

Hacking the Cell Cycle with AI

Grade Level: **9-12** | Duration: **60 minutes** | Subject Area: **Biology**

(Note: this lesson's duration was calculated excluding time estimates for the assessment)

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This lesson was designed for the WeTeach_AI **Advancing AI Literacy Project**. The project supports the development of standards-aligned AI literacy lessons written by teachers for teachers. Additional lesson plan material, such as rubrics, answer keys, activity guides, and instructional considerations can be [found here](#) on our website.

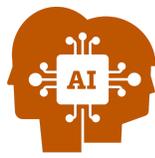
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“Based in North East Texas, I am a STEM educator and leader with nearly 30 years of experience from early childhood to higher education. Passionate about equity and innovation, I design hands-on learning experiences that integrate emerging technologies and make STEM approachable for all. This AI literacy lesson was created to empower students and educators to confidently navigate and apply new technologies to expand access and opportunity in STEM.”

Lesson Description

In this culminating lesson, students will synthesize their knowledge by creating AI-assisted projects such as infographics, video scripts, or interactive quizzes. They'll brainstorm ideas, collaborate with AI tools, and produce engaging products that demonstrate mastery of cell cycle concepts and AI literacy. Peer review and reflection activities will help students evaluate both their learning and the role of AI in shaping their understanding. This hands-on experience empowers learners to apply science and technology creatively.



Lesson Objectives

(formatted as “Students will be able to...” statements)

- Design and produce an AI-assisted artifact (infographic, script, podcast, or interactive quiz) that accurately communicates the cell cycle, replication, and differentiation/cancer connections.
- Defend biological claims in their product with cited evidence and document how AI was used, its limitations, and what was revised.
- Critique peer products using a standards-aligned rubric and recommend targeted improvements.
- Reflect on learning to evaluate how AI supported or limited understanding and formulate best-practice guidelines for future use.

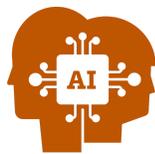
Essential Questions

1. *What makes a scientific explanation both accurate and compelling for an audience?*
2. *How should we collaborate with AI to enhance learning and communication without sacrificing accuracy or ethics?*

TEKS Alignment (Texas Standards Alignment)

§112.42 Biology

- **(c)(6)(A):** Explain the importance of the cell cycle to the growth of organisms, including an overview of the stages of the cell cycle and deoxyribonucleic acid (DNA) replication models.
- **(c)(6)(B):** Explain the process of cell specialization through cell differentiation, including the role of environmental factors.
- **(c)(6)(C):** Relate disruptions of the cell cycle to how they lead to the development of diseases such as cancer.



CSTA/ISTE Alignment (National Standards Alignment)

CSTA	ISTE
3A-AP-22: Design and develop computational artifacts working in team roles using collaborative tools.	2.4.b: Collaborate and co-learn with students to discover and use new digital resources and diagnose and troubleshoot technology issues.

Effective Pedagogical Strategies

The instructor utilizes a mixture of instructional strategies (e.g., discussions, modeling, student activities, worksheets, projects).	Student experiences, expertise, and prior knowledge are respected and accounted for in the content design.
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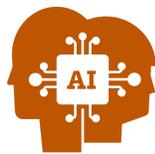
AI Literacy Competencies

(based on TeachAI Framework)

Creating with AI 1: Use AI systems to explore new perspectives and approaches that build upon original ideas.	Managing AI 3: Direct generative AI systems by providing specific instructions, appropriate context, and evaluation criteria.
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Key Terms

Term	Definition
Algorithm	Step-by-step procedure for solving a problem, used in AI systems.
Bioinformatics	Use of computational tools to analyze biological data.
Genetic Engineering	Direct manipulation of an organism's genes using biotechnology.
Mutation	A change in DNA sequence that can alter cell function.
Predictive Model	AI system that forecasts biological outcomes based on data.



Launch

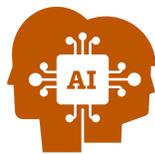
Engaging activity or prompt to introduce the lesson. **Estimated time: 10 minutes**

Objective: Activate prior knowledge about the cell cycle and inspire students to think creatively about communicating science using AI tools.

