NEXT LEVEL TECH
ACTIVITY BUNDLE

For Grades 9-12

Use the three activities below to introduce youth grades 9–12 to the world of artificial intelligence (AI) through a combination of unplugged and technology based activities.



STEM NEXT
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STEM Next

Next Level Tech Activity Bundle

(Grades 9–12)

Welcome to the Next Level Tech Activity Bundle!

Use the three activities below to introduce youth grades 9–12 to the world of artificial intelligence (AI) through a combination of unplugged and technology based activities. Youth will explore how AI works, discover how AI recognizes patterns and makes predictions, and experience firsthand how humans and AI interact.

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Lesson 1: AI Under Construction (Unplugged)

In this lesson, youth will be able to:

- Explain how an algorithm uses data to make decisions or predictions.
- Design and test a simple algorithm using a set of criteria and data.
- Identify how the data and rules used by an algorithm can influence its results, including potentially creating bias.



Time needed: 60 minutes

Preparation

Materials	• Data Cards • Scholarship Algorithm • Markers, pens or pencils • Sticky notes • Scissors • Emoji Sheet
Setup	• Copy a set of Data Cards and the Scholarship Algorithm for each group. • Review the slide deck and discussion prompts.
Presentation	Slides

Facilitation

Overview

In this unplugged activity, youth explore how AI algorithms use data, rules, and patterns in the decision-making process. Working in teams, youth design a simple algorithm. As they test and revise their algorithms, youth discover that the decisions an AI system makes depend heavily on the data and rules it is given. Youth will also see that algorithms can produce unexpected, biased results.

Engage

1. Ask youth: “What is AI?” Allow several youth to provide a definition or example. Share: “Artificial intelligence, or AI, is technology that allows computers to learn from information and perform tasks that usually require human thinking, such as recognizing pictures, understanding language, finding patterns, or making predictions.” (Slide 2)

2. Ask: “How do AI systems learn?” Allow youth to make suggestions. Introduce the term *algorithm* and explain: “An algorithm is essentially a set of instructions or rules used to solve a problem or make a decision.” (Slide 3)

3. Separate youth into pairs and distribute the Emoji Sheet to each small group. Have youth cut apart the emojis. Instruct pairs to create an algorithm: “Decide what characteristics to use. Write a rule. Sort the objects into two groups.” (Slide 4)

4. After pairs have sorted their emojis, ask: “How did you sort your emojis? Why did you categorize them that way? What features helped you decide which categories to create? Would another group be able to use your algorithm and sort the emojis into the same groups? Let’s give it a try.”

5. Have pairs exchange algorithms and test. After pairs have tested, compare the results and discuss any variations in the sorting.

Investigate

1. Explain the challenge: “You are an AI development team. A local nonprofit has asked you to create an algorithm that can make decisions about awarding a service-based scholarship to a local high school senior. Your job is to design the rules the AI will use to make those decisions.” (Slide 5)

2. Distribute the Scholarship Algorithm and four Data Cards to pairs of youth. Give the same set of Data Cards to each pair. The Scholarship Algorithm provides guidelines and steps that should be used to complete the challenge.

3. Once each pair has completed their algorithm, distribute eight new data cards. Each pair should run the data through the algorithm to determine if the person is a scholarship candidate or not.

4. Have youth examine their results. Discuss: “Did the algorithm make a reasonable decision? Did it use information that shouldn't matter? Did it ignore information that should matter? Could someone manipulate the result? Could the algorithm disadvantage certain people?”

5. Have each pair re-examine their algorithm. Invite youth to place a sticky note next to each rule to label the rule as Keep, Change, or Remove. Have pairs revise their algorithm based on those labels. Instruct pairs to rerun the algorithm with all the data cards.

6. Bring the whole group back together. Discuss their findings: “What information did your algorithm use? Who decided which information mattered? Did your algorithm always make a fair decision? Could your algorithm unintentionally favor one group of people over another?”

Wrap-up

1. Explain: “AI doesn't automatically know what is fair or important. It learns from data and follows the rules created by people. If the data or rules contain problems, the results can also contain problems.”

2. Have youth provide suggestions to complete this sentence based on the activity: "An AI algorithm is only as good as _____." Have each youth write their completed sentence on a sticky note and hang in the room (Slide 6).

