Agriculture Production Challenges

As students develop their projects and gain a thorough understanding of challenges, they examine numerous factors involved in agricultural production (both crops and animals). As the world population grows, production of food must increase without an increase in available land. In some cases, a cost-benefit analysis will help students understand the impact of certain decisions on the actual cost of food production. In other cases, students may explore whether the practice actually helps accomplish the goal of increased food production that is sustainable for the future. Students may analyze and address some of the following challenges listed below as they develop their project:

1. Animal Agriculture: How do we increase production while maintaining healthy and safe meat and poultry?

In order to feed the world, we want larger and healthier flocks or herds of animals, and in turn, a safer food supply. Students may explore the benefits and costs of keeping animals healthy. When addressing the costs of animal production it is important to consider:

- Use of Antibiotics
- Animal Welfare
- Animal Housing
- Size of Flock or Herd

· **Links for Additional Research**:

- Animal Health Institute: http://www.ahi.org/issues-advocacy/animal-antibiotics/
- American Humane Association: http://www.americanhumane.org/animals/programs/farm-animal-welfare.html
- American Veterinary Medical Association: https://www.avma.org/kb/resources/reference/animalwelfare/pages/default.aspx?utm_source=oldsite&utm_medium=prettyurl&utm_term=animalwelfare&utm_campaign=redirect
- Centers for Disease Control and Prevention: http://www.cdc.gov/narms/get-smart.html
- Department of Agriculture's Animal and Plant Health Inspection Service: http://www.aphis.usda.gov/animal_health/index.shtml
- Department of Agriculture's Animal and Plant Health Inspection Service: http://www.aphis.usda.gov/animal_welfare/
- Department of Agriculture's National Agriculture Library--Animal Care Guidelines: http://awic.nal.usda.gov/farm-animals/animal-welfare-audits-and-certification-programs/animal-welfare-audits-and-1
- The Food and Drug Administration:http://www.fda.gov/forconsumers/consumerupdates/ucm349953.htm
- World Organization for Animal Health: http://www.oie.int/animal-welfare/animal-welfare-key-themes/
- World Organization for Animal Health: http://www.oie.int/en/for-the-media/amr/
- World Organization for Animal Health: http://www.oie.int/animal-health-in-the-world/

2. Cropland: What are the challenges to increasing output, and what are ways in which farms can increase production?

In order to increase production to feed the growing population, farmers must consider the costs and benefits of each of these tools or practices.

- Land use
- Use of Corn in the Production of Ethanol
- Use of Genetically Modified Seeds
- Producing Organic Agriculture
- Pesticide Use
- Transportation Costs
- Distance to Market

· Links for Additional Research:

  - World Bank: http://data.worldbank.org/indicator/AG.LND.AGRI.ZS
  - Department of Agriculture's Economic Research Service: http://www.ers.usda.gov/data-products/major-land-uses.aspx#.UmVFl-A71nI
  - Department of Agriculture's National Agricultural Statistics Service: http://usda01.library.cornell.edu/usda/current/FarmLandIn/FarmLandIn-02-19-2013.pdf
  - Department of Energy: http://www.afdc.energy.gov/fuels/ethanol_fuel_basics.html
  - Environmental Protection Agency: http://www.epa.gov/otaq/fuels/renewablefuels/
  - Congressional Budget Office: http://www.cbo.gov/sites/default/files/cbofiles/ftpdocs/100xx/doc10057/04-08-ethanol.pdf
  - Department of Agriculture's Economic Research Service: http://www.ers.usda.gov/data-products/adoption-of-genetically-engineered-crops-in-the-us.aspx#.UmVGLeA71nI
  - Public Broadcasting Service: Should We Grow GM Crops?: http://www.pbs.org/wgbh/harvest/exist/
  - The Institute of Food Technologists: http://www.ift.org/food-technology/daily-news/2012/september/21/impact-of-gmos-on-the-future-of-agriculture.aspx
  - World Health Organization: http://www.who.int/foodsafety/biotech/en/
  - Department of Agriculture's Economic Research Service: http://www.ers.usda.gov/topics/natural-resources-environment/organic-agriculture.aspx#.UmVGjeA71nI

- National Organic Standards Board: http://www.ams.usda.gov/AMSv1.0/NOSB

    - Department of Agriculture's Agriculture Marketing Service: http://www.ams.usda.gov/AMSv1.0/nop

    - Department of Agriculture's Economic Research Service: http://www.ers.usda.gov/topics/farm-practices-management/chemical-inputs.aspx#.UmVG0-A71nI

- Environmental Protection Agency: http://www.epa.gov/pesticides/food/

3. Environment: What environmental concerns must be factored in during crop production?

Environmental concerns also play a role in agriculture. Weather affects production, and some farming practices may improve the environment for the future. When taking into consideration the environment, think about the following issues:

- Conservation Practices
- Irrigation and Water Use
- Weather (drought, floods, etc.)

· **Links for Additional Research:**

    - Department of Agriculture's Natural Resources Conversation Service: http://www.nrcs.usda.gov/wps/portal/nrcs/detail/national/technical/?cid=stelprdb1041269

    - National Sustainable Agriculture Coalition: http://sustainableagriculture.net/publications/grassrootsguide/conservation-environment/

    - Department of Agriculture's Office of the Chief Economist: http://www.usda.gov/oce/weather/

    - AG Web: Weather News: http://www.agweb.com/weather/agriculture_weather.aspx

    - Department of Agriculture's Economic Research Service: http://www.ers.usda.gov/topics/farm-practices-management/irrigation-water-use.aspx#.UmVF3uA71nI

    - Environmental Protection Agency: http://www.epa.gov/agriculture/tsur.html