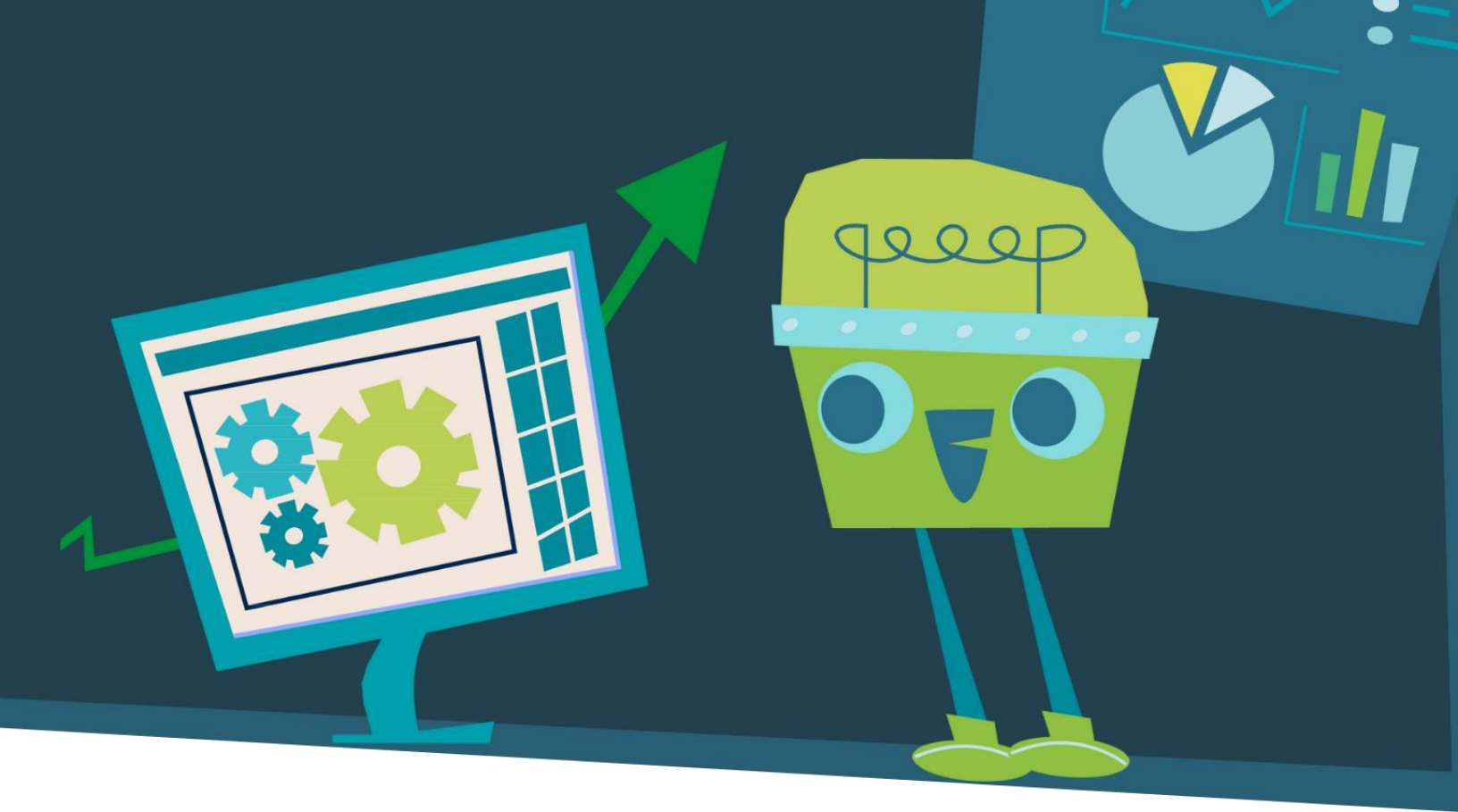




Success Through AI Mastery

Facilitator Guide



**JA
Canada**

Member of
JA Worldwide

Overview

Welcome! Thank you for dedicating your time and expertise to guide students through the exciting world of Artificial Intelligence. This course, "Success Through AI Mastery," is designed to be an interactive exploration that encourages critical thinking, creativity, and real-world application.

YOUR ROLE AS A FACILITATOR

Your role is not to be an AI expert, but a **guide** who sparks curiosity, encourages students to share their perspectives, and helps them connect the concepts in this course to their own lives. This guide is your playbook, designed to support you every step of the way.

HOW TO USE THIS GUIDE

This guide is designed to be used with two key resources: the main **digital course content** (videos, slides, interactive questions) and the printable **Student Guide** (where students record their ideas).

This guide provides you with:

- A clear session outline with estimated timings.
- Opening questions to grab students' attention.
- Talking points and discussion prompts to debrief videos and core concepts.
- Step-by-step instructions for facilitating activities.
- Facilitator Tips to help you manage the classroom and encourage participation.

A Note on Knowledge Checks: You have flexibility with the "Knowledge Check" sections. You can run them as a whole-group discussion, or have students answer individually in their Student Guides first. Choose the approach that best suits your group's dynamic.

