

LESSON: **Guilds & Communities, Plants & People**

GRADE: 3

OBJECTIVES:

Social Studies

SS.3-5.BS.2 Understand the influences on individual and group behavior and group decision-making.

- Understand that people involved in a dispute often have different points of view.
- Understand that communicating different points of view in a dispute can often help people to find a satisfactory compromise.

Science

Science & Engineering Practices

3-LS2-1 Construct an argument with evidence, data, and/or a model.

MATERIALS & RESOURCES:

- Plant guild information (included in lesson)
- Internet access to:
 - [Native American Three Sisters Gardens, New Mexico University-
http://ddl.nmsu.edu/kids/webquests/wqthreesisters_k.html](http://ddl.nmsu.edu/kids/webquests/wqthreesisters_k.html)
 - [Seeds of Change Companion Planting Table-
http://www.seedsofchange.com/enewsletter/issue_55/companion_plantin_g.aspx](http://www.seedsofchange.com/enewsletter/issue_55/companion_plantin_g.aspx)
- Paper & pencil, art supplies if story is to be told with art work

PRESENTATION:

Students will learn that plants *get along* based on *points of view*, similar to humans. More accurately, plants form **guilds** based on the *needs* and contributions of each plant. Members of human communities have various needs and contributions. If we view our communities as guilds we can find compromise and cooperation.

Science perspective: Plants are found growing in particular “communities” in natural habitats. Animals form groups that help them survive. Can it be shown that plants do the same or similar thing to survive? Make your argument with some evidence.

Humans have learned from observing how plants grow in communities in their natural habitats. Humans use this information for growing plants in human habitat, especially growing food.

DIRECTIONS:

1. Read and discuss information about plant guilds. Identify needs and contributions of various plants. How do they get help and help each other? While considering the plant guilds, begin to compare humans in families, class, communities. How do they rely on each other for needs and help each other? Examples:
 - Corn needs lots of nitrogen and offer support to vines, beans give nitrogen and need support for vines
 - Walnut trees produce a growth prohibitor/ Walnut shell can be used to stop weed growth
 - Apple tree roots grow in top 12” of soil/comfrey sends out a deep tap root bringing up water and minerals from subsoil for shallow rooted plants
 - The Seeds of Change Companion Planting Table or any companion planting data is helpful in pointing to many elements of a successful plant community. These elements can be attributed to people.

2. Make a list of needs and benefits provided by humans in human communities. Following are just a few ideas. There are hundreds more connections between people.
 - Care & Support- parenting, family, friends, community, teachers
 - Safety- crossing guards, police, fire fighters, nurses, doctors, parents, teachers
 - Food, Water, Air, Housing, Clothing- farmers, grocers, cooks, artisans, cloth makers, tailors, carpenters,
 - Learning- teachers, principles, school employees, each other, books, documentaries, artists, musicians
3. After review of information about plant guilds and human communities, students can write a story about living in community, using what they have learned about plant guilds. Who are their “sisters”? Who supports them, nourishes them, helps them with safety or learning? Whom do students “support”, keep safe, entertain, feed, teach, etc. Some students may be better able to express this through pictures by painting, collage, or drawing. Some may want to tell about it out loud, in a story.

TIME:**45-90 min**

Examples of Plant Guilds:

The "three sisters" of New Mexican agriculture, corn, beans, and squash, were hundreds of years ahead of their time. This system serves as the basis for intercropping systems currently being used around the world as tools to increase agricultural productivity in areas facing food shortages. Why is this a successful system?



