**Vernier Labquest Extension Investigation 2**

**Grade**: 6 **Kit**: SEPUP Issues & Earth: The Earth in Space **Actvity**: 76

Vernier LabQuest 10

**Title of Investigation:** A Year Viewed from Space/What Causes the Seasons?

**Guiding Question**: What causes the yearly cycle of the seasons on Earth?/ How does the tilt of the globe influence warming caused by the light bulb?

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**Summary of Activity:** In SEPUP Activity 76, students use a computer model ([www.sepuplhs.org](http://www.sepuplhs.org)) to investigate the effects of the revolution of Earth around the Sun and Earth’s tilt on seasonal changes in the Northern Hemisphere. Students use the simulation to observe Earth as it revolves around the Sun and to record data for different seasons. They use their observations to develop an explanation for the cause of Earth’s year and seasons. In this extension, students use a globe and Vernier temperature probe to monitor simulated warming of their city by the sun in winter and summer.

**Possible extension**: Use the 4 cities listed in the computer model.

**Science Standards:**

* + 1. Demonstrate that the seasons in both hemispheres are the result of the inclination of the earth on its axis, which causes changes in sunlight intensity and length of day.

**Equipment used:**

Lab Quest lesson 10, Labquest, temperature probe, ring stand and utility clamp, globe of the Earth, masking tape, metric ruler, lamp with 100 watt bulb, 20 cm length of string

**Description of Procedures, notes (LabQuest 10):**

Students attach the temperature probe to the globe with the tip of the probe at their location. They position the globe for winter data collection according to the setup directions. Beginning and final winter temperatures are recorded and a graph of temperature vs. time can be examined. The globe is then positioned for summer data collection according to the setup directions. Beginning and final summer temperatures are recorded and a graph of temperature vs. time can be examined.

**Scientific questions:**

How does the temperature change for summer compare to the temperature change for winter? During which season is the sunlight more direct? As you move the globe from its winter position to its summer position, how does the part of the globe closest to the bulb change?