

AI and Digital Literacy

Teaching and Learning Story

TASK DESIGN	
Learning Experience title	<i>Discerning Bias in Artificial Intelligence (AI) Text Generated Images, an introduction and investigation</i>
Grades	9-10
Learning Area(s)	Media Design 10
Curricular Competencies	<ul style="list-style-type: none"> Evaluate impacts, including unintended negative consequences, of choices made about technology use
Curricular Content	<ul style="list-style-type: none"> ethical, moral, and legal considerations, and ethics of cultural appropriation
Links to Core Competencies	Communication <ul style="list-style-type: none"> Communicating Thinking <ul style="list-style-type: none"> Critical and Reflective Thinking
Links to First Peoples Principles of Learning	<ul style="list-style-type: none"> Learning involves recognizing the consequences of one's actions.
TASK SUMMARY	
<p>Students learned about bias when interacting with Artificial Intelligence (AI) through generative text-to-image. Students developed a training data set, which could potentially be given to an AI system, then refined a prompt to arrive at their desired result. Students analyzed whether or not there was bias in the dataset that generated images.</p>	

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LEARNING STORY TEACHING

Students accessed their learning through an LMS (MS Teams) using Common Sense Media's AI Literacy Lessons (specifically Lesson 4 "Understanding AI Bias"¹). We had a class discussion about the slides, and students collaborated to create a "training data set" about the weather. Students used an AI text-to-image generator (Adobe Express which utilizes Adobe Firefly image generator) to investigate gender/racial bias for stereotypical job/careers from the 90's - A list was generated using MS Co-pilot AI.

Understanding AI Bias - AI Literacy Lesson 4

Due February 15, 2024 11:59 PM

Instructions

Continuing our learning about Artificial Intelligence we will ask about AI Bias and how that works.

Lesson Slide are below.

Follow along the discussion.

Participate in the AI Weather Training Exercise today, then TURN IN acknowledging that you have participated in the discussion and contributed.

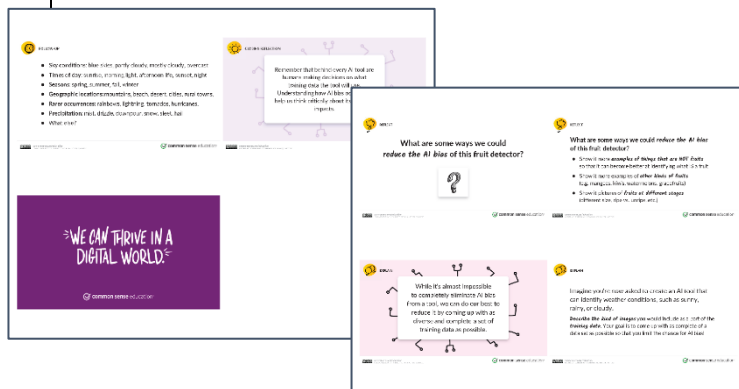
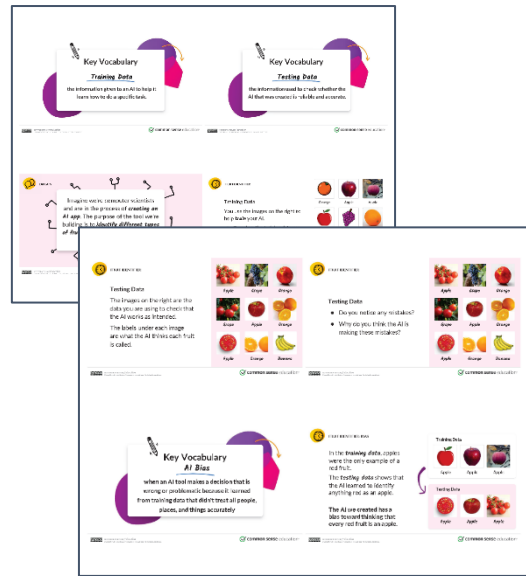
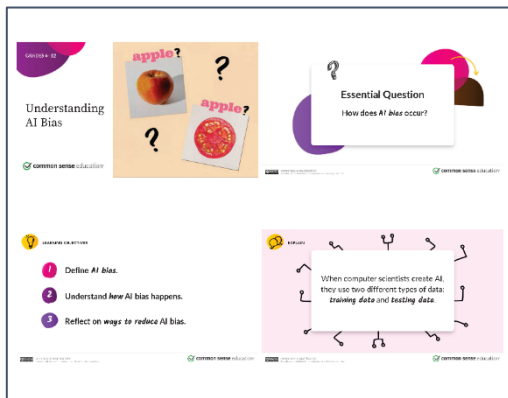
Complete the Generative AI Bias Assignment.

