What is Machine Learning?

Grade 2-7 Activity Write Up

What is Machine Learning?

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Actua is creating a Canada where every child has the skills and confidence they need to achieve their full potential. As a leading science, technology, engineering and mathematics (STEM) outreach organization, Actua includes over 40 universities and colleges, engaging 500,000 youth in 600 communities each year. For 25 years, Actua has focused on identifying and removing the barriers for entry into STEM and now have national programs dedicated to engaging Indigenous youth, girls and young women, Black youth, those facing economic barriers and youth in Northern and remote communities. For more information, please visit us online at www.actua.ca and on social media: Instagram, LinkedIn, Facebook and YouTube! For more information, please visit us online at www.actua.ca and on social media: Instagram, Facebook, LinkedIn, TikTok and YouTube!

What is Machine Learning?

Activity Summary

In this activity, participants will investigate how machines learn from data. They will discover how artificial intelligence (AI) systems recognize patterns, make predictions, and improve as they process information. By sorting images and using visual cues, participants will understand how machines learn from labeled data and explore the impact of machine learning (ML) across different industries and in everyday life.

Developed by Actua, 2025.

Delivery Environment	Activity Duration	Intended Audience	Tech
In-Person	60 minutes	Grades 2-7 (*Ages 6-12*)	**Facilitators should have access to a laptop, projector, speakers, and a screen or blank wall to project onto.** • Projector • Speaker • Screen/Blank Wall • Laptops/Tablets

Achievement Goals

Learning Goals

Following this activity, participants will:

- **Understand** how machines learn from humans using data and patterns.
- **Explain** how supervised learning enables machines to learn from labeled data provided by humans.
- **Design** a basic machine learning model using labeled data.

Success Criteria

Following this activity, participants can express:

- **I can explain** different ways machines learn from data and give examples of machine learning in everyday life.
- **I can describe** how computers learn by studying examples that have already been labeled by people.
- **I can teach** a computer by sorting images and giving it examples to learn from.

Logistics (Timing, Group Sizing, Materials)

Section Title	Time	Group Size	Materials
Opening Hook	10 minutes	*Whole Group*	**Facilitators** • What is Machine Learning? 2-7 - Activity Slide Deck (*Appendix C*) • Writing Surface (e.g. Whiteboard) • Writing Utensil (e.g. Marker)
Section 1: Learn Like a Machine	15 minutes	*Whole Group*	**Facilitators** • What is Machine Learning? 2-7 - Activity Slide Deck (*Appendix C*)

Section Title	Time	Group Size	Materials
			• ▶️ What is Machine Learning? (OxfordSparks, 2:19s) • Quick Draw - Google • Quick, Draw! Data **Per Participant** • Paper • Writing Utensil (e.g. pencil)
Section 2: Spot the Difference	25 minutes	*Pairs or Small Groups (3-4)*	**Facilitators** • What is Machine Learning? 2-7 - Activity Slide Deck (*Appendix C*) **Per Pair or Small Group** • Train the Machine - Activity Page (*Appendix C*) • Writing Utensil (e.g. pencil)
Reflection & Debrief	10 minutes	*Whole Group*	• N/A

Safety Considerations

Safety considerations have been provided below to support safety during this activity, however they are not necessarily comprehensive. It is important that you review the activity and your delivery environment to determine any additional safety considerations that you should be implementing for the delivery of these activities.

Emotional Safety

- Facilitators should understand that participants have different lived experiences and prior knowledge about AI safety, AI, and digital citizenship. This activity may involve or lead to discussions of sensitive topics, such as ethical implications of AI. Facilitators should encourage open, respectful

discussions and acknowledge all perspectives. Facilitators should always keep the participants' emotional safety in mind in these discussions, and defer to training from their institution and training received.

Curriculum Links

This activity aligns with these components found in the [UNESCO AI Competency Framework for Students](#):

AI Techniques and Applications: AI Foundations

- Learners are expected to develop basic knowledge, understanding and skills on AI, particularly with respect to data and algorithms, and understand the importance of the interdisciplinary foundational knowledge required for gradually deepening understanding of data and algorithms. They should also be able to connect conceptual knowledge on AI with their activities in society and daily life, concretizing a human-centred mindset and ethical principles through an understanding of how AI works and how AI interacts with humans (p. 32-34).

