NEXT LEVEL TECH
ACTIVITY BUNDLE

For Grades K-5

Use the three activities below to introduce youth in grades K-5 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 K–5)

Welcome to the Next Level Tech Activity Bundle!

Use the three activities below to introduce youth in grades K-5 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 Detective (Unplugged)



In this lesson, youth will be able to:

- Define artificial intelligence in simple language.
- Identify AI uses in daily life.
- Identify limitations to AI.

Time needed: 60 minutes

Preparation

Materials	• Common items pictures • Scavenger hunt handout
Setup	• Make copies of the pictures of common items and hang them around the room (for younger youth). • Make copies of the scavenger hunt handout (1 per older youth).
Presentation	Slides

Facilitation

Overview

In this activity, youth become AI detectives as they explore their classroom, afterschool program, or everyday surroundings to define AI and identify examples of artificial intelligence in their daily life.

Engage

1. Ask youth: “What are some things that people make? What are some things that grow in nature?” Show images of a variety of natural and artificial items and have youth classify them (Slide 2). Create a chart of natural and artificial items and invite youth to suggest additional items for each category.

2. Ask youth: “What does it mean to be intelligent? Who would you say is intelligent and why?” After several youth have answered, share: “Being intelligent means using our brain to learn new things, solve puzzles, and think about the world around us.” (Slide 3)

3. Ask youth: “Can machines be as smart as us?” Show youth the cartoon of a machine (Slide 4) in nature and ask them if this could happen. Emphasize: “A computer or robot is a machine. It does not have a brain like we do. Robots can only do what people have told or trained them to do.”

4. Define AI (Slides 5–6): Explain: “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, and making predictions.” **For younger youth,** say: "AI is when we teach computers to find patterns and make smart guesses or decisions."

Investigate

1. Explain: “AI is all around us! Your challenge is to become an AI detective and find examples of AI being used in everyday life."

2. **For younger youth:** Turn the hunt into a movement game. Place pictures around the room showing common items. Call out: "Find something that you think uses AI!" Invite youth to move to a picture of something they think uses AI. Then ask: “What does it do? How does it help people? What makes you think it uses AI?” Call out: “Find something that is definitely NOT AI.” Repeat the questions asked previously. Finally, call out: “Find something you are not sure uses AI.” As a group, discuss the object and decide if it uses AI or not. Don't worry about making every answer technically perfect. The emphasis is on noticing and asking questions about technology.

3. **For older youth:** Provide each group of two youth a scavenger hunt handout. Allow youth to name each item on the list by searching the room, exploring the program area, or drawing on their own knowledge. Allow 10–15 minutes for the hunt. Bring the group back together and discuss their findings. Ask youth: “What do people use this item for? What information might AI need to do its job? How does AI help people?”

Wrap-up

1. Project the Five Big Ideas of AI (Slide 7). Explain to youth that something artificially intelligent can do any of these five things:

a. Perceive and understand its environment
b. Reason and plan to make decisions
c. Learn new knowledge and skills
d. Interact with humans and the environment
e. Impact society

2. Project a few examples of common items (Slides 8–14) and have youth identify if they are AI, not AI or maybe AI. Ask older youth which of the big ideas is the AI item demonstrating.

Implementation

Career Connection

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

Lesson 2: Think Like AI: 20 Questions (Unplugged)



In this lesson, youth will be able to:

- Formulate effective questions and use clues to identify an unknown object.
- Explain that AI uses data and patterns to make predictions and decisions.

Time needed: 60 minutes

Preparation

Materials	• Decision checklist • Question cards
Setup	• Make copies of the question cards (1 per pair of younger youth). • Make copies of the decision checklist (1 per older youth).
Presentation	Slides

Facilitation

Overview

In this activity, youth will experience how artificial intelligence uses questions, information, and patterns to make predictions. As youth narrow down possibilities using clues, they make connections between their own problem-solving strategies and how AI systems use data to identify patterns and make informed guesses.

Engage

1. Tell youth: "Today we're going to pretend to be an AI machine!" Choose an object or picture without showing youth. Direct youth to take turns asking yes-or-no questions to determine the object or picture. Keep track of the number of questions that are asked and limit the number to 20. Write or

display the questions and answers as you proceed. Continue until the object has been guessed correctly or the group has asked 20 questions.

2. Review the questions that were asked and discuss how the questions could be reworded to be more helpful. For example, instead of asking, "Is it a dog?" try asking, "Does it have four legs?"

3. Ask: “Which question helped you the most? Did you change your guess after getting a new answer?”

Investigate

1. Direct youth to find a partner.

2. **For younger youth:** Instruct one youth to secretly choose a common animal. The other youth will ask questions to get enough information to guess the animal. The youth guessing can ask up to 10 yes-or-no questions. To help youth formulate questions, distribute the question cards to each pair and review them with youth.

3. **For older youth:** Instruct one youth to secretly choose an object in the program area or from a list of items that you have created. The other youth will ask questions to get enough information to guess the item. The youth guessing can ask up to 10 yes-or-no questions.

4. Invite youth to switch roles and play again.

5. **For older youth:** Introduce a decision tree and explain how it works (Slides 2–3). Have the groups repeat the activity using the decision checklist, then compare the number of questions needed to identify the object with and without it. Direct youth to record their questions and answers on the decision checklist.

