

Soil, erosion, food and agriculture

- How (generally) will climate change likely affect agriculture (eg. regions will not all be impacted in the same way, and food production may go down in regions that are already struggling – what are some of those regions?)
- Be able to list some possible ‘positive’ effects of climate change on agriculture, and some negative ones
- What are the ‘big three’ grains produced globally?
- What causes erosion?
- What factors exacerbate erosion (make it worse)?
- How can a farmer minimize erosion?
- Know that food distribution, not total amount of food, is currently a major cause of hunger in the world.
- Know that cereal production is currently keeping up with population, but barely, and in some areas (regionally), it is not.
- Know where in the world we are seeing the most severe problems (continent of Africa)
- What is soil? Soil is alive in addition to its non-living components
- Know what top soil and parent material are
- What is topsoil, and what regions have thicker topsoil and which have poor topsoil, and why (eg. why do grasslands have such good soil)? Fibrous roots, intermediate rate of decomposition
- Know what factors contribute to soil quality
- Know what some negative effects of inorganic fertilizers are on the environment (eg. they can cause excessive nutrients to flow into the water system causing algae blooms and choking waterways)\. They are expensive. They can lead to degradation of the living components of soil.
- Know the benefits of crop rotation and especially nitrogen rich plants such as legumes (with their nitrogen fixing bacteria symbionts)
- Know what nitrogen fixing bacteria are, and what they do.
- What was the green revolution? What have been some problems associated with it? Benefits? What is the green revolution focusing on now? (eg. soil conservation and keeping erosion down, integrated pest management, genetic engineering etc.)
 - Green revolution initially (and still) focused on lots of inorganic fertilizers and high levels of chemical pesticides
- Know what integrated Pest Management is
- Know the difference between industrial agriculture, Traditional ag (both intensive and subsistence) and plantation agriculture

- What are some global concerns around food production? Eg. food production keeping up with population growth, regional differences (some regions can't grow enough food), topsoil loss, climate change, soil fertility degradation, monocultures of crops, genetic engineering, pesticide resistance etc..!
- What are some advances we are making in agricultural production?
- How do most plants get nitrogen 'naturally': the nitrogen cycle and bacteria!
- How do we give it to them in most intensive agriculture?: Augmenting soil with inorganic and chemical fertilizers
- What is kwashiorkor and marasmus (protein deficiencies)
- What is a pesticide? What are some categories and types?
- What are some problems associated with pesticides?