AI Techniques and Applications: Application Skills

- Learners are expected to be able to construct an age-appropriate knowledge structure on data, AI algorithms and programming, and acquire transferable application skills. (p. 41).

Human-Centered Mindset: Human Agency

- Learners are expected to be able to recognize that AI is human-led and that the decisions of the AI creators influence how AI systems impact human rights, human-AI interaction, and their own lives and societies (p. 29-30).

AI Systems Design: Problem Scoping

- Learners are expected to be able to understand the importance of 'AI problem scoping' as the starting point for AI innovation. They are also expected to

acquire the knowledge and project-planning skills needed in order to conceptualize and construct an AI system (p. 35).

This activity can be connected to the following subject areas:

Science

- Understanding the role of science and technology in society and daily life.
- Demonstrate an understanding of systems that involve input, process, output, and feedback.
- Classify organisms according to similarities and differences in visible characteristics and behaviors.

Mathematics

- Collect, organize, and interpret data to identify patterns and make informed decisions.

Community Connections

Community connections are suggestions from Actua, grounded in our approach, on how facilitators can adapt the activity to reflect the strengths, interests, and priorities of the community where or with whom it is delivered. Consider the following guiding questions to adapt the activity in meaningful ways:

- **Consult with community:** Are there local organizations, Knowledge Keepers, or community members who could contribute insight or context to this topic?
- **Draw on youth experience:** How can you give participants opportunities to share, reflect on, and apply how this learning is relevant to them or their community? Invite participants to identify what knowledge, who, and where they already learn from.
- **Integrate local examples:** How can you tailor this activity to local or regional interests, industries, or community priorities (e.g. land and environment, health, technologies)?

Activity Procedure

To Do in Advance

SECTION	PREPARATION
General	• **Think ahead and be ready to adapt:** ○ Determine your **delivery method** and leverage ideas from the delivery recommendations and adaptations sections. ○ While **estimated times** are provided, it will be helpful to think about how much time you would like to spend on different activities and discussions. ○ While **group sizes** (individual, pairs, groups) are suggested, many activities are flexible for whatever will work in your classroom. • **Prepare for the content:** ○ Have **answers in mind** to share with participants for the various reflection questions asked. ○ Examine the provided materials to determine if they are **suitable** for your participants. • **Equipment:** ○ Ensure device, screen and projector are set up.
Opening Hook	• Think of 3-4 simple images or objects to draw on the board. Some examples include a cat, a bicycle, a tree, or a fish.
Section 1: Learning Like A Machine	• Familiarize Yourself with Quick, Draw! Explore the game yourself and try drawing a few prompts to understand how the AI guesses. • Visit the Quick, Draw! Data page to see examples of the dataset.

SECTION	PREPARATION
Section 2: Spot the Difference	● Review the Train the Machine - Activity Page (*Appendix C*). 　○ Note the key features in each labeled dataset for the three birds: goose, loon, and duck. 　○ Go over the correct answers for the prediction and testing part of the activity.

Opening Hook

1. Tell participants that you will be drawing an image on the board, and they are encouraged to call out their guesses as you draw.

2. Slowly draw at least 3 to 4 images. You can choose any simple object or animal that you feel comfortable drawing and that will be easy for participants to recognize.

3. As you draw, encourage participants to make quick predictions and think about the clues that help them figure out each image.

4. After completing the drawings, invite participants to a discussion

   a. Ask participants: "Which drawings were easiest to recognize, and which were more difficult?"

   b. Ask participants: "What helped you figure out the correct answers?"

      i. Our brains build a mental collection of images from life, and drawings can be recognized by matching their patterns and shapes to what is already known.