Implementation

Alternative

- If digital devices are available, consider having youth complete the Most Likely To activity. This interactive experience explores how AI makes predictions based on patterns and data. Youth can test the AI by entering different inputs and seeing what the machine predicts, highlighting how AI can make surprising—and sometimes biased—assumptions.

Career Connection

- Share the career profiles for an **artificial intelligence engineer** and a **mechatronics technician.**

Lesson 2: Fake, Flawed, or Fair?

In this lesson, youth will be able to:

- Define generative AI.
- Identify stereotypes or patterns that may appear in AI-generated images.
- Analyze how prompts, training data, and human choices can influence AI-generated images.
- Revise a prompt to encourage a more diverse and representative output.



Time needed: 60 minutes

Preparation

Materials	• Digital device with access to an AI image generator • Image Prompts
Setup	• Review the slide deck and discussion prompts.
Presentation	Slides

Facilitation

Overview

In this digital activity, youth explore how generative AI creates images from text prompts and investigate how the wording of a prompt can influence an AI-generated image. Youth create and analyze images, and then compare how an AI system represents people in different careers and situations.

Engage

1. Ask the group: “Who is the most creative person you can think of? It can be someone you know or someone who is famous. Why do you feel that person is creative? What does it mean to be creative?” (Slide 2)
2. Display an AI-generated image (Slide 3). Ask: "Do you think this picture is creative? Do you think a person created this image or a computer?” After

youth make their predictions, explain: “Generative AI is technology that can create new content, such as text, images, audio, and video, based on patterns it learned from large amounts of data.” (Slide 4)

3. Give youth this prompt: “Create an image of a scientist working in a laboratory. Imagine you are an AI generator. What will the scientist look like? What will they be wearing? What equipment will be present? Will the scientist be young or old? What gender might the scientist appear to be? What race or ethnicity might the scientist appear to be?” If youth are hesitant to answer, tell them: “Don't worry about being ‘right.’ We're making predictions so we can compare them with the AI's choices.”
4. Generate the image using an image generator such as ChatGPT, Google Gemini, or Canva. Discuss: “What did the AI image include that you expected? What surprised you? What assumptions did you make before seeing the image?” Remind youth that both humans and AI can make assumptions based on patterns.

Investigate

1. Hand out digital devices and Image Prompts to pairs of youth. Have youth randomly select one of the prompts or assign a different prompt to each pair. Instruct youth to enter the prompt into the AI image generator just as it is written.
2. After each pair has generated an image, discuss the results: “Who appears in the image? What does the person look like? What are they wearing? What are they doing? What assumptions did the AI make?”
3. Have youth revise their image prompt to make the image more inclusive, detailed, and representative of the situation.
4. Have each pair share their before and after images. Have youth explain what they changed in their prompt and why.

Wrap-up

1. Facilitate a discussion about the ways that AI-generated images can be used for good and for harm. Ask: “Do you think the good outweighs the bad? Why?” (Slide 5)

Implementation

Alternative Facilitation

- Have youth draw their own image of the scientist in the Engage section.

- If time allows, allow youth to create other AI-generated images using the image generator.

Career Connection

- Share the career profiles for **artificial intelligence engineer, natural language processing (NLP) engineer,** and **AI data annotator.**

Lesson 3: Verysafeland Airport Mystery

In this lesson, youth will be able to:

- Train an AI system to recognize a face.
- Identify and describe different types of data collected through surveillance systems.
- Demonstrate how limitations in training data can lead to errors such as false positives and false negatives using a simplified AI model.
- Evaluate the privacy and equity trade-offs of facial recognition and surveillance technologies in public institutions.



Time needed: 60 minutes

Preparation	
Materials	• Devices with internet access to Teachable Machine • Data Set Images • Test Images • AI and Decision-Making Guide
Setup	• Review the slide deck and discussion prompts. • Practice using Teachable Machine. • Make Date Set Images and Test Images digitally available to youth so they can be uploaded to Teachable Machine as needed.
Presentation	Slides

Facilitation

Overview

In this activity, youth explore how modern AI systems collect, analyze, and act on personal data through the lens of surveillance and facial recognition

technologies. Using an interactive, story-based investigation set in an airport, youth examine how biometric and behavioral data are gathered and how AI systems convert people into data points, then evaluate the trade-offs between safety and privacy.

