

AI Teacher Guide for Secondary Schools: Grades 7-9

A comprehensive resource for educators teaching artificial intelligence literacy, ethics, and practical skills to students aged 11-15

Chapter 1

Introduction to AI Literacy for Teachers



Why Teach AI to Secondary Students?



Future-Ready Skills

AI is rapidly transforming the job market across all industries. Students who understand AI concepts gain a competitive advantage in future careers, from healthcare to creative industries.



Critical Thinking Development

Learning about AI strengthens analytical reasoning, problem-solving abilities, and creativity. Students learn to question how technology works rather than passively accepting it.



Ethical Awareness

Early exposure to AI ethics prepares students to navigate complex moral questions about privacy, bias, and responsibility in our increasingly automated world.

What is Artificial Intelligence?

Artificial Intelligence (AI) refers to computer systems designed to simulate human intelligence tasks such as learning, reasoning, problem-solving, and decision-making. Rather than following rigid programming, AI systems adapt and improve through experience.

Everyday AI Examples:

- **Voice assistants** like Siri and Alexa understanding spoken commands
- **Recommendation systems** on Netflix and Spotify suggesting content
- **Image recognition** in photo apps identifying faces and objects
- **Predictive text** completing your sentences as you type



Key AI Terms Every Teacher Should Know

1 **Algorithm**
A precise set of step-by-step instructions that tells a computer how to solve a problem or complete a task. Like a recipe, algorithms provide ordered steps to reach a desired outcome.

2 **Data Set**
A structured collection of information used to train AI systems. Data sets can include images, text, numbers, or other information types that help AI learn patterns and relationships.

3 **Model**
The trained AI system that makes predictions or decisions based on what it learned during training. Think of it as the "graduate" of the learning process, ready to apply knowledge to new situations.

4 **Training**
The process of teaching an AI system by exposing it to large amounts of example data. Through training, the AI learns to recognise patterns and improve its accuracy over time.

5 **Features**
The specific characteristics or properties of data that an AI system uses to identify patterns and make decisions. In image recognition, features might include colours, shapes, or textures.



AI: Learning from Data to Make Decisions

At its core, artificial intelligence transforms raw information into actionable insights through sophisticated pattern recognition and continuous learning.



Chapter 1 Activity: AI in Our Daily Lives

Offline Activity: AI Scavenger Hunt

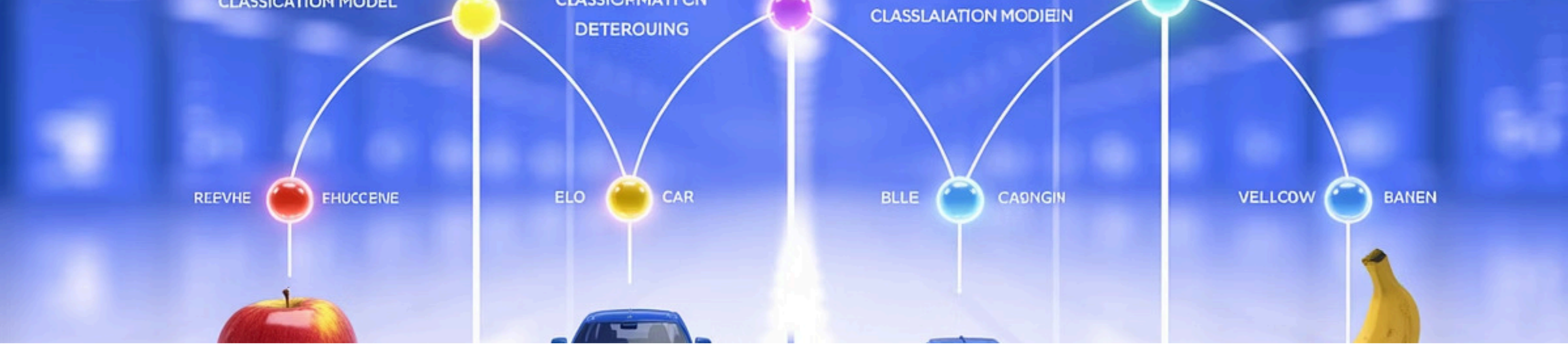
Students work in pairs to identify 10 examples of AI they encounter in daily life (smartphones, recommendations, voice assistants, etc.). They create a poster categorizing these by type (predictive, recognition, recommendation systems).

