Green Futures

Transition Year Module

September 2026

LESSON 2

GreenFutures

Artificial Intelligence, Ethics and Climate Solutions

What AI actually is, how it's used in climate science and the questions we must ask about it.

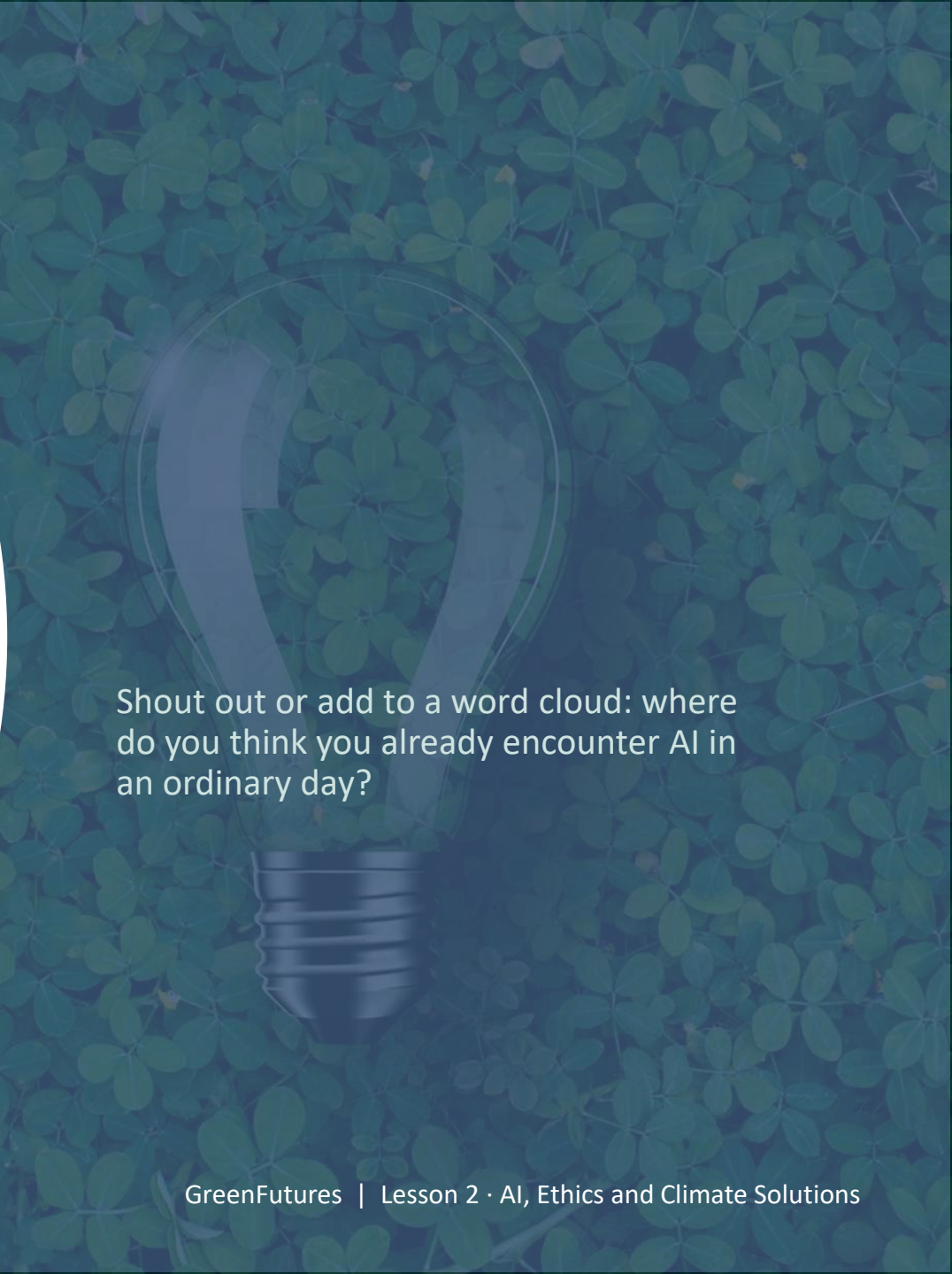
UNESCO Greening Curriculum concepts: Climate Science · Resilience Building · Climate Justice · AI Ethics

Recap and today's goals

1. Last time: we saw how climate scientists rely on huge datasets and how AI helps make sense of them
2. Today, explain basic AI concepts and terminology in plain language
3. Identify real ways AI is used in climate and environmental work
4. Evaluate the benefits and risks of AI systems, including bias
5. Reflect on ethical questions around technology and sustainability

Let’s start here

Do you use AI?