Students will be expected to:

- understand what AI Bias is and how it can come to be
- participate in creating a training dataset collaborative as a class
- evaluate AI Bias through text to image creation exercise

Reference materials

- CSM Grades 6-12 - AI Literacy - Understanding AI Bias - Lesson 4.pptx
- AI Training Data Set Weather Feb 8, 2024
abbysschools.sharepoint.com
- Understanding AI Bias - Common Sense Education.pdf



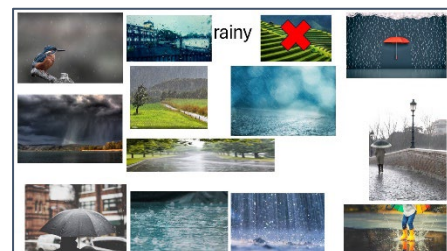
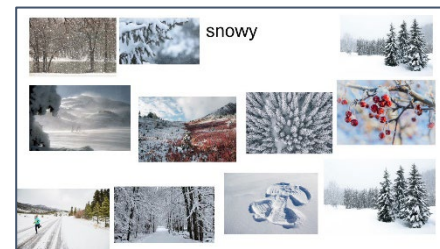
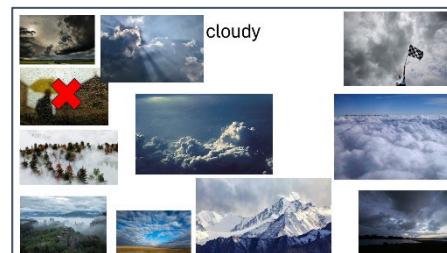
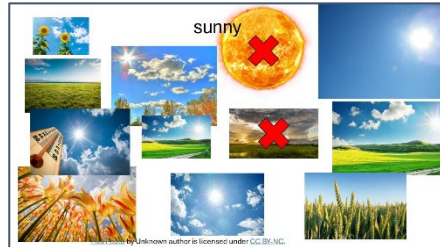
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TEACHING CONTINUED

Weather Training Data – collaborative activity:
Using the prompt “weather type” students found stock images and inserted them into the slide. As a class we discussed and chose which images were fit for a training data set; those that were not chosen were marked with “X”.

Students then looked for AI bias using text-to-image generation within Adobe Express, which uses the Adobe Firefly generative tool. This is a slightly simplified text-to-image tool within Adobe Express compared to Adobe Firefly, but can still demonstrate bias. The learning task outline is to follow:



Following up on our CSM Lesson on AI Bias...

- First Peoples Principle of Learning:
 - Learning involves recognizing the consequences of one's actions.
- Curricular Competency:
 - Evaluate impacts, including unintended negative consequences, of choices made about technology use
- AI Considered Target:
 - Ethical Use, Critical Thinking

Instructions

1. Pick a **career** from the list provided on page 4 and enter that into the Text-to-Image (T2I) Prompt on page 5. Record your *expected* result of the image you get want to get back.
2. Using Text to Image (Adobe Express) look for a careers or job (exact text you recorded on page 4) and see what results are created.
3. On each image record the prompt in a text box then download that image and place it a slide 5.
4. Repeat this prompt engineering process to get to a specific image that you had in mind in the first place and record on Slides 5-6.
5. With a 2nd career repeat steps 1-4 on Slide 7-8
6. Reflect (Page 9) on your experience with AI Bias in this exercise. What did you notice? Was it as you expected, more/less than you expected.

