Unit 7: Artificial Intelligence

Content Area: **Computer Science**
Course(s):
Time Period: **Marking Period 2**
Length: **15 Days**
Status: **Published**

Summary

As artificial intelligence continues to shape the future of digital interaction, it is essential for students entering the field of web design to understand both the practical applications and ethical implications of AI technologies. This unit introduces students to the emerging role of AI in web development, with a focus on how AI tools can assist with layout design, content generation, image editing, accessibility, and user experience optimization. Through guided exploration, students will analyze the benefits and limitations of AI-driven design, compare human and machine-generated outputs, and reflect on responsible and ethical use, particularly in relation to originality, authorship, and copyright concerns. Over the course of this 2–3 week unit (approximately 8-10 hours of instructional time), students will engage with hands-on activities, real-world examples, and critical discussions designed to prepare them to make informed, conscientious decisions about incorporating AI tools into their future design workflows.

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MATH.K-12.1	Make sense of problems and persevere in solving them
ELA.L.SS.11–12.1	Demonstrate command of the system and structure of the English language when writing or speaking.
MATH.K-12.3	Construct viable arguments and critique the reasoning of others
ELA.L.KL.11–12.2	Apply knowledge of language to understand how language functions in different contexts, to make effective choices for meaning or style, and to comprehend more fully when reading or listening.
MATH.K-12.5	Use appropriate tools strategically
MA.9-12.1.2.12prof.Pr4	Selecting, analyzing, and interpreting work.
MA.9-12.1.2.12prof.Pr5	Developing and refining techniques and models or steps needed to create products.
WRK.K-12.P.4	Demonstrate creativity and innovation.
WRK.K-12.P.5	Utilize critical thinking to make sense of problems and persevere in solving them.
WRK.K-12.P.6	Model integrity, ethical leadership and effective management.
WRK.K-12.P.8	Use technology to enhance productivity increase collaboration and communicate effectively.
WRK.K-12.P.9	Work productively in teams while using cultural/global competence.
TECH.9.4.12.CT	Critical Thinking and Problem-solving
TECH.9.4.12.DC	Digital Citizenship
TECH.9.4.12.IML	Information and Media Literacy
	The ability to ethically integrate new technologies requires deciding whether to introduce a technology, taking into consideration local resources and the role of culture in acceptance. Consequences of technological use may be different for different groups of people and may change over time. Since technological decisions can have ethical implications, it is essential that individuals analyze issues by gathering evidence from

multiple perspectives and conceiving of alternative possibilities before proposing solutions.

Network security depends on a combination of hardware, software, and practices that protect data while it is at rest, in transit, and in use. The needs of users and the sensitivity of data determine the level of security implemented. Advanced attacks take advantage of common security vulnerabilities.

A computing system involves interaction among the user, hardware, application software, and system software.

Digital tools such as artificial intelligence, image enhancement and analysis, and sophisticated computer modeling and simulation create new types of information that may have profound effects on society. These new types of information must be evaluated carefully.

Network connectivity and computing capability extended to objects, sensors and everyday items not normally considered computers allows these devices to generate, exchange, and consume data with minimal human intervention. Technologies such as Artificial Intelligence (AI) and blockchain can help minimize the effect of climate change.

Engineers use science, mathematics, and other disciplines to improve technology. Increased collaboration among engineers, scientists, and mathematicians can improve their work and designs. Technology, product, or system redesign can be more difficult than the original design.

Successful troubleshooting of complex problems involves multiple approaches including research, analysis, reflection, interaction with peers, and drawing on past experiences.

Complex programs are designed as systems of interacting modules, each with a specific role, coordinating for a common overall purpose. Modules allow for better management of complex tasks.

The design and use of computing technologies and artifacts can positively or negatively affect equitable access to information and opportunities.

Complex programs are developed, tested, and analyzed by teams drawing on the members' diverse strengths using a variety of resources, libraries, and tools.

Changes caused by the introduction and use of a new technology can range from gradual to rapid and from subtle to obvious, and can change over time. These changes may vary from society to society as a result of differences in a society's economy, politics, and culture.

Essential Questions/Enduring Understandings

Essential Questions:

- How can AI tools support and enhance the process of web design and development?
- What are the ethical responsibilities of web designers when using AI-generated content, images, or code?
- In what ways does AI change the role of creativity, authorship, and decision-making in web design?

Enduring Understandings:

- AI tools can streamline aspects of web design by generating content, assisting with layout decisions, improving accessibility, and automating repetitive tasks, but they do not replace the need for human creativity and judgment.

- The use of AI in web design raises important ethical questions around originality, authorship, bias, and copyright, requiring designers to be responsible digital citizens.
- Understanding the capabilities and limitations of AI empowers web designers to make informed decisions about when and how to use these tools effectively and ethically.

Objectives

Students Will Know:

- That AI tools can assist with web design tasks such as layout generation, code suggestions, image editing, and content creation.
- That using AI-generated content requires careful attention to issues like copyright, attribution, bias, and originality.
- That AI is a tool that complements, but does not replace, human creativity and critical thinking in design.

Students Will be Skilled at:

- Identifying appropriate use cases for AI tools in the web design process.
- Critically evaluating AI-generated images, text, or code for quality, originality, and ethical use.
- Using an AI design tool (such as an image generator, layout assistant, or code suggesting) to enhance a basic web page while maintaining creative and ethical control.
- Explaining the decision-making process behind incorporating or rejecting AI-generated elements in a design project.

Learning Plan

- Project-Centered Work
    - Students apply their knowledge of HTML, CSS, and Photoshop while incorporating AI tools (e.g., text generators, image creators, or code assistants) into a design project—such as building a themed web page or redesigning a personal portfolio—with guided checkpoints focused on responsible AI use.
- Inquiry & Reflection
    - Essential questions drive class discussion and activities. Students investigate:

When should AI be used?

What are the implications of using AI-generated content?

What makes a design “original” in an AI-assisted workflow?
These questions promote reflection and discussion, anchoring the ethical dimensions of the unit.

- Hands-On Tool Exploration
    - Students try out specific AI tools (with updated teacher-curated options), analyze results, and compare outcomes to their own manual design/code solutions. This fosters digital literacy and discernment.
- Scaffolded Learning
    - Each class period focuses on one key concept or skill (e.g., copyright, bias in AI-generated images, prompt crafting for layout or image generation, evaluating AI code), building toward the final project.
- Presentation & Evaluation
    - Students present their projects with a short written or spoken reflection explaining how and why they used AI, what they kept or changed, and how they addressed any ethical concerns.

Assessment

- Formative:
    - Reflections,
    - ethical case study worksheet
    - class participation
    - Final project
- Summative:
        - creativity
        - AI use
        - coding
        - visual design
        - ethical reflection
- Alternative:

- verbal discussions
- debrief
- presentations

Materials

- Core instructional materials: Core Book List
- Supplemental materials:
  - Internet
  - Computers
  - Projection system for lecture
  - w3schools
  - chatGPT
  - Harvard U - Berkman Klein Center
  - CodeHS (for remediation and differentiation as deemed appropriate)
  - Bootstrap example code