EdSutra

Curriculum

Grade 7

About age 12–13 · Year 8 in the UK · Class 7 in India · 31 Units · about 16 hours

Every EdSutra Unit rated for Grade 7, in the suggested order. Each Unit is one simulation in which the learner takes on a real job, and each lists what learners will be able to do at the end.

- Three stages in a suggested order. Module 1 comes first; after it, any Module can be opened.
- Every Unit is one simulation. The learner takes a job, climbs Bloom's steps from Remember to Evaluate, and ends on an In real life card. Create happens in the browser-based Labs.
- "I can..." lines are each Unit's learning outcomes. "Ask the class" is a question to open discussion.
- Module 1 is free with no account. Everything else is one $99 purchase.

Stage 1 · Beginner

Foundations: How does a machine learn?

How a machine learns from examples, and why the data matters.

Module 01 · AI Foundations Free

The words AI people use, and how a machine learns from examples and makes a call.

4 Units · about 3 hours · Labs: Computer Vision Lab, Neural Playground

Unit 01 · 60 min · All grades · Role: Codebook Keeper

AI Alphabet A to Z Words

- I can understand 26 foundational AI words in simple language
- I can connect each AI term to an everyday example
- I can use AI vocabulary in short, everyday sentences of their own
- I can distinguish correct from incorrect uses of AI terms in real tools and conversations

Ask the class If an AI tool gets something wrong, who should check it: the tool, the company, or you?

Teaching guide: edsutra.com/downloads/curriculum/teaching-guides/edsutra-teaching-guide-ai-alphabet.pdf

Unit 02 · 40 min · Grades 6–8 · Role: AI Detective

What is AI? The Knowledge Map

- I can say what AI is in one line: a machine doing a task that usually needs a human mind
- I can tell systems that follow rules from systems that learn from examples
- I can identify key AI milestones, their eras and the people and teams behind them
- I can explain one connection between AI ideas and one limit of a system's results

Ask the class Whose work is easy to miss when a headline names just one AI inventor?

Teaching guide: edsutra.com/downloads/curriculum/teaching-guides/edsutra-teaching-guide-what-is-ai.pdf

Unit 03 · 55 min · Grades 6–9 · Role: Training Inspector

How Machines Learn The Cookie Sorter Investigation

- I can explain how supervised learning uses labeled examples to learn a pattern
- I can analyze which features a model is using to make predictions
- I can evaluate model behavior with unseen data, accuracy, precision, and recall
- I can diagnose shortcut learning and propose counterexamples that improve generalization
- I can design a stronger feature strategy for a classifier

Ask the class Have you ever learned a shortcut that worked in practice but failed on the real test?

Teaching guide: edsutra.com/downloads/curriculum/teaching-guides/edsutra-teaching-guide-how-machines-learn.pdf

Unit 04 · 30 min · Grades 7–10 · Role: Grading Engineer

Neural Networks The Avocado Grader

- I can name the parts of a neural network (inputs, weights, bias, neuron, output)
- I can work out by hand whether a neuron lights up from its readings, weights and bias
- I can train a network and choose how many neurons it needs
- I can explain what each trained neuron learned, and choose between networks on evidence

Ask the class Brains inspired neural networks. How is a network like your brain, and how is it different?

Teaching guide: edsutra.com/downloads/curriculum/teaching-guides/edsutra-teaching-guide-neural-networks.pdf

Module 04 · Data & Knowledge

Where the data comes from, what it leaves out and how it shapes what a model learns.

2 Units · about 1.5 hours · Labs: Data Explorer Lab

Unit 01 · 50 min · Grades 6–9 · Role: Intake Inspector

Data & Datasets The Data Kitchen

- I can read a dataset: rows are examples, columns are features, one column is the label
- I can identify problems in datasets: missing values, duplicates, outliers, label bias
- I can measure how cleaning choices change a real model's accuracy and fairness
- I can explain why deleting a biased feature doesn't remove bias

Ask the class Should a computer help choose who gets into a club or team? What would make that fair?

Teaching guide: edsutra.com/downloads/curriculum/teaching-guides/edsutra-teaching-guide-data-kitchen.pdf

Unit 04 · 25 min · Grades 7–10 · Role: Data Diet Advisor

The Story Copier When AI Learns from AI

- I can name the loop: human stories, a model, its book, the next model
- I can predict which words survive copying: rare ones vanish first, common ones last
- I can choose a training recipe that keeps rare words for eight generations
- I can compare two copiers and name the setting that made one forget more
- I can judge whether a real kind of app will lose rare things, backed by evidence from your runs

Ask the class Whose stories might go missing if AIs mostly learn from other AIs?