Code Funhouse Activity: AI Basics Quest

Complete the "AI Basics Quest" module where students explore interactive examples of different AI types and build their first simple decision-making algorithm.

Learning Outcomes:

- Students can identify at least 5 real-world AI applications
- Students can explain how AI learns from data in their own words
- Students understand the difference between AI and traditional programming
- Students demonstrate awareness of AI's presence in everyday technology



Chapter 2

Understanding Classification Models

What is a Classification Model?

A classification model is a type of AI system that sorts data into predefined categories or classes. It analyses input information and assigns it to the most appropriate group based on learned patterns.

The Classification Process:

1. Receive input data with various features
2. Analyse patterns based on training
3. Assign data to appropriate category
4. Provide prediction with confidence level



Classic Example: Email Filtering

Your email spam filter is a classification model that examines incoming messages and categorises them as either "spam" or "not spam" based on characteristics like sender, content, and links.

Common Classification Algorithms for Beginners

1

Decision Trees

A flowchart-like structure that makes decisions by asking a series of yes/no questions. Each branch represents a choice, leading to a final classification at the leaves.

Best for: Situations requiring clear, explainable decision-making processes

2

k-Nearest Neighbours (k-NN)

Classifies new data by finding the 'k' most similar examples in the training set and using their categories to predict. Like asking your closest neighbours for advice.

Best for: Pattern recognition with well-distributed data

3

Logistic Regression

Calculates the probability that input belongs to each category, then assigns it to the most likely one. Despite the name, it's used for classification, not prediction of continuous values.

Best for: Binary classification with clear boundaries

How Classification Models Learn



Collect Labelled Data

Gather training examples where the correct category is already known



Find Patterns

The model analyses features to discover what distinguishes each category



Make Predictions

Apply learned patterns to classify new, previously unseen data accurately

The quality of training data directly impacts model accuracy. More diverse, representative examples lead to better classification performance. This is why data collection is such a critical first step in building effective AI systems.

Real-World Example: Diagnosing Plant Diseases



Agricultural AI in Action

Farmers use classification models to quickly identify crop diseases by photographing leaves with their smartphones. The AI analyses visual features and classifies the plant as healthy or diseased.

How It Works:

- **Input:** Photograph of plant leaf
- **Features:** Colour patterns, spots, texture abnormalities
- **Output:** Disease classification with treatment recommendations
- **Impact:** Early detection saves crops and reduces pesticide use

This technology democratises agricultural expertise, helping small-scale farmers make informed decisions without specialist knowledge.

Chapter 2 Activity: Build Your Own Classifier

Offline Activity: Paper Prototype Classifier

Students design a decision tree on paper to classify objects in the classroom (books by genre, students by favorite subject, etc.). They test their classifier with real examples and refine their rules based on accuracy.

Code Funhouse Activity: Classification Challenge

Complete the "Classification Challenge" where students train a model to categorize images, adjust training data to improve accuracy, and test their model with new examples. They experiment with the plant disease classifier featured in the chapter.

Learning Outcomes:

- ☐ Students can create a simple classification decision tree
- ☐ Students understand how training data affects model accuracy
- ☐ Students can identify features that make good classification criteria
- ☐ Students recognize the importance of diverse, representative training data
- ☐ Students can evaluate classifier performance and suggest improvements

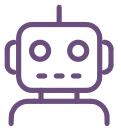
Chapter 3

Introducing Code Funhouse for AI Learning



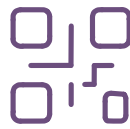
What is Code Funhouse?