Shout out or add to a word cloud: where do you think you already encounter AI in an ordinary day?

DEMYSTIFYING THE TERM

What AI Is and Is Not

- AI refers to technologies designed to carry out tasks that would otherwise need a human mind such as recognising images, understanding language, spotting patterns, making predictions
- We already use it: the algorithm choosing your social media feed, autocomplete and predictive text, streaming recommendations and voice assistants
- AI is not magic and it doesn't ‘think’ or ‘understand’ the way people do. It finds statistical patterns in the data it was trained on
- AI is also not one single thing. It is a broad family of different tools and techniques

HOW DOES IT WORK?

Machine Learning and Pattern Recognition

- Machine learning is the most common form of AI in use today: a model is shown many examples and learns to spot patterns in them
- An accessible way in: think of the line of best fit you draw in maths (slope, x/y-intercept). Machine learning is, at its simplest, a much more powerful version of finding the pattern that fits the data
- The more (and better) the data, the more reliable the pattern the model learns

Machine Learning: Learning a Model from Data

Example: use study hours to predict an exam score

1 Start with examples

Past observations tell us what happened for students who studied different amounts.

Sample training data

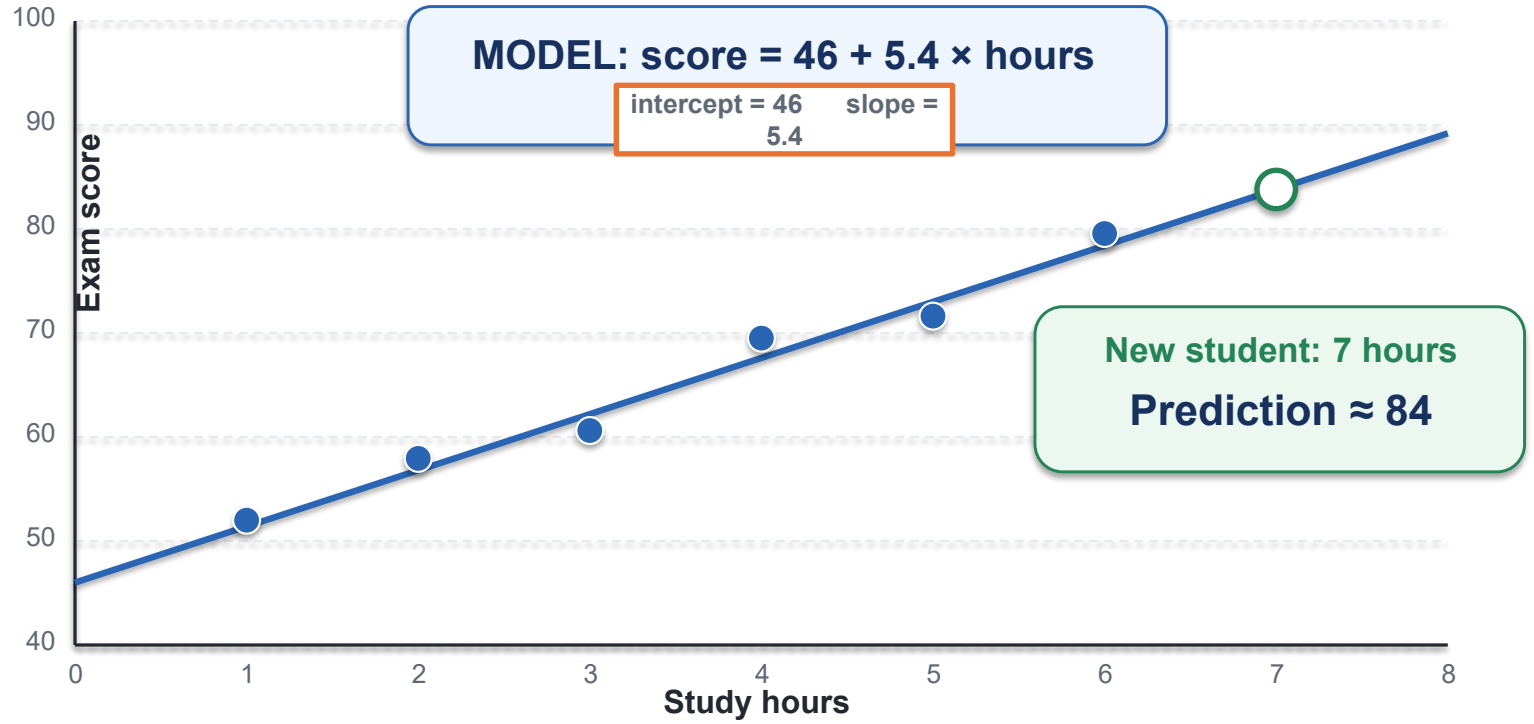
Study hours	Exam score
1	52
2	57
3	61
4	68
5	72
6	79

Input (x): study hours

Output (y): exam score

The algorithm does not memorise the table. It learns a pattern.