Our goal is to create an active, engaging learning environment. Don't be afraid to let discussions run for an extra minute if students are engaged, and always encourage them to share their own examples and ideas.

COURSE GOAL

"Success Through AI Mastery" is designed to provide students with a comprehensive understanding of Artificial Intelligence, covering its history, fundamental concepts, and transformative power across industries like healthcare, finance, and robotics. Students will explore diverse career paths—from technical engineering roles to non-technical management positions—and delve into the entrepreneurial opportunities and challenges within Canada's AI landscape.

LEARNING OUTCOMES

By the end of this program, students will be able to:

- **Master AI Fundamentals:** Identify, differentiate, and explain the core principles of AI, Machine Learning, and Deep Learning, and compare these to traditional computing approaches.
- **Evaluate Real-World Impact:** Analyze and interpret how AI technologies such as Computer Vision and Natural Language Processing are applied to transform industries and **evaluate** their effectiveness in solving complex problems.
- **Navigate Career Pathways:** Identify and categorize diverse technical and non-technical roles in the AI field and determine the specific skills required for success in each.
- **Innovate Responsibly:** Propose and justify entrepreneurial applications of AI while assessing and addressing ethical considerations.

SKILLS DEVELOPED

Critical thinking, problem-solving, communication, citizenship and digital skills.

COURSE OVERVIEW

LESSON	OVERVIEW
Lesson 1: What is Artificial Intelligence?	An introduction to Artificial Intelligence (AI), covering its history, fundamental concepts, and real-world applications, offering insights into how AI is transforming various industries and shaping the future of technology.
Lesson 2: Machine Learning Foundations	Students will delve into the core principles of Machine Learning (ML), exploring supervised, unsupervised, and reinforcement learning techniques, along with algorithms, providing a foundational understanding of how machines can learn from data to make predictions and decisions.
Lesson 3: Computer Vision	Learners will be introduced to the basics of computer vision, covering image processing techniques, object detection, and image classification, offering insights into how machines can interpret visual data and extract meaningful information from images.
Lesson 4: Natural Language Processing (NLP)	Students will delve into NLP, exploring the intricacies of human language comprehension by machines, covering topics such as text cleaning, tokenization, stemming vs. lemmatization, and various NLP applications like sentiment analysis and text summarization.
Lesson 5: Robotics	Students will explore Robotics, tracing its evolution, discussing the types of robots, their real-life applications across industries, and the basics of robotics systems, along with the significant role of AI in robotics, focusing on decision-making, learning, and adaptation.
Lesson 6: AI's Integral Role in Entrepreneurship & STEM	This session highlights the diverse AI job roles, the reasons for pursuing a career in AI, the evolution of AI careers over time, industry demands for AI skills, and the entrepreneurial path in AI, featuring success stories and common challenges faced by AI startups.
Lesson 7: Career Paths in AI	Students will learn about AI career paths, trends, and challenges, including technical and non-technical roles, industry demands, portfolio building, continuous learning, entrepreneurship, and success stories of AI-driven companies.

LESSON OUTLINE

Each session follows a consistent structure designed to maximize engagement and understanding:

- **Introduction (5 min):** A brief welcome and a relatable opening question to activate prior knowledge.
- **Video (5 min):** A short, engaging video that introduces the core concepts and themes of the lesson.
- **Core Concepts Review (10-15 min):** A slide deck presentation that dives deeper into technical details and real-world examples.
- **Knowledge Check (10 min):** A facilitated group discussion or individual quiz to test understanding of key terms and concepts.
- **Creative Activity (10 min):** A hands-on brainstorming or design task in the Student Guide (e.g., designing a feature, solving a problem) to apply learning.
- **Wrap-up (5 min):** A summary of key takeaways and a brief look ahead to the next session.

Lesson 1: What is Artificial Intelligence?

LESSON AT A GLANCE (45 MIN)

- **Learning Objectives:**
 - Define what Artificial Intelligence (AI) is and what it is not.
 - Differentiate between AI, Machine Learning (ML), and Deep Learning (DL).
 - Classify examples of Artificial Narrow Intelligence (ANI) in daily life.
 - **Key Terms for This Lesson:** Artificial Intelligence (AI), Machine Learning (ML), Artificial Narrow Intelligence (ANI), Generalization
 - **Materials Checklist:**
 - Ability to play video with sound.
 - Student access to the digital course and their Student Guides.
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INTRODUCTION (5 MIN)

- **Welcome & Introductions:** Greet the students, introduce yourself, and share a brief, interesting fact about your career or why you're interested in technology.
- **Talking Points:** Your goal is to ground the abstract concept of AI in the students' everyday lives.
- **Opening Question:** Start the discussion with a relatable question:

"Before we begin, what comes to mind when you hear the term 'Artificial Intelligence'? Think about the last app you used on your phone—was it TikTok, Spotify, or maybe Google Maps? Where do you think AI might have been working 'behind the scenes' to help you?"

