Part 2 Responsible AI: Teacher presentation notes

Slide 1

The following presentation is part of CSIRO's 'Artificial Intelligence in Action' classroom resource collection. The content has been developed in collaboration with the CSIRO's Data 61 team, who are leading the use and development of Responsible AI within CSIRO.

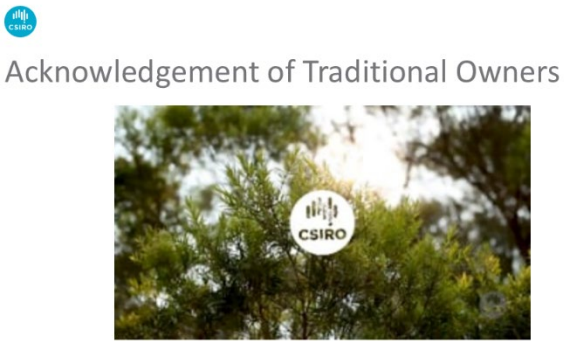
This presentation is Part 2 of a two-set Responsible Artificial Intelligence (AI) in Action series:

1. Part 1 – Understanding Artificial Intelligence (AI)
2. Part 2 – Responsible Artificial Intelligence (AI).

Part 2 helps introduce and explore the ethical use of AI (artificial Intelligence) to students. It provides definitions and examples of responsible AI, then explores how AI relates to scientific research to develop innovative STEM solutions. Discovery activities and discussion questions are provided to support the content.

You can find more information about the collection and use of the presentation in the related Teacher Guide. Available at https://www.csiro.au/en/education/Resource-Library.

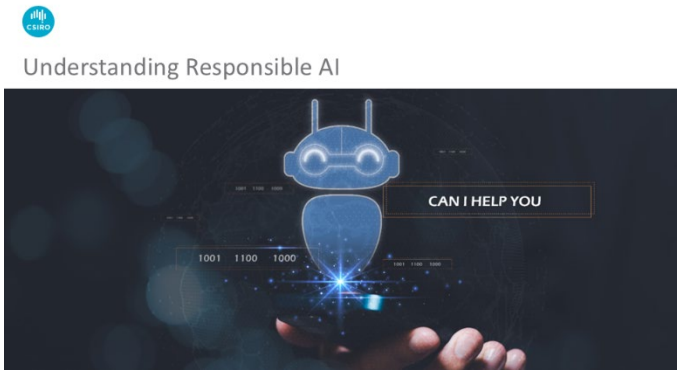
Slide 2



Optional: You may wish to include an acknowledgement of country at the start of your session. The video provided here is a suggestion. Or you may wish to use your school version or make your own. For more information check out Reconciliation Australia.

Video Link - https://vimeo.com/417035853

Slide 3



AI is already all around us; when we log into our phones using face ID, when we search the internet, or when we use spell-check in an email.

Understanding how AI works will help us determine how to make it work best for us.

Let's watch a quick video to remind us about what AI is and how it works.

Presenter note – * If you are using this presentation in conjunction with Part 1, you may wish to skip rewatching the video.

Slide 4

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The power of AI lies in the 'data' or information that it holds. This can be information it gathers or information it is taught.

A very important thing to remember: **AI is only as good as the instructions and information it is given**.

Let's watch a video to learn more about how AI collects and uses information.

Video Content Information

AI EXPLAINED: It’s maths, not magic (a simple guide). Artificial Intelligence (AI) is all around us. But how does it actually work?

In this short video the CSIRO team help shed light on the science behind the AI-driven apps and programs we use every day.

Share the video with students to help broaden their understanding of how AI works in today's world.

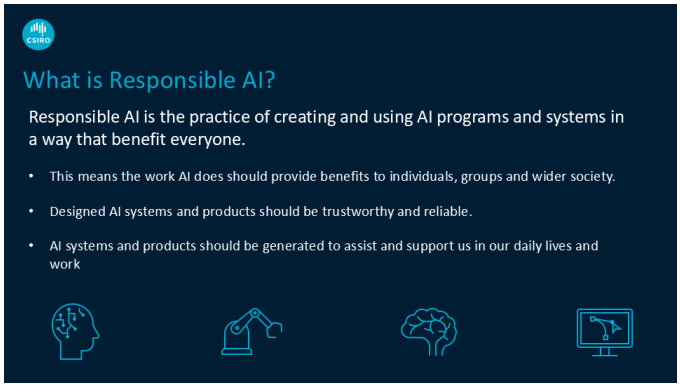
You can watch the video as a class group or share the link with students to watch individually.

This content was proudly supported by Google Australia’s Digital Future Initiative.

