



Lesson #4: Global Agricultural Challenges — Geography & Climate

Lesson Focus & Goals

- Students will investigate how climate factors (temperature, rainfall, and soil quality) impact food production. They will use global maps to identify regions unable to produce crops year-round, make comparisons between regions, and consider adaptation strategies.

Materials Needed

- Student computer or printed global data maps
- Student worksheets with guiding questions
- Blank world map
- Colored pencils, highlighters, or sticky notes for map marking

Student Learning Objectives

- Identify environmental factors necessary for crop growth.
- Analyze maps to locate regions where farming is difficult year-round.
- Explain how climate differences shape agricultural production around the world.
- Consider possible adaptation strategies in different environments.

Lesson Components

Intro (5 min)

- What conditions do plants need to grow?
- Can crops grow everywhere in the world, all year long?

Map Investigation — Global Agro-Ecological Zones (20-30 min)

- The world's population relies on agriculture, but not all land is created equal. From scorching deserts to frigid tundra, our planet presents diverse geographic and climatic challenges to food production. The Food and Agriculture Organization (FAO), in collaboration with IIASA, developed the Global Agro-Ecological Zoning (GAEZ) system to map where, what, and how much food could potentially be grown based on natural resources.
- Students will think like a global agricultural planner. By interacting with the GAEZ Data Portal,

they will analyze how fundamental environmental and geographical factors—like temperature, water, and soil—determine the planet's most productive farmlands and identify the regions facing the greatest natural constraints.

- For this activity, students will need a worksheet and a blank world map. They can either interact with the data through the website portal, or the provided printed data maps.
- Groups identify challenges and brainstorm adaptation strategies (e.g., irrigation, greenhouses, drought-resistant crops).

Wrap-Up Discussion (5–10 min)

- Whole class share: Which regions are most at risk for food insecurity due to climate?
- Reflection prompt: “If you were a farmer in one of these regions, what adaptations would you try first?”