(Listen for examples like recommendation algorithms, route planning, or photo filters.)

VIDEO (5 MIN)

- **Introduce the Video:** "To get started, let's watch a short video that gives a big-picture view of what AI is, where it came from, and why it's suddenly everywhere."
- **Play Lesson 1 Video**
- **Talking Points:** The video covers the basic definition of AI, the difference between AI/ML/DL, and a brief history. Your goal is to make these concepts relatable through discussion.
- **Facilitate Discussion:** Use these prompts to debrief:
 1. "The video mentioned AI assistants like Siri and Alexa. What's one good thing and one frustrating thing about using them in your experience?"
 2. "The 'AI Winter' happened because people were disappointed with what AI could do. Do you think people's expectations for AI today are too high? Why or why not?"

CORE CONCEPTS REVIEW (10 MIN)

- **Introduce the Slide Deck:** "Now, let's dive a little deeper. The following slides explore the key concepts, history, and challenges of AI that we just saw in the video."
- **Guide students through the Lesson 1 Slides**
- **Facilitator Focus:** Briefly pause on the slides that differentiate **AI, ML, and DL**, and the slide that explains the different **types of AI (ANI, AGI, ASI)**. Use the 'umbrella' or 'layers' analogy from the course content to help clarify the relationship.

KNOWLEDGE CHECK - GROUP DISCUSSION (10 MIN)

- **Introduce the Activity:** "Time for a quick check-in! Let's try answering these questions to apply what we've learned."

- **Facilitator Note:** You can discuss these questions as a group, or you can invite students to answer them independently in their Student Guides before reviewing as a group.
- **Facilitate Each Question:**
 - **Question 1 (Video Game Scenario):** "Let's look at the first scenario about the video game. Let's take a quick poll by show of hands. Who thinks the answer is A? B? C? D? Now, can someone who chose **(a)** explain why they picked it? What makes the other answers incorrect?"
 - **Question 2 (Sorting Activity):** "This one is about organizing the concepts. Which of these three—AI, Machine Learning, or Deep Learning—is the biggest, most general category?" (Guide them to place AI at the top.)
 - **Question 3 (Multiple Response - ANI Examples):** "Let's go through these one by one. A GPS app—is that an example of a 'narrow' AI designed for one task? How about a chatbot that can have a deep philosophical conversation?" (Discuss why some are ANI and others are theoretical AGI.)
 - **Question 4 (Generalization Scenario):** "This scenario describes an AI that works in one situation but not another. Which of the technical limitations we saw in the slides does this sound like?"

ACTIVITY - BRAINSTORM & SHARE (10 MIN)

- **Introduce the Capstone Project:** "Now for the fun part. Throughout this course, you'll be designing your very own AI companion. For this first step, you'll think like a designer, identifying a problem to solve."
- **Guide the Activity:**
 1. "Take 5 minutes to brainstorm on your own or with a partner. You can write or draw your ideas in your Student Guide."
 2. "Use the prompts to identify a problem, propose an AI solution, and give your AI a name."
 3. **(After 5 minutes):** "Okay, let's hear some ideas. Who has a problem they think an AI could solve? Let's share a few."

WRAP-UP & LOOK AHEAD (5 MIN)

- **Summarize:** "Great work today. We've defined what AI is, seen how it's different from Machine Learning, and started designing our own AI companions."
- **Look Ahead:** "In our next lesson, we'll uncover how Machine Learning works and explore the different ways that machines actually learn from data."

Lesson 2: Machine Learning Foundations

LESSON AT A GLANCE (45 MIN)

- **Learning Objectives:**
 - Differentiate between Supervised, Unsupervised, and Reinforcement Learning.
 - Determine the type of data required for each learning model.
 - Identify the appropriate machine learning model (Supervised, Unsupervised, or Reinforcement) for a given real-world scenario.
 - **Key Terms for This Lesson:** Supervised Learning, Unsupervised Learning, Reinforcement Learning, Labeled Data
 - **Materials Checklist:**
 - Ability to play video with sound.
 - Student access to the digital course and their Student Guides.
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INTRODUCTION (5 MIN)

- **Welcome & Recap:** Briefly recap Lesson 1. "Last time, we learned that Machine Learning is a type of AI. Today, we're going to uncover how that learning actually happens."
- **Talking Points:** The goal is to make the three types of ML feel intuitive before students even learn the technical terms.

- **Opening Question:**

"How did you learn to tell the difference between a cat and a dog? Did someone show you pictures and tell you the answer? Did you figure it out on your own by noticing patterns? Or did you learn by trial and error? Let's discuss."

(Use their answers to introduce the ideas of being "supervised," learning on your own, and learning from feedback.)

VIDEO (5 MIN)

- **Introduce the Video:** "This video will introduce us to the three main ways machines learn and how they use data to get smarter over time."
- **Play Lesson 2 Video**
- **Talking Points:** The video explains the core concepts of Supervised, Unsupervised, and Reinforcement Learning. Your goal is to help students connect these terms to real-world examples.
- **Facilitate Discussion:**
 1. "The video gave a few examples. Can you think of another place where an AI might learn using **Supervised Learning** (learning from labeled examples)?"
 2. "Which of the three types of learning do you think is the most powerful? Why?"