The video has been embedded in the presentation. You can find the video on YouTube via the following link:

https://www.youtube.com/watch?v=5mHxO2JpCR0

Slide 5



AI is being used more and more in our day-to-day activities. This raises questions of responsibility and ethics:

- What can artificial intelligence (AI) do?
- How can it make our lives easier?
- How can it make businesses and individuals more productive?
- Who is represented in the data?

As AI has the potential to influence our lives, we need to ensure that AI systems are designed to recognise that everyone is equal, and everyone deserves safety.

Developing equal and ethical AI systems is known as Responsible AI.

Let’s explore way in which we already use AI and consider how we can use these powerful tools safely and responsibly.

Slide 6-13

Opinion Line Activity

Create a real or imagined line on the ground, from one side of the classroom (or another large flat area) to the other. Explain to students that you will read a set of statements to them. Indicate that one side of the line is strongly agree, and the other side of the line is strongly disagree. Make it clear to students that they can stand anywhere on the line depending on how strongly they agree/disagree with a given statement.

Read out the statements one at a time. After students have organised themselves for each statement, ask one or two students to explain their thinking. Highlight that there are different answers and explain that these are tricky situations.

These responses might sometimes come with caveats or conditions. Use the key questions to facilitate conversation.

Statements (slides 7 - 13) [order can be changed by teacher]

1. It's okay to use AI when working on assignments.
2. It's a good idea to use a computer program to figure out where to make new gardens in our school based on what animals live here.
3. A computer program should decide who can run for school captain based on behaviour points given by teachers.
4. It's okay to use AI when playing video games.
5. You should have to tell your teacher if you're using AI to help with your homework.
6. It's okay for the tuckshop to use a special program to see which snacks students like and offer them more.

Discussion Questions:

Is there anything that could make you change your mind?

1. Is that always fair/not fair?
2. What made you move to this spot?
3. Was this an easy choice for you to make?

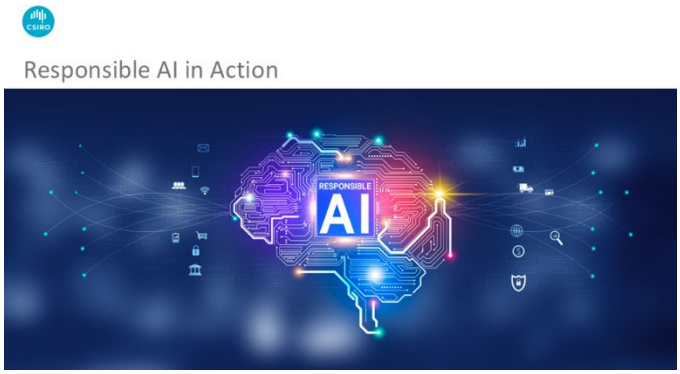
4. What does it mean if not everyone agrees?

Discussion Topic Note

* It is unlikely that all students will agree with each other on every statement. However, students can sometimes be reluctant to disagree with their peers.

At the start of this activity, to point out to students that part of the challenge of ethical AI is that not everyone will agree with what is fair and unfair. But they should not expect everyone to agree. Tell students they are allowed to ask questions, and they can have caveats (requirements) on to answers. Throughout the activity, pause to ask students why/how they have made their decisions.

Slide 14



AI can assist us in our daily lives but can also help solve the big problems we face, including climate change etc.

STEM researchers and innovators are starting to use these powerful tools in their work. We know that AI has the potential to make great change to our lives and our environment. But how do we decide what projects to work on?

In our last activity, we saw that not everyone thinks the same way - what someone thinks is a good or ethical idea may be different to others think. This is the challenge of responsible AI.

Slide 15

Companies and governments make challenging decisions all the time when deciding on projects to work on.

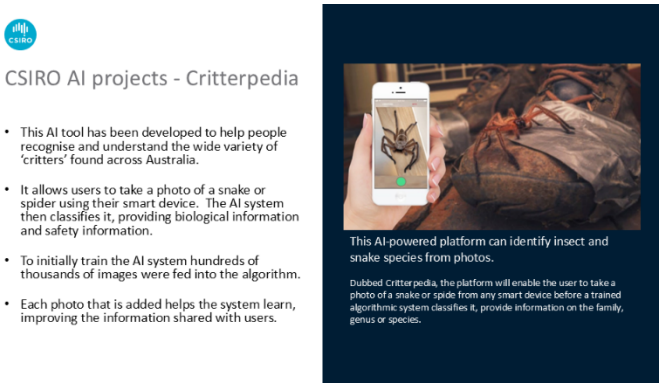
- Is it ok if the project helps some people but not others?

- What is more important, privacy or health?
- Are people more important than animals?

CSIRO is the national science agency and does a lot of work in the AI space, especially the ethical and responsible use of AI tools.

Here are some examples of how CSIRO is using responsible AI in action. The following projects use an AI system to help gather and understand data ethically.

