

# Teachers' Toolkit — Introducing AI to Children

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This toolkit is designed to help teachers introduce core ideas about artificial intelligence (AI) to children in age-appropriate ways. It provides learning objectives, activity plans, discussion prompts, assessment ideas, and safety/ethics guidance for each age group.

## How to use this toolkit

- Start by reading the learning objectives for the age group you teach.
- Follow the lesson plan suggestions and adapt the timing to your class length.
- Use the discussion prompts to check conceptual understanding and build critical thinking.
- Balance hands-on activities with reflection about ethics, bias, and privacy.

## **Learning objectives (by age group)**

### **Early Years (Ages 5–7)**

- Recognize simple examples of 'smart' technology (voice assistants, smart toys).
- Understand that computers can follow instructions and find patterns.
- Practice basic problem-solving and sequencing activities.

### **Primary (Ages 8–11)**

- Explain what AI means in everyday language: systems that learn from data and follow rules.
- Build simple projects using block-based coding or interactive visual tools.
- Discuss fairness and that technology can be unfair if trained on biased examples.

### **Middle School (Ages 11–14)**

- Describe supervised vs unsupervised learning conceptually.
- Collect simple datasets, visualize them, and reason about model outputs.
- Learn the basics of data privacy and the importance of consent.

### **Secondary (Ages 14–18)**

- Understand key ML concepts (training, validation, bias, overfitting) at a conceptual level.
- Work with real datasets and build simple models or use high-level tools to explore predictions.
- Engage critically with ethical and societal implications of AI systems.

## Lesson plans and activities

### Early Years (45-minute session)

1. Warm-up (5 min): Talk about 'smart' objects. What makes a toy smart?
2. Activity (20 min): "Robot Says" — students give step-by-step instructions to a classmate acting as the 'robot'. Discuss how precise the instructions must be.
3. Hands-on (15 min): Read a short illustrated story where a character uses a helpful machine. Ask questions about the machine's actions.
4. Wrap-up (5 min): Ask students what they learned about instructions and helpful machines.

### Primary (2 x 45-minute sessions)

1. Session 1 — Patterns and predictions (45 min): Use image sorting or a block-coding exercise (Scratch or micro:bit). Guide students to spot patterns and make simple predictions.
2. Session 2 — Build & test (45 min): Use a tool like Machine Learning for Kids to train a simple classifier with pictures or short texts. Discuss errors and why the system makes them.

### Middle School (3 x 50-minute sessions)

1. Session 1 — Data and features: Collect a small dataset (e.g., fruit photos, short text labels). Discuss what features are useful.
2. Session 2 — Train & evaluate: Use a guided tool (Google Teachable Machine or simple Python notebooks) to train a model and evaluate accuracy.
3. Session 3 — Ethics & bias: Present case studies where models made unfair decisions; have students propose mitigation strategies.

### Secondary (4–6 sessions)

1. Session 1 — Conceptual foundations: Overview of supervised learning, datasets, labels, evaluation metrics.
2. Session 2 — Hands-on modeling: Work in Python (notebook) or a high-level GUI tool to build a logistic regression or decision tree on a small dataset.
3. Session 3 — Robustness and fairness: Test models on edge cases, adversarial examples, and discuss mitigation.
4. Session 4 — Societal implications: Structured debate, research, and presentation on law, regulation, and ethics.

## Assessment ideas

- Project rubric: idea clarity, dataset quality, evaluation approach, and reflection on limitations and ethics.
- Short reflection prompts: "What surprised you about the model?" "How would you improve the dataset?"
- Peer reviews: students test each other's projects and provide constructive feedback.

## Classroom management & resources

- Timeboxing: Keep hands-on labs short and structured; use phased checkpoints.
- Pair programming: Pair students to improve collaboration and debugging.
- Accessibility: Provide text alternatives, captions for videos, and adjust activities for different learning needs.

## Safety, privacy and ethics (teacher notes)

Discuss age-appropriate privacy: do not collect personally identifiable data without consent, avoid collecting faces or names for public datasets, and discuss how data sharing works.

- Teach students to ask: Who created this dataset? Whose voice is missing? Who benefits?
- Introduce the idea of bias: datasets can have blind spots and reflect historical inequalities.
- Encourage critical thinking about claims made by commercial AI systems.

## Further reading & tools

- [Machine Learning for Kids](#)
- [BBC micro:bit](#)
- [Google AI Education](#)
- [Intro CS resources](#)