



**Hewlett Packard  
Enterprise**

# **Artificial intelligence: Facilitator guide**

**This lesson is designed for students ages 12 to 15 (grades 6 to 9)**

In this lesson, students will learn how computers use algorithms to learn from and make predictions based on data. Students will use innovating thinking to imagine how artificial intelligence is all around us.



## Lesson purpose

- Students will be introduced to artificial intelligence (AI) and discover how computers learn how to mimic human behavior by developing pattern recognition.

## Lesson objectives

Students will be able to ...

- Learn how artificial intelligence uses algorithms to identify patterns and discover insights.
- Use innovative thinking and teamwork to imagine how AI might be used to make predictions based on datasets.
- Discover how artificial intelligence can change the way we communicate, learn, and work.

## Agenda

- Introduction (5 minutes)
- Warmup & discussion (20 minutes)
- Activity – AI bingo (20 minutes)
- Share out (10 minutes)
- Wrap up (5 minutes)

## Materials

(Print one of each material per student)

- Handout with two activities
- Pre- and post-session surveys (share pre-survey with teacher ahead of session)
- Optional video: [How AI works in everyday life](#)

## Vocabulary

- **Artificial intelligence (AI)** – any human-like behavior displayed by a machine or system. In AI's most basic form, computers are programmed to “mimic” human behavior using extensive data from past examples of similar behavior.
- **Algorithm** – process or set of rules to be followed in calculations or other problem-solving operations by a computer.
- **Machine learning** – algorithms that are able to take a data set and use it to identify patterns, discover insights, and/or make predictions.

## Pre-visit prep

Preparation will take 30 minutes.

- Familiarize yourself with the basics of artificial intelligence. Read [What is Artificial Intelligence?](#) on HPE's website and watch [How AI works in everyday life](#).
- Learn about the setting of your visit, how many students you will be working with, and ask the teacher if there is anything helpful to know in advance.
- Share the pre-session survey with the teacher and ask to have students complete it ahead of the session.
- Ask the teacher about the students' level of exposure and access to technology. This can provide insight on how well the students will relate to the examples and concepts. You may need to adjust the content if students have less exposure with AI.
- Work with the teacher ahead of time to figure out a room arrangement where the students can walk around and interact with their classmates for the large-group bingo activity.
- Gather a few interesting stories about AI from the news or your personal experience that you can share with the students as quick real-world anecdotes (during warm-up activity discussion).
- Learn what technology will be available and use that to determine how the activity will be facilitated.
- Print necessary handouts and materials.

## Teaching tip

Read the general characteristics of students in various grade/age groupings and be sure to ask the teacher what additional characteristics may be helpful for you to know about their students.

## Students ages 12 to 15 (grades 6 to 9)

- Very curious
- Enjoy interacting with peers
- Like to work in small groups and are active learners
- Prefer conferring with classmates prior to being called upon
- Tend to be self-conscious, easily embarrassed, and yet appreciate humor
- Might not be thinking of or planning ahead yet for their future



## Step 1: Introduction (5 minutes)

Share your ...

- Name
- What you do
- Why you enjoy working in tech
- Fun fact to help you connect to the students (hobbies, favorite subject, your connection to the school or city you are in)

### Teaching tip

**Build excitement and trust early on:** Be friendly and enthusiastic! Feel free to build some rapport with students, such as asking them to raise their hands if they're interested in working in tech or sharing a story from school when you first learned about tech careers.

## Step 2: Warm-up activity (15 minutes)

### Handout activity: The intelligent piece of paper (10 minutes)

Pass out handout and introduce the activity.

**Say:** There is one way this piece of paper is smarter than you. It has never lost a game of tic-tac-toe to a human, and it has played thousands of times. It has either won or tied every game it has played, and it will do the same with you!

Tell students they have five minutes to complete the game and they can work individually or in pairs. If they are working in pairs, have them take turns being the “paper” and playing against the paper. Remind students that the “paper” always starts first.

### Teaching tips

- **Use your local name for tic-tac-toe:** there are many names for tic-tac-toe such as noughts and crosses. Replace tic-tac-toe to what is most common in your country.
- **Play an example tic-tac-toe game:** If helpful, have a student join you to show an example game to the entire class. Use a whiteboard or large piece of paper if that is available in the classroom. As the teacher, you should play as the “paper” and explain each move and have a student act as the other player.



## Discussion about artificial intelligence (5 minutes)

When five minutes is complete, ask students if they were able to beat the paper and explain the point of the exercise.

**Say:** Just like this piece of paper, computer programs follow rules, or algorithms, to solve problems. Computer programs apply inputs to their algorithms that produce outputs. In the case of this game, your moves were the “input”, the rules were the “algorithm”, and the paper’s next move was the “output”. Programmers create smart algorithms to create programs with AI that are smarter than humans and can even learn, recognize patterns, and predict what will happen next. Machine learning is the process of machines learning from these algorithms.