5. Display the What is Machine Learning? 2-7 - Activity Slide Deck (*Appendix C*), explain that computers and machines do not have memories like humans, but they can learn from examples called **data**.

   a. Each example, such as one drawing or one image, is called a **data point**. When many data points are collected together, they form a **dataset**. Just like how our brain uses past experiences to recognize new drawings, computers and machines use a dataset to learn patterns and make predictions.

    b. Highlight that machines can learn from many types of data, including images, measurements, text, video, and audio. Provide examples for each type and explain how a computer or machine can use that data to recognize patterns, make predictions, or perform tasks.

6. Invite participants to share other examples of data they encounter in their daily lives.

    a. Possible Responses: photos or videos on computers; voice commands on smart devices; recommended songs or videos on online video sites; choices made in video games.

Section 1: Learn Like a Machine

1. Using the What is Machine Learning? 2-7 - Activity Slide Deck (*Appendix C*), gather participants and ask: "Take a glance at these everyday programs. What do they all have in common?"

    a. They all use **artificial intelligence (AI)**. AI works because of algorithms, a list of instructions created by people, that help machines and computer programs learn from data, solve problems, and make decisions. These algorithms teach computers to use the data they have, like pictures, sounds, or repeated experiences, to recognize patterns, make predictions, and improve over time.

    b. AI follows instructions from the data, but they don't understand or think like humans. This means that even though AI can make predictions or suggest decisions, it doesn't have feelings, opinions, or awareness like we do, it's just using the information and rules it's been given.

    c. **Video Game Characters:** Some characters use AI that changes how they behave based on your actions. They follow programmed rules and patterns to make decisions and respond in smarter ways during gameplay.

    d. **Weather Apps:** These applications use AI to analyze huge amounts of data from satellites, sensors, and past weather patterns. AI helps predict forecasts, track storms, and update conditions in real time to provide more accurate and personalized weather information.

e. **Face Filters:** These applications use AI to detect your face and apply filters that adjust in real time. They learn from lots of examples to know where your eyes, nose, and mouth are.

2. Ask participants: "How can we help machines learn and get better at a task over time?"

   a. Possible Responses: Providing it with more data or examples; updating its algorithm, collecting feedback and adjusting it; training it with different scenarios; comparing its answers to the right ones.

3. Introduce the concept of **machine learning (ML)** - a type of AI where a machine or computer program learns from data and improves and adapts its performance on a task over time, without needing someone to program every step.

   a. Computers don't think like us - they notice patterns in the examples you give them and make guesses based on those patterns.

   b. For example, some mobile apps can learn your favorite songs or shows and suggest new ones you might like; a character in a video game learns how to dodge your attacks; or smart assistants learn how to understand your voice.

   c. Present the ▶ What is Machine Learning? (OxfordSparks, 2:19s) video to summarize what machine learning is.

4. Inform participants that they will test whether a machine can predict their drawings, similar to our previous drawing exercise.

   a. Introduce participants to Quick, Draw!, an AI game by Google where a computer tries to recognize what you're drawing in real time. The computer has learned to make guesses by observing millions of drawings from people around the world.

5. Give each participant a sheet of paper and a pencil, crayon, or marker.

6. Launch Quick, Draw! and share your screen with participants. Start the game and show the prompt of the object they will be drawing (e.g. "calculator").

   a. Ask participants to draw their version of the object prompt within 20 seconds.

b. Choose one participant's drawing to replicate digitally in Quick, Draw! within the same 20-second limit.

c. Have participants watch and predict what the AI will guess and when.

d. Repeat the process for the remaining prompts, completing a total of six rounds.

7. After completing the game, reflect on the results for each prompt.

    a. <u>For any prompts where the AI guessed correctly</u>:

        i. Select the drawing to explore examples of how other people drew the same object. This shows what helped the AI guess correctly and also reveals other guesses the AI considered, along with the drawings associated with those guesses.

        ii. Ask participants: "Do you think the drawing looks similar to other people's drawings? How might that have helped the AI?"

    b. <u>For any prompts where the AI guessed incorrectly:</u>

        i. Select the drawing to check what the AI thought it might be and the closest matches. You can also view drawings made by other people, which the AI used to learn what to look for when identifying that prompt.

        ii. Ask participants: "What features of the drawing confused the AI?"

