

Lesson 3: Innovations in AI

45 minutes

Overview

In this lesson, students explore an application of AI called Seeing AI and examine how it is supporting people with visual impairments. Then, students research other examples of how AI is impacting society, focusing on users who are impacted by the examples they find. Finally, students share their findings with each other.

Question of the Day: How is AI helping to solve problems around the world?

Assessment Opportunities

1. Describe how Artificial Intelligence is having an impact on society

See the activity guide for this lesson as a way to measure each step of the problem solving process.

Standards

Full Course Alignment

CSTA K-12 Computer Science Standards (2017)

- IC - Impacts of Computing

Agenda

Before the Lesson

Warm Up (5 minutes)

Journal

Activity (35 minutes)

Wrap Up (5 minutes)

Objectives

Students will be able to:

- Describe how Artificial Intelligence is having an impact on society

Preparation

- Print copies of the activity guide for each student
- Prepare to digitally distribute the AI Research Areas resource to students.
- Check the "[Teacher's Lounge](#)" forum for verified teachers to find additional strategies or resources shared by fellow teachers

Links

Heads Up! Please make a copy of any documents you plan to share with students.

For the teachers

- [Innovations in AI](#) - Slides
▼ Make a Copy
- [Seeing AI](#) - Video

For the students

- [Innovations in AI - Activity Guide](#) - Activity Guide
▼ Make a Copy
- [Innovations in AI Research Areas - Student Resource](#) - Resource
▼ Make a Copy

Teaching Guide

Before the Lesson

Students will be researching applications of artificial intelligence and machine learning on the internet. You can provide students with copies of the [Innovations in AI Research Areas - Student Resource](#) guide to help students in their research. We haven't provided these directly to students because sometimes these sites are blocked by district filtering programs, or the latest news-worthy application of AI may not be middle-school appropriate. **We strongly suggest you check each site for inappropriate content and to make sure it will load on classroom computers before sharing it with students.**

Warm Up (5 minutes)

Journal

 **Prompt:** *What are some examples we've seen so far in class of how AI is being used to solve problems? Or, what are some examples you might know of from outside of class?*

Have students write in their journals, then discuss with a neighbor before sharing as a full class. Keep a list of ideas at the front of the room.

Discussion Goal: This prompt helps focus attention on how Artificial Intelligence specifically is helping to solve problems, as opposed to other forms of technology. Many of the videos so far have mentioned ways that AI is being used, such as helping to screen for cancer or being used in driverless cars. Students may also draw in examples of AI from outside the classroom, especially if there has been a recent story in the news. Make sure to focus on examples that use AI specifically, especially examples that involve making decisions from data (as have been shown in class).

Remarks

These are excellent examples, and they show a wide range of issues that artificial intelligence can help solve. Today, we'll have a chance to dive in and see other ways that AI is making an impact on the rest of the world.

 **Question of the Day:** How is AI helping to solve problems around the world?

Activity (35 minutes)

 **Display:** Show students the slide with the Problem Solving Process

Remarks

Remarks: When we use artificial intelligence to solve problems, we still go through the problem-solving process - define, prepare, try, and reflect. As we do that, it's important to empathize with our users and ask "Who is included? Who is excluded?". This can be harder to think about - let's look at an example of how AI can help include people who are sometimes left out of the latest technology.

 **Video:** Show students the [Seeing AI](#) video in the slides. Prompt students with the Questions to Consider before starting the video.

 **Discuss:**

- What problems does this app help Andre solve?
- What data does it use?
- How does Andre interact with the app?

Discussion Goal: Students should recall several examples from the video, such as describing the outside world while riding in a taxi or recognizing handwriting or reading social media posts. Students should also be able to describe how Andre interacts with the app - usually by pointing at an object and having it recognize it. Students may struggle describing the data that it uses, but guide students to realize that it probably had to look at a lot of similar images of the world as training data before it could recognize what Andre was looking at.

 **Discuss:** What could be an unintended consequence of this app? For example, maybe it could be helpful and used in a different way to solve another problem. Or, maybe it could have unintended consequences that could be harmful for users?

Clarify for students that, for this question, they do not have to refer to anything in the video - they can come up with their own ideas using their imaginations or drawing from personal experiences. Have students discuss with a neighbor first before sharing as a full group.

Discussion Goal: There is no single right answer to this question - it's more important that students share the reasoning behind their thoughts. Students may comment on how image recognition isn't perfect and it may incorrectly identify something for Andre that could be harmful. Students may also wonder if this app could be used for deaf people as well, using audio from their environment to tell what's going on. Or, they may remember the handwriting comment from the video and suggest that the app could be used to help students improve their handwriting.

Remarks

This is one example of how artificial intelligence is making an impact on the world. Today, you'll have a chance to investigate other examples of AI as we investigate these same questions.

Distribute: Pass out the **Innovations in AI - Activity Guide** to each student.

 **Display:** Display the instructions for the activity guide. Have students choose a topic they would like to research. They can change topics during class, but selecting one initially is helpful when starting their research.

 **Research:** Have students log into a computer to begin researching. Digitally distribute a copy of the **Innovations in AI Research Areas - Student Resource** so students have access to some starting resources to begin their search. Students can also find this in the Student Resources section of this lesson on Code Studio.

Circulate: Monitor students as they research different applications of AI. Make sure students are finding examples that truly involve artificial intelligence, especially making decisions from data.

 **Display:** Have students begin filling out the back of their activity guide, where they will describe the innovation that they found. Remind students that the final question is their opinion based on their imagination or other experiences - it does not have to come from a video or news article.

Circulate: Monitor students as they answer the questions on the their activity guide. If students are struggling to write down responses, ask them to explain their innovation to you and then prompt them to write down some of their responses on the activity guide.

 **Pair-Share:** Have students find one other person in the class. Each person takes turns describing the innovation that they found, summarizing their responses to the activity guide. This activity can be repeated several times, but students should have at least one other example of an AI innovation that isn't their own.



The responses in the activity guide can be used to formatively assess how well students have met the objectives of the lesson. Consider collecting the guides and reviewing them, and incorporating some of the examples into lessons later in the unit as students learn more about machine learning and creating their own apps and machine learning models.

Wrap Up (5 minutes)

 **Prompt:** *Describe one other AI innovation you heard about during today's lesson. What problem was it solving? What data did it use?*

Students shouldn't summarize the innovation they researched - instead, they should summarize one of the innovations they heard from their peers.

Assessment Opportunity

Formative Assessment: Consider using this prompt as an exit "ticket out the door" where students can describe the innovation they heard from a partner. Alternatively, these responses can be collected and read later to determine how well students were able to research different applications of AI.



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