

Learner Full Name: _____ School: _____
 Assigned Workstation: _____ Class: _____

Session 39: What Is AI? Machines That Learn

You hear about it on the radio, on TV and from older brothers and sisters: **AI**. Some people say it will do everything; some people are afraid of it. Today you will find out what AI really is, how it learns, and why it sometimes gets things badly wrong. No magic, just ideas you can understand.

1. Plain Talk: What Is Artificial Intelligence?

Artificial Intelligence (AI) is a computer program that has learned to spot **patterns** from a very large number of **examples**, so it can make a good guess about something new.

Think about how you learned to tell a ripe plantain from an unripe one. Nobody gave you a rule book. Your grandmother simply showed you plantain after plantain: *"This one is ripe. This one is not ready."* After many examples, you could look at a plantain you had never seen before and guess correctly. **AI learns in a similar way: from examples, not from a list of rules.**

💡 AI IS NOT ALIVE

AI does not think, feel or understand like a person. It has no opinions and does not "know" things the way you do. It is a very powerful pattern-guessing machine, built and controlled by people.

2. Rules or Examples? Two Ways to Make a Computer Smart

In Sessions 36 and 37 you wrote programs in Scratch. You gave the computer exact **rules**: *"IF touching sachet THEN change score by 1."* AI works differently: people give it **examples** and it works out the pattern by itself.

NORMAL PROGRAM: PEOPLE WRITE RULES

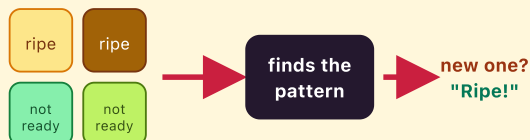
if colour is yellow then

say "Ripe!"

else say "Not ready"

The computer only does exactly what the rules say.
A brown, spotty ripe plantain? The rule fails!

AI: PEOPLE GIVE EXAMPLES



...thousands more

It makes a guess about plantains it has never seen.

Figure 39.0: Rules vs examples. A normal program follows rules people wrote; AI learns a pattern from many examples.

1. Three Jobs AI Can Do

Most AI you will meet does one of three jobs:

1. RECOGNISE

It works out **what something is**: a face, a voice, a word in a photo, a sick cassava leaf.

2. PREDICT

It guesses **what comes next**: the next word you will type, the next video you might like, tomorrow's rain.

3. CREATE

It **makes something new** from patterns it learned: a paragraph, a picture, a song, a voice. This is called **generative AI**.

2. Where Have You Seen AI?

Many people use AI every day without knowing it. Tick every one you (or someone in your family) has seen, and write which job it does: **R** (recognise), **P** (predict) or **C** (create).

Seen?	Where AI hides	Job (R, P or C)
☐	A phone keyboard suggests the next word as you type a message.	-----
☐	A phone unlocks when it sees its owner's face.	-----
☐	YouTube or TikTok shows "videos you might like".	-----
☐	Google Translate turns an English sentence into Twi, Ewe or Hausa.	-----
☐	An email inbox moves scam messages into the Spam folder by itself.	-----
☐	A chatbot (ChatGPT, Gemini, Meta AI in WhatsApp, Copilot) writes an answer to a question.	-----

One more: Where else do you think AI might be used in Ghana (farming, hospitals, markets, transport, banking)?

AI MADE IN AFRICA

In 2019 Google opened an AI research centre in Accra, its first in Africa. Researchers across the continent are building AI that understands African languages and helps farmers spot crop diseases from a phone photo. Maybe one day you will build some too!

1. The Three Steps of Machine Learning

The examples we give an AI are called **training data**. Learning from them is called **training**. Every AI goes through the same three steps:

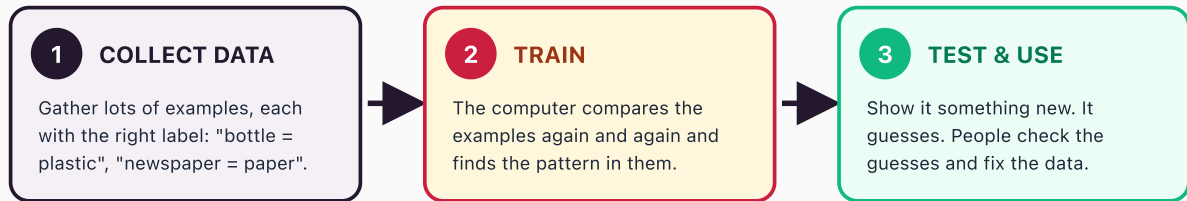


Figure 39.1: Collect, train, test. Real AI systems learn from millions of examples, not just a handful.

2. Be the Machine! (Plantain Puzzle)

Here is your training data. Study the pattern, then label the three new plantains.