CORE CONCEPTS REVIEW (10 MIN)

- **Introduce the Slide Deck:** "Now, let's get more specific. The following slides break down the different types of Machine Learning with real-world examples to help us see them in action."
- **(Guide students through the Lesson 2 PDF Slides)**
- **Facilitator Focus:** Spend time on the slides that show the direct comparison between **Supervised and Unsupervised Learning**. Emphasize the key difference: the presence or absence of **"labeled data."**

KNOWLEDGE CHECK - GROUP DISCUSSION (10 MIN)

- **Introduce the Activity:** "Ready to test your understanding? Let's work through these scenarios together to see if we can apply what we've learned about Machine Learning."
- **Facilitate Each Question:**

- **Question 1 (Spam Filter Scenario):** "In this scenario, what's the most important clue in the description? Is the data labeled or unlabeled?" (Guide them to see that "manually labeled" points to Supervised Learning.)
- **Question 2 (Matching):** "Let's match these up. Which one sounds like learning with a 'teacher' who helps you find the answers? Which one sounds like learning by exploring on your own?"
- **Question 3 (Retail Company Scenario):** "Here, the company has a lot of data, but no groups. They want the AI to find the groups. Does that sound like Supervised or Unsupervised learning?"
- **Question 4 (Checklist):** "If we're teaching an AI to recognize a hockey puck using Supervised Learning, what's the most important thing we need to give it? Lots of examples, or the rules of the game?"

ACTIVITY - BRAINSTORM & SHARE (10 MIN)

- **Introduce the Activity:** "Let's build on your AI companion idea. Now that you know about Machine Learning, think about how your AI would learn to do its job."
- **Guide the Activity:**
 1. "Take 5 minutes to think about the main feature of your AI. Which of the three types of Machine Learning would it use? You can write or draw your ideas in your Student Guide." "Think about the data it would need. Would it need labeled data? Would it learn from trial and error?"
 2. **(After 5 minutes):** "Let's hear a couple of examples. Who has an idea for what kind of ML their AI would use and why?"

WRAP-UP & LOOK AHEAD (5 MIN)

- **Summarize:** "Today we've learned the three key ways machines learn: with a teacher (Supervised), on their own (Unsupervised), and with rewards (Reinforcement)."
- **Look Ahead:** "Next time, we'll explore a really cool application of this: **Computer Vision**, or how we teach machines to see."

Lesson 3: Computer Vision

LESSON AT A GLANCE (45 MIN)

- **Learning Objectives:**
 - Define Computer Vision (CV) and its purpose.
 - Sequence the key steps in the CV process.
 - Differentiate between core CV tasks like Object Classification and Object Detection.
 - **Key Terms for This Lesson:** Computer Vision, Acquisition, Object Classification, Object Detection
 - **Materials Checklist:**
 - Ability to play video with sound.
 - Student access to the digital course and their Student Guides.
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INTRODUCTION (5 MIN)

- **Welcome & Recap:** "Last time, we learned about how machines learn. Today, we're focusing on a specific type of intelligence: how they learn to 'see'."
- **Talking Points:** The goal is to get students thinking about the prevalence of visual AI in their lives.
- **Opening Question:**

"Besides unlocking your phone with your face, where else have you seen technology that seems to 'see' or recognize things? Think about security cameras, cars, or even apps on your phone."

(Listen for examples like self-checkouts, social media photo tagging, or sports replay analysis.)

VIDEO (5 MIN)

- **Introduce the Video:** "This video will introduce us to the fascinating field of Computer Vision and the basic steps a computer takes to understand an image."
- **Play Lesson 3 Video**
- **Talking Points:** The video explains that computers see images as pixels and breaks down the process of interpretation. Your goal is to have students consider the complexity of this task.
- **Facilitate Discussion:**
 1. "The video mentioned that computers see images as a collection of pixels. Why do you think it's so much harder for a computer to recognize an object than it is for a human?"
 2. "What's one thing you use that you think would be impossible without Computer Vision?"

CORE CONCEPTS REVIEW (10 MIN)

- **Introduce the Slide Deck:** "Now, let's look closer at the process. The following slides break down how a computer goes from seeing pixels to identifying objects, and the challenges it faces along the way."
- **(Guide students through the Lesson 3 PDF Slides)**
- **Facilitator Focus:** Emphasize the slide that shows the **steps of the CV process**. Also, pause on the slide that explains the difference between **Object Classification** ("What is it?") and **Object Detection** ("Where is it?").

KNOWLEDGE CHECK - GROUP DISCUSSION (10 MIN)

- **Introduce the Activity:** "Time to see if we can apply what we've learned. These questions will test our understanding of how Computer Vision works in the real world."
- **Facilitate Each Question:**

- **Question 1 (Grocery Store Scenario):** "The checkout needs to answer 'Is this an apple?'. Is that a 'what' question or a 'where' question? Does that make it Classification or Detection?"
- **Question 2 (Sorting Activity):** "Let's put these steps in order. What has to happen first before a computer can do anything with an image?" (Guide them to "Acquisition".)
- **Question 3 (Caribou Drone Scenario):** "The main goal here is to find and count the caribou. To do that, does the AI need to know what a caribou is, or where each one is located?"