8. On your screen, share [Quick, Draw! Data](#) - the full dataset of drawings collected from people around the world as they played the game.

9. Invite participants to select and explore a few prompts and notice how drawings differ or are similar across the world.

    a. Explain that the AI in Quick, Draw! has learned to recognize objects by analyzing millions of drawings. As players provide a drawing, each act as a piece of data that helps the AI find patterns - for example, what most cats, trees, or cars tend to look like. The more examples the AI views, the better it becomes at recognizing new ones.

    b. This dataset helps machine learning scientists train new AI models to recognize objects more accurately and understand patterns in how people around the world draw the same object.

    c. Emphasize that even machines make mistakes, especially with unusual or creative drawings, showing that learning is not perfect. Reinforce the idea that machines learn from lots of examples and that the quality and variety of data are important for helping them guess more accurately.

Section 2: Spot the Difference

1. Explain to participants that, just as people learn in different ways, AI systems can also learn in different ways. Introduce **supervised learning**, one main type of machine learning.

   a. **Supervised Learning:** The AI system is given many labeled examples and learns to identify the patterns linked to each label.

       i. In supervised learning, the model is trained using input data paired with correct labels, such as images labeled 'dog' or 'cat'. The model analyzes these examples to learn patterns and features that define each category (e.g. images labelled as 'cat' have whiskers). Once trained, it can make predictions on new, unlabeled data, providing the most likely label.

       ii. This type of learning is used by machines in image recognition apps, filtering spam emails, or even helping doctors detect diseases from x-ray scans.

2. Tell participants that they will practice supervised learning, just like an AI system does. Divide them into pairs or small groups and provide each group with the Train the Machine - Activity Page (*Appendix C*) and a writing utensil.

3. Explain that they have labeled datasets of photos for three Canadian birds: goose, loon, and duck. Using these photos, they will act as an AI, noting key characteristics from each dataset to help them identify the birds in the next step.

4. In pairs or small groups, have participants carefully examine the labeled photos or dataset of each bird.

   a. Encourage them to note down patterns or unique characteristics for each bird on the "Training Time" page:

       i. Body shape, neck length, beak type

        ii. Colour patterns, markings, or feather shapes

        iii. Size differences or posture

    b. Based on what they observe, have them identify "rules" or clues that could help an AI identify each bird.

        i. For example - If the neck is long and the body is gray, it's a goose.

5. Once participants have listed the unique characteristics for each bird, have them turn to the "Testing Time" page. They'll now see a series of animal descriptions. Using what they learned from studying the labeled dataset, they must decide whether each description matches a goose, loon, or duck.

6. Using the What is Machine Learning? 2-7 - Activity Slide Deck (*Appendix C*), reveal the correct answers and find out which groups made accurate predictions.

    a. Lead a brief discussion on which characteristics were most helpful in identifying each bird and which ones caused confusion.

7. Highlight that this is how supervised learning works: the AI observes and analyses the labeled examples, learns patterns, and then uses those patterns to make predictions on new data.

8. Ask participants: "What do you notice about the colors, backgrounds, or angles in the photos? Are there any that might confuse an AI system?"

    a. Similar backgrounds (like water or grass) could confuse the AI if it relies too much on surroundings instead of bird features.

    b. Similar features and sizes between water birds could make it difficult for the AI to tell them apart without context or clear details.

    c. Different angles or crops could make it hard for an AI to recognize the same bird (e.g., a close-up vs. full-body image).

9. After discussing these examples, explain that this is similar to the challenges real AI systems face when learning from images. The AI learns by searching for patterns in the data it's given - like shape, size, or texture - but if the data includes confusing or inconsistent examples, the AI might make mistakes.

10. Emphasize that the quality and variety of data are very important for helping machines learn accurately. If most of the photos show birds from the same

angle or in the same environment, the AI might not perform well when it views something new or different.