Slide 16



Critterpedia

The tool allows users to identify critters with their smart device, by uploading photos of a snake or spider to the Critterpedia platform. A system trained with an algorithm then classifies the photo, providing users with information on the family, genus or species. The artificially intelligent (AI) platform considers not only these images, but also additional information, like GPS location.

To teach the platform, hundreds of thousands of images of snakes and spiders were fed into the system. It was a sizeable task uniquely perfect for an AI solution.

"The visual differences between the two species can be quite subtle. We need a great deal of training data to adequately identify critters," explains project lead and Data61 researcher Dr Matt Adcock.

The application aims to provide education and awareness for all Australians. And, as a wildlife safety tool, could ultimately save human and animal lives.

Discussion Question

1. How might this AI system benefit you or the people around you?

Slide 17

Spark

'Spark' is an open framework for fire prediction and analysis. It takes our current knowledge of fire behaviour and combines it with state-of-the-art simulation science to produce predictions, statistics and visualisations of bushfire spread.

Spark can read weather data from meteorological forecasts and use this information directly within fire models.

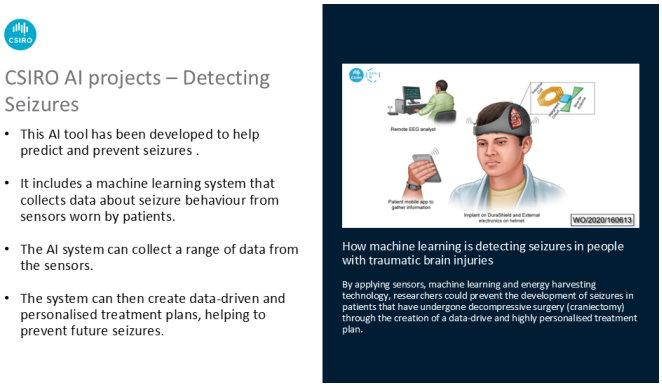
Geographic information, such as land slope, vegetation and un-burnable areas, such as roads and water bodies, also affect the spread of the fire.

Spark allows users to easily incorporate such environmental data and to use this information to define a fire spread rate.

Discussion Question

2. How might this AI system be used where you live?
3. Do you think it could help people in other locations or other countries?

Slide 18



Detecting Seizures

By applying sensors, machine learning and energy harvesting technology, researchers could prevent the development of seizure disorders in patients that have undergone

decompressive surgery (craniectomy) through the creation of a data-driven and highly personalised treatment plan.

Discussion Question

1. Could a system like this be adapted for everyday use?
2. Do you know any other health related apps that benefit people?

Slide 19

Student Activity (Optional)

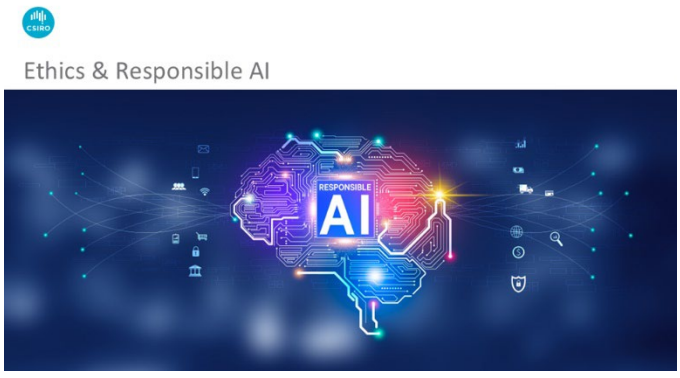
Students can undertake the activity linked with the Developing Responsible AI worksheet. A copy of this worksheet can be accessed in the Responsible AI in Action section of the CSIRO Digital Resource Library. https://www.csiro.au/en/education/Resource-Library.

Students can work individually or in pairs.

Ask students to choose a problem or issue that they feel passionate about. Students will then use the prompts on the provided worksheet (Developing Responsible AI) to complete the task.

Students can share their ideas and solutions in small groups or as a whole class. Completed worksheets could be displayed around the classroom or used as the basis for a longer project task.

Slide 20



Around the world, people can see the great potential of AI to solve many problems, but others are worried that AI could be used in unethical ways.

Who decides if something is fair and ethical? When there are hundreds even thousands of people working on AI projects, not everyone will agree on what is ethical or responsible.

While certain values are held by all, others are unique. What we think is fair and just is influenced by many different factors, including our backgrounds, race, religion, gender, life experiences, and social circles. All these influences impact our shared values.

So how do we decide?

Let's have a look at a specific framework that has been created for use in Australia.

