WP 4.2 Skeleton of lesson plans for Interdisciplinary Pedagogical Micro-Units (IPUs) in each area of study along with technological tools to be incorporated Violence, racism, stereotypes, poverty and exploitation - Lesson Plan

Generative AI

Lesson Topic	***Integrating Computer Science, Language Arts, and Mathematics through the theme of Artificial Intelligence (AI) and Generative AI – Tools, Applications, and Ethics.***
Phenomenon	The class is presented with an AI-generated piece of content (e.g. a short essay or image) that is nearly indistinguishable from human-created work. This real-world phenomenon of AI producing creative content serves as the lesson's springboard, provoking questions like "Can a computer be creative?" and "How do AI tools impact our lives?"
Grade Level	Upper secondary (ages 15–18).
Learning Objectives	By the end of this interdisciplinary micro-unit, students will be able to: • Explain core concepts of AI and generative AI: Define artificial intelligence and generative AI in simple terms and identify popular AI tools (e.g. ChatGPT for text, DALL·E for images). • Apply AI tools in practice: Use a generative AI tool (such as ChatGPT) to generate text and another (such as DALL·E) to create an image, then analyze and critique the outputs. • Connect with Language Arts: Evaluate the clarity, style, and coherence of AI-generated text (e.g. an essay or poem), comparing it with human writing, and practice effective communication by discussing or writing about AI outputs. • Connect with Mathematics: Understand at a conceptual level how AI uses patterns and probabilities to make predictions (e.g. how a chatbot selects the next word), and interpret simple data related to AI usage or bias (such as word frequency or statistical trends in AI-generated content). • Discuss ethical implications: Identify and debate key ethical issues of AI (e.g. plagiarism/academic honesty, bias, misinformation, intellectual property) and relate them to personal and societal values • Real-world and EU connections: Recognize real-world applications of generative AI in society (education, media, jobs) and describe how organizations (including the EU) are responding with guidelines or policies to promote responsible AI use
Subjects Integrated:	Grade Level Upper secondary (ages 15–18).
Materials:	• Technology: Internet access and a computer (or device) for the teacher to demo AI tools (projector or interactive whiteboard recommended). If available, student devices for hands-on use of ChatGPT (text generation) and DALL·E or a similar image generator. • Accounts/Access: A class account or setup for OpenAI's ChatGPT and DALL·E (or alternatives like Bing Image Creator, which uses DALL·E). Ensure these tools are accessible and allowed in your school setting beforehand. • Pre-made AI Examples: Prepare an AI-generated short text (e.g. a one-paragraph story or essay) and an AI-generated image relevant to a current topic or the students' interests. These will be used as the phenomenon examples to analyze. • Other Materials: Whiteboard/flipchart and markers for brainstorming, sticky notes or paper for group work, and optional handouts with prompt examples or an outline of ethical questions.

Subjects Integrated	2 X 45 Minute Sessions
Assessment:	• Formative Assessment during Activities: Throughout the lessons, assess understanding by listening to discussions and checking group work. For example, gauge comprehension in Session 1 by the reasons students list for pros/cons of AI writing. Similarly, during the ethics discussions in Session 2, observe how well students grasp the issues and use reasoning. The quality of their questions and arguments is an indicator of meeting the critical thinking objectives. • Exit Ticket (end of Session 2): Have each student write a quick exit ticket (on paper or online): one thing they learned about AI that they found important, and one question or concern they still have. This not only gives insight into each student's learning (did they meet the objectives?) but also helps identify any misconceptions to address in future classes. • Optional Follow-Up Assignment: If appropriate, a short reflective essay or a creative task can be assigned. For instance, students write a paragraph on "When is it right or wrong to use AI in our work?" or attempt to use an AI tool at home and report back on the experience. This can be collected as a minor assessment to see if they can articulate the concepts and ethical stance in writing (aligning with both Language and ethics objectives).