2 Choose a model family: “equation of the line"



3 Training learns the parameters

ML = choose a model family + find the parameter values that best fit the data

A line is a simple model. More expressive models can be curves, decision trees or neural networks.

Classification: Learning a Decision Boundary

Simplified weather example: classify a day as Rain or No rain

1 Label past examples

For each past day we record simple weather measurements and whether rain occurred.

Illustrative teaching data

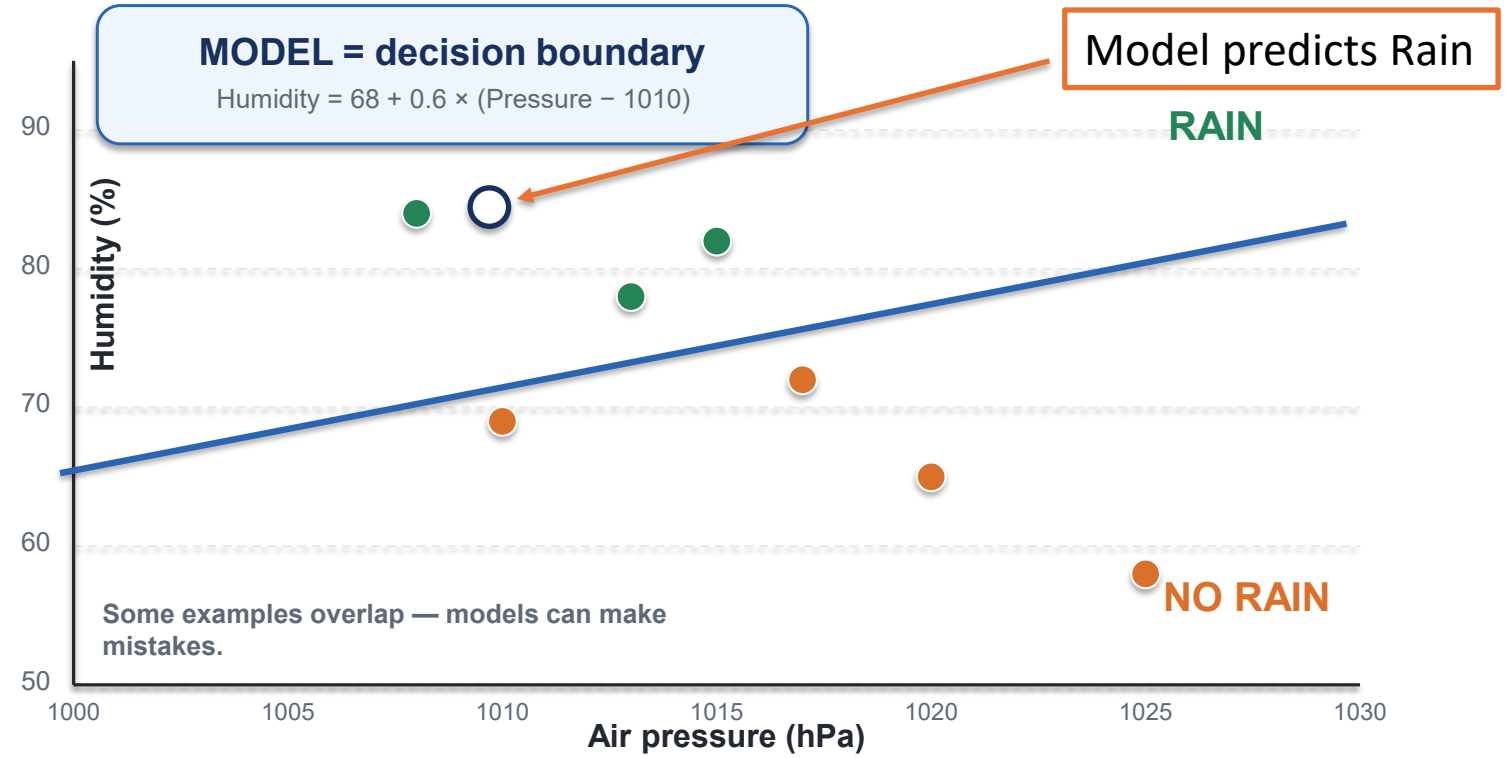
Pressure (hPa)	Humidity (%)	Class
1025	58	No rain
1020	65	No rain
1017	72	No rain
1013	78	Rain
1008	84	Rain
1004	91	Rain
1015	82	Rain
1010	69	No rain

Inputs: pressure + humidity

Output: Rain / No rain

Real forecasts use many more variables.