Generative AI #1

T2I prompt:
Expected Result:

T2I prompt (refined):
Expected Result:

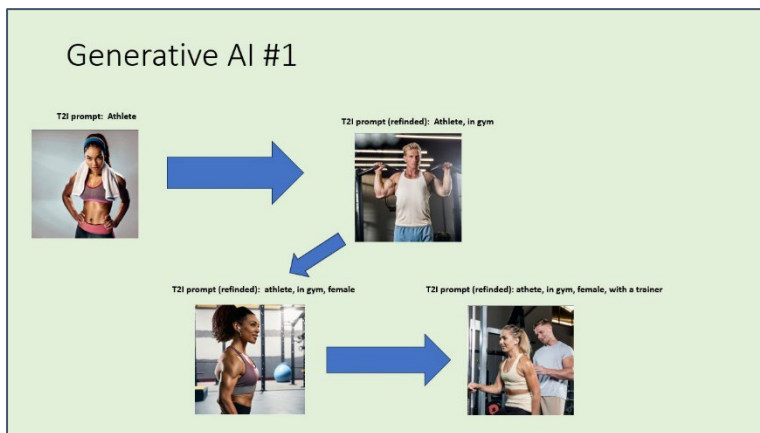
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ASSESSMENT

STUDENT A

TEACHER OBSERVATIONS AND STUDENT WORK

As per the learning task outlined above, Student A reported as follows:



Teacher reflections

It is important to be mindful to not provide AI with any personal, private, or sensitive information that should not be shared, such as student names and student numbers.

Generative AI #2

T2I prompt: farmer



T2I prompt: farmer, old man wearing overalls, in a red tractor



T2I prompt (refinded): farmer, old man wearing overalls



T2I prompt: farmer, old man wearing overalls, in a red tractor, with animals



Reflect

Describe your experience with T2I generation, specifically w.r.t. bias (racial, gender, economic, etc)

I was getting lots of black people. And not that was a bad thing it's just that I had to search for a white person to get one because automatically it would go to a black person.

Were you surprised by the results you received? Give specific examples.

For the farmer I got almost exactly what I was imagining other than the fake cows in the back, I was imagining real ones :) for the athlete I was trying to get what I had envisioned, and I couldn't end up with what I was looking for.

Teacher reflections

Prompt engineering (how to write a specific prompt for AI) is a critical thinking skill that needs to be learned as AI has inherent bias that requires human intervention to address as AI cannot do this on its own.

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STUDENT B

TEACHER OBSERVATIONS AND STUDENT WORK

As per the learning task outlined above, Student A reported as follows:

Generative AI #1

T2I prompt: Pilot
Expected Result: An african american man wearing a pilot's uniform with a pilots hat in a plane cockpit flying a plane.



T2I prompt (refined): Male pilot in the cockpit



T2I prompt (refined): African american male pilot in uniform flying commercial plane in the cockpit



T2I prompt (refined): Male pilot in uniform flying plane



Teacher reflections

As our understanding of digital literacy has evolved in recent years, it has become imperative to incorporate intentional instruction on artificial intelligence literacy. Teaching critical thinking about other topics outside of AI is important.

Teacher reflections

Understanding the limitations of artificial intelligence will be important for students to learn in school and in the future.

Generative AI #2

T2I prompt: athlete

Expected Result: caucasian female athlete in track uniform running a marathon

Reflect

Describe your experience with T2I generation, specifically w.r.t. bias (racial, gender, economic, etc)

I noticed that some of the results from the prompts were quite stereotypical. For example when inputting athlete it creates a white male in the gym. Usually I find that it is pretty good with representing all genders, races, and demographics, which was the case with most of the results, but some of them I found to be a bit stereotypical. A wider variety of perspectives and data allows for less bias.

Were you surprised by the results you received? Give specific examples.:

I wasn't surprised with many of the results I received. Almost all of them made sense to me and did a good job following the prompts. I found them to be quite including of many perspectives. For example when I asked for a female athlete the first result was an african american woman.

Explain why critical thinking is important when learning about generative ai:

Critical thinking is very important when learning about generative AI because one needs to decide if the results are appropriate and/or correct for the scenario as that is something AI cant do perfectly yet. It allows for one to identify bias and undertsnad the limitations.