**HEAT TRANSFER GUIDED NOTES** (Use pages EXPLAIN 128-131)

**ENERGY FROM THE SUN (HEADING)**

What is ***radiation***?

**99%** of the radiant energy from the Sun consists of (1.)\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_,

(2.) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_, and (3.) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

1. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ **Light**

The majority of sunlight is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

***Visible Light***  is \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

The atmosphere is like a \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ to visible light, allowing it to pass through. At Earth’s surface it is converted to \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ energy, also known as heat.

***Near-Visible Wavelengths (Subheading)***

(2.) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

(3.) \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Ultra-Violet (UV) Light has \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ wavelengths and can

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

Visible light wavelengths are \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ than Infrared Radiation (IR). Infrared

Radiation is sensed as \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ energy or \_\_\_\_\_\_\_\_\_\_\_\_\_.

As energy from the Sun is absorbed by Earth, it is also radiated from the Earth into the

atmosphere as \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

**ENERGY FROM THE EARTH (HEADING)**

Not all the energy coming from the Sun reaches Earth’s surface.

***Absorption (Subheading)***

Gases and particles in the atmosphere absorb about \_\_\_\_\_\_\_\_\_\_ percent of incoming solar radiation.

The following gases absorb:

All Incoming UV Light Some Infrared Radiation from the Sun

1. 1.

2. Ozone 2. Carbon Dioxide

3.

The Earth’s atmosphere does not absorb \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_. Visible Light must be converted into infrared radiation before it can be absorbed.

***Reflection (Subheading)***

Clouds and other small particles in the air reflect about \_\_\_\_\_\_\_\_\_\_\_ percent of the Sun’s radiation.

Earth only receives and absorbs \_\_\_\_\_\_\_\_\_\_\_\_ percent of incoming solar radiation.

30 percent is reflected into space

+ 20 percent of incoming radiation that is absorbed into the atmosphere

= 50 % that the Earth receives and absorbs.

**RADIATION BALANCE (HEADING)**

The amount of radiation Earth receives from the Sun is the same as the amount Earth radiates into the outer atmosphere. Earth absorbs the Sun’s energy and then radiates that energy away until a balance is achieved.

*Define the Greenhouse Effect:*

Describe the Greenhouse Effect in your own terms. Feel free to draw pictures AS WELL AS use words to show that you understand the concept. **(This means that I want you to write a description AND draw a picture)**

**Radiation, Conduction and Convection**

|  |  |  |
| --- | --- | --- |
| **Radiation** | **Conduction** | **Convection** |
| **Define:**  **Additional Notes:**  **Picture/Example:** | **Define:**  **Additional Notes:**  **Picture/Example:** | **Define:**  **Additional Notes:**  **Picture/Example:** |