now we will consider the respect towards those affected by the conclusions of research | | | | | | **Bloom’s taxonomy**   * Knowledge * Understanding * Application | | | | * Analysis * Synthesis * Evaluation |
| **Learning Objectives:**   * Students can understand how scientific discoveries may upset people and be used negatively * Students can develop their understanding of their own empathy | | | | | | | | | | |
| **Activity**  **Task 1**  \*This lesson discusses mental illness, specifically depression, so a short talk at the start of the lesson explaining this would be a good idea, as well as discussing some ground rules (confidentiality, avoiding judgements)\*  Students asked to come up with as many symptoms of depression as they can think of, in pairs, to establish what it is. Do using post-it notes  Field answers from the class and then reveal the symptoms from the DSM-V. See how their answers compare to the diagnostic criteria.  **Task 2**  Students are given a scenario of someone with depression and have to come up with as many different possible reasons for having depression as possible, again working in pairs. Do this on post-it notes. Discuss answers and probe using directed questioning.  **Task 3**  Students shown a summary of a family study that suggests depression is passed on through genetics. Students asked to read the study and write their own conclusion. Field answers from the class to check understanding.  **Task 4**  Go back to the scenario of a patient with depression and ask how the children of that patient would feel having read the conclusion they have just written. Discuss as a class, hopefully highlighting how that research itself may not distress people, but the conclusions might also distress people.  **Task 5**  Students given 5 pieces of research, of different difficulties, and asked to choose one and explain how that research could upset other people and who it could upset. Done in books. Pupils can pair up and peer assess with good, reasoned answers shared with the class.  To extend:   * Students could explain how the research conclusions could be used as a positive (for instance, providing ore support for children of people with depression) * Students may be prompted to consider that scientists sometimes get things wrong. How could an incorrect conclusion lead to negative implications for people (i.e. if there wasn’t actually any genetic influence on depression and the results of research were just a fluke) | | | | **What will the students learn from the activity?**  Understanding what depression is  Empathy developed and students start exploring why people get depression  How to look at evidence and find a conclusion  Applying conclusions to real life and applying empathy  Students engage in the real-life implications of research and also think about a scientist’s moral obligations in research and reporting the research | | | | | **Assessment & Feedback**  **Class discussion**  **Checking post-its, class discussion**  **Class discussion**  **Class discussion**  **Peer assessment**  **Books handed in at the end of the lesson and marked in accordance with school marking policy** | |
| *Reminder: The above plan should include sufficient challenge & support for all abilities* | | | | | | | | | | |
| **Home Learning:**  **n/a** | | | **Role of TA:**  **n/a** | | | | **Resources:**  **PowerPoint attached with scenario and research on slides which can be printed out separately on A4 and laminated**  **Post-its** | | | |

Lesson 4 – Why is it important that scientists are honest?



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| **Subject**  Science – being a moral scientist | **Class**  Year 7 | **Date and period**  September 2015 | | | **Attainment of students (grade/ levels etc)**  Mixed | | | **SEN/EMA:** | | |
| **Prior Learning/Context:**  Students have looked at the use of animals and humans in research, as well as how conclusions may affect members of society. This lesson follows on and discusses the impact of dishonest research. | | | | | | **Bloom’s taxonomy**   * Knowledge * Understanding * Application | | | | * Analysis * Synthesis * Evaluation |
| **Learning Objectives:**   * Students understand how scientific research can be dishonest or bias * Students can understand the implications of dishonest or bias research | | | | | | | | | | |
| **Activity**  **Task 1**  Starter – ask the class to calculate the odds on flipping a coin and getting ‘heads’ ten times in a row. Allow them to use a calculator.  Ask the class how much they would like to bet that you can flip a coin and get ‘heads’ ten times in a row (you could offer stamps/credits or a forfeit for the loser).  Once they have accepted the bet, keep flipping the coin and counting out when you get a ‘head’, but simply ignoring when you get a ‘tails’. Celebrate when you get to 10, ignoring the protestations of the students.  Ask them to discuss what the problem is with your conclusion that you always toss a ‘head’.  **Task 2**  Students are given the scenario of a drug trial where half of the human participants are given a new drug and half are given a placebo. Questions on board prompt them to get the basics of how a drug trial works and the importance of blinding and the use of placebo  **Task 3**  Teacher leads the class through the following infographic explaining the problem of publication bias (only publishing results which support a certain theory/hypothesis). This is advanced level so it will need working through slowly  <http://www.economist.com/blogs/graphicdetail/2015/07/daily-chart-other-placebo-effect>  **Task 4**  Students are asked to discuss the implications of publication bias on depression treatment (linking back to previous lesson), focusing on different people:   * The people who want the treatment * The government who are spending money on the treatment * The family of the people who want the treatment * The people who are selling the drug   **Task 5**  Students given a list of outcomes from scientific research and have to work in pairs to establish what the worst possible outcome of dishonesty in that research would be.  Discuss as a class using directed questioning.  Students are then prompted to write a short paragraph explaining why honesty is so important in scientific research, using an example from the list above to support their argument. These can be peer assessed if there is sufficient time. | | | | **What will the students learn from the activity?**  Focus on honesty  Understand the importance of honesty and avoiding bias in research  Applying the value of honesty to a real-life problem that scientists face  Application to a topic that they are familiar with, building on their understanding of depression  Application of value of honesty to novel scenarios. Using evidence to justify their arguments. | | | | | **Assessment & Feedback**  **Class feedback**  **Self assess answers using teacher guidance**  **Directed questioning**  **Peer assessment and marking of books after the lesson** | |
| *Reminder: The above plan should include sufficient challenge & support for all abilities* | | | | | | | | | | |
| **Home Learning:**  **n/a** | | | **Role of TA:**  **n/a** | | | | **Resources:**  **PowerPoint attached** | | | |

