**Chapter 1: The State of our Earth**

**Reading Guide**

**Vocabulary**

Learn the definition of each term. The **bold** words require you to know more than just the definition. For example, ecosystem service: you should what they are, be able to name several types and describe how we benefit from those services.

System

Ecosystem

Biotic

Abiotic

**Ecosystem Services**

**Environmental Indicators**

Sustainability

**Biodiversity**

Genetic Diversity

Species Diversity

Ecosystem Diversity

Speciation

Background Extinction Rate

Greenhouse Gases

Anthropogenic

**Sustainable Development**

**Ecological Footprint**

**Scientific Method**

Hypothesis

Null Hypothesis

Replication

Sample Size

Accuracy

Precision

Uncertainty

Inductive Reasoning

Deductive Reasoning

Theory

Natural Law

Control Group

Natural Experiment

**Environmental Justice**

**Reading Outline**

The Mysterious Neuse River Fish Killer

1. **What is Pfiesteria?**
2. **What does Pfiesteria do to humans? Fish?**
3. **What triggers Pfiesteria change from a harmless algae feeder to a toxin producing fish killer?**
4. **What are three different lessons we can learn from the Neuse River Mystery?**

1.1 Environmental science offers important insights into our world

1. **Explain how the Neuse River is part of a larger system.**
2. **Fill in the chart below to learn about biotic and abiotic factors**

|  |  |  |  |
| --- | --- | --- | --- |
| **Factor** | **Abiotic (A) or Biotic (B)** | **If abiotic, describe one biotic factor that is influenced by or impacted by the factor** | **If biotic, describe one abiotic factor that is influenced by or impacted by the factor** |
| **Sunlight** |  |  |  |
| **Bacteria** |  |  |  |
| **Water temperature** |  |  |  |
| **Trees** |  |  |  |
| **Soil nutrients** |  |  |  |

1.2 Humans alter natural systems

1. **How does new technology generally impact resource use?**
2. **Who uses more resources per capita: a child born in Los Angeles or a child born in rural India? Why?**

1.3 Scientists monitor natural systems for signs of stress

1. **Fill out the following chart about the five global environmental indicators outlined in Table 1.2 and pages 5-11**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Indicator** | **Increasing, decreasing or staying the same right now?** | **To achieve sustainability, does it need to increase, decrease or stay the same in the future?** | **Why should you (personally) care about this indicator?** | **How does this indicator connect to ONE other indicator?** |
| *Biological Diversity* |  |  |  |  |
| *Food production* |  |  |  |  |
| *Average Global Temperature and [CO2]* |  |  |  |  |
| *Human Population* |  |  |  |  |
| *Resource depletion* |  |  |  |  |

1.4 Human well-being depends on sustainable practices

1. **What happened on Easter Island and what should we learn from their mistakes?**
2. **Pick a resource that you use on a daily basis (food, gasoline, paper, whatever you want) and describe how that resource could be used sustainably and unsustainably.**
3. **List 10 things you NEED in order to survive and be a happy, well adjusted human being.**
4. **Go to** [**http://www.myfootprint.org/**](http://www.myfootprint.org/) **and determine your ecological footprint. Record the following information at the end: (do this at home)**
	1. **How many earths would we need if everyone lived like you**:
	2. **Global acres required to support you**:

1.5 Science is a Process

1. **Describe how you use the scientific process to investigate the following two situations. Be sure to include**
	1. **You like to eat french fries, but only on Fridays. However, the commons is almost always sold out of french fries, but only on Fridays.**
	2. **There are fewer roly polies around the science building than over by the ceramics studio.**

1.6 Environmental science presents unique challenges

1. **Why is it more difficult to study environmental science that other science disciplines such as biology and chemistry?**
2. **What is environmental justice and why should you care about it?**

Additional Work:

Answer all the MC questions and FRQ #1 at the end of Ch 1.