BURSA İNOVASYON MERKEZİ

STEM ve YAPAY ZEKA TEMA: SÜRDÜRÜLEBİLİR TARIM PROGRAMI

STEM ETKİNLİK PLAN ŞABLONU

Team Name:	Green Ideas
Teachers' Names:	Müberra Nuran Karadavut, Mine Polat, Seda Gülal Kartal, Sibel Bayraktar
Topic Title:	Greening the Future: Green Roofs and Grass Seeding Techniques; Key Points to Consider When Planting Grass
Learning Objectives / Goals:	Students gain basic knowledge about green roof applications and drip irrigation systems, learn soil enrichment and grass planting techniques. Students learn how to apply green roof systems to model houses. Students install drip irrigation systems on their model houses. Students enrich soil by producing compost. Students prepare soil and plant grass seeds.
Related Learning Outcomes:	Science: Effects of soil modifications (compost production, soil enrichment) on ecosystems. Understanding how drip irrigation systems enable efficient use of water.
	Social Studies: Contributions of sustainable agriculture practices and environmentally friendly technologies to social and economic development.
	Mathematics: Calculating green roof areas and determining quantities of materials used. Analyzing collected data on irrigation efficiency and plant growth.
	Turkish Language: Presenting project results to classmates or other teachers. Writing short stories or poems about environmentally friendly agricultural methods.
	Preparing a project to apply what we learned in this lesson on our school's terrace.
Grade Level:	4th Grade
Duration:	6 Class Hours
21st Century Skills:	Critical Thinking and Problem Solving: Finding innovative and analytical solutions. Communication: Expressing ideas effectively and improving listening and understanding. Teamwork and Collaboration: Working effectively with others toward common goals. Creativity and Innovation: Generating new ideas and improving existing systems. Digital Literacy: Using technology effectively and evaluating digital information. Adaptability and Flexibility: Adjusting to changing conditions. Entrepreneurship: Taking risks, setting goals, and working persistently to achieve them.
Learning Approach:	Inquiry-Based Learning: Students ask questions about concepts they need to learn. For example: • Why are green roofs important? • How does a drip irrigation system save water? • How does compost improve soil quality?

	Project-Based Learning: Students learn by creating a meaningful real-world product (model houses with green roofs and drip irrigation systems). They gain practical experience and develop planning, collaboration, and problem-solving skills.
Tasks (Teacher and Student Roles):	Teacher Responsibilities: 1. Guidance: Guides students throughout the project and encourages inquiry. 2. Preparing and distributing materials needed for the project. 3. Observation and evaluation of student participation and development. 4. Facilitating group work and ensuring fair task distribution. Student Responsibilities: 1. Research: Collect information about green roofs, drip irrigation, compost, and grass planting. 2. Asking questions and generating ideas. 3. Model construction and system installation. 4. Compost production and soil preparation for planting grass.
Materials / Technologies:	For Green Roof and Model House: • Cardboard or carton (for model houses) • Plastic or small pots (for mini roof gardens) • Grass seeds • Organic soil and compost materials • Small stones and gravel (for drainage) For Drip Irrigation System: • Thin plastic tubes or straws • Small water bottles or droppers (water reservoirs) • Scissors and needles for making holes • Tape or silicone adhesive For Compost Production: • Small containers for compost materials • Gloves for hygiene and safety • Organic waste (vegetable peels, tea waste, eggshells)
LESSON PLAN ACCORDING TO THE 5E LEARNING MODEL	The teacher begins a discussion about environmental problems and sustainable agriculture. Students watch a short video or view images about green roofs and drip irrigation systems. The teacher asks students how environmentally friendly houses can be built and explains that they will build such structures in this project.
	Students are divided into groups and project materials are distributed. Each group explores how green roofs and drip irrigation systems work. The teacher guides students but allows creative exploration.
	Groups share what they discovered during the exploration stage. The teacher explains how green roofs contribute to water conservation and thermal insulation and why drip irrigation is important. Students discuss which plants can grow on green roofs and how drip irrigation works.
	Each group builds a model house with a mini green roof and drip irrigation system. Students prepare soil, add compost, and plant grass seeds.

	They install irrigation tubes on the roofs. Students discuss environmental benefits and the relationship with climate change.
	Each group presents their model house and explains how their systems work. The teacher evaluates each group and gives feedback. Students complete evaluation forms reflecting on their learning. A small exhibition is organized where students review each other's projects.
Related Resources:	Websites and Online Resources: TÜBİTAK Science for Children Magazine National Geographic Kids NASA Climate Kids EBA (Education Information Network)
References:	NASA Climate Kids. (2023). What is Climate Change? Accessed: 12 November 2024. https://climatekids.nasa.gov/climate-change/