ACTIVITY - BRAINSTORM & SHARE (10 MIN)

- **Introduce the Activity:** "Let's give your AI companion the power of sight. How would it use Computer Vision to help you?"
- **Guide the Activity:**
 1. "Take 5 minutes to brainstorm a visual feature for your AI. What problem would it solve using its 'eyes'? You can write or draw your ideas in your Student Guide. ."
 2. "Think about the tools we just learned about. Would it use Object Detection? Classification? Or maybe something like OCR to read text?"
 3. **(After 5 minutes):** "Who has a cool idea for a visual feature? Let's share a few."

WRAP-UP & LOOK AHEAD (5 MIN)

- **Summarize:** "Today we've seen how computers learn to interpret the visual world, from classifying objects to detecting them in a scene."
- **Look Ahead:** "Next time, we'll move from sight to language, as we explore **Natural Language Processing** and how we teach machines to understand us."

Lesson 4: Natural Language Processing (NLP)

LESSON AT A GLANCE (45 MIN)

- **Learning Objectives:**
 - Define Natural Language Processing (NLP).
 - Analyze key challenges in NLP, such as ambiguity and slang.
 - Distinguish between different applications of NLP.
 - **Key Terms for This Lesson:** Natural Language Processing (NLP), Sentiment Analysis, Tokenization, Ambiguity
 - **Materials Checklist:**
 - Ability to play video with sound.
 - Student access to the digital course and their Student Guides.
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INTRODUCTION (5 MIN)

- **Welcome & Recap:** "So far, we've explore how AI can learn and see. Today, we're going to learn how AI can listen and respond to us by exploring Natural Language Processing."
- **Talking Points:** The goal is to get students thinking about the nuances of human language that we take for granted.
- **Opening Question:**

"What are some of the challenges a computer might face when trying to understand the way we talk or text? Think about jokes, sarcasm, or how the same word can mean different things."

(Listen for examples like "cool" meaning good or cold, or the tone of voice changing a sentence's meaning.)

VIDEO (5 MIN)

- **Introduce the Video:** "This video will introduce us to the world of NLP and explain why teaching a computer to understand sarcasm, slang, and context is so challenging."
- **Play Lesson 4 Video**
- **Talking Points:** The video covers the core challenges of NLP. Your goal is to connect these technical challenges to the students' own communication experiences.
- **Facilitate Discussion:**
 1. "The video mentioned a few challenges. Which one do you think is the hardest for an AI to overcome? Why?"
 2. "Have you ever been misunderstood over text because the other person couldn't hear your tone? How is that similar to the challenges an AI faces?"

CORE CONCEPTS REVIEW (10 MIN)

- **Introduce the Slide Deck:** "Now, let's break down the details. The following slides explore the specific challenges of NLP and showcase its powerful applications, from translation to sentiment analysis."
- **(Guide students through the Lesson 4 PDF Slides)**
- **Facilitator Focus:** Pause on the slide that shows examples of **ambiguity and slang**. Use the examples to reinforce how much humans rely on context. Also, highlight the **Sentiment Analysis** application, as it's a very common use of NLP.

KNOWLEDGE CHECK - GROUP DISCUSSION (10 MIN)

- **Introduce the Activity:** "Let's see if we can spot NLP in action. These questions will test our ability to identify NLP concepts and applications."
- **Facilitate Each Question:**

- **Question 1 (Slang Scenario):** "The word 'sick' has two meanings here. Is this a problem with the sentence structure, or the meaning of a specific, informal word?"
- **Question 2 (Customer Reviews Scenario):** "The company wants to know if reviews are 'happy' or 'unhappy'. What's the term for analyzing the emotional tone of a text?"
- **Question 3 (Matching):** "Let's match these technical terms. Which one sounds like 'cleaning up' the text? Which one sounds like 'chopping it up' into words?"

ACTIVITY - BRAINSTORM & SHARE (10 MIN)

- **Introduce the Activity:** "Now, let's give your AI companion a voice and personality. How will it communicate with you?"
- **Guide the Activity:**
 1. "Take 5 minutes to define your AI's personality. Is it a funny sidekick? A serious assistant? You can write your ideas in your Student Guide. "
 2. "Then, write a short line of dialogue showing how it would respond to a sarcastic comment. This will show its personality in action."
 3. **(After 5 minutes):** "Who wants to share their AI's personality and its sarcastic reply? Let's hear a few."

WRAP-UP & LOOK AHEAD (5 MIN)

- **Summarize:** "Today we've learned how AI understands language, the challenges it faces with things like sarcasm, and how it's used for tasks like sentiment analysis."
- **Look Ahead:** "Next time, we're bringing it all together as we explore the world of **Robotics** and give our AI a physical body."