Teaching guide: edsutra.com/downloads/curriculum/teaching-guides/edsutra-teaching-guide-model-collapse.pdf

Stage 2 · Intermediate

Capabilities: What can AI do with pictures, sound and words?

How AI sees, hears, reads, writes and makes new things.

Module 02 · Seeing & Sensing

How a machine turns a picture or a video into something it can recognize.

3 Units · about 1 hours · Labs: Computer Vision Lab

Unit 01 · 35 min · Grades 6–10 · Role: Observation Officer

Seeing & Sensing How Machines See the World

- I can explain how images are stored as arrays of numbers
- I can describe the three stages of a computer vision pipeline
- I can identify real-world applications across medicine, transport, and entertainment
- I can understand why lighting, angle, and resolution affect model accuracy

Ask the class When you look at a photo, what do you notice that a computer only stores as numbers?

Teaching guide: edsutra.com/downloads/curriculum/teaching-guides/edsutra-teaching-guide-seeing-sensing-intro.pdf

Unit 02 · 12 min · Grades 7–10 · Role: Channel Listener

Uni-modal AI One Signal at a Time

- I can name and identify a single input signal (image, text, audio, sensor)
- I can explain what one signal can and cannot reveal
- I can match the right signal to a task and find the missing signal
- I can judge whether one signal is enough for a given decision

Ask the class Which of your senses could you manage without for a day, and what would you miss?

Teaching guide: edsutra.com/downloads/curriculum/teaching-guides/edsutra-teaching-guide-unimodal-ai.pdf

Unit 05 · 25 min · Grades 7–11 · Role: Sound Analyst

Audio & Speech The Sound Prism

- I can match amplitude, frequency, duration, and brightness to what you hear
- I can read a spectrogram as frequency × time × energy, and explain why it is a measurement rather than what a machine hears
- I can predict which feature meter a sound will move most, then check it against live measurements
- I can produce a counterexample that defeats the visible thresholds and explain the failure from the numbers
- I can decide which listening tasks four coarse features can and cannot support

Ask the class Which sounds around you would be hardest for a machine to tell apart, and why?

Teaching guide: edsutra.com/downloads/curriculum/teaching-guides/edsutra-teaching-guide-audio-ai.pdf

Module 03 · Language & Text

How a language model reads a sentence, guesses the next word and translates.

8 Units · about 3.5 hours · Labs: AI Story Canvas Lab

Unit 01 · 12 min · Grades 7–10 · Role: Word Mechanic

Language & AI Intro Key Ideas You'll Use

- I can define tokens and tokenization
- I can explain embeddings as number-based representations of meaning
- I can describe attention as a way to compare relationships between tokens
- I can explain next-token prediction as the core behavior of language models
- I can identify real-world NLP applications such as chatbots, translation, summarization, and sentiment analysis

Ask the class If a machine can finish your sentences, does it know what you mean? How could you tell?

Teaching guide: edsutra.com/downloads/curriculum/teaching-guides/edsutra-teaching-guide-language-ai-intro.pdf

Unit 02 · 20 min · Grades 7–10 · Role: Relay Operator

The Translation Telephone How words become meaning — and back

- I can name the journey a message takes: encode, whisper chain, decode
- I can explain that meaning is preserved while the exact words change
- I can compare an input and output and count how much meaning survived
- I can find an ambiguous message's breaking point and judge whether its meaning survived

Ask the class Have you ever been misunderstood because your words could mean two things? What happened?

Teaching guide: edsutra.com/downloads/curriculum/teaching-guides/edsutra-teaching-guide-natural-language.pdf

Unit 03 · 20 min · Grades 7–10 · Role: Sorting Clerk

The Meaning Detector How AI sorts text by what it means

- I can name what a classifier outputs: a label and a confidence, not new text
- I can explain that the label is a sum of weighted cue words
- I can scan a review and predict its label from the cues
- I can find what fools the detector — negation, sarcasm, mixed signals
- I can judge when to trust a call versus send it to a human

Ask the class When should a computer's yes-or-no call about a message be checked by a person?

Teaching guide: edsutra.com/downloads/curriculum/teaching-guides/edsutra-teaching-guide-text-classification.pdf

Unit 04 · 12 min · Grades 7–10 · Role: Digest Editor

The Compression Lab How AI shortens a story without changing what it says

- I can explain what a good summary does: answer the key questions, add nothing new
- I can explain how an extractive summarizer chooses lines: it counts fact words
- I can squeeze a story to the shortest card that still keeps every key point
- I can explain why a fact-counting machine can drop the most important fact
- I can judge which summary is safe to send: faithful and complete

Ask the class When is reading only the summary fine, and when do you need the whole thing?