Lesson Steps

Activity 1: (45 minutes)	• Hook (Phenomenon Display – 5 min): Without initially revealing its origin, present the class with a short essay or paragraph written by an AI (ChatGPT). For example, it could be a well-crafted 100-word student essay on a familiar topic. Ask students to read it (project it on screen or distribute copies). Then prompt discussion: "What do you notice about this essay? Could a computer have written it? Why or why not?" Encourage a few quick observations. After guesses, reveal that it was AI-generated, highlighting the phenomenon that AI can produce human-like writinghttps://www.joinprisma.com/blog/ai-in-the-classroom. This provokes curiosity and sets the stage for learning. • Class Discussion – What is AI? (10 min): Pose the question "What is Artificial Intelligence, and where have you seen it?" to activate prior knowledge. On the board, jot down student examples of AI they've heard of (e.g. virtual assistants, recommendation algorithms, translation tools). Build on their answers to explain AI and generative AI in simple terms: e.g., "AI is when computers perform tasks that normally require human intelligence. Generative AI means it can create new content – like writing or images – by learning from lots of data"https://www.joinprisma.com/blog/ai-in-the-classroom. Keep it non-technical: compare a generative AI to a student learning to write by reading many books and then composing a new story. Emphasize popular tools: ChatGPT (creates text) and DALL·E (creates images) as prime exampleshttps://www.joinprisma.com/blog/ai-in-the-classroom. (Computer Science connection: understanding what these tools are and how they work at a high level.) • Mini-Lecture & Math Connection – How AI Generates Text (5 min): Briefly explain the concept of AI language models predicting words. For instance: "ChatGPT doesn't 'think' like us – it uses math! It was trained on millions of sentences. When you ask a question, it replies by choosing words that are most likely to follow each other based on probabilities from its training data." You might demonstrate a simple probability example on the board (Mathematics connection): write a sentence starter like "Once upon a ___" and ask what words are likely next (students might say "time"). Explain that AI picks the word with a high probability ("time") or sometimes a less obvious word to make it creative. This shows how mathematics (statistics and probability) underpins text generation in an accessible way. • Interactive Prompt Exercise (10 min): As a class, formulate a prompt to give to ChatGPT. For example: "Write a 4-line poem about school life in the style of Shakespeare" or a question related to a topic in literature or history they're studying. Show the live result from ChatGPT on the projector. Then analyze the language in the output: • Ask students: "Is the tone or style appropriate? Does it make sense and use good grammar?" (Language Arts skills: reading comprehension and stylistic analysis). • Highlight parts that seem "very human-like" and any part that seems off or mechanical. This is an opportunity to discuss that AI sometimes produces fluent but flawed text, and it doesn't truly understand meaning – it's just following patterns. • Group Reflection – AI vs Human Writing (10 min): Put students into small groups (3–4 per group). Have each group quickly list advantages and disadvantages of using an AI like ChatGPT for writing. For example, advantages might be "fast, can get ideas or grammar help", while disadvantages might be "might be incorrect, lacks personal voice, could be cheating if used for homework". After ~5 minutes, invite groups to share one point each. Capture key ideas on the board. Ensure ethical issues start to surface here (e.g., fairness of using AI in assignments, reliability of information). Mention real-world context: many students are already experimenting with AI for schoolwork – surveys show roughly a quarter of older teens have used ChatGPT to help with assignmentshttps://www.pewresearch.org/short-reads/2024/05/15/a-quarter-of-u-s-teachers-say-ai-tools-do-more-harm-than-good-in-k-12-education/. This makes the discussion very relevant to their lives.

Activity 1:
(45 minutes)

Wrap-Up of Session 1 (5 min): Recap the main takeaways: AI can generate realistic text and is a powerful tool, but it has limitations. Reinforce that Computer Science helped us understand how it works, Language Arts let us critique the writing quality, and Math gave us insight into the underlying probability mechanism. Tease the next session: "Tomorrow, we'll see how AI creates images and tackle some big questions about ethics and creativity."

Activity 2/Session 2:
(45 minutes)

- **Recap and Warm-Up (5 min):** Begin by revisiting yesterday's key points. Ask: *"What surprised you about AI text generation?"* and *"Would you trust an AI's answer or writing? Why or why not?"* This leads into today's focus. Ensure everyone knows today you'll explore AI-generated images and ethical issues. You might show a quick, fun example: an image created by DALL·E with a quirky prompt (e.g. "a cat painting a portrait in Van Gogh's style") to spark interest and a few laughs.
- **DALL·E Demonstration – Generating an Image (10 min):** Introduce **DALL·E**, an AI that generates images from text descriptions. Explain in simple terms that it was trained on millions of pictures and it creates new images by combining patterns (similar to how ChatGPT combines word patterns, but with pictures). Live demo: ask students for an image idea; craft a prompt together and input it into DALL·E (or show a pre-generated result if live demo isn't feasible). Project the resulting image for all to see. Discuss briefly:
- *"Does the image match our idea? What details are well-done, and what looks strange?"*
- Emphasize the creative aspect: the AI is not copying an existing single image, but generating a new one based on learned patterns. (Math/CS connection: images are made of pixels/numbers; the AI uses complex mathematical models to produce the image.)
- **Class Activity – Interpreting AI Art (10 min):** Show the class the AI-generated image alongside a human-created image (if available) on a similar theme. You can use an artwork or a photograph from a known source for contrast. Ask the class to compare them:
- *"What feelings or story does each image convey? Can you tell which is AI-made if you didn't know?"*
- This integrates **Language Arts** as students practice visual literacy and descriptive skills, articulating differences in style or emotional impact. It also reinforces critical thinking about authenticity of media (tying into media literacy – an important real-world skill).
- Mention that generative AI is now used in media and news (for instance, AI-created images or videos have appeared online, sometimes leading people to believe false events). This is a segue into ethics.
- **Ethics Jigsaw Discussion (15 min):** Divide the class into **three focus groups**, each tackling one of the following ethical scenarios involving AI:
- **Academic Integrity:** A student uses ChatGPT to write a homework essay. Is this plagiarism or cheating? How should teachers and schools handle this? (Discuss honesty, learning impact, and possible policies.)
- **Bias and Reliability:** An AI chatbot gives answers that contain subtle biases or inaccuracies about a historical or social topic. What are the risks of trusting AI output? How can we double-check information? (Discuss the importance of human oversight, fact-checking, and how bias can enter AI from biased training datahttps://www.joinprisma.com/blog/ai-in-the-classroom.
- **Creativity and Copyright:** An artist's style is mimicked by AI images (like DALL·E producing a Van Gogh-style picture) or AI-generated music mimics real artists. Is it fair to use an AI to create art in someone else's style? Who owns the AI-created content? (Discuss intellectual property and the value of human creativity.)

