

# What Do Farmers Do?

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## **Standards of Learning**

Science 6.9

English 6.1, 7.1

## **Objective**

Student will:

- learn how seasons affect what farmer's do.

## **Materials**

- Pictures of farms during different seasons
- 4 sheets of chart paper

## **Background Knowledge**

Discuss seasonal changes and the terms vernal equinox, summer and winter solstice. Review the terms global warming and how it affects the US and Virginia weather.

The seasons that our world goes through affect everything around us especially our farms and gardens. During the spring is when most people plant their farm full of flowers or vegetables. Then during the summer they have beautiful flowers or vegetables with the sun shining down on them or they pick them for their family to eat. Farmers will harvest their crops if they need to in the summer, and they will also have their livestock out on the farm so they can enjoy the fresh air. In the fall the leaves start to fall from the trees and most vegetables that are left are harvested. Lastly, in the winter, the farm is empty except for snow that has fallen on the ground. Livestock are put up in the barn so they can stay warm. There are many objects that represent our different seasons, such as a sun or vegetable for summer, leaves or pumpkins in the fall, sleds or snow hats in the winter, and flowers or bees for the spring. However, the changes in the seasons are also much more complicated than just what we see on earth. There is a popular misconception that the seasons on the Earth are caused by varying distances of the Earth from the Sun on its elliptical orbit. This is not correct. The primary cause of the seasons is the 23.5 degree of the Earth's rotation axis with respect to the plane of the ecliptic, as illustrated in the adjacent image. This means that as the Earth goes around its orbit the Northern hemisphere is at various times oriented more toward and more away from the Sun, and likewise for the Southern hemisphere. Thus, we experience Summer in the Northern Hemisphere when the Earth is on that part of its orbit where the N. Hemisphere is oriented more toward the Sun and therefore the Sun rises higher in the sky and is above the horizon longer, and the rays of the Sun strike the ground more directly. Likewise, in the N. Hemisphere Winter the hemisphere is oriented away from the Sun, the Sun only rises low in the sky, is above the horizon for a shorter period, and the rays of the Sun strike the ground more obliquely.

An equinox occurs twice a year, when the tilt of the Earth's axis is inclined neither away from nor towards the Sun, the Sun being vertically above a point on the Equator. At an equinox, the Sun is at one of two opposite points on the celestial sphere where the celestial equator and ecliptic intersect. These points of intersection are called equinoctial points: the vernal (spring) point and the autumnal (autumn) point.



A solstice is an astronomical event that happens twice each year, when the tilt of the Earth's axis is most inclined toward or away from the Sun, causing the Sun's apparent position in the sky to reach its northernmost or southernmost extreme. The solstices, together with the equinoxes, are connected with the seasons. In some cultures they are considered to start or separate the seasons while in others they fall in the middle. The English expressions "midwinter" (winter solstice) and "midsummer" (summer solstice) may derive.

### **Procedure**

1. Hold up the picture of the farm during the summer time, ask the students what happens on the farm during the summer?
2. Make a list on the chart paper.
3. Repeat the process for each season
4. After all seasons are done, compare the list. Is one list longer than the others? Is there a reason for this?
5. Discussion Questions:
  - How would global warming affect this list?
  - Would this list look the same for crop farmers as opposed to animal farmers?
  - How would this list compare if students completed it in South America as opposed to North America?
  - What actually causes the seasons?

### **Extension**

1. Have the students draw a farm in each of the seasons as it may look.
2. Have a farmer come to the class to talk about farm life, and how it changes with the seasons.