Materials:

- Examples of science communication artifacts (infographic, short video, interactive quiz)
- Projector or screen
- Quick poll tool (Mentimeter, Google Forms, or hand-raise)

Teacher Instructions	Sample Teacher Remarks
<p>Display two or three examples of engaging science communication pieces (infographic, short video clip, or interactive quiz). Some examples are provided below:</p> <ul style="list-style-type: none"> - How AI is finding cancer treatments with... - The Future of AI and Cancer Research - AI and Cancer - NCI <p>Ask students to analyze what makes these examples effective. Pose the essential question:</p> <ul style="list-style-type: none"> - <i>“What makes a scientific explanation accurate AND compelling for an audience?”</i> <p>Conduct a quick poll: <i>“Would you trust AI to help create science content for students? Why or why not?”</i></p> <hr/> <p>Anticipated Student Outcomes</p> <ul style="list-style-type: none"> - <i>Students identify qualities of effective science communication.</i> - <i>Students connect prior knowledge of the cell cycle to real-world communication challenges.</i> - <i>Students understand the purpose and expectations for creating an AI-assisted artifact.</i> 	<p><i>“Take a look at these examples—what grabs your attention? Is it the visuals, the clarity, or something else?”</i></p> <p>(Pause for responses)</p> <p><i>“Now, think about the cell cycle. It’s complex, but we need to make it understandable and engaging. What makes an explanation both accurate and compelling?”</i></p> <p>(Invite ideas)</p> <p><i>“Would you trust AI to help create science content? Why or why not? Let’s see what you think in our quick poll.”</i></p> <p>(Conduct poll and briefly discuss results)</p> <p><i>“Great insights! Today, you’ll create your own artifact—an infographic, video script, podcast outline, or interactive quiz. You’ll collaborate with AI, but you’ll also check its work carefully. Your goal is to make something accurate, creative, and clear.”</i></p>



Exploration

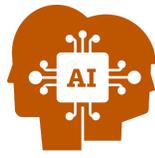
Step-by-step student tasks, experiments, or investigations. **Estimated time: 30 minutes**

Objective: Students will collaborate with AI tools to design and refine a science communication artifact (infographic, video script, podcast outline, or interactive quiz) that accurately explains the cell cycle and its connection to cancer, while documenting AI’s role and limitations.

Materials:

- Graphic organizers for planning artifact content (provided in this lesson’s resources)
- Prompt refinement guide with examples (provided in this lesson’s resources)
- Rubric for assessment (provided in this lesson’s resources)
- Student devices with access to AI tools
- Textbook or vetted reference sources

Teacher Instructions	Sample Teacher Remarks
<p>Explain that students will create an AI-assisted artifact to communicate the cell cycle and cancer connection clearly and accurately.</p> <p>Emphasize that AI is a partner, not the final authority—students must verify and revise AI outputs.</p> <p>Allow students to select their preferred artifact type: infographic, video script, podcast outline, or interactive quiz.</p> <p>Provide brief examples or descriptions of each format to guide decision-making.</p> <p>Students generate initial content using AI (e.g., draft script, quiz questions, infographic layout).</p> <p>Encourage students to annotate AI output: highlight accurate points, flag errors, and note revisions.</p> <p>Share examples of effective prompts:</p> <ul style="list-style-type: none">- “Create a 5-question quiz on the cell cycle for high school students.”- “Draft a 60-second video script explaining why	<p><i>“Now that you’ve seen how science communication can be creative, it’s your turn to design an artifact that explains the cell cycle and its link to cancer. You can choose an infographic, a short video script, a podcast outline, or an interactive quiz.”</i></p> <p>(Pause for students to choose formats)</p> <p><i>“AI will help you brainstorm and draft ideas—but remember, it’s not perfect. Your job is to check its work and make revisions so your artifact is accurate and engaging.</i></p> <p><i>Start by giving AI a clear prompt. For example: ‘Create a 5-question quiz on the cell cycle for high school students.’</i></p> <p><i>If the response is too vague, refine your prompt by adding details like: ‘Include stages of the cell cycle and why cancer occurs when the cycle is disrupted.’”</i></p> <p>(Circulate and support)</p> <p><i>“Highlight what AI got right and what needs fixing. Ask yourself: ‘Would a scientist agree with this</i></p>



<p>cancer occurs when the cell cycle is disrupted.”</p> <ul style="list-style-type: none">- Scaffold refinement for struggling students:- “Add visuals and include key enzymes.”- “Make it engaging for teens—use analogies.” <p>Circulate and ask students guiding questions:</p> <ul style="list-style-type: none">- “What evidence supports this claim?”- “How did you improve the AI’s response?”- “Would a scientist agree with this explanation?” <p>Remind students they will present their artifact concept and one example of an AI-generated element they revised during the discussion phase.</p>	<p><i>explanation?’</i></p> <p><i>Use your textbook or trusted sources to verify. By the end of this activity, you’ll have a draft artifact and notes on how AI helped—and where you had to step in.”</i></p> <hr/> <p>Anticipated Student Outcomes</p> <ul style="list-style-type: none">- <i>Students produce a draft artifact that demonstrates accurate understanding of the cell cycle and cancer connection.</i>- <i>Students document AI’s contributions, limitations, and revisions made for accuracy.</i>- <i>Students practice prompt refinement and evidence-based reasoning.</i>
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Whole Class Discussion

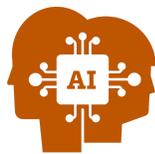
Discussion questions, teacher prompts, and expected student responses. **Estimated time: 20 minutes**

Objective: Students will share their AI-assisted artifact concepts, critique AI’s role in the process, and synthesize best practices for accurate and ethical AI collaboration in science communication.

