



Climate Change and Farming

Learning objective: To have students learn about an impact of climate change on farming, specifically the relationship between soil moisture and planting conditions.

Recommended grade level: Pre-school to grade 5, ages 5 – 10

Subjects: science, social studies, geography (physical)

Skills: critical thinking, gardening

Recommended time: 30 minutes for the experiment and discussion. Additional activity could be done at another time.

Number of participants: Unlimited

Materials: beans (three per student), dry soil or sand, potting soil, water, plates

Background Information for Educators

Climate Change & Smallscale Farmers

Smallscale (subsistence) farmers, defined by the U.N. Food and Agriculture Organization as, “farm households that own or/and cultivate less than two hectares of land,” are among those most likely to suffer from hunger due to climate change.

Smallholder farmers already face numerous hurdles to grow enough food for themselves and their families. They need sufficient fertile land, rains which come at the right time, health and strength to work the fields, freedom from conflict, access to inputs such as seeds and fertilizers, and fair marketing opportunities. Climate change is an additional burden for smallholder farmers.

A changing climate does not only mean higher temperatures, but it is also leading to increased droughts, greater flood damage, stronger storms, rising sea levels, and increased spread of human, livestock and plant diseases.

Many of the farmers the Foodgrains Bank supports are already

noticing changes, such as unpredictable rains and more frequent droughts.

Canadian Foodgrains Bank’s member agencies are doing excellent programming work in helping farmers adapt to these changes—be it conservation agriculture, small irrigation schemes, or sand dams.

For more information on how the Canadian Foodgrains Bank network is working to counter-act climate change, visit foodgrainsbank.ca

Activity

This activity is intended to illustrate how moisture levels in soil have an impact on a farmer’s ability to plant and grow food, and to explain how climate change is affecting the availability of water around the world.

1. Prepare 3 different plates of soil, with about a half a cup of soil on each plate: one with dry soil/sand, one with very wet soil (simply add extra water to some potting soil until it is a thin mud), and one with good potting soil. You may do one set of soil plates for a smaller class, or set up several “stations” of soil plates for larger classes.
2. Give each student 3 beans.
3. Have each student try to plant one bean in each soil plate and observe what works and what doesn’t. Permit ample time for students to engage with the different soils.
4. Explain the connections between climate change, soil water content and farming. Suggested script and student discussion questions below.

Post-activity Discussion Questions:

Suggested answers provided in italics.

What was the difference between the three soils?

What was it like planting in the first (dry) soil? Could you hide your bean in it? Do you think the bean would grow into a plant in that soil? What would happen if a strong wind came and blew on this soil?

In dry soil it is very difficult for plants to grow. Plants need water and lots of nutrients found in good soil. Dry soil does not have enough water for plants to grow and absorb those nutrients. Dry, sandy soil can easily be blown away by wind and rain. This is a big problem in places where there is not enough moisture in the soil.

What was it like planting in the second (wet) soil? Could you hide your bean in it? Do you think the bean would grow into a plant in that soil? What would happen if this soil was on a steep hillside?

Plants need water, but sometimes there can be too much water! Just like we need food, but we can get sick if we have too much or not the right kind of food. With too much water, plants “drown”. When soil is on a steep hillside and there is too much rain or runoff, the soil can wash away, taking along with it any plants that were growing.

What was it like planting in the third soil? Could you hide your bean in it? Do you think the bean would grow into a plant in that soil? Would this soil blow away or flow away?

Moist soil is the best for growing plants. It sticks together a little bit, which allows roots to dig deep and find the water and nutrients they need. It also can't blow away, and will stay put in steep places.

Explanation:

- Seeds and plants need water, and they need the right amount of water, as we just saw with our different plates of soil. In many places around the world, like Niger and Bangladesh, the right amount of water is not always available. In some places, like Niger, there is often not enough water—it may not rain for months and months. In these places, the soil can be like the first plate. It is pretty hard to grow plants in dry soil.
- In places like Bangladesh, there may be too much water due to too much rain, flooding and the ocean getting higher! In these places, the soil can be like the second plate. It is pretty hard to grow plants in really wet soil. Sometimes, because the ocean is getting higher, ocean water goes into the soil which also makes it salty—this is even worse for plants.
- Farmers all around the world are saying that these problems with water are getting worse. This is due to climate change. In dry places, rain isn't coming when it usually does. This makes it difficult for farmers to know when to plant their seeds, and makes it so that plants do not grow very well. In other places, there is too much water. Storms are getting worse and worse, flooding fields and ruining homes. This makes it difficult to grow food, and also leaves people without houses.
- Organizations like the Canadian Foodgrains Bank [or your member organization] are working hard to help people in these places adapt to climate change. This means helping them change how they farm so that they can still grow food or make a living when there is either not enough or too much rainfall.

Further Discussion:

- What are some ways you think farmers can adapt to climate change? (new farming methods, irrigation, digging canals and making dams, new crop varieties that grow better in droughts or can better handle hotter temperatures, supplementing their farm income with other activities).
- What else can we do about climate change?

Additional Activity - Plant Some Seeds!

This additional activity allows children the experience of planting their own seeds and growing some food.

Materials: packet of seeds (radishes, peas or lettuce are good choices as they sprout quickly), small pots or paper cups (one for each child), potting soil.

Recommended time: 10 minutes

Activity:

- Fill each pot with soil (you could label each pot with the children's names so they can watch their own seeds grow).
- Have the children make two small holes in the soil with their fingers and drop one seed in each hole. Cover up the holes with more soil.
- Water the seeds—only about 4 tablespoons of water is necessary.
- Place the pots in a sunny window and water regularly (when the soil feels dry).
- Wait and watch your plants grow!

