Groundwork Education in Mathematics and Science

Module: Structures of Life **Investigation/Lesson:** 1/1 Origins of Seeds: Seed Search

Date(s): 2-3 full periods Lee Ann Nickerson & Christy Rich

Content Vocabulary:

fruit
seed
property
estimate
structure
function

Optional new vocabulary

botanist
biologist

Concepts/Skills/Core Content:

What should a student know/be able to do as a result of this lesson?

1) know that the frit is the structural part of the plant that contains the seeds.

2) understand that, although the properties of fruit may be different, the function of fruit is the same: all are seed holders.

3)plants, including their fruits and seeds, are living organisms classify

Which core content bullet(s) is addressed in this lesson?

1.1.1 (objects [seeds] have observable properties)
3.1.1 (plants are living things)
3.1.3 (fruits are structural components of a plant that functions as a seed holder)

Materials:

What materials are needed for this lesson?

Fellow: Assemble materials on page 8 of Investigation 1. Bring nutcrackers if nuts will be used (nuts must be in their shells for it to be considered a fruit). Plastic wrap may be preferable to newspaper as a table lining –especially if you plan to have students any of the fruit. Baskets should be available to transport fruits to individual tables.

Teacher: Obtain a variety of fruits---including those commonly termed vegetables and nuts for the seed search. Snap peas make great pea pods for the intro. Be sure to select an assortment that includes fruits with one seed, a few seeds, and some with many seeds. A good selection is shown on the transparency 'Comparing the Fruits and Seeds We Investigated'.

What materials preparation is necessary for this lesson?

The transparency for sharing-out after seed searching is attached as is a sample of guided discussion for wrap-up. Histogram transparency is also attached.
No preparation is needed for the fruits being used.

Classroom/Materials Management:

How will students be grouped?

Groups of 4 for the seed pod/histogram and seed search activities.: 2 getters, a group recorder and a group recorder. Groups of 2 for the seed sorting exercise.

How will materials be distributed/returned?

Fellow will distribute pea pods and set-up plastic knife and paper plates for 1st investigation.
****Allow each student to work with his/her own pea pod** initially and record in science notebook.
Fellow and Teacher will set-up work stations together for seed search
The 2 getters will obtain fruit selections (*have baskets) for each table and assist in clean-up.

Student Notes/Notebooks:

Where and how will students record important classroom information? How will students know what to record?

1)Students will use science notebooks to record observations (properties, #seeds)) and their drawing of their pea pod.
2) Each group's recorder will gather group data on # of seeds and the group reporter will add the group data to the histogram transparency (supplied). All students will record the most frequently occurring number of seeds per pea pod found in their science notebook.
(they may also enter their prediction and how close they came when the 'class' pea pod was opened.)
3) science notebooks will be used for recording properties , # seeds, and drawings during the seed search instead of the FOSS worksheet "Comparing Seeds" . Fellow will prepare a sample science notebook entry on chart paper for the students to model during the activity (sample attached). Each student should enter observations for 3-4 different fruits. **Fellow and Teacher ould circulate during this activity and try to ensure that each student has selected fruits having differing numbers of seeds (and also fruits that are commonly referred to as vegetables or nuts)
4) Students will also use science notebooks during wrap-up. Class will use a transparency (supplied) to share-out. After the questioning/discussion period that accompanies the wrap-up, students will draw a 'line of learning' and enter the BIG IDEAS of the lesson from the content/inquiry flip chart (Teacher) uses to sum up the lesson. They can underline the key vocabulary terms

How will students organize their notes/notebooks?

1)The Fellow will prepare/explain a sample format displayed on a flip-chart for entering observations/data during the Seed Search activity.
2) The Teacher will guide the wrap-up entries to science notebooks---the 'line of learning' and the information from the chart that should be entered.

How will you provide feedback to your students about their notes/notebooks and their organization?

Science notebooks will be collected and comments/suggestions/encouragement entered by the Fellow for this first investigation; Teacher will assess notebooks after the Part 2 "The Sprouting Seed".
No grades will be assigned for notebook work.

Literacy Connections: Seeds are Everywhere

At the end of the wrap-up discussion (guide is attached), there is a lead-in portion for introducing the next part, The Sprouting Seed. This is the opportune time to read
Seeds are Everywhere with the class.

Thinking Through the Lesson:

Introduction-How will you introduce the lesson and connect it to prior student learning?

An apple and a pea pod will be used to introduce fruits and seeds.
Teacher will prompt students to compare the two AND to note any similarities (to assess prior knowledge).
Class observations recorded by Fellow on a T-chart.
Kinds of observations that students might make:
Both apples and pea pods come from plants & are living organisms
Both are edible
One is a fruit and one is a 'vegetable'

Facilitation-How will you facilitate learning and move all students to higher order thinking?

1) During open discussions (intro, histogram follow-up, Comparing Fruits and Seeds We Investigated: and its wrap-up: Fellow will use a class roster to check-off each time a student contributes to discussion. Both Teacher and Fellow can use this to get quieter students involved.
2) For estimating number of seeds in some fruit: Teacher and Fellow should have already devised/discussed different strategies that students could use to estimate when a fruit contains lots of seeds. This way, they could guide/encourage students to adopt various systems.
3) For sorting seeds: Teacher and Fellow should devise multiple sorting methods based on the less obvious properties (e. g., hardness of the seed) and try to encourage students to do the same. Not every group of 2 should be using the same obvious property.

Closure-How will you know what each student has learned/is able to do?

Science notebooks will be the primary means of deciding how well students learned the lesson.

Guided closure using the suggested wrap-up questions/discussion (attached) in tandem with the Word Bank and the Content/Inquiry Chart (sample attached) during wrap-up will reinforce concepts and vocabulary

Informal assessment opportunities:
During wrap-up discussion after using the Comparing the Fruits and Seeds We Investigated and constructing the Content/Inquiry Chart: cover the chart and ask main concept questions like "In what part of a plant are seeds found?" Use white boards to have students hold up their answers. This can be done as part of the scripted wrap-up (attached)
At the end of the class, ask each student to write something they learned about seeds (or fruit) on a sticky note and post it on a parking lot as they leave.

Structures of Life: Investigation 1, Part 1
Content/Inquiry Concepts for Class Chart
(Science Word Bank Vocabulary is underlined)

- The fruit is the plant structure that contains the seeds of the plant.
- Fruits from different plants have different properties like size, color, shape, hardness, smell, and even the number of seeds in them.
- Just like fruits, seeds also have many different properties.
- Even though fruits from different plants have different properties, all fruits serve the function of seed holder for the plant.

Structures of Life: Investigation 1, Part 1

Sample Science Notebook Organizer

For Comparing Seeds

(Teacher charts this sample organizer to demonstrate how students should record in their notebooks)

Name of Fruit
Number of Seeds
Properties of Seeds
Drawing or Sample of Seeds

Charting the number of seeds in our bean pods

1	2	3	4	5	6	7	8	9	10	11	12

What number of seeds occurs most often?
If we open another pea pod, can you make a prediction about the number of seeds that will be inside?