Develop STEM skills using cross-curricular teaching pathways

Your STEAM Lesson Plan

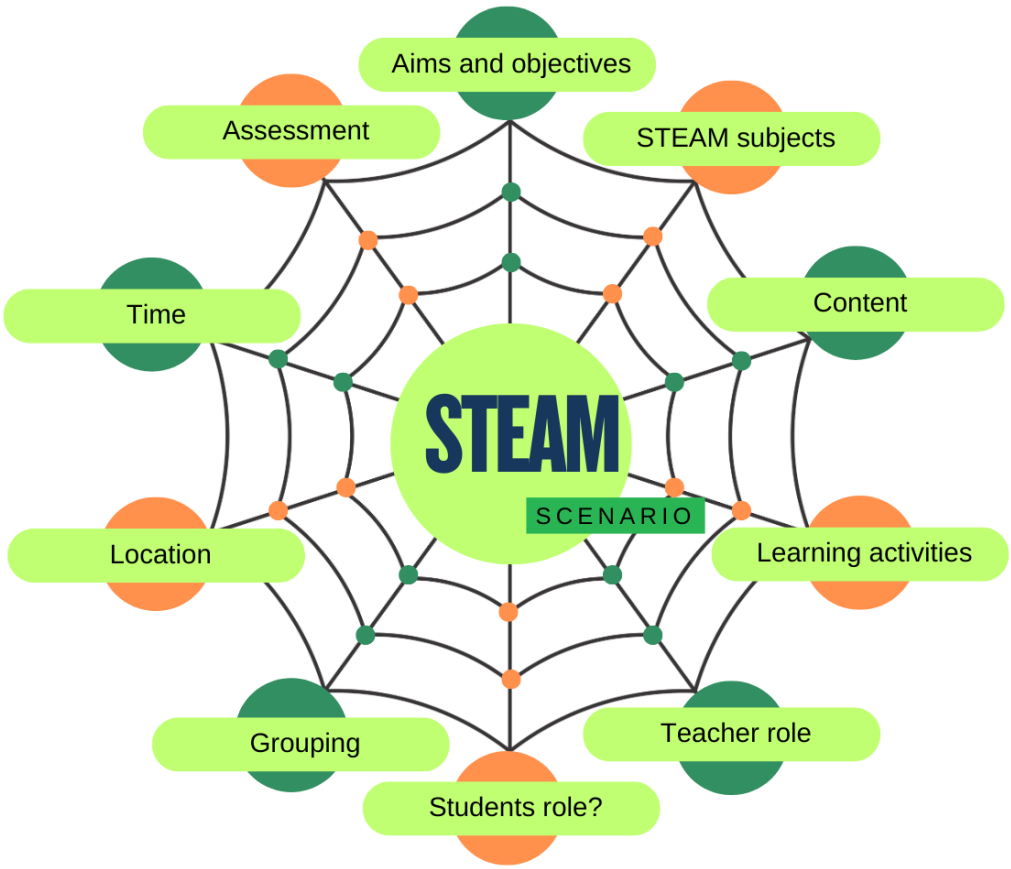
1 LESSON OVERVIEW

YOUR NAME & SURNAME: FUNDA ALTINTAŞ

TITLE OF YOUR LESSON: PODCASTS WITH AI ABOUT CLIMATE CHANGE

SUMMARY: *Students will be able to learn more about climate change and its effects on oceans and living creatures in the ocean. They will discuss on this subject. At last prepare a 4-minutes podcast summarizing all their findings.*

SIZE OF CLASS: 20-25 (12-16 YEARS OLD)



2 THE SPIDER WEB OF LEARNING

What is the rationale? *Students need to understand climate change because it is one of the most pressing global issues. Learning about its impact on oceans and marine life helps students make connections between science, human behavior, and environmental responsibility. Using AI and podcasting encourages digital literacy, creativity, and communication skills, which are essential for the 21st century.*

Aims and objectives:

- *To understand the causes and effects of climate change, especially on oceans and marine ecosystems.*
- *To develop research, collaboration, and communication skills in English language.*
- *To apply AI tools to create a podcast, combining creativity with technology.*
- *To raise awareness and encourage responsible behavior toward the environment.*

STEM subjects:

- ***Science:*** *Climate change, ocean ecosystems, marine biology.*
- ***Technology:*** *AI tools for podcast creation (e.g., transcription, voice synthesis, editing).*
- ***Engineering:*** *Sound recording and editing techniques.*
- ***Mathematics:*** *Data analysis related to climate patterns or ocean temperatures.*
- ***English (Language Arts):*** *Research, writing scripts, summarizing findings.*
- ***Geography:*** *Effects of climate change on different regions of the world.*
- ***Art/Media Literacy:*** *Designing podcast covers, selecting music or sound effects.*

Content:

- Scientific understanding of climate change and its effect on marine life.
- Research and critical thinking skills.
- How to structure and produce a podcast.
- Use of AI tools in media creation.
- Collaboration and oral communication skills.