Code Funhouse is an innovative, interactive platform specifically designed to make coding and AI literacy accessible and engaging for secondary school students. It combines cutting-edge educational technology with proven pedagogical approaches.



AI-Powered Tutoring

Personalised AI tutors adapt to each student's learning pace, providing targeted support and encouragement exactly when needed.



Multiple Languages

Students can learn Python, HTML/CSS, and JavaScript with scaffolded lessons that build progressively from basics to advanced concepts.



Gamified Experience

Learning adventures, challenges, and rewards maintain engagement whilst students develop real programming skills.

Visit codefunhouse.com to explore the platform's full capabilities and teaching resources.

How Code Funhouse Supports AI Education

Gamified Learning Adventures

Transform abstract AI concepts into interactive quests and challenges that capture student imagination. Learners progress through themed worlds, each introducing new AI principles through hands-on coding projects.

Collaborative Coding Challenges

Foster teamwork and peer learning with group projects where students build AI applications together. Collaboration develops communication skills whilst tackling real-world problems.

Flexible Learning Modes

Choose between self-paced modules for independent study or live tutoring sessions for direct support. This flexibility accommodates diverse classroom schedules and learning preferences.

Using Code Funhouse in Your Classroom

01

Set Up Teacher Accounts

Register at codefunhouse.com/signup/teacher to access the educator dashboard with comprehensive classroom management tools and analytics.

02

Create Student Groups

Organise your classes into groups, assign learning paths, and customise which AI topics align with your curriculum objectives.

03

Assign AI Projects

Select from pre-built AI challenges or create custom assignments focused on classification models, data analysis, or ethical decision-making.

