Animal Attitudes: Besting Biases

Gr. 5-7 Activity Write Up

Actua | 111 Murray Street, Ottawa, ON K1N 5M5 | www.actua.ca | 613 234 4137

actüa
Youth · STEM · Innovation
Jeunesse · STIM · Innovation

Animal Attitudes: Besting Biases

Terms of Use

Prior to using this activity or parts thereof, you agree and understand that:

- It is your responsibility to review all aspects of this document and the associated activity write ups, and ensure safety measures are in place for the protection of all involved parties.
- Any safety precautions contained in the “Safety Considerations” section of the write-ups are not intended as a complete list or to replace your own safety review process.
- Actua shall not be responsible or liable for any damage that may occur due to your use of this content.
- You may adapt the content for your program (remix, transform, and build upon the material), providing appropriate credit to Actua and indicating if changes were made. No sharing of content with third parties without written permission from Actua.

About Actua

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!

Animal Attitudes: Besting Biases

Activity Summary

In this activity, participants will explore the role of bias in the development of social attitudes. Participants will play an interactive game where they create an argument to defend an assigned animal on why it is the best animal. Then, participants will explore AI labelling and how an AI system can become biased. Finally, participants will examine AI labelling and human bias in STEM by drawing a scientist and participating in reflective discussion.

Developed by Actua, 2025

Delivery Environment	Activity Duration	Intended Audience	Tech
In-Person	1 hour and 45 minutes	Grades 5-7 (*Ages 10-13*)	Certain activities will require a laptop/tablet. With modifications, it is possible to run this entire lesson in pairs/groups. **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:

- **Learn** how an AI system works and labels data.
- **Describe** how bias can affect attitudes towards something.
- **Examine and reflect** on bias in STEM.

Success Criteria

Following this activity, participants can express:

- **I can describe** how an AI system works and labels data.
- **I can explain** to someone how bias affects attitudes.
- **I can examine** my experiences with bias in STEM and reflect on them.

Logistics (Timing, Group Sizing, Materials)

Section Title	Time	Group Size	Materials
Opening Hook	10 minutes	*Whole Group*	**Facilitators** • Animal Attitudes - Activity Slide Deck (*Appendix C*)
Section 1: Animal Attitudes	30 minutes	*Small Groups (3-4)*	**Facilitators** • Animal Attitudes - Activity Slide Deck (*Appendix C*) • Animal Misinformation Fact Sheet - Activity Page (*Appendix C*) **Per Small Group or Pair** • Animal Facts (*refer to To Do in Advance*)

Section Title	Time	Group Size	Materials
			• *Optional:* Computer Device or Tablet to do research
Section 2: AI Animal Machine	20 minutes	*Individual and Whole Group*	**Facilitators** • Animal Attitudes - Activity Slide Deck (*Appendix C*) • Chart Paper or Whiteboard • Markers **Per Individual** • Red and Green Marker ○ ***Note:*** Alternatively, red (6) and green (6) stickers
Section 3: Besting Biases	30 minutes	*Individual and Whole Group*	**Facilitators** • Animal Attitudes - Activity Slide Deck (*Appendix C*) **Per Individual** • Writing Utensil • Colouring Utensil • Draw a Scientist - Activity Page (*Appendix C*)
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

- This activity involves discussion on misinformation and disinformation, which may be a sensitive topic. Thinking about these issues might remind participants of past experiences or bring up strong feelings. In addition to the suggestions above, facilitators should:
    - Make it clear that participants can step back from any activity, discussion, or resource that feels too heavy.
    - Build in space for reflection, questions, or quiet processing.
    - Offer the following resource on the topic of gendered misinformation and disinformation if relevant, Tackling Online Gendered Disinformation: Youth Guide, which discusses what it is and how to take action. More resources can be found on actua.ca/misinformation.
- Approach these topics with sensitivity. Participants may have negative and/or traumatic experiences related to bias and stereotypes. Keep discussions broad and avoid focusing on a participant's individual experiences with the topic. Ensure you maintain a safe space for all participants.
    - ***Note:*** If difficult conversations do arise, refer to your organization's policies and training related to navigating difficult conversations with participants.
- 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.

Electronic and Technology Use

- Participants are to be advised about safe practices for handling electronic devices such as laptops/computers. This includes guidelines for avoiding liquids, using devices in safe locations to prevent accidental falls and damage.
- Facilitators should check cords and electronic components for damage before distributing them to participants.

Online Safety

Some components of this activity require the use of devices connected to the internet.