Plantain	Skin colour	When you press it	Label (the answer)
Example A	Green	Hard	Not ready
Example B	Yellow	Soft	Ripe
Example C	Black with spots	Very soft	Ripe
Example D	Green-yellow	Hard	Not ready

New plantain	Skin colour	When you press it	Your guess
Mystery 1	Yellow with brown spots	Soft	-----
Mystery 2	Dark green	Hard	-----
Mystery 3	Black	Very soft	-----

What pattern did you use?

🍌 MORE (AND VARIED) EXAMPLES = BETTER GUESSES

If you had only seen yellow plantains, would you know a black one can be ripe too? An AI is only as good as the examples it learned from. That is why AI companies collect **huge** amounts of data.



1. AI Always Guesses, and Guesses Can Be Wrong

AI never knows an answer for certain. It makes its best guess from the patterns it learned. Sometimes the guess is wrong, and the worrying part is that AI can sound **just as confident when it is wrong** as when it is right.

2. Garbage In, Garbage Out

Computer scientists have a saying: "**Garbage in, garbage out.**" If the training data is wrong, too small or one-sided, the AI learns the wrong pattern:

✗ WRONG LABELS

Someone labels a plastic bottle as "paper".

The AI learns the mistake and repeats it.

👉 TOO FEW EXAMPLES

It saw only 2 things, so it has not seen enough.

It guesses wildly on anything new.

⚖️ ONE-SIDED DATA

It saw many bottles but hardly any sachets.

It works well for some things and badly for others.

Figure 39.2: Garbage in, garbage out. Bad training data teaches the AI bad patterns.

3. Bias: When AI Is Unfair

When one-sided data makes an AI treat some people worse than others, we call it **bias**. In 2018, a researcher named **Joy Buolamwini**, whose family comes from Ghana, tested face-analysis programs from big technology companies. They made far more mistakes on darker-skinned women than on lighter-skinned men, largely because the photos used to train and test them were mostly of lighter-skinned faces. Her work pushed companies to improve their systems.



PEOPLE MUST STAY IN CHARGE

AI can help doctors, teachers, farmers and banks, but a **person** should check its important decisions. AI should be a helper, never the final judge of someone's exam, health or future.

Think about it: A school builds an AI to mark handwriting, but trains it only on very neat handwriting. Who might it treat unfairly, and how could the school fix it?



1. Lab Mission: Train a Recycling Robot

Open the **Teach the Robot** 3D lab on your session page. You will teach a robot to sort rubbish into **Plastic**, **Paper** and **Cans**, just by showing it examples. Then you will test how well it learned.

- 1 Too few examples:** Label only **2** items, then press **Let the robot sort**. Write its score below.
- 2 Good training data:** Press **Forget everything**. Now teach it at least **2 examples of every kind** (6 or more), then test it again.
- 3 Garbage in:** Teach it one **wrong** example on purpose (for example, call a bottle "Paper"). Test it, and watch for the mistake it learned from you.

Round	Examples taught	Score (out of 5)	Mistakes
1. Too few examples	-----	-----	-----
2. Good training data	-----	-----	-----
3. One wrong example	-----	-----	-----

What did you notice? Which round gave the best score, and why?

In Round 3, what did the robot get wrong because of your wrong example?

2. Spot AI at Home (With a Parent or Mentor)

Ask a parent, guardian or mentor to open a message on their phone (no need to send it!). Type **"I am going to"** and write the three words the keyboard suggests. That is AI predicting the next word from patterns in the owner's past messages and millions of others.

Suggestion 1

Suggestion 2

Suggestion 3

1. True or False?

Statement	True	False
AI is alive and thinks and feels like a person.	☐	☐
AI learns patterns from examples called training data.	☐	☐
If an AI sounds very sure of its answer, the answer must be correct.	☐	☐
An AI trained mostly on one group of people can be unfair to other groups.	☐	☐
Your phone keyboard suggesting the next word is an example of AI predicting.	☐	☐

2. Written Review Questions

Question 1: What is the difference between a normal program (like your Scratch game) and an AI?

Question 2: What does "garbage in, garbage out" mean? Give an example.

3. Self-Assessment & Mentor Sign-Off

Tick the column that reflects your confidence at the end of Session 39:

AI Understanding Competency	With Help	Almost Alone	All By Myself!
1. I can explain what AI is in my own words.	☐	☐	☐
2. I can give examples of AI that recognises, predicts and creates.	☐	☐	☐
3. I can describe how AI learns from training data (collect, train, test).	☐	☐	☐
4. I can explain why AI makes mistakes and how bias happens.	☐	☐	☐

Mentor Signature: _____

Date Completed: _____