04

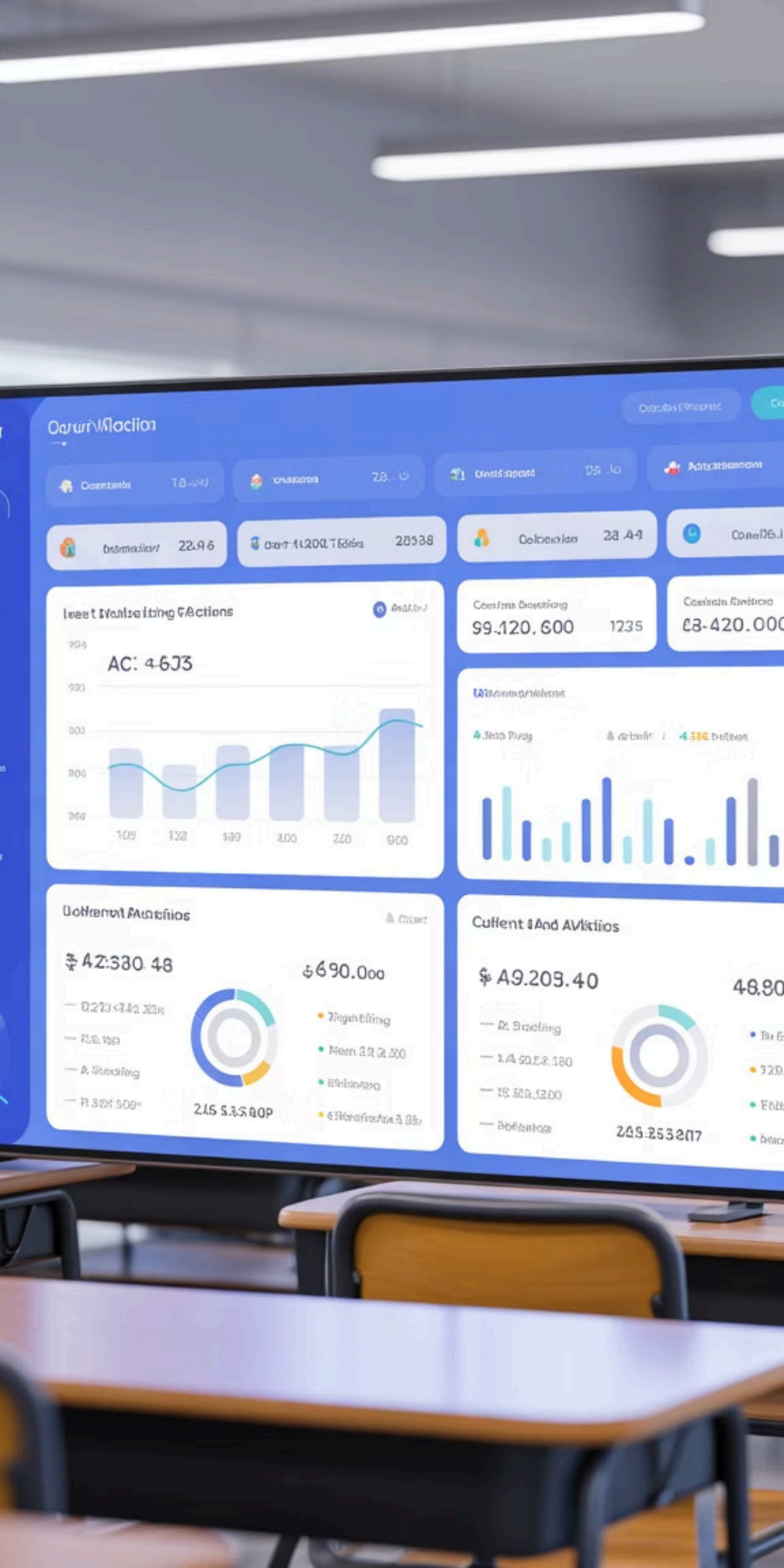
Monitor Progress

Track individual and class performance through detailed analytics, identifying students who need additional support or extension activities.

05

Adapt Your Teaching

Use insights from the platform to adjust instruction, provide targeted interventions, and celebrate achievements with your students.



The Code Funhouse teacher dashboard provides real-time visibility into student engagement, completion rates, and skill development across all AI literacy modules.

Chapter 3 Activity: Explore Code Funhouse

Offline Activity: Platform Planning Session

Students brainstorm a coding project they'd like to create (game, quiz, story, calculator). They sketch out the logic flow, identify what inputs and outputs they need, and plan the steps their program should follow.

Code Funhouse Activity: Complete the "Getting Started Tutorial" and "First Project Builder" modules.

Students create their first interactive program using the visual coding interface, experiment with different AI blocks, and share their creation with classmates for feedback.

Learning Outcomes:

- Students can navigate the Code Funhouse platform independently
- Students understand the connection between planning and coding
- Students can create a simple interactive program with inputs and outputs
- Students demonstrate computational thinking by breaking problems into steps
- Students can explain how their code works to peers

Chapter 4

Exploring AI Bias and Ethical Decision Making



What is AI Bias?

AI bias occurs when artificial intelligence systems produce systematically unfair, prejudiced, or discriminatory outcomes that disadvantage certain groups of people. This isn't intentional malice—it emerges from flawed data or design choices during development.

Common Sources of Bias:

- **Historical bias:** Training data reflects past discrimination
- **Representation bias:** Some groups underrepresented in data
- **Measurement bias:** Features chosen favour certain groups
- **Algorithmic bias:** Design choices amplify existing inequalities



Why It Matters

Biased AI systems can deny opportunities, reinforce stereotypes, and perpetuate historical injustices at unprecedented scale. Teaching students to recognise and address bias is essential for building a fairer future.

Why AI Bias Matters in Education

Perpetuating Stereotypes

Biased AI can reinforce harmful stereotypes about gender, race, ability, or socioeconomic status. When students see technology reflecting prejudice, it normalises discrimination and limits their aspirations.

Excluding Marginalised Groups

AI systems trained primarily on majority group data often fail to recognise or serve minority populations effectively, creating technological barriers that deepen existing inequalities.