Teaching guide: edsutra.com/downloads/curriculum/teaching-guides/edsutra-teaching-guide-summarization.pdf

Unit 05 · 30 min · Grades 7–10 · Role: Bench Translator

The Translation Bench How meaning moves across languages

- I can explain that translation preserves meaning units, not individual words
- I can describe how word order, gender, and particles differ across languages
- I can translate a sentence and predict which meaning units survive
- I can analyze why idioms and culture-specific words break in translation
- I can judge when a translation is faithful enough to ship vs. needs a human

Ask the class Is there a word in a language you know that has no good English match?

Teaching guide: edsutra.com/downloads/curriculum/teaching-guides/edsutra-teaching-guide-translation-multilingual.pdf

Unit 07 · 40 min · Grades 6–12 · Role: Request Writer

Prompting AI The Signal Tuner

- I can name the four features that make a prompt clear: clarity, specificity, role and audience, guardrails
- I can rewrite a vague prompt until it reaches an expert score
- I can predict and test which kinds of noise hurt a prompt most
- I can back your best change with evidence, and explain what a heuristic prompt score can't see

Ask the class Can a score tell you whether a piece of writing is good? What might it miss?

Teaching guide: edsutra.com/downloads/curriculum/teaching-guides/edsutra-teaching-guide-prompting-ai.pdf

Unit 08 · 45 min · Grades 7–11 · Role: Instruction Engineer

Prompt Literacy The Prompt Engine

- I can name the five parts of a strong prompt and what each one controls
- I can explain how adding each part changes the same AI answer
- I can build complete prompts for real goals by choosing the right part for each slot
- I can diagnose why a prompt produced a bad answer — vague, missing, or conflicting parts
- I can judge competing prompts against a rubric and choose which one to ship

Ask the class Who is the best explainer you know? Which of the five parts do they always include?

Teaching guide: edsutra.com/downloads/curriculum/teaching-guides/edsutra-teaching-guide-prompt-literacy.pdf

Unit 09 · 25 min · Grades 7–12 · Role: Reading Assessor

Evaluating AI Writing The Response Judge

- I can name the four judging lenses and the failure each one catches
- I can explain how a response's verdict is counted from evidence, not guessed
- I can tag claims, tone cues, loaded words, and clarity signals in a fresh response
- I can diagnose which lens a broken response fails, and cite the exact span that proves it
- I can weigh two rival responses and defend a ship / revise / reject call with evidence

Ask the class Have you read something that sounded certain but turned out wrong? How could you have checked?

Teaching guide: edsutra.com/downloads/curriculum/teaching-guides/edsutra-teaching-guide-eval-writing.pdf

Module 07 · Creative AI

How generative AI makes pictures, music and text, and whether that counts as creativity.

4 Units · about 1.5 hours · Labs: Sound and Music Lab

Unit 01 · 5 min · All grades · Role: Studio Technician

Generative AI Start Here

- I can recognize generative AI as producing an output from learned patterns
- I can name examples of generated outputs: words, images, music, and code
- I can recall that learning patterns happens before a prompt steers generation

Ask the class If one prompt can make many different outputs, who decides which one is good?

Teaching guide: edsutra.com/downloads/curriculum/teaching-guides/edsutra-teaching-guide-generative-ai.pdf

Unit 02 · 25 min · Grades 7–11 · Role: Pattern Maker

Algorithmic Art The Pattern Studio

- I can identify the grid, motif, symmetry, palette, density, border, and seed rules in a generative pattern
- I can predict and explain how one rule changes a pattern while the other rules remain fixed
- I can build, test, replay, and save a deterministic pattern recipe
- I can infer hidden rules by comparing generated patterns with candidate recipes
- I can evaluate authorship, originality, and cultural credit using relevant evidence

Ask the class If you write the rules and a computer draws the picture, who is the artist?

Teaching guide: edsutra.com/downloads/curriculum/teaching-guides/edsutra-teaching-guide-algorithmic-art.pdf

Unit 03 · 30 min · Grades 7–11 · Role: Algorithmic Music Producer

Music & AI The Melody Engine

- I can identify the sequence, transition counts, probabilities, seed, and temperature that drive a next-note model
- I can predict a next note from visible counts and explain how temperature reshapes its probabilities
- I can train, generate, inspect, listen to or watch, and revise a seeded machine melody
- I can distinguish songbook fingerprints using rests, leaps, repetition, and transition evidence
- I can evaluate an AI-music workflow using authorship, consent, representation, and model evidence

Ask the class If you change two notes in an AI-made tune, is it your song? What would make it yours?