Reflection & Debrief

1. Gather participants for a group discussion to reflect on what they learned.
   a. Ask participants: "How might machine learning shape the way we live, and what surprises could come from its use?"
   b. Ask participants: "Why does the quality and type of data we give a machine matter, and what could happen if the data is missing, limited, or unbalanced?"
2. Discuss the different careers listed in *Appendix A: Career & Mentor Connections*.

Delivery Adaptations

How might you adapt the time, space, materials, group sizes, or instructions to make this activity more approachable or more challenging? **Modifications** are ways to make the activity more accessible, **extensions** are ways to make the activity last longer or more challenging.

Modifications

GENERAL

- Each part of this activity can be delivered as a short, 10–30 minute session, spread out over multiple days / class sessions.

SECTION 2: SPOT THE DIFFERENCE

- Focus on only two birds instead of all three birds. Make sure to remove any descriptions in the testing or prediction section that refer to the bird you are not including.
- Identify the descriptions and unique characteristics of each bird dataset as a whole class or group, instead of in small groups or pairs.
- Limit the number of descriptions in the testing or prediction section to 3 or 4.

Extensions

SECTION 1: LEARN LIKE A MACHINE

- If devices are available, have participants play Quick, Draw! in pairs or small groups. Encourage them to take turns drawing and guessing what the AI might predict. After each round, groups can compare their results and discuss which objects were easiest or hardest for the AI to recognize and why.

SECTION 2: SPOT THE DIFFERENCE

- Introduce additional similar Canadian birds, such as herons, to increase variety and complexity.

- After studying the labeled bird photos, have participants create a flowchart or decision tree to design their own decision paths for identifying each bird.
  - Example - Does it have black-and-white patterns?
    - If Yes → It is a Loon
    - If No → It is a Duck
- After completing the prediction/testing section, have participants review which birds they guessed correctly and which they got wrong. Ask them to reflect on the features or patterns they missed and update their notes or "rules" for each bird. Then, repeat the activity with new descriptions to check if their improved observations help them make more accurate guesses. This mirrors how an AI learns from feedback and improves its predictions over time.

References & Gratitude

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Appendices

Appendix A: Career & Mentor Connections

AI/MACHINE LEARNING ENGINEER

- Builds and trains artificial intelligence systems that can learn from data to make predictions or perform complex actions. They support the machine learning researcher.

COMPUTER PROGRAMMER

- Computer programmers write, modify, and test code and scripts in a variety of programming languages that allow computer software and applications to function properly.

MACHINE LEARNING RESEARCHER / DATA SCIENTIST

- Machine learning researchers or data scientists clean and interpret data while building models using a combination of that data and machine learning algorithms.

Appendix B: Background Information

DATA AND DATASETS

Data comes in many forms, including numbers, images, words, and other types of information. They provide insights about individuals, groups, and the world around us. It is a key resource for understanding patterns, making decisions, and predicting outcomes. Specifically, data can be used to:

- Identify correlations and trends that might not be obvious at first glance.
- Develop a deeper understanding of complex systems and behaviors.
- Inform decisions in real time or future planning.
- Make decisions based on past patterns or observed information.

Datasets are also essentials for creating algorithms, which are sets of instructions or rules that a computer follows to solve problems or make decisions. By analyzing and learning from data, algorithms can help humans understand and act on information more effectively.

Some applications of how data drives algorithms include:

- **Traffic and navigation apps:** Analyzing road and traffic patterns to suggest the fastest routes.
- **Outer space and weather systems**: Studying patterns to predict astronomical events or weather changes.
- **Shopping and media recommendations**: Using purchase and viewing history to suggest products or content that people may like.
- **Healthcare and diagnostics**: Analyzing medical data to identify health risks, suggest treatments, or support research.

ARTIFICIAL INTELLIGENCE

Artificial intelligence (AI) is a branch of Computer Science that deals with a machine's ability to simulate intelligent behaviour. This includes cognitive functions we associate with human minds, such as perceiving, reasoning, learning, and adapting.

