

Week 1	Team Building through Environmental Science
	Focus: Build classroom community through environmental awareness and inquiry-based collaboration. Standard: SCI.LS2.C.h – Understand that ecosystems maintain stability through complex interactions, but disturbances (including human-caused) may cause lasting changes or a shift to a new ecosystem. Skills Developed: Collaboration, observation, inquiry, basic ecosystem vocabulary Activities with Descriptions: • Eco-Scavenger Hunt → Explore the school grounds to identify natural/human-made features and their roles in an ecosystem. • Build-a-Biosphere Challenge → Teams build terrariums and explain how water, soil, and plant life are interdependent. • Ecosystem Jigsaw → Each group studies and presents one ecosystem type found in Qatar (e.g., desert, mangrove). Formative Assessment(s): Group observation charts, reflection logs Summative Assessment(s): Collaborative poster or mini-presentation of a local “biosphere”
Weeks 2–5	Unit 1: Ecosystems and Interdependence
	Focus: Explore how organisms interact within ecosystems and the impact of disturbances on ecosystem stability. Standards: <i>SCI.LS2.C.h</i> – Ecosystem stability depends on complex interactions. Disturbances, including those caused by humans, can change ecosystems permanently or temporarily. <i>EE.HS-LS2-2</i> – Use graphs or models to explain the reliance of animal populations on food resources and shelter from their environment.

	Skills Developed: Graph reading, data interpretation, food web construction, resilience analysis Activities: • Predator-Prey Simulation → Enact a population fluctuation scenario and record outcomes. • Food Web Mapping → Build food webs of Qatar’s desert/marine ecosystems. • Graphing Populations → Analyze population data of threatened species. Formative Assessment(s): Food web worksheet, population quiz Summative Assessment(s): Case study on ecosystem recovery; endangered species presentation
Weeks 6–9	Unit 2: Earth’s Dynamic Surface
	Focus: Understand the Earth’s surface is continuously reshaped by constructive and destructive forces. Standards: SCI.ESS2.C.h – Water’s unique properties influence Earth’s dynamics, including erosion, energy transfer, and chemical change. EE.HS-ESS2-1 – Create a model that shows how natural forces like volcanoes and erosion change Earth’s surface over time. Skills Developed: Modeling geological processes, analysis of physical changes Activities: • Volcano in a Bottle → Build a safe volcano model to visualize land formation. • Erosion Lab → Use wind/water to test erosion on different soil types. • Tectonic Puzzle → Use fossils and landforms to “reconstruct” the Earth’s plates. Formative Assessment(s): Vocabulary quiz, model demonstration worksheet Summative Assessment(s): Group model and write-up comparing constructive/destructive forces
Weeks 10–13	Unit 3: Natural Resources and Human Activity

	Focus: Investigate how resource availability and natural hazards shape human societies. Standards: <i>SCI.ESS3.A.h</i> – Availability of natural resources influences human society development and carries environmental, social, and economic costs/benefits. <i>EE.HS-ESS3-1</i> – Construct explanations using evidence about how natural hazards influence human decisions and settlement. Skills Developed: Geographic analysis, policy evaluation, sustainability planning Activities: • Hazard Mapping Challenge → Plot disaster zones in Qatar and assess risk. • Extraction Debate → Teams debate fossil fuel extraction or desalination. • Design a Sustainable Town → Plan a resource-efficient city layout. Formative Assessment(s): Case study worksheet, quiz on global resource maps Summative Assessment(s): Infographic on disaster response; project plan for sustainable use
Weeks 14–17	Unit 4: Climate Change and Human Impact
	Focus: Explore the scientific basis for climate change and evaluate mitigation strategies. Standards: <i>SCI.ESS2.D.h</i> – The climate system is driven by solar radiation and its interaction with atmosphere, ocean, and land. Human activity is altering this balance. <i>SCI.ESS3.C.h</i> – Managing natural resources responsibly is essential for sustainability and minimizing climate impact. <i>SCI.ESS3.D.h</i> – Models are used to simulate and predict climate change caused by natural and human influences. Skills Developed: Climate data analysis, feedback loop understanding, solution evaluation

	Activities: • Carbon Footprint Tracker → Calculate and reduce personal emissions. • Greenhouse Effect Demo → Build a visual/physical model. • Policy Pitch → Present local/national policy ideas to address climate change. Formative Assessment(s): Climate graph analysis, debate participation Summative Assessment(s): Research paper on climate science; group presentation on mitigation
Weeks 18–20	Unit 5: Biodiversity and Conservation
	Focus: Understand biodiversity's role in ecosystem function and how to protect it. Standards: <i>SCI.LS4.D.h</i> – Biodiversity is essential for Earth's functioning and human survival. Human actions are reducing biodiversity, but conservation efforts can reverse this. <i>SCI.ESS3.C.h</i> – Sustainability depends on effective resource management and conservation strategies. Skills Developed: Threat analysis, species-specific planning, advocacy Activities: • Habitat Loss Role Play → Simulate stakeholder debate (conservationist, business, resident). • Species Simulation → Simulate extinction pressures and how populations respond. • Design a Wildlife Sanctuary → Plan protected zones for local species. Formative Assessment(s): Threat graphic organizer, skit/poster Summative Assessment(s): Conservation model design; rationale presentation

Weeks 21–24	Unit 6: Environmental Engineering and Innovation
	Focus: Apply engineering to design technology-based solutions to environmental problems. Standards: <i>SCI.ESS3.C.h</i> – Human societies must develop responsible technologies to ensure sustainability. <i>SCI.ESS3.D.h</i> – Global climate models must be continually improved to manage long-term impacts. <i>SCI.LS4.D.h</i> – Sustaining biodiversity requires innovation in managing human impact. Skills Developed: Systems thinking, design process, evaluation and presentation Activities: • Green Tech Gallery → Explore local/global green technologies. • Problem-Solution Map → Identify a Qatar-based challenge and brainstorm. • Eco-Invention Pitch → Students pitch a prototype solution to peers or school leaders. Formative Assessment(s): Brainstorm maps, tech research logs Summative Assessment(s): Innovation design project and impact pitch