**Ask:** What comes to mind when you think of artificial intelligence?

[**Ideal responses:** facial recognition, text editors, robots, smart assistants, self-driving cars, chatbots, social media monitoring, AI art, personalized shopping/recommendations]

**Ask:** What is artificial intelligence?

[**Ideal responses:** human-like behavior displayed by a machine or system]

**Ask:** What are the benefits of artificial intelligence?

[**Ideal responses:** reduction in human error, digital assistance/accessibility, 24/7 availability, innovation, perform repetitive jobs, daily applications]

**Ask:** What are some risks of artificial intelligence?

[**Ideal responses:** costs, security breaches, lack of creativity, replacing human jobs, ethics, bias, lack of emotion]

### Teaching tips

- **When asking a question:** “Count to seven” to wait for answers (students need time to think!) or pair students up.
- **Think-Pair-Share:** Give time for students to brainstorm their ideas independently, then ask them to share their ideas with the person next to them, then share to the larger group.



## Understanding why artificial intelligence is important (5 minutes)

- **Explain:** Companies like HPE use artificial intelligence to work more efficiently, analyze vast amounts of data in the blink of an eye, and solve complex problems. Artificial intelligence uses patterns and other inputs to make predictions and outcomes just like the piece of paper used your previous move to decide its next move in the tic-tac-toe game.
- **Optional video:** If your classroom has the technology, show this video explaining artificial intelligence (0:00–2:51): [How AI works in everyday life](#).
- **Ask:** What are some real-life examples of predictive artificial intelligence?  
[**Ideal responses:** social media advertisements, shopping recommendations, the “for you” page on TikTok]
- **Dig in:**
  - How does Instagram curate advertisements for its users?  
[**Ideal responses:** Instagram uses past clicks, brands you follow, your demographics, people you know, people you follow, and captions to predict what you will click on]
  - How does your email spam filter know what is spam?  
[**Ideal responses:** the spam filter uses past emails you have labeled as spam and text and content of emails to predict what is spam]
- **Say:** Artificial intelligence algorithms require a dataset and rules in order to make a prediction. In the next activity, you will use real-life examples of predictive AI to identify datasets and predictions.



## Step 3: Activity (AI bingo) – Classroom activity (20 minutes)

**Overview:** Students must find a partner who has used an AI system listed on the card and together students must identify the prediction (output) that the system (learning algorithm) is trying to make and the dataset (inputs) it might use to make that prediction. The first student to get five squares filled out in a row, diagonal, or column wins. For longer play, the first student to fill out the entire sheet wins.

## Step 4: Share out (10 minutes)

**Discussion:** Have students discuss the squares they filled out. If there is extra time, ask students if they can come up with additional examples.

## Step 5: Wrap up (5 minutes)

**Say:** Now that we've learned more about artificial, why does it matter? [**HPE**

**facilitator note:** Have students share answers. Examples could include “Artificial intelligence makes our technology smarter and more efficient.”; “Machine learning will help us solve greater complex problems.”; “AI can automate processes to save us time.”]

**Say:** I'm going to have you fill out a short Exit Ticket survey. [**Pass it out or share link**] While you work on this, I'm going to tell you a little more about what happens at HPE around artificial intelligence ...

**Say:** Thank you for contributing and working with me! I'm impressed by your knowledge and ideas, your creative problem solving, and your teamwork. If you are interested in learning more about HPE, you can visit [hpe.com/about](https://hpe.com/about). We offer artificial intelligence solutions to our customers such as quality control, video analytics, speech-to-text, and autonomous driving!

## Step 6: Post visit follow-up checklist

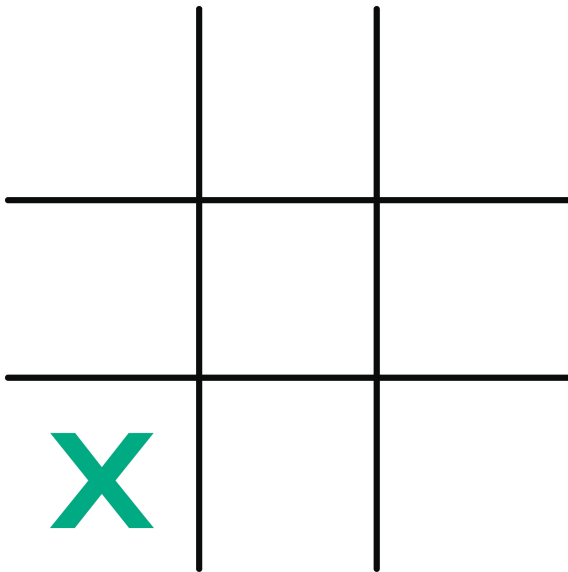
- Thank the teacher/school/youth organization and the students.
- Share any resources HPE offers that may be helpful to the students.
- Ask for feedback.
- Offer to visit again with another topic in the series if the school is interested and can make time.

