Science Barge
Green Education Program Activity Choices

Elementary Grades 3-5

Scope and Sequence Standards

Grade Three
- Plant and Animal Adaptations
- Matter
- Energy

Grade Four
- Animals and Plants in Their Environment
- Interactions of Air, Water and Land

Grade Five
- Exploring Ecosystems
- The Nature of Science
- Food and Nutrition
- Earth Science

Biodiversity: Food Web Twister
- Students will begin to answer the basic question, "What is food?" Students will participate in our Food Web Twister activity with each student playing the role of a producer, consumer or decomposer within the Hudson River estuary. Students will gain knowledge regarding the relationships between organisms and will parallel that knowledge with a growing understanding of food and food waste.

Food/Botany/Planting
- Students will create a plant part chart examining the different plant parts as well as edible examples of each. Students will get the opportunity to become urban farmers by growing their own hydroponic basil that they will care for at home or at school. Students will learn to appreciate the importance of a varied and balanced diet and will gain a sense of environmental stewardship by growing and caring for their plants.

Carbon Footprint: How Many Miles are on my Menu?
- Students will be encouraged to consider their impact on the environment by discussing how food moves around. Students will use their math and geography skills to complete our "How Many Miles are on my Menu?" worksheet and activity. Students will incorporate these lessons into their considerations of future food choices.

Climate Change: Greenhouse Effect Role Play

- With the unique backdrop of our greenhouse as a case study, students will act out the greenhouse effect as "heat" and "greenhouse gases" and discover how it contributes to global warming. They will identify common sources of greenhouse gas emissions and define stewardship. Students will consider ways to curb their own emissions at home, and leave with an Energy Conservation Action Sheet.

Intermediate Grades 6-8

Scope and Sequence Standards

Grade Six

- Simple and Complex Machines
- Interdependence

Grade Seven

- Interactions Between Matter and Energy
- Dynamic Equilibrium: The Human Animal

Grade Eight

- Humans and Their Environment: Needs and Tradeoffs

Scientific Method: Water Quality Puzzler

- Students will examine each step of the scientific method and will use their scientific skills to hypothesize, experiment and share data with their peers regarding sampling and testing the water characteristics of the Hudson River, rainwater and nutrient rich water from our aquaponics system. Students will gain an intimate knowledge of the ecology of estuaries, acid rain and the nitrogen cycle.

Carbon Footprint: The Story of Food

- Students will be encouraged to consider their impact on the environment by exploring the story of food from production to consumption. They will examine industrial and local food systems and compare how each system impacts people and the environment. Working in groups, students will examine food labels for clues about origin and production. They will use that information to creatively illustrate the story of a food item of their choice from "farm to fork".

Solar Cooking

- Students will discuss the advantages and disadvantages of transitioning to a renewable energy future by comparing and contrasting solar energy, wind energy and fossil fuels. Students will participate in our solar cooking workshop by building 100% recyclable solar ovens that they can take back

to class for further experimentation. Students will be introduced to the social benefits of using solar power to heat water and cook food.

Climate Change, Farming and You

- Students will explore the links between climate change, agriculture and the foods they eat. They will review basic climate change science and learn to differentiate between "weather" & "climate". They will participate in a Climate-Crop Match-Up, examining agricultural products from the Northeast and considering the impact that a changing climate may have on production of these foods. Finally students will explore their "foodprint" and the ways they can lessen their own contribution to climate change.

<u>High School Grades 9-12</u>

<u>Scope and Sequence Standards</u>

Chemistry

- The Physical Nature of Matter

Earth Science

- Maps and Measurement
- Climate

Living Environment

- Scientific Inquiry
- Ecology
- Human Influences on the Environment

Physics

- Energy
- Projects and Problem Based Learning Activities

Scientific Method: Water Quality Puzzler

- Students will examine each step of the scientific method and will use their skills to hypothesize, experiment and share data with their peers regarding sampling and testing the water characteristics of the Hudson River, rainwater and nutrient rich water from our aquaponics system. Students must work in teams to discover the point of origin of their water samples which will require a degree of insight into ecology and the process of elimination. Students will gain an intimate knowledge of the ecology of estuaries, acid rain and the nitrogen cycle.

Carbon Footprint: The Story of Food

- Students will be encouraged to consider their impact on the environment by exploring the story of food from production to consumption. They will examine industrial and local food systems critically and compare the impacts of each system on people and the environment. Students will

examine food labels & packages to glean information on ingredients, production methods, origin, and waste. Working in teams, students will use the combined knowledge gained from their examination of both food systems and labels to creatively illustrate the story of a food item from "farm to fork".

Green Design Challenge

- Students will be given the opportunity to examine green design and green building techniques by learning more about sustainable materials and easy ways to green their homes. Students will be asked to work in small groups to complete our Green Design Challenge where they must creatively come up with ways to design attractions or individual buildings that align with particular sustainable design parameters. Students will be encouraged to use their imagination and will be invited to share their designs with their peers.

Climate Change, Farming and You

- Students will explore the links between climate change, agriculture and the foods they eat. They will review basic climate change science and learn to differentiate between "weather" & "climate". They will work in teams to assess the possible advantages and disadvantages of climate change, examining agricultural products from the Northeast and considering the impact that a changing climate may have on production of these foods. Finally students will explore their "foodprint" and the ways they can lessen their own contribution to climate change.