Potato Variety Comparison Inquiry

Adapted from: Life Lab "What's in a Name?" from *The Growing Classroom*

Overview: Students grow different varieties of the same crop to test their suitability to the school's garden soil and climate.

Subject area: Science

Grade level: 3rd

Next Generation Science Standards:
3-LS3 Heredity: Inheritance and Variation of Traits

- **3-LS3-2.** Use evidence to support the explanation that traits can be influenced by the environment.

3-LS4 Biological Evolution: Unity and Diversity

- **3-LS4-3.** Construct an argument with evidence that in a particular habitat some organisms can survive well, some survive less well, and some cannot survive at all.

Objectives: Students will be able to analyze and differentiate between three varieties of potatoes.

Prep time: 30 minutes

Initial lesson time: 45 minutes

Optional follow-up lesson and observation time: 15 minutes per week for 3-4 months

Teacher Background: Plant varieties are bred by scientists working for seed companies and are developed for their different characteristics. Some tomatoes, for example, make big fruits; some resist pests and diseases; some do well in certain climates and poorly in others; some grow longer, shorter, rounder, firmer, redder, bigger, faster, and so on. Many varieties are hybrids and do not reproduce the same seed from season to season. However, seeds of non-hybrid varieties can be saved, as they develop seeds especially well-suited to certain environments.

Potato Planting Information:
Pre-sprout potato tubers one to two weeks prior to planting them and place them in one layer in a flat box or crate with the seed end facing up. Put them in a warm room (70 degrees F) where light levels are medium in intensity. The warmth will stimulate the development of strong sprouts. Also, in the presence of light, the sprouts will remain relatively short and won't break off as easily.

Potatoes like to grow in sandy loam soils. Improve other soils by incorporating organic matter. The optimum germination temperature is 50-70 degrees F.

Loosen compacted soil by digging a spot eight to 12 inches deep and toss soil back in, rather than turning the soil over. If adding compost, mix it in six to eight inches.

Sprouted tubers the size of an egg can be planted whole. For larger tubers, cut them with a clean, sharp knife so they contain two or more eyes and have some flesh left surrounding each eye. Plant the seed potatoes directly after cutting, or if extremely rainy conditions are forecast, dry out the cut pieces prior to planting. Click here for more detailed information about cutting sprouted tubers or planting them whole.

In the raised beds, lay out rows that are 20"-26" inches wide. Dig a shallow trench about 6"-8" deep. Place each seed tuber about 12" apart. **Cover** the seed pieces immediately after planting with about 4" of soil. Leave the remaining soil to hill up later.

About two weeks after planting, the leaves should emerge. When the plants have grown to about 8" high, begin to hill up the soil around them by adding about 3" of soil. (4"-6" of the plant should still be exposed.) Add 1"-2" more soil to the hill about two to three weeks later. Continue hilling as the season progresses.

Materials needed:

- A prepared garden bed
- 3 different varieties of sprouted potato tubers
- Trowels
- Gloves
- Rulers
- String
- Plant Labels
- Sharpies
- Clipboards
- Data Collection Sheets (1 copy of each form per student)

Space needed: One to two raised garden beds.

Staff needed: 1

Discussion: *What do plants need to grow? How do plants reproduce? How do we know when it is the right time to plant a certain vegetable?* There are different varieties of each vegetable plant. *Why would we plant one variety over another?*

Presentation steps:

1. Show students the 3 different sprouted tubers and discuss the differences between them.
2. Ask the class to predict which variety will grow the best, be the tallest, have the most potatoes germinate, taste the best, be the least susceptible to pest or disease damage, etc.
3. Have students divide and measure out a garden bed into several equal sections and sow each section with one variety of sprouted tubers.

4. Students will create labels for each section of sprouted tubers. Labels should include the variety name and date planted. Put the labels in each section so it is very obvious where each potato variety is planted.
5. In the following weeks, have students treat all the varieties exactly the same: water the potato plants the same amount, weed the same amount, add soil to the hills, etc.
6. Have students make weekly observations and record all the information on their charts. See attachments for data sheets.
7. In early June or the following fall, if the class will be the same, have students harvest the crop together, have a tasting party and discuss the experiment results.

Conclusion: Ask students, *which variety produced the most? Which grew the most? Which tasted the best? Which was the most disease/pest resistant? Which factor is the most important? Which would you rather grow if you were a farmer?* Ask the class to vote on the best variety. *Would the best variety for our garden be the best variety to grow no matter where you live? Why might another variety be better somewhere else?* (Different climate, different soil, shorter or longer growing season)

Potato Variety Investigation

Name_____

Guess:

Which variety will have the most potatoes germinate (sprout)? _____

Which variety will be the tallest? _____

Which variety will have the least pest and disease damage? _____

Which variety will taste the best? _____

Test: Record potato variety data once per week until harvest.

	# Germinated			Plant Height In Inches			Pest/Disease Damage (Scale 0-5)			Taste (Scale 0-5)		
Date	A	B	C	A	B	C	A	B	C	A	B	C

Potato Varieties: _____ = A _____= B _____= C

Potato Variety Investigation **Name_____**

Tell: Were your predictions true?

Potato Varieties: _____ = A _____= B _____= C

Potato Variety Investigation **Name_____**

Data Collection:

	Quantity dug up			Average Diameter (inches)			Total Variety Weight (pounds)			Taste (Scale 1-5)		
Date	A:	B:	C:	A:	B:	C:	A:	B:	C:	A:	B:	C:

Conclusion:

Do you remember from last spring, which variety grew the best (plant was large, healthy, pest and disease resistant)?

Which variety produced the most potatoes?

Which variety was the largest?

Which variety tasted the best?

Potato Variety Investigation **Name_____**

Which factor is the most important?

Which variety would you rather grow if you were a farmer?

Which is the best variety for this garden?

Would the best variety for this garden be the best variety to grow no matter where you live? Why or why not?