Learning activities:

- **Discussion:** Introduction to climate change and its effects.
- **Research:** In small groups, students research using digital tools and articles.
- **Script Writing:** Students write a podcast script summarizing their findings.
- **AI Tools:** Use AI to generate parts of the podcast (e.g., narration or music).
- **Podcast Recording and Editing:** Finalize a 4-minute podcast.
- **Presentation and Reflection:** Groups share their podcasts with the class.

Teacher role:

- *Guide discussions and provide background knowledge.*

- *Support students in using AI tools and ensure safe digital practices.*
- *Monitor group work and give feedback.*
- *Facilitate reflection and help students connect their learning to real-world issues.*

Students' role:

- *Active researchers and content creators.*
- *Collaborate in groups to share ideas and divide tasks.*
- *Use technology creatively and responsibly.*
- *Reflect on their learning and communicate it through a podcast.*

Grouping:

*Students will work in **groups of 4-5** to encourage teamwork and manage roles efficiently (e.g., researcher, scriptwriter, tech lead, editor).*

Location:

- *Mainly in the **classroom and computer lab**.*
- *AI tools and podcast editing can also be done **online** if students have access.*

Time:

- **1st 40 minutes:** Introduction, discussion, and group research.
- **2nd 40 minutes:** Script writing and AI tool use.
- **3rd 40 minutes:** Podcast recording, editing, and group presentations.

3 ACTIVITIES

In the following section you are asked to describe the different activities which make up your lesson plan. You can add more activities by simply copy-pasting the above activity box for as many times as you require for your lesson plan.

ACTIVITY 1

Learning Outcomes, 21 century Skills, and Competencies What are the main objectives of this activity? Consider the Bloom's Taxonomy and write here the skills the learner will develop and demonstrate during this activity (e.g., communicative skills, computational thinking, problem solving, etc).	• **Remembering & Understanding:** Identify key facts about climate change and its effects on oceans and marine life. • **Applying:** Use AI tools to plan and produce a podcast. • **Analyzing:** Compare different sources of information and evaluate environmental data. • **Creating:** Design and record an original 4-minute podcast to communicate research findings. • **Evaluating:** Reflect on the quality and clarity of the podcast and peer contributions. **Skills and Competencies Developed:** • **Communication Skills:** Writing scripts, discussing in groups, presenting findings.

	• **Critical Thinking & Problem Solving:** Analyzing environmental problems and finding ways to explain them. • **Digital Literacy & Computational Thinking:** Using AI and podcast tools effectively. • **Collaboration & Teamwork:** Working in groups to divide tasks and share responsibilities. • **Creativity:** Creating engaging and informative podcast content. • **Media Literacy:** Evaluating digital sources and using media tools responsibly.
Role of teacher What is the role of the teacher in this activity? Write here what the teacher will be doing during this activity and what is his specific role for it.	The teacher acts as a facilitator and guide throughout the activity. Their specific roles include: Introducing the topic and explaining the objectives. Supporting students during research and helping them understand complex concepts. Guiding the use of AI and podcast tools. Monitoring group work, encouraging collaboration, and providing feedback. Assessing the final podcasts and promoting reflection on the learning process.
Role of students What is the role of the students in this activity? Write here what the students will be doing during this activity and what is their specific role for it.	Students take an **active and collaborative** role in their learning. Their specific tasks include: • Researching information about climate change and its effects on oceans. • Working in groups to discuss findings and write a podcast script. • Using AI tools to support podcast creation (e.g., voice, editing, music). • Recording and editing a 4-minute podcast. • Presenting their podcast and reflecting on what they learned.
ICT Tools and Resources required What ICT tools, resources or other technologies will be required? Choose the tool(s) and explain how you will use it.	Internet Access: For students to research climate change, find reliable sources, and gather data. Computers/Tablets: To write scripts, use AI tools, and edit the podcast. AI Tools (e.g., ChatGPT, AI Voice Generators): Used for generating ideas, improving scripts, creating voiceovers or summaries. Podcast Editing Software (e.g., Audacity, GarageBand, or Anchor): For recording, editing, and mixing the podcast audio. Microphones/Headphones: To ensure good sound quality during recording. Presentation Tools (e.g., PowerPoint, Canva): Optional tools to create a cover or short visual intro for their podcast presentation.