AI is becoming increasingly vital in our lives. From digital assistants, GPS navigation, and autonomous vehicles to tools like Siri/Google Home and generative AI tools (e.g., OpenAI's Chat GPT), its impact on our daily lives is growing. AI plays a crucial role in various aspects of work, enhancing efficiency, and taking on hazardous or monotonous tasks. As AI applications grow, discussions on AI ethics and responsible practices are increasingly important.

MACHINE LEARNING

Machine learning (ML) is a type of artificial intelligence where computers learn from data, improve at tasks over time, and adapt without being programmed step by step. Instead of giving the computer every possible instruction, we give it ways to learn from experience, similar to how people practice and improve.

For example, you might teach a computer to play checkers. Rather than listing every possible move, you could program it to learn from playing many games. Eventually, it could get so good that it plays better than the person who wrote the program

The learning process usually includes a few steps:

1. **Give it Data:** First, the computer is given a lot of data to process. This could be pictures, numbers, text, or sounds.
2. **Find the Patterns:** The computer then analyzes all this data and starts to find patterns, building its own "rules" based on experience.
3. **Make Predictions or Actions:** Using these patterns, the computer can make decisions or predictions when it encounters new data.
4. **Get Better and Better:** As the computer gets more data, it can adjust its patterns to become more accurate. The more data and computing power it has, the better its predictions become

Machine learning is used across different fields and in our everyday lives. In your daily life, ML works quietly behind the scenes in many of the tools and apps you use. It powers autocorrect and predictive text on your phone, suggests videos to watch on streaming platforms, and runs the filters on social media apps that recognize and

track your face. It also helps your phone unlock through facial recognition by learning your unique features, and it keeps your email inbox clean by filtering out junk mail.

In addition, ML is making an impact in the wider world. In healthcare, it helps doctors diagnose illnesses more accurately, such as spotting broken bones in X-rays. It is also the "brain" behind self-driving cars, enabling them to observe and respond to the world around them. In industries like agriculture and manufacturing, ML supports smarter ways to grow food and produce goods more efficiently.
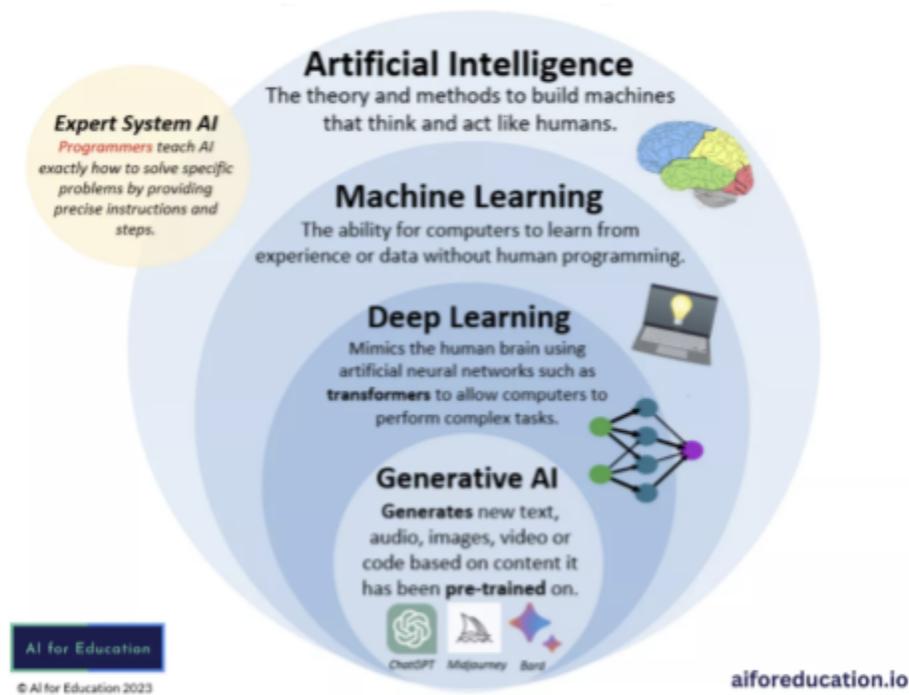
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Artificial Intelligence VS Machine Learning VS Deep Learning