6. Explain: “AI uses a system of questions and information to find an answer, just like we just did. AI doesn’t magically know an answer. It uses answers and patterns to make a prediction.”

Wrap-up

1. Connect the activity to AI by saying: "AI can do something similar to what you did while playing 20 Questions. An AI system can look at information, find patterns, and make a prediction or guess. When we played 20 Questions, we collected information with every question. Then we used that information to narrow down the possibilities."

2. Have youth complete this statement with 2–3 words. “AI is like 20 Questions because _____.” (Slide 4)

Implementation

Career Connection

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

Lesson 3: Quick Draw!

In this lesson, youth will be able to:

- Define data, data set, bias, and prediction in relationship to AI technology.
- Compare the human learning process to the way machines learn.
- Recognize that missing or limited data can lead to inaccurate predictions.



Time needed: 60 minutes

Preparation

Materials	• Devices with internet access • Google Quick, Draw! • Google Quick, Draw! Dataset Explorer • Chart paper or whiteboard • Markers or digital drawing tool
Setup	• Review the slide deck and discussion prompts. • Preview and try Google Quick, Draw! and the Dataset Explorer. • Verify youth access to Google Quick, Draw! and the Dataset Explorer. • Prepare a method for drawing simple pictures during the warm-up.
Presentation	Slides

Facilitation

Overview

In this activity, youth investigate how artificial intelligence learns from datasets to make predictions. Through drawing games, discussion, and Google Quick, Draw!, youth discover that AI systems identify patterns in large collections of data rather than thinking like humans. Youth also begin to recognize that the quality and variety of data influence how well AI systems make predictions.

Engage

1. Ask youth: “How do you learn something new, such as a new topic in school or a new sport? How do machines learn if they don’t think?” Allow youth to share ideas. If no one has any ideas, add, “Humans program, or give instructions to, machines, which allows the machines to learn.”
2. Ask youth: “What is data?” Connect the idea of collecting data to an activity youth have done in your program or in school. Explain that data helps humans make decisions and AI machines to make predictions.

Investigate

1. Ask: “How does a person make a prediction?” Guide youth toward the idea that predictions are often based on things we have seen, experienced, or learned before. Tell youth they will play a quick drawing game to explore how prior experience helps them make predictions. Explain that you will begin drawing an image on the board, on chart paper, or digitally, and youth will try to predict what you are drawing in fewer than 20 seconds.

2. Choose one youth to be the timer. The rest of the group will be the guessers. Begin drawing a simple, familiar object. Possible examples include a house, bird, clock, or apple. Youth may call out predictions as you draw. Have the timer record how long it takes the group to correctly identify the image. Repeat with three or four images or as many as time allows.

3. After the game, ask: “How were you able to predict what I was drawing even though I didn’t tell you what it was and you hadn’t seen those exact drawings before?”

4. Guide youth to recognize that they compared the shapes and features in the new drawings with houses, birds, clocks, apples, or other objects they had seen before. Youth used prior experience to make a prediction. Explain that all the images, objects, and experiences they have encountered are part of a personal dataset they use every day, often without realizing it.

5. Project the Introduction to How Machines Learn slide (Slide 4) and explain the diagram.

6. Tell youth that they will now test whether a machine can do something similar to what they did in the drawing game: Use previous examples to predict what someone is drawing.

7. Direct youth to Google Quick, Draw! and have them follow the prompts to draw each object they are given. If helpful, model one round for the whole group before youth begin working independently.

8. Give youth a few minutes to explore the activity. Expect some excitement and allow youth time to experiment with the tool.

9. Show youth the Google Quick, Draw! Dataset Explorer. Explain that Google Quick, Draw! has been trained using many drawings made by other people. When youth create a new drawing, the system compares patterns in that drawing with patterns it learned from those previous examples to make a prediction.

10. Connect this dataset back to the earlier activity: Youth used their past experiences with houses, birds, clocks, and other objects to make predictions. Google Quick, Draw! also relies on previous examples, but its dataset is deliberately collected and used to train the machine. Ask: "Based on what you have seen so far, do you think Google Quick, Draw! shows intelligence? Why or why not?" Encourage youth to connect their responses to the group's definition of intelligence.

11. Show examples from the bread drawing dataset. Ask: "Why do you think some people drew bread as a slice while others drew it as a loaf?" Use youth responses to introduce the idea that people may represent the same thing differently depending on their experiences, cultures, or surroundings.

12. Explain: "The examples an AI learns from matter. If most of the examples come from certain people, places, or groups, the AI may not learn all the different ways something can look."

13. Introduce the term *bias*. Ask youth if they have heard the word before and invite a few responses. Explain that youth will continue exploring bias throughout the AI lessons.

14. Say: "Bias in AI can happen when the data used to train a system does not represent enough different people, experiences, or examples. Bias can cause the system to work better for some situations or people than others."

Wrap-up

1. Direct youth to create a small dataset of everyday objects by collecting or drawing 15–20 examples. Lead a discussion about what patterns an AI system might learn from their datasets.

Implementation

Career Connection

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

Adapted from Day of AI–Discovering Artificial Intelligence (Grade 3).