Description of the activity Share here the description of the activity.	In this activity, students will explore the topic of climate change, with a focus on its effects on oceans and marine life. Working in small groups, they will research scientific facts, collect data, and discuss their findings. Then, they will write a script and use AI tools to help them create a 4-minute podcast summarizing what they have learned. Throughout the process, students will use digital tools to research, write, record, and edit their podcast. They will collaborate, share ideas, and use technology creatively. In the final stage, each group will present their podcast to the class, followed by a brief reflection and discussion. This activity combines science, technology, communication, and creativity, helping students develop 21st-century skills in an engaging and meaningful way.

4 ASSESSMENT

How will students be assessed on their learning?

1. **Research Quality (Content Knowledge):**
   - Accuracy and depth of information about climate change and ocean life.
   - Use of reliable sources.
2. **Collaboration and Participation:**
   - Active contribution to group work.
   - Positive teamwork and equal task sharing.
3. **Podcast Content and Structure:**
   - Clear and logical script.
   - Well-organized presentation of findings.
4. **Use of ICT and AI Tools:**
   - Effective and responsible use of technology.
   - Creativity in applying digital tools.
5. **Communication Skills:**
   - Clear voice, good pacing, and engaging tone in the podcast.
   - Ability to summarize key points effectively.
6. **Reflection and Presentation:**
   - Presentation of the final podcast.
   - Participation in group reflection or class discussion.

Assessment can be done using a simple **rubric** with levels such as "Excellent," "Good," "Needs Improvement" for each category. Peer and self-assessment can also be included to encourage reflection.

5. REFLECTING ON THE DEVELOPMENT PROCESS

Inspiration and Initial Ideas

Clearly articulate the sources of inspiration for this plan, mentioning particularly sources of inspiration provided through the course.

This lesson plan was developed based on several key concepts and approaches introduced throughout the course. One major source of inspiration was the emphasis on STEAM education, which encourages the integration of science, technology, engineering, arts, and mathematics. This interdisciplinary approach shaped the overall structure of the activity, allowing students to explore scientific topics through creative and technological means. Additionally, the course's focus on project-based learning (PBL) inspired the idea of students working collaboratively on a meaningful, real-world task—in this case, creating a podcast to raise awareness about climate change and its impact on oceans. The inclusion of AI tools in the lesson plan was also directly influenced by course content that demonstrated how emerging technologies can support student creativity, engagement, and digital literacy. Furthermore, the lesson design was guided by the 21st-century skills framework, which highlights the importance of critical thinking, communication, collaboration, and the responsible use of digital tools. Finally, modules related to climate change and sustainability within the course played a key role in selecting the topic, as they emphasized the importance of educating young people about global environmental issues and empowering them to take action. Altogether, these sources helped shape a dynamic and student-centered learning experience that connects curriculum goals with real-world relevance.

Planning Process

Describe the steps taken to create this plan and explain how thoughts were organised during the planning process.

The planning process for this lesson began with identifying a meaningful and relevant topic that aligns with both STEAM objectives and current global challenges—climate change and its impact on oceans. Once the topic was chosen, the next step was to define clear learning goals and outcomes, using Bloom's Taxonomy to ensure a progression from understanding to creating. The integration of AI tools and podcast production was then considered to make the lesson engaging and to promote 21st-century skills such as creativity, collaboration, and digital literacy. After establishing the content and tools, the lesson was structured into three 40-minute sessions, each with specific activities that build on one another—from research and discussion to scriptwriting, and finally podcast creation and presentation. Roles of the teacher and students were clearly defined to support active, student-

centered learning. Finally, assessment criteria were designed to evaluate both the learning process and the final product. Throughout the planning process, ideas were organized around the principles of STEAM education, project-based learning, and real-world relevance, ensuring that the lesson would be both educational and impactful.

Learning from the Process

Reflect on your personal planning and development process for designing this lesson plan. What key insights and lessons did you learn?

Designing this lesson plan offered valuable insights into how interdisciplinary approaches like STEAM and project-based learning can create more meaningful and engaging educational experiences. One of the key lessons I learned was the importance of balancing structure with flexibility—while clear goals and session plans are essential, allowing space for student creativity and collaboration enriched the process and outcomes. I also realized how powerful technology, especially AI tools, can be in enhancing student agency and digital literacy when thoughtfully integrated.
Another important insight was the value of starting with a real-world problem—in this case, climate change—and building the lesson around that issue. This not only increased student motivation but also helped link classroom learning to global citizenship and social responsibility. The process also reinforced the importance of clear role definitions and scaffolding, particularly when introducing new formats like podcasting.
Finally, I came to appreciate how planning with 21st-century skills in mind—such as critical thinking, communication, and collaboration—can guide decisions in meaningful ways. This experience has strengthened my ability to design student-centered, technology-enhanced lessons and has encouraged me to continue exploring creative, real-world approaches in future teaching practices.