- Facilitators should review the provided videos and read/explore provided websites and materials to determine if they are suitable for your participants.
- Where applicable, facilitators should remind participants to stay on task and only use the links provided within this activity.
- Facilitators should also model and encourage appropriate online behaviour by all participants in the group (e.g., using chat boxes to answer and ask questions, using positive and encouraging language, using devices for the purpose of the task).
- Discuss the use of any online application with your team and/or supervisor and follow any organizational guidelines and policies related to technology use. Ensure participants' privacy and consent are respected.

Curriculum Links

This activity aligns with these components found in the UNESCO AI Competency Framework for Students:

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).

Ethics of AI: Embodied Ethics

- Learners are expected to be able to develop a basic understanding of the ethical issues around AI, and the potential impact of AI on human rights, social justice, inclusion, equity and climate change within their local context and with regard to their personal lives. They will understand, and internalize the following key ethical principles, and will translate these in their reflective practices and uses of AI tools in their lives and learning: Do no harm, Proportionality, Nondiscrimination, Sustainability, Human determination, and Transparency (p. 31-32).

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).

Human-Centered Mindset: AI Society Citizenship

- Learners are expected to be able to build critical views on the impact of AI on human societies and expand their human-centred values to promoting the design and use of AI for inclusive and sustainable development (p. 45-47).

This activity can be connected to the following subject areas:

Science

- Investigate, describe, and compare the key characteristics that define living things,
- Analyze and Interpret data, evidence, and scientific knowledge to develop solutions, make decisions
- Understanding the role of science and technology in society and daily life.

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.

Section 1: Animal Attitudes	• Review the Animal Misinformation Fact Sheet - Activity Page (*Appendix C*) and determine which facts you'd like to share during this activity section. Feel free to add your own!

SECTION	PREPARATION
	○ Include the misinformation prompts into the Animal Attitudes - Activity Slide Deck (*Appendix C*). • Prepare a fact sheet for each of the 6 animals listed on the slides (pig, bat, rat, cat, mosquito, and spider). Determine the most appropriate and digestible information based on your participants' reading levels. ○ ***Note:*** With an older group of participants, with devices and internet access, consider allowing participants to conduct their own research, if appropriate.

Opening Hook

1. Using the Animal Attitudes - Activity Slide Deck (*Appendix C*), begin the activity by having a discussion on their favourite and least favourite animals.
    a. Ask participants: "What is their favourite animal and why?"
    b. Ask participants: "What is your least favourite animal and why?"
2. Explain to participants that each of them has their own attitudes towards certain animals.
    a. Discuss the topics of attitudes, bias and where they may come from (Slides 4 to 5).

Section 1: Animal Attitudes

1. In small groups, participants will be assigned an animal. Their task is to examine the prepared Animal Facts Activity Page (*refer to To Do in Advance*) and work together to create a defence for their animal explaining why their animal is the best.
    a. Participants will use the facts on the sheet and their own personal knowledge and experience related to the animal.

    b. Misinformation will be shared about the different animals in an attempt to sway opinions.
    c. ***Note:*** If appropriate and feasible, participants can use a device to conduct their own research.
2. While participants prepare, the facilitators will at random intervals call "Breaking News!" and share with the group one of the prompts from the Animal Misinformation Fact Sheet - Activity Page (*Appendix C*).
    a. These prompts introduce **misinformation about an animal**, however the prompts are designed to be believable with only a small part of the fact being wrong.
        i. *Example:* "Rats are very playful and even enjoy being tickled. They even have a high-pitched giggle that sounds similar to a young child laughing"
    b. After at least three (3) misinformation prompts have been shared, facilitators can bring the group back together to present their arguments on why their animal is the best.
    c. Facilitators will then reveal which facts were fake and ask if this change in information changes their opinion of the animal.
3. Go through Slides 10-14 of the Animal Attitudes - Activity Slide Deck (*Appendix C*) with participants and discuss the types of misinformation and the examples provided.

Section 2: The AI Animal Machine

1. Explain to participants that for the rest of the activity, they will be completing a few simple simulations of training an AI system.
2. Work through Slides 16-22 of the Animal Attitudes - Activity Slide Deck (*Appendix C*) to explain to participants what AI is and how AI systems use features and labels to make sense of data.
    a. On Slide 22 - spend time brainstorming features with participants to teach an AI how to tell the difference between a square and rectangle.