Teaching guide: edsutra.com/downloads/curriculum/teaching-guides/edsutra-teaching-guide-music-ai.pdf

Unit 04 · 30 min · Grades 7–11 · Role: Registration Examiner

Machine Creativity The Creativity Court

- I can classify examples of generative creativity as combinational, exploratory, or transformational without anthropomorphising the system
- I can distinguish novelty from value and justify a grid placement with cited evidence
- I can trace a generated artifact's contribution across source, system design, prompt/rules, sampling, selection, editing, and presentation
- I can apply that same contribution trace to your own saved Algorithmic Art and Music & AI work
- I can evaluate real, dated copyright precedent and defend a verdict with coherent evidence

Ask the class Can a machine be creative, or only the people who build and use it? Why?

Teaching guide: edsutra.com/downloads/curriculum/teaching-guides/edsutra-teaching-guide-machine-creativity.pdf

Stage 3 · Advanced

Responsibility: Who answers for what AI does?

How to build with AI, set rules for it and keep a person in charge.

Module 05 · Ethics & Society

Bias, accountability and the rules society sets, worked through as cases to decide.

4 Units · about 2.5 hours

Unit 02 · 45 min · Grades 7–12 · Role: Duty Registrar

AI Accountability The Accountability Grid

- I can differentiate the responsibilities of developers, companies, users, and regulators
- I can apply transparency, fairness, privacy, and safety principles to specific stakeholder actions
- I can identify distractor 'responsibility-washing' actions that deflect rather than allocate accountability
- I can defend a complete accountability map with reasoning grounded in stakeholder capability

Ask the class If an AI tool made an unfair decision about you, who would you want to answer for it?

Teaching guide: edsutra.com/downloads/curriculum/teaching-guides/edsutra-teaching-guide-ai-accountability.pdf

Unit 03 · 40 min · Grades 7–12 · Role: Energy Accountant

Environmental Ethics One Message · Two Pathways

- I can explain why an AI chat belongs to a material and technical lifecycle, not only a screen
- I can distinguish recurring use-phase demand from embodied hardware and upstream impacts
- I can compare cloud and on-device pathways across energy, network, cooling, hardware, and task capability
- I can apply proportionality by choosing a responsible pathway without hiding lifecycle trade-offs

Ask the class Should apps show the energy cost of using AI? What would you want to know?

Teaching guide: edsutra.com/downloads/curriculum/teaching-guides/edsutra-teaching-guide-carbon-cost.pdf

Unit 04 · 35 min · Grades 7–12 · Role: Duty Advisor

Responsible AI Use The Use-Case Compass

- I can name the four value axes a use-case decision can be judged against
- I can explain why the same dilemma can produce different scores for different learners
- I can calibrate personal value weights and apply them to six real dilemmas
- I can compare a categorical gut judgment against a numeric alignment score and locate the exact source of disagreement
- I can defend a specific use-case judgment using the dilemma, the relevant value axis, and context

Ask the class Which task would you never hand to AI, and which would you happily share with it?

Teaching guide: edsutra.com/downloads/curriculum/teaching-guides/edsutra-teaching-guide-responsible-use.pdf

Unit 05 · 25 min · Grades 7–12 · Role: Independent Review Officer

AI in Society The Civic Ripple

- I can identify the five links between an AI signal and a social outcome
- I can explain why institutions, operating rules, and feedback loops shape AI's impact
- I can calculate how reach, observed miss rate, and human review change unresolved misses
- I can compare deployment plans and locate which assumption creates the difference
- I can defend a launch posture with safeguards matched to the stakes

Ask the class Should a new AI tool start as a small pilot before everyone uses it? Why?

Teaching guide: edsutra.com/downloads/curriculum/teaching-guides/edsutra-teaching-guide-ai-society.pdf

Module 08 · The Future of AI

AGI, AI safety and what people should keep for themselves as machines improve.

4 Units · about 2 hours

Unit 02 · 30 min · Grades 7–12 · Role: Lifecycle Assessor

AI & Climate The Climate Ledger

- I can distinguish power, energy, emissions, water, and materials, and read each with its correct unit
- I can explain how a system boundary, a grid, and the definition of “one prompt” change an estimate
- I can calculate and compare two deployment scenarios from visible assumptions, carrying ranges
- I can trace how rebound, utilization, or a boundary change reverses an apparent advantage
- I can decide whether an AI use is climate-justified against a bounded non-AI baseline, and specify a lower-impact plan

Ask the class When is an AI task worth its energy, compared with doing it another way?