Simply stated, each of the three sisters serves an important role. To understand the system, one should first consider the three plants separately. Growing corn in rows is a good idea but wastes valuable planting space. Beans require some sort of support system and must be staked up to grow. Finally, both squash and corn require additional nitrogen in the soil to produce adequately in New Mexico's typically sandy soils, which are also prone to losing valuable moisture due to evaporation. As corn reaches for the sun, beans may grow up the strong stalks and the necessity of

building a support system or frame is reduced. One must plant corn some distance apart, leaving the ground bare; however, planting squash between the rows of corn reduces soil moisture loss as the squash foliage acts as natural mulch, reducing soil temperatures and helping to "hold" moisture in the soil where it may be used by the plants and not lost to the atmosphere. Finally, beans have the unique capability of being able to "fix" atmospheric nitrogen, pulling it from the air and improving soil nitrogen status; essentially, "fertilizing" the other two sisters. (New Mexico State University, <http://ddl.nmsu.edu/kids/webquests/3sisresources.html>, Contributed by Dr. Dann Brown, Professor of Botany, Eastern New Mexico University)

Fruit Tree Guild

Another example is an espaliered apple tree, runner beans, strawberries and spinach. The low-lying strawberries act as ground cover, which helps the soil retain moisture, and the nitrogen-fixing runner beans feed the soil underneath the apple tree. And when the runner beans get tall, they can climb the lower branches of the apple tree as well as a nearby trellis. The shade-loving spinach thrives in the shadows created by the apple tree and the runner beans

Espalier Apple Tree



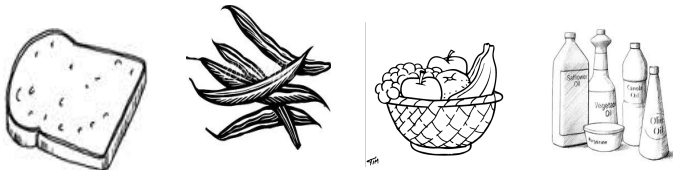
Food Guilds

Characteristics of an Effective Food Guild

- *Linking it to Human Community*

Humans have learned about creating guilds from watching nature in forest or on prairie. In a garden or food guild, the following characteristics are important. The Three Sisters guild has these characteristics. The words in italics ask questions to help you compare the plant guild characteristic to human characteristics.

1. **Produces Food** - Humans depend on plants for staples (grains), legumes (beans & peas), fruits, vegetables, and fats



your food?

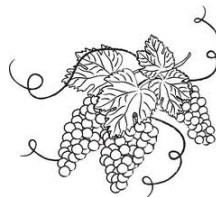
- *Who do you rely on to produce (gather and prepare)*

2. **Food for the soil**- Legumes and organic matter (plant matter that is breaking down) that provide nutrients to the soil.

- *What builds you? Learning, playing, music, friends?*

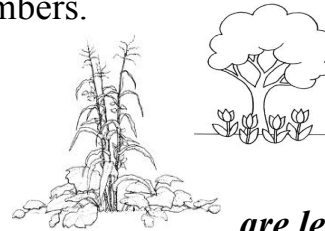
3. **Climbers** - Important for making the most of vertical space.
Grapes, Beans, Peas, Kiwi

Are you able to stretch & Does it stretch your mind to stretch and climb? Do you see climbing by playing and learning?



climb? This is play and learning. learn new ideas? Who helps you people around you stretching and

3. **Supporters** - Plants that provide support to climbers.
Corn, some trees & shrubs



- *Are you supportive to friends when they are learning new ideas? Who supports you? Teachers, family, and friends?*

5. Miners or diggers- Deep roots or tubers that open the soil and bring up nutrients from deep

Carrots, turnips, daikon radish, comfrey

- *Who are the people in class who digs down deep and brings up share with the class?*



contribute? Who information to

6. Groundcovers- Protects soil, provides shade, holds moisture, and suppresses weeds. This provides good environment for growing plants.

Strawberries grow across the top of the soil, as do squash & cucumbers

- *Who does the work in your class of keeping out unwanted distractions (weeds), protecting the quiet, providing a good environment in which you are able to learn?*



7. Protectors- Protection for others in the system (Repellents, attractors, live fencing, etc.)

Marigold flowers repel harmful insects. Frogs eat insects.

Bee balm attracts pollinators.

- *Who are the protectors in you life? Or the people with whom you enjoy playing or talking? Who attracts others with kindness?*