3. Explain to participants that they will now provide data to a new AI system, "The AI Animal Machine". This machine is designed to evaluate whether an animal is good or bad.
4. Facilitators will write the animals across the top of the whiteboard/chart paper and explain to participants that they will be providing data based on the previous activity.
5. Have 10 participants go up to the board and use green (positive), red (negative) and black (neutral) to indicate how they feel about each animal.
    a. ***Note:*** 10 participants makes calculations much simpler but any number of participants can vote. Choose what is most appropriate for your participants.
6. Once participants have finished labelling, facilitators can use Slide 25-26 of the Animal Attitudes - Activity Slide Deck (*Appendix C*) to calculate the results and make conclusions about the data.
7. When finished, ask participants the following discussion questions:
    a. "If this data was the only data an AI had access to, what would it assume?"
        i. What are the implications of this based on this example?
    b. "How can we make the Animal Machine less biased?"

Section 3: Besting Biases

1. Explain to participants that they will now be training a more complex machine that uses more than one feature this time. This time they'll be training an AI system to draw a scientist.
2. Participants will be asked to draw a scientist using the Draw a Scientist - Activity Page (*Appendix C*). Choose **2-3 features** from Slide 27 of the Animal Attitudes - Activity Slide Deck (*Appendix C*) that you will use to train the AI. Ask participants to try their best to make sure the chosen features are included in their drawing as we'll need to use them later.
    a. ***Note:*** It's fine if not all participants use all the features chosen as they will be volunteering their answers.

    b. ***Note:*** A facilitator does not need to review everyone's drawings for the activity to be successful. You should aim to collect 10 labels, per feature, from the group to analyze.
        i. For example, the labels you collect for the feature "STEM Field" could be: chemistry, biology, engineering, environmental science, astronomy, etc.
3. Give participants time to draw their scientists. Participants that are done early can start writing down the labels they find in their drawing.
4. Facilitators should bring the group back to discuss their drawings using Slide 28 of the Animal Attitudes - Activity Slide Deck (*Appendix C*). Ask participants to volunteer answers as some participants may not be comfortable sharing.
    a. What features did we choose to use?
    b. How would you label these features based on your drawing?
        i. **Emotional Safety Approach:** Let participants know that they are not attempting to determine the gender of the scientists drawn. The person who drew the scientist knows the gender of the scientist drawn. Participants should only be labelling their own drawing with a gender (if gender was a feature chosen).
        ii. **Note:** It is easiest to work through one feature at a time. Use Slide 29 or 30 to help facilitate this on the screen if using a screen and slides.
        iii. **Note:** Sample data is provided on Slide 30 if you'd like an example to work from.
5. Ask participants: "What features would an AI tool likely use to generate an image of a scientist?"

Reflection & Debrief

1. Gather participants in a circle and have the following discussions:
    a. Ask participants: "What factors affect how someone feels about something?"
    b. Ask participants: "Why does an AI system have bias? What helps prevent it?"

c. Ask participants: “What are helpful strategies to help combat bias in society?”
    i. *Possible responses: make sure we educate ourselves before drawing conclusions, practicing good research techniques and using multiple sources, be willing to understand different perspectives, be kind and respectful to others regardless of differences, etc.*
    ii. ***Note:*** This question can go deeper or be made more shallow depending on the setting, facilitator comfort and relationships with participants.
    iii. ***Note:*** Please refer to *Safety Considerations* and determine what is appropriate for your setting and audience.

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

SECTION 1: ANIMAL ATTITUDES

- Remove the spider and mosquito from the list of animals as they are the most difficult to defend in most cases.
- Provide an example argument for participants struggling with brainstorming ideas.

SECTION 3: BESTING BIASES

- Choose one feature to explore as a group and tally the results.

Extensions

SECTION 3: BESTING BIASES

- For older participants (*Gr. 9-12*) group similar features together and calculate the weighting of the dataset. This is easiest with just 1 feature but more can be chosen depending on the group.
    - Example: Based on the data gathered from 20 students, 6 participants drew a scientist with straight hair and 14 drew a scientist with curly hair.
        - 14/20 = 7/10 = 70%
        - 6/20 = 3/10 = 30%
    - In this example the AI system would assume that 70% of the time it should draw a scientist with curly hair.

- Complete the exercise above but instead use Google image search to search for “CEO”. Take the first 20 results and count how many images present a male CEO compared to how many present a female CEO.
    - What weighting would the AI use when drawing a CEO based on those 20 images?

