CHICAGO BOTANIC GARDEN

Grades 7–9
Unit 1: Guiding Questions and Assessments

1.1: Understanding the Greenhouse Effect
Guiding Questions
- What are greenhouse gases?
- What are the effects of greenhouse gases in the atmosphere?
- Where does most of the energy on Earth originate?
- What happens to the energy once it reaches Earth?
- What is the greenhouse effect?

Assessment(s)
- Modeling the Greenhouse Effect lab handout
- Earth's Energy Balance Diagram
- Journal entry describing what happens to the energy that comes from the sun

Activity 1.2: GEEBITT
Guiding Questions
- How do surface reflectivity and greenhouse gases contribute to maintaining the Earth's temperature?
- How is temperature affected by changes in surface reflectivity and greenhouse gas concentrations?
- What is the impact of increased greenhouse gases on the Earth's temperature?
- What are the implications of new average "surface" temperature? How would increased average surface temperature affect everyday local temperatures?

Assessment(s)
- Earth's temperature simulation worksheet

1.3: Greenhouse Gas Emissions—Natural and Human Causes
Guiding Questions
- What is the role of greenhouse gases in the atmosphere?
- What are natural causes of greenhouse gas emissions?
- In what ways do humans contribute to greenhouse gas emissions?
- How can increased greenhouse gas emissions lead to climate change?

Assessment(s)
- Where do Greenhouse Gases Come From handout
- Greenhouse Gas Emissions Diagram

Activity 1.4: **Nature Walk & Ecosystem Introduction**
Guiding Questions

- What are the different roles in an ecosystem?
- How does energy flow through ecosystems?
- What are the connections between biotic and abiotic factors in an ecosystem?

Assessments

- Ecosystem model and description

Activity 1.5: Leaf Litter Ecology Lab
Guiding Questions

- What organisms are present in a leaf litter community?
- What are the ecological relationships between members of a leaf litter community?

Assessment

- Student lab report

1.6: Food for Thought: climate change and trophic cascades
Guiding Questions

- What is a trophic cascade?
- How can climate change set a trophic cascade in motion?

Assessment

- Student handout, Climate Change and Arctic Ecosystems

1.7: Ecosystem Services
Guiding Questions

- What is the value of healthy ecosystems?
- How do I benefit from ecosystem services?

Assessment

- Student handout, Ecosystem Services

Full Unit 1 Pre- and Post-Assessments covering activities 1 through 7