2 The model is a boundary between the classes



3 Training finds boundary parameters

Here: slope = 0.6; baseline = 68% humidity at 1010 hPa

Teaching simplification only. Real rain forecasts combine pressure trends, temperature, wind, radar, satellite data and numerical weather prediction.

🔬 Research in Action

AI at Work in Climate Science

- **Climate modelling** - combining huge datasets to project how the climate may change
- **Weather forecasting** - from short-range warnings to longer seasonal outlooks, including flooding, frost and heat-event predictions
- **Flood- and heat-risk mapping** - identifying which areas are most exposed
- **Early warning systems** - giving communities more time to prepare for extreme events
- Watch a video here (AISMIR Centre, UCD)
- Watch a video here (AI for the Planet, Google)

ACTIVITY

⏱ ~8 minutes

Spot the Bias

1. Look at the two example scenarios shown by your teacher: (1) An Garda Síochána (Recording Devices) (Amendment) Bill 2025; and (2) Area Monitoring Systems
2. In pairs, discuss: what could go wrong when each system is used on people or places it wasn't well trained on?
3. Write one sentence: "AI can be biased or can create errors because..."
4. Share back to the class

This connects directly to Lesson 4, where we look at climate justice and fairness in more depth.

GETTING IT RIGHT

Responsible and Ethical AI

- UNESCO's Recommendation on the Ethics of Artificial Intelligence sets out global principles: transparency, fairness, human oversight, and environmental sustainability
- The EU AI Act is a recent example of governments turning these principles into law
- Ethical AI means asking: who built this system, what data trained it, who checks its decisions, and who is affected if it gets something wrong?
- These are live, unresolved debates - there often isn't one single ‘correct’ answer, which is exactly why they're worth discussing

Read more:

"No More Hidden Costs": UN Chief Launches AI Environmental Transparency Initiative

EU Statement – UN Global Dialogue on Artificial Intelligence Governance | EEAS

AI’s environmental costs threaten water, land and climate | UN News

ACTIVITY

⏱ ~6 minutes

Fact, Myth or It is Complicated?

1. Your teacher will show a short series of social media-style posts making claims about climate change or AI
2. For each one, decide: is this well-supported, false, or somewhere in between?
3. Discuss: what made a claim easy or hard to evaluate?

This builds the digital literacy skill of evaluating credibility - a skill for life, not just for climate topics.

THE OTHER SIDE OF THE COIN

The Environmental Cost of Digital Technology

- AI and digital technology don't just help the climate - they also have a real environmental footprint
- Data centers use significant amounts of energy and, in many cases, water for cooling.
- Irish data centers consumed 23% of all metered electricity in Ireland in 2025. In 2015, the consumption was 5%.
- Ireland is one of the most data-center-dense countries in Europe relative to its size, which has made data centers a live national debate about energy demand and the electricity grid
- Wider issues: digital inclusion and access, and the environmental footprint of the devices we all use

IT'S NOT ALL BAD NEWS

Working Towards Balance

- International efforts are underway to make AI more sustainable and more fairly governed
- The UN Global Dialogue on AI Governance (July 2026) and the AI for Good Global Summit bring governments and researchers together on these questions
- The Coalition for Sustainable AI includes over 100 universities and companies working on more sustainable AI
- The EU also regulates the energy and emissions performance of data centers

- Watch here UN Global Dialogue on AI Governance
- No Country Can Govern AI Alone | Inside the UN's Global Dialogue on AI Governance | United Nations

APPLY IT ⏱ ~8 minutes

JUDGE A REAL AI-CLIMATE CLAIM

Find (or your teacher will provide) one real news headline or social media claim about AI and climate change.

In your own words, write: what is the claim, is it well-supported by evidence, and what would you want to check before believing it fully?

How they show their work: Short written response (4-6 sentences) added to their climate journal, with a class share-back for a few volunteers.

What have we learned?

- ✓ We can explain what AI is (and isn't) in plain terms
- ✓ We've seen real examples of AI supporting climate science
- ✓ We understand that AI can be biased and why that matters
- ✓ We know some of the global efforts working to make AI more responsible and sustainable

Next lesson: from AI back to the physical world - energy, nature, food and cities, and how they connect to sustainability.

See you in Lesson 3: Sustainable Systems – Energy, Nature, Food and Cities

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