Slide 21

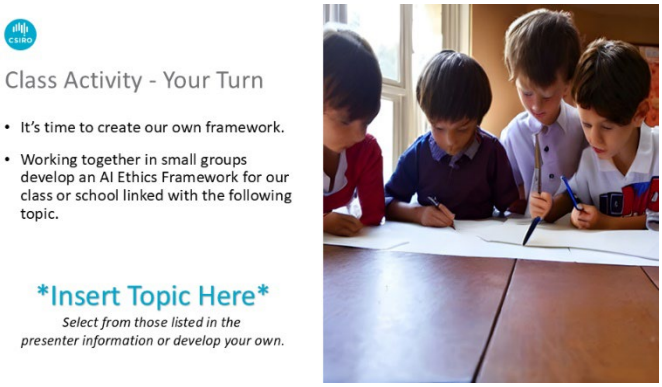
In Australia, the government asked CSIRO to create a framework on the ethical and responsible use of AI. Think of a framework as a set of rules that help businesses and teams decide what AI projects to do, how to create them and how to use them.

*A more detailed explanation of the Australian AI framework can be found in the Teacher Guide document.

Discussion questions:

1. Do all these points make sense? Which ones should we talk about?
2. Do you think having a framework is a good idea? Why/why not?
3. Are any parts of this framework more important than others? Why/why not?
4. If an AI system is already built and in use, does it matter if these guidelines weren't followed to build it?

Slide 22



AI image generator (2023) *children working at a table create rules* , *craiyon*. Available at: https://www.craiyon.com/ (Accessed: 30 November 2023).

Group Activity

Working in pairs or small groups, students create their own set of AI guidelines. They can be general, focused to one area, or be a use-case scenario for a specific AI.

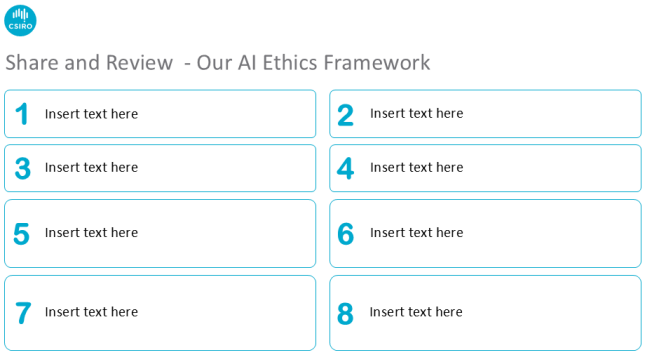
You may wish to start the discussion on the selected topic as a whole class to give students an opportunity to bounce ideas off one another. Alternatively, you could have small groups work on different topics for their frameworks. Students could then come together to discuss during the sharing activity.

Potential topics:

- Using ChatGPT for schoolwork.
- Rules for using AI-assist programs in video games.
- Collecting data for an AI system to use.
- Alternatively – provide students with an AI project or task from your own work and ask them to create a set of rules for its use/creation.

Activity note - * Depending on how the framework activity has gone, you may be able to complete the framework or continue this as an ongoing activity.

Slide 23



Group Sharing

1. Ask groups to nominate a speaker.
2. Have groups share the key points from their guideline framework.
3. If you are working on the same topic, you could use the slide to collate information.

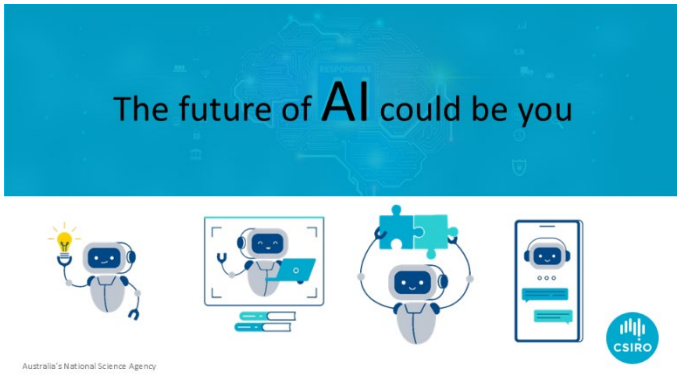
Key Points to Highlight

Remember to review! Ethical and responsible behaviour requires constant reflection. This framework will need to be in a constant state of review to ensure it is up to the task of guiding the use of AI.

Discussion questions:

1. How will we make sure we are following the framework?
2. Are there any parts of the framework you are unsure about?
3. Can we leave the framework now and never change it? Why/why not?

Slide 24



It is important to recognise the speed at which AI and technology systems develop. The information and discoveries we make today may look very different in the future.

Remember that AI is a tool that relies on data and information. We have a responsibility to ensure we are using reliable and trustworthy data.

As we work to implement the use of AI across many fields, it is likely that your future job will use some form of AI. How might you use AI to change the world and help others?