

Neuroethics

Background

The aim of this session is to introduce students (aged 5-11) to some of the ethical questions surrounding research, both neuroscience specifically and more generally. The students will be given different ethical questions and have the opportunity to put together cases on each side of the debate. This information sheet should be used in conjunction with the 'Primary –Neuroethics PPT' PowerPoint presentation.

Artificial intelligence

(Slide 1) Title slide.

(2) Begin by asking the students to suggest what artificial intelligence or AI means. Explain that Artificial intelligence is the ability a computer or robot has to think and learn.

(3) Inform the students that the process by which this works is the following: humans make a computer chip, like a robot brain, and/or write instructions for the robot brain. These computer chips are then put into the machine or computer allowing them to think and learn. When the computer/machine makes a mistake, it will learn from it and correct it the next time so like us, it can learn from its experiences and mistakes.

(4) Explain that scientists are trying to make these computers and robots smarter so they can do things that humans currently do.

(5) These smart machines are now able to do lots of things, for example, understand our speech and language (Alexa), play games against us like chess, drive our cars for us without a human driver and predict what we are drawing.

(N.B. Click on the picture of the pencil to link to google quickdraw. You could play this game with the students.)

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(6) Next, ask the class to think about the ethical issues with artificial intelligence and what smart machines would mean for our future.

You may wish to split the class into small groups to discuss each question in turn and then suggest answers which you could write up on the board. The following section outlines some questions you may ask with possible answers.

Overall discussion theme:

Should we allow robots to become as smart as humans?

Q1. What are the advantages?

- Help humans by doing boring jobs
- Help humans by doing dangerous jobs e.g. mining, space exploration
- Machines make fewer mistakes, don't get tired and are faster e.g. avoiding crashes while driving as automated
- Help humans by predicting what we will need e.g. what food to order/buy
- Can interact with humans and be fun e.g. playing games, chatting
- Help monitor humans for changes that happen when we get ill

Q2. What are the disadvantages?

- If machines can do a lot of jobs, what will humans do, how will they earn money?
- Sometimes emotions are important in making decisions and machines won't have that
- It is expensive to make all these machines, could the money be spent somewhere else?
- Humans may become less creative as machines solve many of the problems
- Machines realise that they are smarter than humans and don't need us - could be dangerous
- If machines all fail, our world is too dependent on them and we will be unable to do anything ourselves

Artificial intelligence cont.

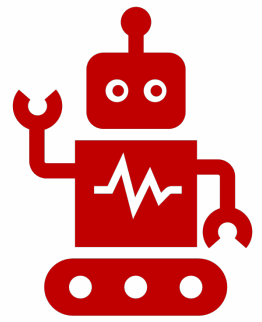
Q3. Do they need a set of rules?

Ask the students what these rules would be e.g. never hurt a human, always listen to a human, having a 'killswitch'

You could ask students about any conflicts. If a human asks a machine to hurt another human?

Q4. Should we treat them the same as humans?

Ask the students whether, if robots are as smart as us, they should have the same rights. They may also have the same feelings as us, are these feelings real? Should we be able to turn them off?



Reading Minds

(7) In the next section, you will ask the class to think about the ethical issues surrounding the ability to read minds. Inform the students that we can currently see changes in the brain when people think about different things or do different tasks. We do this by scanning their brains. We are far away from being able to read minds and discover everyone's thoughts, but what could be the problems with this if we were able to do it?

Overall discussion theme:

Should we be allowed to read minds?

Q1. When should we be able to read minds?

Ask the students to come up with situations where we should and shouldn't be able to read minds e.g. our friend sitting next to us, should our parents be able to read our minds to see if we are lying? Should we be able to see if criminals are lying or telling the truth about a crime?

Ask whether they would want other people to read their thoughts and feelings? Could it be helpful to read the thoughts of others?

Q2. Who should be allowed to read our minds?

Should everyone be able to read minds? Friends? Parents? Teachers? Should the police be able to read minds to prevent crimes?

Q3. Should we be able to put people in jail if they think about doing a crime in the future?

Read out the following scenario: The police have caught a person they think has committed a crime. While reading their thoughts, they find out the person has not committed a crime, but they are thinking about committing a crime. Do you put them in jail anyway because they thought they were going to commit the crime?

Ask the students whether they have thoughts that don't lead to actions. Is it fair to judge people on their thoughts alone?

Changing Memories

(8) In the next section, ask the class to think about the ethical issues surrounding the ability to change memories. Ask the students to suggest what a memory is. Encourage answers through asking where memories are stored. Inform the students that making memories is the way in which our brains store information. This allows us to learn new things, gain new knowledge and skills. For example, you may learn the alphabet so you can read, or learn how to cook so you can feed yourself. You may also learn that something is dangerous, like running across a road.

Ask the students whether they think memories change. Take suggestions and inform the students that our brains change memories ever so slightly when we think about them. So the memory we made of an event may be different from what actually happened.

Inform the students that in the future, scientists may be able to find specific memories in our brains and change or delete them altogether.

Overall discussion theme:

Should we be allowed to change memories?

Q1. When should we be able to change memories?

Ask the students to come up with situations where we may want to change a memory. Would they change their teacher's memory so they don't have to do their homework? Would you give people happy memories? Could we just give everyone knowledge e.g. how to do maths, so we don't have to go to school?

This could relate to something bad that has happened to us - If it still makes us feel sad, would we want to delete that memory? Are all bad experiences really bad, or do they help us learn and make us strong? What would happen if someone wanted to change our memory because they knew something bad about us?

Q2. Who should be able to change memories?

Should anyone be able to change our memories? Would we want our friends to change our memories? Our parents? Our teachers? The doctor? How would we know what is real anymore if our memories are changing all the time?