Lesson 5: Robotics

LESSON AT A GLANCE (45 MIN)

- **Learning Objectives:**
 - Explain the relationship between robotics and AI.
 - Categorize different types of robots based on their function.
 - Describe the key components of a robotic system.
 - **Key Terms for This Lesson:** Robotics, Industrial Robot, Sensors, Actuators, Control System
 - **Materials Checklist:**
 - Ability to play video with sound.
 - Student access to the digital course and their Student Guides.
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INTRODUCTION (5 MIN)

- **Welcome & Recap:** "We've covered learning, seeing, and hearing. Today, we're talking about doing. We'll explore the exciting field of robotics and how AI gives machines the ability to physically interact with the world."
- **Talking Points:** The goal is to broaden the students' definition of "robot" beyond humanoid figures.
- **Opening Question:**

"What are some examples of robots you've seen in real life or in videos? What kinds of jobs were they doing?"

(Listen for examples like factory arms, rovers on Mars, robot vacuums, or delivery drones.)

VIDEO (5 MIN)

- **Introduce the Video:** "This video will take us on a quick tour through the history of robotics, from ancient concepts to the smart, AI-powered robots of today."
- **Play Lesson 5 Video**
- **Talking Points:** The video covers the evolution of robotics. Your goal is to get students thinking about the future trajectory of this technology.
- **Facilitate Discussion:**
 1. "The video showed robots in factories and even on other planets. Where do you think we'll see robots working in the next 10 years that we don't see today?"
 2. "What do you think is the biggest difference between a simple machine and a true robot?"

CORE CONCEPTS REVIEW (10 MIN)

- **Introduce the Slide Deck:** "So, what makes a robot a robot? The following slides break down the key components of a robotic system and explain the crucial role AI plays in making them autonomous."
- **(Guide students through the Lesson 5 PDF Slides)**
- **Facilitator Focus:** Emphasize the slide that explains the **relationship between Robotics and AI** (Robotics = the body, AI = the brain). Also, review the slide on the **key components** (Control System, Sensors, Actuators) using the human body analogy. Make sure to highlight the new Canadian examples of robotics in construction.

KNOWLEDGE CHECK - GROUP DISCUSSION (10 MIN)

- **Introduce the Activity:** "Let's apply what we've learned about robotics to some real-world scenarios."
- **Facilitate Each Question:**

- **Question 1 (Assembly Line Scenario):** "This robot works in a factory doing the same task over and over. Based on the types we saw, what's the best category for this?"
- **Question 2 (Matching):** "Let's use the human body analogy. Which component is the 'brain'? Which are the 'senses'? And which are the 'muscles'?"
- **Question 3 (Warehouse Robot Scenario):** "This robot needs to see, understand, and learn. Is that something a simple machine can do, or does it need a 'brain'?"

ACTIVITY - BRAINSTORM & SHARE (10 MIN)

- **Introduce the Activity:** "Now, let's think about the physical form of your AI companion. What would it look like and why?"
- **Guide the Activity:**
 1. "Take 5 minutes to decide on a physical form for your AI. Is it a robot that moves? A stationary device? Or does it live in your phone? You can write or draw their ideas in their Student Guides."
 2. "The most important part is to justify your choice. How does its form help it do its job better?"
 3. **(After 5 minutes):** "Let's hear some different ideas. Who chose a physical robot and why? Who chose a purely digital form?"

WRAP-UP & LOOK AHEAD (5 MIN)

- **Summarize:** "Today we've seen how robotics gives AI a physical presence in the world, and how the 'brain' of AI and the 'body' of a robot work together."
- **Look Ahead:** "Next time, we'll look at how these amazing technologies are being used to create new businesses and drive scientific discovery in **AI in Entrepreneurship & STEM.**"

Lesson 6: AI's Integral Role in Entrepreneurship & STEM

LESSON AT A GLANCE (45 MIN)

- **Learning Objectives:**
 - Explain how AI is used as a tool for innovation in business.
 - Analyze the role of AI in accelerating scientific research.
 - Develop an entrepreneurial pitch for an AI-based idea.
 - **Key Terms for This Lesson:** Entrepreneurship, STEM, Data Analysis, Automation
 - **Materials Checklist:**
 - Ability to play video with sound.
 - Student access to the digital course and their Student Guides.
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INTRODUCTION (5 MIN)

- **Welcome & Recap:** "So far, we've focused on what AI is and how it works. Today, we're going to focus on what you can do with it. We'll see how AI is driving innovation in business and science right here in Canada."
- **Talking Points:** The goal is to frame AI as a tool for creativity and problem-solving.
- **Opening Question:**

"Can you think of a new business idea that could use AI? Or a big scientific question—like curing a disease or stopping climate change—that could be answered faster with the help of a smart computer?"

