How Much Soil is There?

Lesson Plan Title: How Much Soil is There? **Grade:** 4 **Lesson Length:** 20 minutes

Using an apple, students will understand how small a proportion of the Earth has the appropriate physical conditions for successful agricultural activities. Students will also draw conclusions based on evidence (parts of the apple) to respect the Earth as a complex environment and the farmers who care for the land generation after generation.

MATERIALS NEEDED:

- Apple
- Paring Knife
- Paper Towel

INSTRUCTIONS

1. Arrange the classroom so that all students can view the demonstration.
2. The apple represents the Earth. Cut it into quarters.
   - Three of the quarters represent the world's oceans. Put them aside.
   - One quarter represents the world's total land area.
3. Take the quarter that represents the land area and slice it in half.
   - Half of the quarter (1/8 of the whole apple) represents the parts of the Earth not suitable for human habitation (polar regions, deserts, mountains, etc.).
   - Put this piece aside.
4. The 1/8 of the apple left represents the portion where humans can live (population ecumene).
   - Much of this 1/8, however, is not suitable for agriculture.
5. Slice the 1/8 apple into four sections (each piece is now only 1/32 of the whole apple).
   - Three of these sections represent areas not suitable for agricultural production (inappropriate climate and soil conditions, land taken up by cities, highways, etc.).
   - Put them aside.
6. You are now left with only 1/32 of the apple (Earth) that is suitable for agricultural activities.
   - Carefully peel this piece (since agriculture takes place at the surface of the Earth in a soil layer approximately one meter thick and in the immediate atmosphere above it).
   - This small piece of apple peel represents the total area of agricultural land that has to feed the entire population of the planet.
   - As the population increases, more land is taken up by cities and highways, thus reducing the amount of agricultural land.

HOW WILL FUTURE POPULATIONS BE ABLE TO FEED THEMSELVES?

- Use the infographic with farmer case study to have students review dairy's then and now approach to innovation, conservation and dedication. ***(More infographics can be found at MidwestDairy.com > Resources)***
- Working in groups, or individually, have students identify ways dairy farmers are using sustainable practices to care for the land generation after generation.