LESSON GOALS

The primary goal for the study is to equip students with the knowledge and skills needed to conduct an investigation using comparative inquiry. Give the increased demand for alternative means for food production, it is essential for students to compare and contrast organic and conventional methods to make wise decisions. Most students tend to have an interest in food, particularly as it relates to taste and appearance. The curriculum objective is to use process skills of observing, classifying, communicating, measuring, predicting, inferring, identifying, and manipulating variables; recording, analyzing and operationally defining terminology, formulating models, experimenting, constructing hypotheses and drawing conclusions.

MATERIALS

Individuals/Small Groups:
- 1 pH soil testing kit
- 1 nutrient soil test kit
- 2 gallons of water
- Small amount of dry mustard powder
- Organic compost fertilizer
- Natural bug spray
- Conventional commercial fertilizer
- Commercial bug spray
- Rake, manual tiller, hoe
- 1 meter stick and 1 ruler

Class:
- pH test kit for soil
- Nutrient testing kit for soil
- Plastic gallon jugs with lids
- Fresh dry mustard

POSSIBLE STUDENT-DRIVEN QUESTIONS

- What is organic food? Conventional food?
- What are clear distinct characteristics between organic and conventional food?
- Does the way food is grown determine whether it is organic?
- Have you ever had any organic food? How did it taste?
- Are organic turnip greens healthier than conventional turnip greens?
PROCEDURE

Hypothesis: Organic food increases the quality based on health (less pesticide use), taste, appearance and the amount produced.

Procedures:
The sampling site will be a selected area in the back of the schoolyard. The area selected will be based on its proximity to my science classroom for easy access and observation purposes. The soil will be the same using different types of food production.

Methodology:
Phase I  Assess the status of the area for planting by testing soil acidity, test soil nutrient level, determine earthworm population

Phase II  Determine area, size, amount of sunlight; type of fertilizer based on nutrient ration from testing

Phase III  Determine fall plants and time factor for growth; choose among turnip greens, collards, carrots, onions and spinach

Phase IV  Conduct the following steps in the order stated:

1. Till/cultivate/plow the ground with the manual tiller
2. Rake area to remove trash, e.g. sticks
3. Even spread the fertilizer over the ground using the rake
4. Dig rows
5. Read directions on package for planting seeds
6. Plant seeds
7. Cover with dirt
8. Tap it with the hoe
9. Dampen the soil with water (moisture and sun help to germinate faster)
10. Make observations daily

Data Collection

1. Soil testing kit - acidity
2. Soil testing kit - ratio level of nitrogen, phosphorus, potassium
3. Test to determine earthworm population
4. Measure area for planting
5. Measure plant growth
6. Observe extent of crop damage

Data Analysis

The acidity level and ratio of nutrients will determine the type of fertilizer that is recommended. Also, sampling the earworm population will determine whether to purchase additional earthworms. Also, the area should be designated for planting crops based on the amount of sunlight and its proximity to my classroom.
Recording/Measurement
The following measurements/recording should include: pH level, nutrient ratio level, earthworm census, area for planting, height of plants, description of changes in appearance, and the length of time to ripen.

Prediction
If organic turnip greens are better, then a significant change would be evident in the amount and quality of growth, extent of crop damage, and taste.

Analysis and Communication
Students will analyze results based on the amount of turnip greens produced, quality of plant growth, extent of cop damage due to pest, and taste

Students will present and communicate results in a culminating activity which comprises two experimental groups (organic and conventional), culinary arts group, research group and the economics group. A brief panel session will conclude the session.

RESOURCES
- Hydroponics, Less Bridgewood
- Growing Fruits and Vegetables Organically, Jean Nick
- Organic Vegetable Gardening, Time-Life Book
- Complete Idiot’s Guide to Gardening, Jane O’Connor
- Solar Gardening, Leandre Poisson

BUDGET
- Acidity test, $10
- Nutrient Test (40 tests), $20
- Dry Mustard Seed Powder, $4
- Compost (black gold), $1
- Bug Spray, $2
- Garden tools - hoe, rake, manual tiller (2 of each), $50
- Turnip Greens Seeds, $5
- Earthworms, $8