Teaching guide: edsutra.com/downloads/curriculum/teaching-guides/edsutra-teaching-guide-ai-climate.pdf

Unit 03 · 30 min · Grades 7–12 · Role: Safety Case Reviewer

AI Safety The Safety Case Lab

- I can match hazard, risk, alignment, misuse, robustness, monitoring, containment, and recovery to plain-language examples
- I can predict where a failure path should be interrupted and explain how the four control layers differ
- I can assemble a safety case by linking each claim to supporting evidence and a named control owner
- I can run failure injections and locate the first missing or failed control
- I can decide deploy / pilot / revise / do-not-deploy under explicit constraints using residual paths, evidence gaps, and reversibility
- I can redesign an architecture or operating policy to close a hazardous path and document the remaining uncertainty

Ask the class Who should decide whether an AI tool is safe enough to use at school?

Teaching guide: edsutra.com/downloads/curriculum/teaching-guides/edsutra-teaching-guide-ai-safety.pdf

Unit 04 · 30 min · Grades 7–12 · Role: Commons Steward

AI & Humanity The Future Commons

- I can distinguish automation, augmentation, substitution, agency, dependency, access, and recourse
- I can predict how one AI deployment changes a task and a human role, then compare stakeholder perspectives
- I can fill a consequence matrix for an authored scenario using provided evidence and explicit assumptions
- I can change value weights and identify which recommendation flips, why, and who bears the cost
- I can deliberate among plausible futures and defend adoption conditions using evidence, distribution, and reversibility
- I can draft a Human Choice Charter: protected decisions, disclosure, opt-out, skill preservation, access, appeal, review triggers

Ask the class Which decisions about your life should always stay with a person, never a machine?

Teaching guide: edsutra.com/downloads/curriculum/teaching-guides/edsutra-teaching-guide-ai-humanity.pdf

Unit 05 · 30 min · Grades 7–12 · Role: Capability Auditor

AGI & Superintelligence The Capability Observatory

- I can distinguish narrow AI, generality, transfer, autonomy, AGI, and superintelligence, and separate definitions from predictions
- I can predict whether a high score in one domain transfers to a changed task
- I can run authored systems through a transparent multi-domain test battery and record pass / partial / fail with evidence
- I can inspect spiky capability profiles and diagnose memorization, tool dependence, brittle transfer, or missing embodiment/context
- I can audit a public-style 'approaching AGI' claim for definition, evidence breadth, counterexamples, and uncertainty
- I can design a capability test suite with task diversity, hidden transfer cases, failure criteria, and a limits statement

Ask the class What would an AI have to do to convince you it was truly general? What wouldn't count?

Teaching guide: edsutra.com/downloads/curriculum/teaching-guides/edsutra-teaching-guide-agi.pdf

Module 09 · Intelligence Management

Match AI tools to the work they do best, check their results and keep a person responsible for the outcome.

2 Units · about 1 hours· Labs: Open Project Canvas

Unit 03 · 25 min · Grades 7–12· Role: Handoff Checker

Delegation & Verification The Proof Gate

- I can name the parts of a handoff: goal, task, context, constraint, deliverable, acceptance check, evidence and escalation
- I can predict what an agent does with a blank line on its job card, and which check (if any) catches it
- I can write a complete job card, and make the human call on briefs that pass every automatic check
- I can diagnose false acceptance, false rejection, gaming the test, stale context and a fake score on a real gate
- I can choose which job card to trust, backed by facts from your own runs

Ask the class What's something you'd hand to a helper, and how would you check it was done well?

Teaching guide: edsutra.com/downloads/curriculum/teaching-guides/edsutra-teaching-guide-delegation-verification.pdf

Unit 04 · 30 min · Grades 7–12· Role: Mission Director

Agent Orchestration The Orchestration Room

- I can identify specialist, task, dependency, handoff, shared context, coordinator, and verification gate
- I can predict which sequential, parallel, or conditional workflow shape completes a mission reliably
- I can decompose an authored mission, assign specialists, define context packets, and execute the deterministic workflow
- I can inspect failed traces and diagnose capability mismatch, missing context, stale version, dependency race, or skipped verification
- I can compare orchestration plans for correctness, latency, cost/rework, observability, and human escalation
- I can design and successfully run an orchestration plan for a fresh mission with explicit interfaces and recovery paths

Ask the class In a group project, what goes wrong when nobody coordinates? Would an AI coordinator help?

Teaching guide: edsutra.com/downloads/curriculum/teaching-guides/edsutra-teaching-guide-agent-orchestration.pdf