Give each group a printed scenario or have it on the board. Groups discuss for ~7-10 minutes, noting their thoughts. The teacher rotates to facilitate, ensuring each group considers pros, cons, and real examples. (For instance, you might inform them that AI-generated songs mimicking real singers have been releasedhttps://www.joinprisma.com/blog/ai-in-the-classroom, and companies and lawmakers are currently debating the legality and ethics of such cases.)

- **Group Presentations (10 min):** Each group briefly shares their scenario and a summary of their discussion. After each group, invite one question or comment from the rest of the class to foster cross-talk. The teacher highlights common threads: **responsibility** (both users and creators of AI have a responsibility), the need for **critical thinking** when using AI outputs, and awareness of **ethical guidelines**. Note that institutions worldwide, including the EU, are working on guidelines for ethical AI use in education and beyond. For example, the European Commission has published teacher guidelines on using AI and is updating them to address generative AI developments. This shows students that their discussions connect to real policy efforts.

Activity 2/Session 2: (45 minutes)	• Conclusion – Big Takeaways (5 min): Conclude with a whole-class reflection. Ask: “How do you feel about AI now – is it more of an opportunity or a challenge?” Students can do a quick round-robin or write a one-sentence takeaway. Emphasize the interdisciplinary nature of what they learned: • In Computer Science, they demystified how AI tools work at a basic level. • In Language, they examined and produced communication with and about AI. • In Math, they saw how data patterns and probabilities drive AI outputs. • In all subjects, they practiced critical thinking and ethics – evaluating when and how AI should be used. • End on a forward-looking note: AI will likely be part of their future jobs and lives, so understanding it and using it responsibly (a key message echoed by educators and policymakers) will give them a head startWrap-Up of Session 1 (5 min): Recap the main takeaways: AI can generate realistic text and is a powerful tool, but it has limitations. Reinforce that Computer Science helped us understand how it works, Language Arts let us critique the writing quality, and Math gave us insight into the underlying probability mechanism. Tease the next session: “Tomorrow, we’ll see how AI creates images and tackle some big questions about ethics and creativity.” . Thank the class for their participation and encourage them to continue exploring and questioning technology in a thoughtful way.
Teacher Tips	This lesson is firmly grounded in real-world developments and European educational priorities. AI is not a distant science-fiction topic but an everyday reality – from social media filters to virtual assistants – and students may already be using it (knowingly or unknowingly) in their lives. By exploring tools like ChatGPT and DALL·E in class, students gain digital literacy and AI literacy, which are increasingly seen as essential skills. In fact, education surveys indicate a growing number of students and teachers are interacting with AI tools for schoolwork, underscoring the need for guidance in schools. The ethical discussions tie directly to current global and European conversations. The European Commission, for example, has emphasized raising awareness of AI’s impacts and ethical risks in education. There are EU initiatives and guidelines aimed at helping teachers and students use AI responsibly and effectively. By engaging with these topics, the lesson supports EU goals such as developing students’ critical thinking, digital competence, and understanding of emerging technologies. It also highlights real-world applications of AI – from AI-generated media in entertainment to its use in professional fields – helping students connect classroom learning to the outside world. Ultimately, this interdisciplinary lesson shows students how Computer Science, Language, and Mathematics intertwine in the context of AI. It equips them with practical experience (using AI tools), analytical skills to question and assess technology (reading, writing, and quantitative reasoning), and a values-oriented perspective (ethics and societal impact). These competencies are crucial for young people in Europe and beyond as they navigate a future where AI will play an ever-growing role. The lesson thus not only meets curriculum objectives in three subjects, but also contributes to shaping informed, responsible citizens in line with broader educational aims.
Appendix	Presentation in the Digital Repository