VIDEO (5 MIN)

- **Introduce the Video:** "This video explains how AI acts as a catalyst for new ideas, helping entrepreneurs make smarter decisions and scientists make faster discoveries."
- **Play Lesson 6 Video**
- **Talking Points:** The video covers how AI helps with data analysis and automation. Your goal is to have students consider the real-world impact of these capabilities.
- **Facilitate Discussion:**
 1. "The video talked about AI helping with data analysis and automation. Which of those two do you think is more powerful for a new business? Why?"
 2. "How do you think AI could change your own experience as a student in a STEM class like science or math?"

CORE CONCEPTS REVIEW (10 MIN)

- **Introduce the Slide Deck:** "Now, let's look at some real-world examples. The following slides showcase how Canadian companies are using AI to solve problems in healthcare, finance, and more."
- **(Guide students through the Lesson 6 PDF Slides)**
- **Facilitator Focus:** Explore the examples highlighting Canadian companies who are using AI to solve problems in innovative ways. (e.g., Wealthsimple). Briefly explain the problem each company solves to make the examples more concrete.

KNOWLEDGE CHECK - GROUP DISCUSSION (10 MIN)

- **Introduce the Activity:** "Time to think like an innovator. These questions will challenge us to identify opportunities where AI could make a real impact."
- **Facilitate Each Question:**

- **Question 1 (Food Waste Scenario):** "What is the core problem this startup is trying to solve with AI? Is it a physical task, a design task, or a prediction task?"
- **Question 2 (Climate Change Scenario):** "The researchers have too much data to look at manually. Which AI technology that we've learned about is perfect for analyzing images?" (Guide them to Computer Vision.)
- **Question 3 (Multiple Response):** "Let's think about the challenges for an AI startup. Is it usually hard to find problems to solve, or is it harder to get the resources—like data and money—to solve them?"

ACTIVITY - BRAINSTORM & SHARE (10 MIN)

- **Introduce the Activity:** "Let's put on your entrepreneur hats. How could your AI companion become a successful product?"
- **Guide the Activity:**
 1. "Take 5 minutes to think about who would actually use your AI companion. Who is your target audience? You can write their ideas in your Student Guide."
 2. "Then, try to write a one-sentence 'elevator pitch' that quickly explains what your product does and why it's valuable."
 3. **(After 5 minutes):** "Who's ready to share their elevator pitch with the class? Let's hear a few."

WRAP-UP & LOOK AHEAD (5 MIN)

- **Summarize:** "Today we've seen how AI is a powerful tool for creating new businesses and making scientific breakthroughs."
- **Look Ahead:** "In our final lesson, we'll explore the different **Career Paths in AI** and see how you can be a part of this exciting field."

Lesson 7: Career Paths in AI

LESSON AT A GLANCE (45 MIN)

- **Learning Objectives:**
 - Differentiate between technical and non-technical roles in AI.
 - Evaluate the responsibilities of AI-focused roles in a given scenario.
 - Propose a solution to an ethical dilemma related to AI.
 - **Key Terms for This Lesson:** Technical Role, Non-Technical Role, Data Engineer, Data Scientist, AI Ethics Specialist
 - **Materials Checklist:**
 - Student access to the digital course and their Student Guides.
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INTRODUCTION (5 MIN)

- **Welcome & Recap:** "In our final lesson, we're going to talk about the future—your future! A career in AI isn't just for expert coders. We'll explore the wide range of jobs in the AI field."
- **Talking Points:** The goal is to broaden the students' perception of jobs and career paths related to AI.
- **Opening Question:**

"What kinds of jobs do you think are involved in creating an AI like ChatGPT? Does everyone need to be a programmer, or are there other roles?"

2. CORE CONCEPTS REVIEW (15 MIN)

- **Introduce the Slide Deck:** "Let's review the slides to break down the different roles in AI."

- **Facilitator Note:** This lesson is different as there is no video. The slide deck breaks down specific technical and non-technical jobs, showcases Canadian AI success stories, and provides tips on building skills.
- **(Guide students through the Lesson 7 PDF Slides)**
- **Facilitator Focus:** Spend time on the slide that distinguishes between **Technical and Non-Technical Roles**. This is a critical takeaway for students who may not see themselves in a technical role. Use the Canadian company examples to reinforce the real-world application of these roles.
- **Facilitator Tip:** Make this section interactive. After describing a role like "AI Ethics Specialist," ask the class, "What kind of person do you think would be good at this job? What subjects in school might help prepare you for it?"

3. KNOWLEDGE CHECK - GROUP DISCUSSION (10 MIN)

- **Introduce the Activity:** "Now, let's see if you can match the right skills to the right job. These questions will test your understanding of the different roles in the world of AI."
- **Facilitate Each Question:**
 - **Question 1 (Sorting Activity):** "Let's sort these roles. Which ones sound like they involve building, coding, or hands-on data work? Those are your technical roles."
 - **Question 2 (Startup Scenario):** "The company has messy data and needs to build the 'pipes' to clean it up and move it around. Is that the job of a Scientist, an Engineer, or a Manager?"
 - **Question 3 (Hiring Tool Scenario):** "This company is worried about fairness and bias. Which of these non-technical roles is specifically focused on the responsible use of AI?"