Building Responsible Technologists

By teaching bias awareness now, we equip future developers, policymakers, and leaders with the critical thinking skills needed to design inclusive, equitable technology that serves everyone.

Students who understand AI bias become advocates for fairness, questioning technology's role in society and demanding accountability from those who build it.

Real-Life Scenario: Facial Recognition Errors

"Facial recognition systems have been shown to misidentify people with darker skin tones up to 100 times more often than lighter-skinned individuals, leading to wrongful arrests and denial of services."

Classroom Discussion Points:

- Why might training data lack diversity in skin tones?
- What are the real-world consequences of these errors?
- Who should be held accountable when AI makes mistakes?
- How can developers prevent this bias in future systems?

This scenario illustrates how technical choices have profound social impacts, making it essential to prioritise fairness and representation in AI development.



Ethical Decision Making in AI

Transparency

AI systems should be explainable—users deserve to understand how decisions are made and what data influences outcomes.

Human Dignity

Technology must respect human autonomy, rights, and wellbeing. AI should augment human capabilities, not replace human judgment in critical decisions.



Accountability

Clear responsibility for AI outcomes must exist. Developers, organisations, and policymakers share duty for ensuring safe, fair systems.

Fairness

AI must treat all users equitably regardless of background, actively working to eliminate bias and promote inclusive outcomes.

Privacy

Personal data requires protection. AI should collect only necessary information and safeguard it against misuse or unauthorised access.

Classroom Activity Idea: Spot the Bias

Activity Overview

Engage students in critical analysis by examining real datasets and AI outputs for potential bias. This hands-on activity develops awareness and analytical skills essential for responsible technology use.

Activity Steps:

1. Present a dataset or AI output to analyse
2. Students identify potential sources of bias
3. Discuss how bias might affect different groups
4. Brainstorm solutions to improve fairness
5. Design a fairer alternative approach

Encourage students to think systematically about how data collection, feature selection, and algorithmic choices can introduce bias at every stage of AI development.

Example Scenarios

- ❏ **Hiring Algorithm:** An AI screening CVs rejects more female candidates. What patterns might cause this?
- ❏ **Loan Approval System:** Applicants from certain postcodes are denied more frequently. Is this fair?
- ❏ **Content Moderation:** An AI flags posts in certain languages as inappropriate more often. Why might this occur?

Chapter 4 Activity: Investigating AI Bias

Offline Activity: Bias Detective Workshop

Students analyze case studies of biased AI systems (hiring algorithms, predictive policing, loan approval systems). In groups, they identify the source of bias, discuss who is affected, and propose solutions to make the system fairer.

Code Funhouse Activity: Fairness Lab Module

Complete the "Fairness Lab" module where students train two image classifiers—one with balanced data and one with biased data. They compare results, observe how bias affects accuracy across different groups, and learn techniques to create more representative datasets.

Learning Outcomes:

- 1 Students can identify sources of bias in AI systems
- 2 Students understand how training data influences AI behavior
- 3 Students recognize real-world consequences of biased algorithms
- 4 Students can propose strategies to reduce bias in AI development
- 5 Students demonstrate ethical reasoning about technology's impact on society

Chapter 5

Practical Teaching Tips & Resources



Integrating AI Topics into Your Curriculum

Mathematics

Connect AI to probability, statistics, and pattern recognition. Students can analyse data sets, calculate classification accuracy, and explore algorithmic thinking through mathematical lenses.

Science

Explore AI applications in biology (genetics), chemistry (molecular prediction), and physics (pattern recognition). Demonstrate how AI accelerates scientific discovery and hypothesis testing.

Computing

Build practical AI projects using Code Funhouse that reinforce programming concepts whilst introducing machine learning fundamentals. Theory meets practice through hands-on development.

Encouraging Critical Thinking

Question AI Decisions

Train students to ask "Why did the AI make this choice?" and "What data influenced this outcome?" Curiosity about AI's reasoning builds analytical skills.