Engage

1. Ask youth: “With whom do you share your personal data?” (Slide 2) Allow youth to share responses.

2. Distribute a piece of paper and a pencil or pen to each youth. Explain that youth are going to take a quick survey to determine what and how much of their data is being shared publicly or privately, unknowingly. Direct youth to answer quickly and keep a running tally of their "yes" responses. Display the data sharing questions (Slide 3). Allow several minutes for all youth to complete the survey. Then, have youth score their responses. The higher their score, the more of their data has been exposed. Emphasize that the purpose of the questions and the score is awareness, not that youth did anything wrong.

3. Ask youth: “Is your score what you expected? What data can be collected without our consent? Where might you consent to sharing this data?” Possible answers could include surveillance video of us in public places or even data that we agree to give up without realizing it when we agree to certain privacy policies (e.g., credit card purchases, IP address geolocation, cell phone tower triangulation, etc.). Inform youth that much of everyone’s personal data may be publicly available.

4. Ask: “What do you think happens to this data?” Remind youth of how machines learn and that their data is being used to train machines.

Investigate

1. Say: “Today, we’re going to teach a machine to identify faces similarly to how facial recognition works. We’ll train our own facial recognition AI models in small groups of two or three youth using Teachable Machine.”

2. Have each small group log in to Teachable Machine and follow the steps in the slide deck to train the machine. Complete the training step-by-step as a whole group, or provide the instructions and allow each small group to work at its own pace (Slides 4–10).

3. After each group has trained their machine, pause and discuss: “Take a look at the dataset images. What do you notice about them for each person?”

4. Invite groups to test their models using the Test Images. After testing, spend time discussing: "Were the AI predictions 100% correct for each image? Why do you think the AI struggled? How might the AI model change if you were to upload 100 more pictures of Leroy? What could happen if you uploaded a test image of someone that looked like Phil, but wasn't Phil?"

5. Explain: "You just built a simplified version of a real facial recognition system. Does anyone know how a facial recognition system works?" Allow youth to make suggestions. Explain: "First, data is collected. A camera scans your face and turns the image into data points that the computer can measure. Facial recognition does not recognize people the way humans do. It turns a face into measurable data. What are some examples of measurements a system could obtain from a face?" (Slide 11)

6. Explain that facial recognition is used in many places, including an airport. Read the scenario that has occurred at the Verysafeland Airport (Slide 12). Have youth examine the airport images (Slides 13–14) and write down all the data they think is being collected and how it is being collected. Next, inform youth that the cell phones of all passengers on the flight are being collected, along with a face scan. Ask: "What kinds of data will the police and the AI have access to?"

7. Explain: "After examining the data, the authorities announce that your friend Alex has been identified as the prime suspect. Luckily, the authorities have asked our group for help and have provided us with the same data the AI used to make its prediction."

8. Distribute the Decision-Making Guide to each group. Assign each group one passenger to compare to Alex. Be sure to assign one group the actual person who used the airport staff bathroom, Marcus Webb but do not disclose the culprit. Ask groups to review the data collected by the authorities and complete the guide. Demonstrate the various types of data that can be found in the Manifest.

9. Allow time for groups to work. A few minutes into the exploration, share an important piece of information that was just learned: "The Verysafelandian facial recognition AI was trained only on Verysafelandians, which may cause the AI to be biased or less accurate when performing facial recognition on non-Verysafelandians."

Wrap-up

1. Ask: "Which data feels relevant to the prediction? Which data feels irrelevant or questionable to the prediction? Does the facial recognition confidence match the suspect score? Why might those be different? Why

is it relevant that the AI was not trained on foreign faces? Based on your investigation, was Alex guilty?" Allow several groups to respond and explain their response.

2. Announce that the actual person who used the airport staff bathroom was Marcus Webb, the passenger in Seat 1D. Discuss: "Why do you think Alex was suspected? Would you want to live in a safe place like Verysafeland? Why or why not? Do you believe it is worth giving up some privacy and personal data and accepting greater surveillance in exchange for greater safety? Explain your answer."

Implementation

Alternative Facilitation

- Divide this activity into two sessions: one training the computer and one for the airport investigation.
- Shorten the activity by completing Steps 1–5 in the Exploration portion as a facilitator demonstration.

Career Connection

- Share the career profiles for **artificial intelligence engineer, AI ethics and compliance engineer,** and **AI data annotator.**

Adapted from Day of AI–From Data to Decision: AI, Surveillance, and Human Responsibility.