

### **Topic 03: The Greenhouse Effect**

What are the three major types of electromagnetic radiation produced by the sun?

Which causes sunburns? Which is perceived only as “heat”?

Explain the four ways in which gas molecules can interact with solar radiation

What are the three major constituents of the Earth’s atmosphere and their percentages?

What are the six major greenhouse gases?

Where does ozone act as a greenhouse gas?

List the seven major aerosols and how they primarily affect incoming sunlight

What is the net effect of aerosols on incoming solar radiation?

Which greenhouse gas absorbs heat from the largest range of wavelengths?

What is meant by the “Atmospheric Window for Incoming Solar Radiation”?

Draw a diagram showing what happens to 100 units of incoming solar radiation as they interact with the atmosphere and the surface of the Earth

What is meant by albedo? What surface has the highest albedo?

What are the three primary means by which heat from the Earth’s surface is moved back into the atmosphere?

What is meant by the “Atmospheric Window for Earth’s Outgoing Radiation”?

Explain how the Earth and Moon differ in the way that incoming solar radiation interact with each?

Using the analogy of a water tank and a spigot of water, explain the retention of heat in the Earth’s atmosphere

What is meant by the Earth’s Energy Imbalance? How high is it?

Explain how a Greenhouse is a good and poor analog for how the Earth’s atmosphere warms, retains, and gives off heat