Materials:

- Discussion prompts displayed on a board or screen
- Rubric for peer review (provided in this lesson’s resources)
- Student draft artifacts (infographic, script, podcast outline, or quiz)

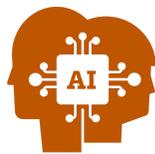
Teacher Instructions	Sample Teacher Remarks
<p>Explain that each group will briefly present their artifact concept and one AI-generated element they revised. Emphasize constructive critique and evidence-based reasoning during discussion.</p> <p>Call on groups to share:</p> <ul style="list-style-type: none">- Artifact type and purpose- Example of an AI-generated element they improved	<p><i>“Now that you’ve worked with AI to design your artifact, let’s share what you created and what you learned. Each group will present your artifact concept and one example of an AI-generated element you revised.”</i></p> <p>(Pause for first group to present)</p> <p><i>“Thank you! As you listen, think about these questions:</i></p>



<ul style="list-style-type: none">- How they ensured scientific accuracy <p>Display prompts:</p> <ul style="list-style-type: none">- “What did AI do well?”- “Where did it fall short?”- “How did you ensure scientific accuracy?” <p>Encourage students to compare experiences and note patterns in AI performance. Summarize key takeaways on the board:</p> <ul style="list-style-type: none">- Clear, specific prompts improve AI output- Verification with trusted sources is essential- AI can enhance creativity but requires human oversight	<p><i>What did AI do well? Where did it fall short? How did you make sure your final product was scientifically accurate?”</i></p> <p>(After a few presentations, invite discussion.)</p> <p><i>“I’m hearing some common themes—AI gave good structure but missed details, or it was creative but not always accurate. What strategies worked best for improving AI responses?”</i></p> <p>(Write student ideas on board)</p> <p><i>“Here are our best practices: use clear prompts and verify with trusted sources, and always apply human judgment. These guidelines will help us—and anyone using AI—create accurate, ethical science communication.”</i></p>
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Anticipated Student Outcomes

- Students articulate strengths and weaknesses of AI in science communication.
- Students identify strategies for improving AI outputs and ensuring accuracy.
- Students collaboratively develop best-practice guidelines for AI use in learning.



Assessment

Formative or summative assessment tasks and criteria.

Objective: Measure students' mastery of cell cycle concepts and their ability to design accurate, engaging AI-assisted artifacts, critique AI's role, and reflect on best practices for responsible AI use.

Materials:

- Peer review rubric (provided in this lesson's resources)
- Rubric for assessment (provided in this lesson's resources)
- Student-created artifacts (infographic, video script, podcast outline, or interactive quiz)

⚠ Note: The time estimates for the various assessment options vary. If time is limited, peer review and reflection can be completed outside of class.

Assessment Opportunities	Facilitation Tips
<p>AI + Me: Communicating Science Responsibly</p> <p><u>Artifact Evaluation</u> Must include accurate explanation of the cell cycle, replication, and cancer connection. It should document AI's contributions, limitations, and revisions.</p> <p><u>Peer Review</u> Students use a rubric to provide each other feedback and critique clarity, accuracy, creativity, and evidence use. Students will provide one targeted improvement suggestion.</p> <p><u>Reflection Prompt</u> "How did AI support or limit your understanding? What guidelines would you recommend for using AI in science?"</p> <p>If assigning outside of class, post clear submission guidelines. Here is a rubric template for assessing student submissions.</p>	<p>Provide clear rubric and expectations before students finalize artifacts. <i>Circulate during group work and ask:</i></p> <p><i>"What evidence supports your decision to accept or reject this AI detail?"</i></p> <p>Encourage students to annotate artifacts with notes like: <i>"AI suggested this—verified by textbook."</i></p> <p>Reinforce evidence-based reasoning: "Use examples from today's activity and discussion to support your answer."</p> <p>Offer sentence starters for scaffolding:</p> <ul style="list-style-type: none">- <i>"One way AI helped me communicate science effectively was ___ because ___."</i>- <i>"One limitation I noticed when using AI was ___ because ___."</i>- <i>"The most important revision I made was ___ because ___."</i>- <i>"If I were to use AI again for science communication, I would ___ because ___."</i>- <i>"A best-practice guideline I recommend is ___ because ___."</i>