Debate Ethical Dilemmas

Facilitate structured debates on controversial AI applications like surveillance, autonomous weapons, or algorithmic hiring. Multiple perspectives develop nuanced understanding.

Examine Data Sources

Encourage investigation into where training data originates, who collected it, and what perspectives might be missing. Data isn't neutral—it reflects human choices.

Consider Societal Impact

Discuss how AI affects employment, privacy, equality, and power distribution. Technology exists within social contexts that students must learn to navigate.



Supporting Diverse Learners

Personalised AI Tutoring

Code Funhouse's adaptive AI tutor adjusts difficulty, pacing, and explanation style based on individual student performance. This ensures all learners receive appropriate challenge and support.

- Struggling students get additional scaffolding
- Advanced learners access extension challenges
- Multiple explanation styles accommodate different preferences

Collaborative Learning

Pair programming and group projects leverage diverse strengths whilst building community. Students learn from peers' perspectives, developing both technical and interpersonal skills.

- Mixed-ability groupings promote peer teaching
- Role rotation ensures equal participation
- Shared problem-solving builds confidence

Additional Resources for Teachers

Code Funhouse Curriculum

Comprehensive lesson plans, assessment rubrics, and teaching guides aligned with national computing standards.

codefunhouse.com/curriculum

AI Ethics Case Studies

Curated collection of real-world AI ethics scenarios with discussion questions, background reading, and classroom activities.

Available through Code Funhouse teacher resources

Educator Communities

Join online forums and professional networks where AI educators share strategies, resources, and support for teaching emerging technologies.

Access via Code Funhouse Community Hub

Professional Development

Code Funhouse offers webinars, workshops, and certification programmes to deepen your AI teaching expertise. Stay current with rapidly evolving technology through ongoing learning opportunities.

Chapter 5 Activity: Cross-Curricular AI Integration

Offline Activity: Subject Connection Map

Students choose their favorite subject (math, science, art, history, language) and research how AI is used in that field. They create presentations showing 3 specific applications and explain how AI enhances work in that discipline.

Code Funhouse Activity: AI Application Builder

Complete the "AI Application Builder" project where students design an AI tool to solve a problem in their chosen subject area. Examples: a math problem solver, a language translation assistant, an art style analyzer, or a historical document classifier.

Learning Outcomes:

- Students can connect AI concepts to multiple academic disciplines
- Students understand AI's broad applicability across fields
- Students can design AI solutions for real-world problems
- Students demonstrate creativity in applying AI to their interests
- Students can communicate technical concepts to diverse audiences



Empower Students to Shape the Future with AI

By providing quality AI education today, you're preparing students to become thoughtful creators, critical consumers, and ethical leaders in tomorrow's technology-driven world.



Summary: Your Role as an AI Educator

Build Foundations

Establish clear understanding of AI concepts through engaging, accessible lessons that connect abstract ideas to concrete examples students can grasp.

Highlight Ethics

Integrate discussions of bias, fairness, and responsibility throughout your teaching. Ethical awareness must be inseparable from technical knowledge.

Leverage Technology

Use Code Funhouse to make AI learning accessible, interactive, and enjoyable. Technology can enhance teaching when applied thoughtfully.

Inspire Curiosity

Foster wonder about AI's capabilities whilst maintaining healthy scepticism. Curious, questioning students become responsible technology stewards.

Your influence extends far beyond the classroom. By teaching AI literacy with ethics at the forefront, you're shaping not just individual futures but the trajectory of technology itself.

Ready to Inspire the Next Generation of AI Innovators?

Join thousands of educators worldwide who are transforming AI education through Code Funhouse. Start your journey towards empowering students with the knowledge, skills, and ethical foundation they need to thrive in an AI-powered world.

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Begin your AI teaching adventure today at [codefunhouse.com](https://www.codefunhouse.com) and discover how accessible, engaging, and impactful AI education can be for your students.