

Horticulture/Garden

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Understanding Soils

Investigation

- Model the process of soil erosion and how to reduce or prevent it.
- Construct a diagram of the soil food web that includes at least four organisms involved.
- Describe the ways that pH can influence the availability of nutrients in soil.
- Compare and contrast some of the garden practices that can reduce soil organic matter or lead to nutrient loss.

Experimentation

- Classify soil texture using the hand-feel method.
- Find your garden soil site on the soil survey and compare its description to the description on the soil survey.
- Construct a compost pile and measure the temperature it reaches during decomposition.

Understanding Plants

Investigation

- Classify essential plant nutrients as macro- or micronutrients and their roles in plant growth.
- Examine the relationship between soil properties and plant growth.
- Identify the environmental factors that could reduce or increase photosynthesis in vegetables in the garden.
- Describe what plants look like that are grown with too little or too much light.

Experimentation

- Grow crops in the full sun and under a shade cloth to observe differences in leaves and growth.



Common Vegetable Crops

Investigation

- Model a crop rotation that takes into account the crop family, growing season and whether the crop is an annual or a perennial.
- Summarize the most common pests and diseases that impact common vegetable crops.

Experimentation

- Find a disease that is common in your area and select a cultivar that is listed to be resistant or tolerant and one that is not. Compare plant growth of both through the season. An example would be early blight in tomatoes or powdery mildew in pumpkins.

The Plant Growing Environment

Investigation

- Summarize what happens to cool- and warm-season crops when grown at the wrong time or under the wrong conditions in the garden.
- Describe the signs that a plant is experiencing stress from too much or too little water.
- Research the materials and designs needed to build a small cold frame or greenhouse.

Experimentation

- Plant short-season crops in containers and experiment with different watering frequencies. Record if they show signs of being over- or underwatered.
- Build a cold frame or small greenhouse where you can start transplants.
- Visit a local greenhouse and discuss with the grower some of their challenges and successes in producing the best transplants for home vegetable gardeners.

Vegetable Crop Management

Investigation

- Compare the most common weeds and methods of control in the home garden.
- Research how plants are grown hydroponically.
- Show what a garden plan would look like with different crops, seasons and sites in the garden for one entire year.

Experimentation

- Calculate and apply fertilizers to your garden site according to the soil report that came with the soil sample from the site.
- Plant a vegetable garden using your garden plan and make sure that crops are rotated in the space across years. In different years, focus on gaining experience in a range of crops (tomatoes, peppers, Irish potatoes, beans (dry and snap), peas, spinach, lettuce, sweet potatoes, okra, sweet corn, radish, carrots, kale, broccoli, cauliflower, summer squash, pumpkins).
- Experiment with different crop growing techniques including:
 - Drip irrigation, successive planting, double cropping, supporting with stakes and cages, mulching with natural and inorganic materials, side dressing with fertilizers, using both chemical and organic fertilizers.

Marketing and Selling Vegetable Crops

Investigation

- Research regions where common vegetable crops are grown and the conditions that are found in those areas.
- Visit a farmers market and determine what the most commonly available crops are and the prices that are being charged.

Experimentation

- Keep track of all your expenditures for each year so you know how much is being spent on seeds, tools, fertilizer, soil amendments, equipment and all other garden expenses.
- Create a short survey that can be given to friends and family or other citizens who represent consumers that determines the crops they are most likely to buy locally and the attributes (cost, flavor, color, appearance) they value most.

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