# Activity 1:

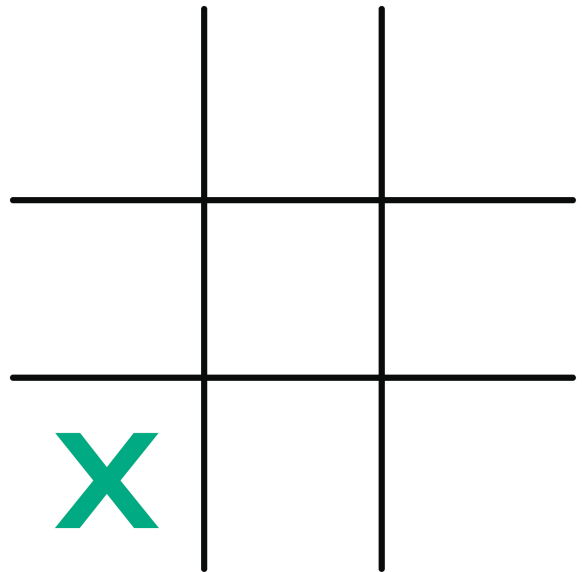
## This piece of paper is smarter than you

**Directions:** Either individually or in pairs, play against this piece of paper. If you are working in pairs, play one game as the “paper” and one game against the “paper”.

### Game 1



### Game 2



**Paper – Move 1:** I am a highly intelligent piece of paper. Let’s play! I am X, and I go first.

**Paper – Move 2:** Go in the opposite corner of move 1. If the other player already went there, then go in a free corner.

**Paper – Move 3:** If there are 2 Xs and a space in a line, then go to that space. If not, if there are 2 Os and a space in a line, then go to that space. If not, go in a free corner.

**Paper – Move 4:** If there are 2 Xs and a space in a line, then go to that space. If not, if there are 2 Os and a space in a line, then go to that space. If not, go in a free corner.

**Paper – Move 5:** Go in the free space.

To learn more about careers in artificial intelligence, visit [this website](#).



# Activity 2:

## AI bingo

**Directions:** Try to identify the prediction the system is trying to make and the dataset it might use to make that prediction. Raise your hand when you complete a bingo! When you are finished, keep trying to fill out the entire worksheet.

<b>Got a weather forecast from a website or used a weather app</b>  Prediction:  Dataset:	<b>Sent a voice-to-text message</b>  Prediction:  Dataset:	<b>Used an online search engine like Google or Bing</b>  Prediction:  Dataset:	<b>Seen a Google autofill search result</b>  Prediction:  Dataset:	<b>Had a writing assignment graded by a computer</b>  Prediction:  Dataset:
<b>Used "safe search" on Google or Bing</b>  Prediction:  Dataset:	<b>Seen a suggested response while sending an email or text</b>  Prediction:  Dataset:	<b>Used a snapchat filter</b>  Prediction:  Dataset:	<b>Played a motion-sensitive video game (Nintendo, Wii, etc.)</b>  Prediction:  Dataset:	<b>Had an Emoji suggested instead of a word (texting on phone)</b>  Prediction:  Dataset:
<b>Watched a recommended video on YouTube</b>  Prediction:  Dataset:	<b>Used a fingerprint to open a device or app</b>  Prediction:  Dataset:	<b>FREE</b>	<b>Clicked on an Instagram ad</b>  Prediction:  Dataset:	<b>Seen news articles suggested in a news app</b>  Prediction:  Dataset:
<b>Had a local TikTok appear on your "for you" page</b>  Prediction:  Dataset:	<b>Seen a suggested ad on Snapchat</b>  Prediction:  Dataset:	<b>Had a text auto-complete or used autocorrect</b>  Prediction:  Dataset:	<b>Listened to a recommended song on Spotify or Apple Music</b>  Prediction:  Dataset:	<b>Seen a recommended product on Facebook</b>  Prediction:  Dataset:
<b>Used facial recognition to open a device or app</b>  Prediction:  Dataset:	<b>Had an email or phone call recognized as spam</b>  Prediction:  Dataset:	<b>Used a map app to find a path to a destination</b>  Prediction:  Dataset:	<b>Used an app to recognize a song playing</b>  Prediction:  Dataset:	<b>Seen a recommended show or movie on a streaming service</b>  Prediction:  Dataset:

## Pre-survey

A team member from Hewlett Packard Enterprise (HPE) will be joining your class today to talk about technology! Could you please answer a few quick questions before the session?

On a scale of 1 (not interested) to 5 (very interested), how interested are you in technology?

**1**

**2**

**3**

**4**

**5**

On a scale of 1 (not a lot) to 5 (a lot), how much do you know about artificial intelligence (AI)?

**1**

**2**

**3**

**4**

**5**

Do you have any questions for the HPE team member about technology related to artificial intelligence?

## Exit survey

Thank you for participating in the session! Could you please answer a few quick questions to let us know how we did?

What did you enjoy most about today's session?

On a scale of 1 (not interesting) to 5 (very interesting), how interested are you in technology?

**1**

**2**

**3**

**4**

**5**

On a scale of 1 (not a lot) to 5 (a lot), how much do you know about artificial intelligence (AI) after today's session?

**1**

**2**

**3**

**4**

**5**

Do you have any questions for the HPE team member about anything from today's session?