References & Gratitude

Actua. (2025). *Misinformation*. actua.ca/misinformation

AI for Education (n.d.). *Generative AI Explainer*. aiforeducation.io/ai-resources/generative-ai-explainer

Amazon Web Services (n.d.). *What is Machine Learning?*. Amazon. aws.amazon.com/what-is/machine-learning/

Badman, A. & Kosinski, M. (n.d.). *What is Data?*. IBM. ibm.com/think/topics/data

Cherry, K. (2024, May 4). *The Components of Attitude Formation of an Attitude and How It Can Be Changed*. Verywellmind. verywellmind.com/attitudes-how-they-form-change-shape-behavior-2795897

CISA. (n.d.). *Tactics of Disinformation*. cisa.gov/sites/default/files/publications/tactics-of-disinformation_508.pdf

Elliott, R. (2024, June 10). *12 surprising facts about rats*. Saga. saga.co.uk/magazine/life/facts-about-rats

Government of Canada. (2024, May). H*ow to identify misinformation, disinformation, and malinformation*. cyber.gc.ca/en/guidance/how-identify-misinformation-disinformation-and-malinformation-itsap00300

Otis N. et al. (2025). *Global Evidence on Gender Gaps and Generative AI*. Harvard Business School. hbs.edu/ris/Publication%20Files/25-023_8ee1f38f-d949-4b49-80c8-c7a736f2c27b.pdf

United Nations Educational, Scientific and Cultural Organization. (2024). *UNESCO AI framework: Competency levels*. unesdoc.unesco.org/ark:/48223/pf0000391105

Appendices

Appendix A: Career & Mentor Connections

COMMUNICATIONS SPECIALIST

- A communication specialist establishes positive associations with the public and mass media on behalf of their clients.

SOFTWARE ENGINEER

- Software engineers design and develop computer software. They are often fluent in multiple programming languages such as Python, Javascript or Swift.

STATISTICIAN

- A statistician is a person who works with theoretical or applied statistics. The profession exists in both the private and public sectors. It is common to combine statistical knowledge with expertise in other subjects, and statisticians may work as employees or as statistical consultants.

Appendix B: Background Information

MISINFORMATION

Information and Data

Information and data permeate our world at every turn. Information comes in many forms such as words, numbers, symbols, and images. The ability to accurately judge and interpret information helps us predict the weather, build cities, keep a personal budget and even explore outer space. The validation of information is critical to working with information and can be divided into 4 types:

- **Valid:** Factually correct, based on data and not misleading.
- **Inaccurate:** Incomplete or manipulated to change the narrative.
- **False:** Incorrect and can be disproven with other data.
- **Unsustainable:** Cannot be proved or disproved based on available data.

Misinformation, Disinformation and Malinformation

As discussed above, information is a critical part of how we navigate our world. However, as the world becomes more and more connected, the ability to spread false information has become more prevalent and easy to access. There are 3 types of false information often abbreviated as MDM.

- **Misinformation:** Misinformation refers to false information that is not intended to cause harm. It tends to be accidental and stems from miscommunication. It can be widespread or focused.
- **Disinformation:** Disinformation refers to false information that is intended to manipulate, cause damage and/or guide people in the wrong direction. It is often focused on disparaging a particular group of people or to sway the opinion of a particular group of people.
- **Malinformation:** Malinformation refers to information that stems from the truth but is often exaggerated in a way that misleads and causes potential harm. This is often intentional and intended to mislead or sway the opinions of others.

Gendered Disinformation

Like disinformation, gendered disinformation consists of misleading or false content. However, what sets it apart is that it specifically targets certain individuals. It's meant to harm women and girls or people who don't go along with traditional gender norms. Its goals are often to reinforce harmful stereotypes and spread unfair and unrealistic ideas about gender roles. Sometimes, it shows up as fake stories about women in leadership, false claims about what girls can or can't do, or even results in threatening behaviour from strangers both in person and online.

When these false messages spread, usually through social media, they can make people question their abilities, limit their current and future opportunities, or even lead to fear speaking out online. Gendered disinformation can seek to silence female voices, furthering pre-existing inequalities and reinforcing harmful stereotypes that create barriers to women and girls, especially in STEM fields.

More resources on the topic of Gendered Misinformation and Disinformation can be found on actua.ca/misinformation.

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.

