BURSA İNOVASYON MERKEZİ

STEM ve YAPAY ZEKA TEMA: SÜRDÜRÜLEBİLİR TARIM PROGRAMI

STEM ETKİNLİK PLAN ŞABLONU

Team Name:	GREEN SAILS
Teachers' Names:	Zülfü ALIMTERİN Rümeysa ATAŞ Nurşen AYDEMİR Mehmet AYGÜN
Topic Title:	Hydroponic (Soilless) Agriculture
Learning Objectives / Goals:	GOALS: - Learning the basics of hydroponic farming systems - Exploring sustainable agricultural methods - Gaining practical skills - Developing scientific method and observation skills - Developing teamwork and collaboration skills - Increasing environmental awareness PURPOSE: Learning the general concepts of hydroponic farming Understanding the importance of efficient water use Recognizing and applying innovative agricultural methods Developing awareness about environmentally friendly and sustainable agriculture Strengthening teamwork and communication skills
Related Learning Outcomes:	Skills: Gaining STEM application and hands-on skills
	Engineering: - Developing innovation and problem-solving skills - Strengthening problem-solving abilities - Increasing awareness of environmentally friendly and sustainable agriculture - Strengthening teamwork and communication skills - Developing skills in analyzing and evaluating scientific data
	Science: - Understanding the importance of efficient water use - Recognizing and applying innovative agricultural methods
Grade Level:	7th Grade
Duration:	40 + 40 minutes
21st Century Skills:	- Collaboration and teamwork - Innovation and creativity - Digital and technological literacy - Environmental responsibility and sustainability awareness - Entrepreneurship

Learning Approach:	5E Learning Model
Tasks (Teacher and Student Roles):	TEACHER ROLES: - Acting as advisor and guide - Providing information and resources - Managing group dynamics - Evaluating students and providing feedback STUDENT ROLES: - Information researcher - Practitioner and system builder - Problem solver and controller
Materials / Technologies:	- Water reservoir - Nutrient solution - Tubes - Carrier materials - Conductors and root frames - Plastic materials - Wooden sticks - LED lights - Seeds and seedlings - Posters and charts - Computer and digital smart board - Artificial intelligence applications
LESSON PLAN ACCORDING TO THE 5E LEARNING MODEL	Video Watching: A short video is shown to students. The video introduces one of the soilless agriculture methods (for example hydroponic or aeroponic farming). It shows how soilless agriculture works and how it is used in daily life. It also includes visuals showing how plants can grow without soil. Questions (10 min): “Have you heard about these farming methods before?” “Is it possible to grow plants without soil?” “In which situations could soilless agriculture be more beneficial?”
	Experimental Activity (15 min): Students build a simple hydroponic system to observe how plants grow without soil. Materials: Transparent plastic container, water, nutrient solution, plant seeds (such as lettuce or basil), cotton or hydroponic sponge. Students discuss questions while building and maintaining the system. Expected Result: Students discover the basic principles of hydroponic farming and observe how plants grow without soil.
	Teacher Explanation (10 min): The teacher explains what soilless agriculture is, how hydroponic systems work, and their environmental advantages. Advantages of Soilless Agriculture: - Saves water - Reduces the use of chemical fertilizers - Can be applied even in areas with limited agricultural land Class Discussion: Students discuss the environmental benefits and possible challenges

	of soilless agriculture.
	Group Work (20 min): Students are divided into small groups. Each group researches a different aspect of soilless agriculture (hydroponics, aeroponics, economic impacts, etc.). Presentation: Each group prepares a short presentation explaining their findings and discussing environmental, economic, and social impacts. Questions: “Which type of agriculture is more sustainable?” “Could soilless agriculture become more widespread in the future?” Expected Result: Students gain deeper knowledge about hydroponic agriculture and share their learning with others.
	Evaluation (15 min): Self-Assessment: Students evaluate their own learning process and identify areas where they need more support. Pre-test / Post-test
Related Resources:	Metin –Görsel ve Video yapay zeka uygulamları Bilimsel makaleler
References:	**https://www.americanhydroponics.com** **https://www.americanhydroponics.com** **https://cals.arizona.edu/hydroponics** **https://www.ted-ed.com** **https://www.coursera.org**

YAPAY ZEKA UYGULAMASINDA HAZIRLANMIŞ ETKİNLİK GÖRSELİ:


Hidroponik
Tarım Etkinliği
AMAÇ:
Hidpolik tarımın genel kavramlarını öğrenmek
Suyu verimli kullanmanın önemin kavramak
Yenilik tarım yöntemlerini tanımak ve uygulamak
Çevre Dostu ve Sürdürülebilir Tarım Yöntemleri Konusunda Bilinçlenmek
Takım Çalışması ve İletişim Becerilerini Güçlendirmek
HYDROPONIC


HİDROPONİK
(TOPRAKSIZ) TARIM