Lesson 5 – What makes a moral scientist?



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| **Subject**  Science – being a moral scientist | **Class**  Year 7 | **Date and period**  September 2015 | | | **Attainment of students (grade/ levels etc)**  Mixed | | | **SEN/EMA:** | | |
| **Prior Learning/Context:**  Students have developed an understanding of the moral dilemmas that scientists face in their careers, dealing with respect and honesty primarily. | | | | | | **Bloom’s taxonomy**   * Knowledge * Understanding * Application | | | | * Analysis * Synthesis * Evaluation |
| **Learning Objectives:**   * Students can apply their understanding of honesty, respect and integrity to the work of a scientist | | | | | | | | | | |
| **Activity**  **Task 1**  Starter task asks students to think of somebody they would describe as having strong morals, or being a good person, and explaining one reason why they think this.  This can then be shared with a partner and then through a whole class discussion.  **Task 2**  Students are then asked to look at the scientists we have looked at through this series of lessons and discuss whether they think they are good people, with strong morals:   * Project Nim’s researchers * Harry Harlow * John Watson * Pfizer researchers   Answers can be shared through class discussion and all opinions must be justified  **Task 3**  Students work in groups of 3-4 to use the discussion to illustrate what a ‘bad scientist’ looks like. This can be done in groups using felt-tips and sugar paper. Encourage students to draw a scientist with various things that represent their lack of morals. For example, they may have a hole where their heart should be, they may have a large wallet, etc.  This may be hard for weaker students so they may want to write key words on the scientist and then explain why they feel that way about the scientist instead  **Task 4**  Students are asked to change their point of view and instead illustrate what a good scientist with strong morals should look like, again with accessories or features that represent their character.  Once done, one member of each group is sent as an envoy to another group to listen to them explain their illustrations.  This student can then share to the rest of the class the best thing from the group they have been listening to produced and why they thought it was important.  **Task 5**  Students are given two minutes of totally independent and silent thinking time, allowing the use of their notes and work from previous lessons, to think about the question:  “Why is it important that people who work in science have good character?”  Individually again, this can be written into a short paragraph in their exercise books | | | | **What will the students learn from the activity?**  What their interpretation of a good person is and what are strong morals  Recap of content and focusing on applying their character understanding  Applying character to science in general terms  Looking positively at character in science  Students can reflect on everything they have discussed in the previous lessons and then try to reflect on what it means for them and how they value character in the field of science | | | | | **Assessment & Feedback**  **Class discussion**  **Class discussion**  **Peer assessment throughout**  **Peer assessment via group envoys**  **Book work marked post lesson** | |
| *Reminder: The above plan should include sufficient challenge & support for all abilities* | | | | | | | | | | |
| **Home Learning:**  **n/a** | | | **Role of TA:**  **n/a** | | | | **Resources:**  **PowerPoint attached**  **Sugar paper**  **Felt tip pens**  **Post-it notes** | | | |