You might come across the terms "artificial intelligence" and "machine learning" used together, but they aren't exactly the same thing. AI is the broad idea of creating machines that can act or think in ways similar to humans. This can range from simple tools like a smart thermostat that adjusts the temperature based on rules, to more advanced systems like voice assistants or even robots. AI systems can learn over time, sense their environment, and make decisions on their own. Within AI, there are different types:

- **Classification AI**: Systems that identifies and sorts things (e.g. Tiktok or Snapchat face filters).
- **Predictive AI:** Systems that use data to make decisions about the future (e.g. Spotify and Apple Music recommendations).
- **Generative AI:** Systems which create new things, such as text, images, or music (e.g. CoPilot and ChatGPT).

Machine Learning is a specific approach within AI. It's a specific way of achieving AI by having computers learn from data instead of being programmed with a long list of rules. So, all machine learning is AI, but not all AI uses machine learning.

Deep Learning (DL) is a more advanced type of ML that uses structures called neural networks, designed to work a bit like the human brain. Deep learning is what enables high-performance AI systems, including many generative AI tools that can create new and transformative outputs.

Types of Machine Learning

Machine learning methods are usually grouped into three main types, depending on the goal and the kind of data they use.

- **Supervised learning** happens when the computer is trained with examples that already have the right answers (called labels). The computer learns the link and patterns between the input and output so it can predict answers for new data. This is used in things like email filters that sort *spam vs. not spam*, or in predicting numbers, like house prices.
- **Unsupervised learning** is when the computer is given data without any labels and has to find patterns on its own. It might group similar things together (clustering), or uncover hidden connections in the data. This is used for things like grouping customers into types or making product recommendations.
- **Reinforcement learning** is like learning by trial and error. A computer "agent" makes decisions in an environment, gets rewards or penalties for its actions, and learns strategies to do better over time. This approach is often used in robotics and training AI to play video games.

ETHICS AND AI

Artificial intelligence offers powerful tools and new possibilities. As these systems learn from data, make decisions, and shape our world, it is important to consider their ethical impacts.

Actua has developed a resource (*Appendix C*) to support facilitators in leading discussions with youth about ethics and responsible AI use. Facilitators are encouraged to engage youth in meaningful conversations that empower them to think critically about how AI is designed, used, and experienced in the world around them. This resource emphasizes human agency and responsibility, supports values-based reflection, and creates space for curiosity, dialogue, and informed decision-making as digital citizens.

Appendix C: Additional Resources

GENERAL

Activity Slide Deck
- [What is Machine Learning? 2-7 - Activity Slide Deck](#)
  - ○ ***Note:*** This link will automatically download to your device.

Supporting Resource
- [AI in Context: Responsibility and Ethics in Artificial Intelligence](#)

SECTION 1: LEARN LIKE A MACHINE

Video(s):
- ▶ What is Machine Learning? (OxfordSparks, 2:19s)

Supporting Resource(s):
- [Quick Draw - Google](#)
- [Quick Draw Data Set - Google](#)

SECTION 2: SPOT THE DIFFERENCE

Activity Page(s):
- Train the Machine - Activity Page (refer below)

What is Machine Learning?

Train the Machine

(1) Training Time

Pay attention to each animal and note any **features, details, or patterns** you can find.

Label: Goose

Features / Description

Label: Loon

Features / Description

Label: Duck

Features / Description

(2) Testing Time

Can you figure out if this animal description is talking about a **duck, a loon, or a goose**?

Description	Animal
A bird with a bright green head and a yellow bill.	
Visible webbed feet are trailing behind it in the water.	
Known for the white "chinstrap" marking under its head.	
The head is completely black, and the bill is straight and dark.	
Standing on land, showing off orange feet.	
A tall, grey-brown bird with a long, black neck and head.	
The body is mostly brown-grey, but the head is vibrantly colored.	
A distinct pattern of white dots on a black back, like tiny checkerboards.	
Seen standing on a shore with its large, brown wings open wide.	
An animal with a white neck-ring and a chestnut chest.	