Main Criteria: Forward Education
Secondary Criteria: Next Generation Science Standards (NGSS)
Subjects: Mathematics, Science, Technology Education
Grades: 9, 10, Key Stage 3, Key Stage 4

Forward Education

Replanting our Forests with Automated Tree Seeders

Next Generation Science Standards (NGSS)
Science
Grade **9** - Adopted: **2013**

STRAND	NGSS.HS-PS	PHYSICAL SCIENCE
TITLE	HS-PS4	Waves and Their Applications in Technologies for Information Transfer
		Students who demonstrate understanding can:
PERFORMANCE EXPECTATION	HS-PS4-2	Evaluate questions about the advantages of using a digital transmission and storage of information.

STRAND	NGSS.HS-LS	LIFE SCIENCE
TITLE	HS-LS2	Ecosystems: Interactions, Energy, and Dynamics
		Students who demonstrate understanding can:
PERFORMANCE EXPECTATION	HS-LS2-2	Use mathematical representations to support and revise explanations based on evidence about factors affecting biodiversity and populations in ecosystems of different scales.
PERFORMANCE EXPECTATION	HS-LS2-4	Use mathematical representations to support claims for the cycling of matter and flow of energy among organisms in an ecosystem.
PERFORMANCE EXPECTATION	HS-LS2-5	Develop a model to illustrate the role of photosynthesis and cellular respiration in the cycling of carbon among the biosphere, atmosphere, hydrosphere, and geosphere.
PERFORMANCE EXPECTATION	HS-LS2-7	Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity.

STRAND	NGSS.HS-LS	LIFE SCIENCE
TITLE	HS-LS4	Biological Evolution: Unity and Diversity
		Students who demonstrate understanding can:
PERFORMANCE EXPECTATION	HS-LS4-6	Create or revise a simulation to test a solution to mitigate adverse impacts of human activity on biodiversity.

STRAND	NGSS.HS-ESS	EARTH AND SPACE SCIENCE
TITLE	HS-ESS2	Earth's Systems
		Students who demonstrate understanding can:
PERFORMANCE EXPECTATION	HS-ESS2-4	Use a model to describe how variations in the flow of energy into and out of Earth's systems result in changes in climate.

PERFORMANCE EXPECTATION	HS-ESS2-6	Develop a quantitative model to describe the cycling of carbon among the hydrosphere, atmosphere, geosphere, and biosphere.
STRAND	**NGSS.HS-ESS**	**EARTH AND SPACE SCIENCE**
TITLE	**HS-ESS3**	**Earth and Human Activity**
		Students who demonstrate understanding can:
PERFORMANCE EXPECTATION	HS-ESS3-1	Construct an explanation based on evidence for how the availability of natural resources, occurrence of natural hazards, and changes in climate have influenced human activity.
PERFORMANCE EXPECTATION	HS-ESS3-2	Evaluate competing design solutions for developing, managing, and utilizing energy and mineral resources based on cost-benefit ratios.
PERFORMANCE EXPECTATION	HS-ESS3-3	Create a computational simulation to illustrate the relationships among management of natural resources, the sustainability of human populations, and biodiversity.
PERFORMANCE EXPECTATION	HS-ESS3-6	Use a computational representation to illustrate the relationships among Earth systems and how those relationships are being modified due to human activity.
STRAND	**NGSS.HS-ETS**	**ENGINEERING DESIGN**
TITLE	**HS-ETS1**	**Engineering Design**
		Students who demonstrate understanding can:
PERFORMANCE EXPECTATION	HS-ETS1-1	Analyze a major global challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal needs and wants.
PERFORMANCE EXPECTATION	HS-ETS1-2	Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering.
PERFORMANCE EXPECTATION	HS-ETS1-3	Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs that account for a range of constraints, including cost, safety, reliability, and aesthetics, as well as possible social, cultural, and environmental impacts.

Next Generation Science Standards (NGSS)

Science

Grade **10** - Adopted: **2013**

STRAND	**NGSS.HS-PS**	**PHYSICAL SCIENCE**
TITLE	**HS-PS4**	**Waves and Their Applications in Technologies for Information Transfer**
		Students who demonstrate understanding can:
PERFORMANCE EXPECTATION	HS-PS4-2	Evaluate questions about the advantages of using a digital transmission and storage of information.
STRAND	**NGSS.HS-LS**	**LIFE SCIENCE**
TITLE	**HS-LS2**	**Ecosystems: Interactions, Energy, and Dynamics**

		Students who demonstrate understanding can:
PERFORMANCE EXPECTATION	HS-LS2-2	Use mathematical representations to support and revise explanations based on evidence about factors affecting biodiversity and populations in ecosystems of different scales.
PERFORMANCE EXPECTATION	HS-LS2-4	Use mathematical representations to support claims for the cycling of matter and flow of energy among organisms in an ecosystem.
PERFORMANCE EXPECTATION	HS-LS2-5	Develop a model to illustrate the role of photosynthesis and cellular respiration in the cycling of carbon among the biosphere, atmosphere, hydrosphere, and geosphere.
PERFORMANCE EXPECTATION	HS-LS2-7	Design, evaluate, and refine a solution for reducing the impacts of human activities on the environment and biodiversity.
STRAND	**NGSS.HS-LS**	**LIFE SCIENCE**
TITLE	**HS-LS4**	**Biological Evolution: Unity and Diversity**
		Students who demonstrate understanding can:
PERFORMANCE EXPECTATION	HS-LS4-6	Create or revise a simulation to test a solution to mitigate adverse impacts of human activity on biodiversity.
STRAND	**NGSS.HS-ESS**	**EARTH AND SPACE SCIENCE**
TITLE	**HS-ESS2**	**Earth's Systems**
		Students who demonstrate understanding can:
PERFORMANCE EXPECTATION	HS-ESS2-4	Use a model to describe how variations in the flow of energy into and out of Earth's systems result in changes in climate.
PERFORMANCE EXPECTATION	HS-ESS2-6	Develop a quantitative model to describe the cycling of carbon among the hydrosphere, atmosphere, geosphere, and biosphere.
STRAND	**NGSS.HS-ESS**	**EARTH AND SPACE SCIENCE**
TITLE	**HS-ESS3**	**Earth and Human Activity**
		Students who demonstrate understanding can:
PERFORMANCE EXPECTATION	HS-ESS3-1	Construct an explanation based on evidence for how the availability of natural resources, occurrence of natural hazards, and changes in climate have influenced human activity.
PERFORMANCE EXPECTATION	HS-ESS3-2	Evaluate competing design solutions for developing, managing, and utilizing energy and mineral resources based on cost-benefit ratios.
PERFORMANCE EXPECTATION	HS-ESS3-3	Create a computational simulation to illustrate the relationships among management of natural resources, the sustainability of human populations, and biodiversity.
PERFORMANCE EXPECTATION	HS-ESS3-6	Use a computational representation to illustrate the relationships among Earth systems and how those relationships are being modified due to human activity.

STRAND	NGSS.HS-ETS	ENGINEERING DESIGN
TITLE	**HS-ETS1**	**Engineering Design**
		Students who demonstrate understanding can:
PERFORMANCE EXPECTATION	HS-ETS1-1	Analyze a major global challenge to specify qualitative and quantitative criteria and constraints for solutions that account for societal needs and wants.
PERFORMANCE EXPECTATION	HS-ETS1-2	Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering.
PERFORMANCE EXPECTATION	HS-ETS1-3	Evaluate a solution to a complex real-world problem based on prioritized criteria and trade-offs that account for a range of constraints, including cost, safety, reliability, and aesthetics, as well as possible social, cultural, and environmental impacts.