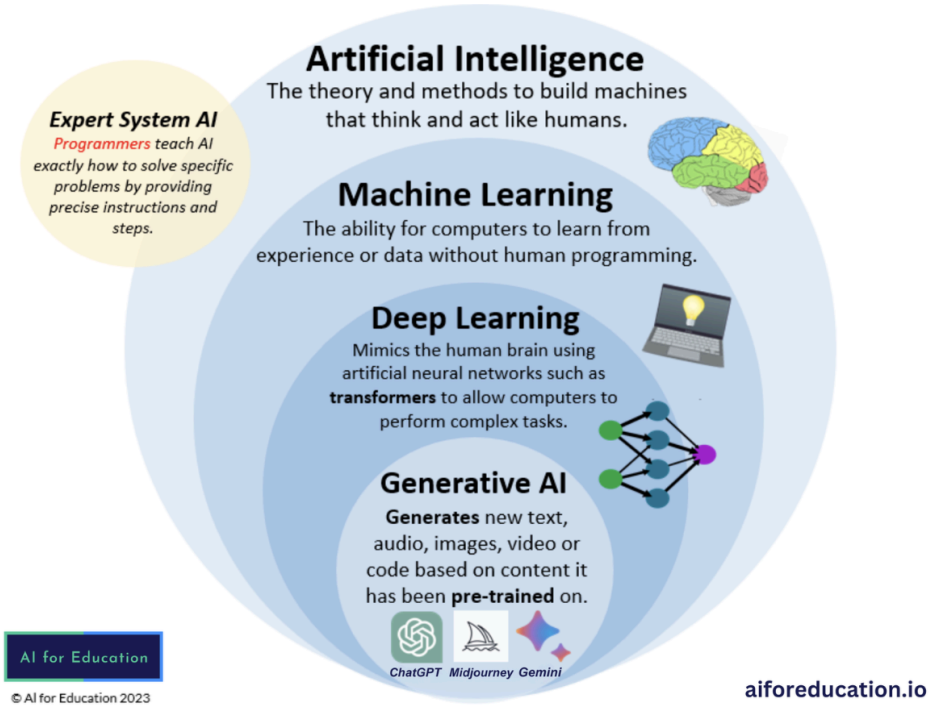
For example, you might teach a computer to play checkers. Rather than listing every possible move, you could program it to learn from playing many games. Eventually, it could get so good that it plays better than the person who wrote the program

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.



AI for Education. (2023). *Generative AI Explainer*. aiforeducation.io/ai-resources/generative-ai-explainer

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

- Animal Attitudes: Besting Biases - 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: ANIMAL ATTITUDES

Activity Page(s)

- Animal Misinformation Fact Sheet - Activity Page (refer below)

SECTION 3: BESTING BIASES

Activity Page(s)

- Draw a Scientist - Activity Page (refer below)

actüa
Youth · STEM · Innovation
Jeunesse · STIM · Innovation

Animal Attitudes: Besting Biases

Animal Misinformation Fact Sheet

Choose some of the following misinformation prompts to share with participants while they prepare their presentations.

Cat	Cats kill 100 times more birds than anything else, including windows and other natural predators.
	A recent study on pet owners found that cat owners have 4 times the number of accidents than dog owners. Are cats unlucky?
Bat	Bats can spread rabies faster than any other animal on Earth. They are also immune and don't feel the negative effects.
	Bats enjoy drinking the blood of other animals, however it has no nutritional value. They do it for fun!
Rat	Rats are playful and love being tickled, they even laugh in a high-pitched giggle much like a young child!
	Due to the increase in large cities and food waste, scientists have found that most rats have almost doubled in size since 2015. The largest rat recorded so far was as large as a cat!
Pig	Pigs and dolphins are both very smart animals. However, dolphins use their smarts to help others, even humans, while pigs use their smarts to trick and steal from other animals!
	Pigs aren't able to sweat. They often escape their pens and steal other animal's water, often resulting in the death of other farm animals on hot days.
Spider	Spiders can sense fear in humans and a recent study found that 80% of people bitten by spiders are afraid of them.
	The average person swallows 8 spiders per year while asleep.
Mosquito	Most types of mosquitoes can actually control whether or not their bite will become itchy.
	Recent studies on mosquitoes have found an increase in cold resistance. Scientists predict that in 10 years most mosquitoes will be able to survive at temperatures as low as -25° Celsius.

actüa
Youth · STEM · Innovation
Jeunesse · STIM · Innovation

Animal Attitudes: Besting Biases

Draw a Scientist

Draw a scientist below. Your image can be whatever you want it to be. You can use an image and words to describe your scientist.

Your drawing must contain or make reference to at least **two (2) features** on the following list. How you describe each feature is your label. For example, if you choose to make their STEM field a feature, the label could be chemistry:

- Gender
- Occupation (their job)
- Clothing and accessories
- Their STEM Field
- Tools and/or devices
- Setting/Location/Environment