4. ACTIVITY - BRAINSTORM & SHARE (10 MIN)

- **Introduce the Activity:** "Let's think about the rules for your AI. As AI becomes more powerful, making sure it acts responsibly is one of the most important jobs. This is the final step in designing your AI companion."

- **Guide the Activity:**

1. "Read the ethical dilemma about your AI detecting plagiarism. Take a moment to think about the conflict between being helpful and academic integrity. You can write your ideas in their Student Guides."
2. "Take 5 minutes to come up with one ethical rule for your AI and decide what action it should take based on that rule."
3. **(After 5 minutes):** "This is a tough one, and there's no single right answer. Let's hear a few different ideas. What rule did you create for your AI?"

5. WRAP-UP & COURSE CONCLUSION (5 MIN)

- **Summarize:** "Today we've explored the huge range of careers in AI, from technical engineers to non-technical ethics specialists. We've also seen that building AI responsibly is a critical part of building effective AI."
- **Course Conclusion:** "Over the last seven lessons, you've gone from defining AI to designing your own. The world of AI is just getting started, and now you have the foundation to be a part of it. Keep asking questions, stay curious, and think about how you can use this technology to build a better future."

Glossary of Key Terms

Actuators: The components of a robot that act as its "muscles," responsible for creating movement (e.g., electric motors, hydraulic pistons).

Algorithms: A set of step-by-step instructions or rules that a computer follows to perform a specific task or solve a problem.

Ambiguity (in NLP): A challenge for AI where a word, phrase, or sentence can have multiple possible meanings, requiring the AI to use context to determine the correct one.

Artificial General Intelligence (AGI): A theoretical type of AI that would have human-like intelligence, with the ability to understand, learn, and apply knowledge across a wide range of different tasks.

Artificial Intelligence (AI): The field of computer science focused on creating systems that can perform tasks that typically require human intelligence, such as learning, reasoning, and problem-solving.

Artificial Narrow Intelligence (ANI): The most common form of AI today, which is designed to be an expert at one specific, "narrow" task (e.g., playing chess, recommending movies, or filtering spam).

Artificial Superintelligence (ASI): A hypothetical type of AI that would surpass human intelligence in virtually all aspects, including creativity, general wisdom, and problem-solving.

Automation: The use of technology to perform tasks with minimal human assistance.

Bias (in AI): A flaw in an AI system that leads to unfair or inaccurate outcomes, often because it was trained on data that was incomplete, non-inclusive, or unrepresentative of real-world diversity.

Computer Vision (CV): A field of AI that enables computers to "see" and interpret meaningful information from digital images, videos, and other visual inputs.

Control System: The "brain" of a robot that processes information from sensors and manages its movements and responses.

Data Engineer: A technical AI professional who builds and maintains the systems that collect, manage, and prepare large datasets, creating the "pipelines" that data flows through.

Data Scientist: A technical AI professional who analyzes complex data to find insights, builds predictive models, and helps organizations make data-driven decisions.

Deep Learning (DL): A specialized subfield of Machine Learning that uses complex, multi-layered neural networks to learn from vast amounts of data and is especially powerful for tasks like image and speech recognition.

Entrepreneurship: The process of designing, launching, and running a new business, which often begins with an innovative idea to solve a problem.

Industrial Robot: A type of robot used in manufacturing and industrial settings to perform repetitive tasks like welding, painting, and assembly with high precision.

Labeled Data: Data that has been tagged with a correct answer or classification, which is then used to train models in Supervised Learning.

Machine Learning (ML): A subfield of AI that gives computers the ability to learn from data and make predictions or decisions without being explicitly programmed for every single task.

Natural Language Processing (NLP): A field of AI focused on enabling computers to understand, interpret, and generate human language, in both text and speech.

Object Classification: A Computer Vision task that answers the question, "What is this object?" (e.g., identifying an image as containing a "cat" or a "dog").

Object Detection: A Computer Vision task that answers the question, "Where is the object?" by identifying the location of one or more objects within an image, usually by drawing a box around them.

Reinforcement Learning: A type of Machine Learning where an AI agent learns to make decisions by performing actions in an environment and receiving rewards or penalties as feedback, similar to trial and error.

Robotics: The field of science and engineering that deals with the design, construction, operation, and use of physical robots.

Sensors: The components of a robot that act as its "senses," gathering information about its environment (e.g., cameras, microphones, proximity sensors).

Sentiment Analysis: An NLP application used to determine the emotional tone (positive, negative, or neutral) within a piece of text.

STEM: An acronym for the fields of Science, Technology, Engineering, and Mathematics.

Supervised Learning: A type of Machine Learning where an AI model is trained on a dataset that has been pre-labeled with the correct answers, much like a student learning with an answer key.

Technical Role: A job in the AI field that typically requires hands-on programming, data analysis, or engineering skills to build and maintain AI systems.

Tokenization: A key step in NLP where a sentence or document is broken down into smaller units, such as individual words or "tokens," so a computer can analyze it.

Unsupervised Learning: A type of Machine Learning where an AI model is trained on unlabeled data and must find hidden patterns or structures on its own, without an answer key.