Title: Potting Soil Ratios: Scientific Method

Time: 40 minutes

Materials:
Peat
Perlite
Compost
Potting plants
Lettuce seeds
Worksheet printouts

Objective:
Students use some of the many inputs that agriculture uses in order to produce our food (compost, peat, and perlite); they think critically about which inputs are more environmentally sustainable and compare this with how those input are most effective in growing human foods

Opening:
Today, we are going to begin growing lettuce for the community garden at the MARC. We want the best possible potting soil mix for our plants so that they start off strong and healthy.

We will be using what we've learned about the scientific method to test what ratio (combination) of materials makes the lettuce plants grow the tallest, using ***compost***, ***perlite***, and ***peat moss***.

Have students quickly review the scientific method (what it is, and what are the different pieces).

Activity 1: Potting Material Review (10 min)

Ask students: What do plants' roots need to grow?

___nutrients___ + ____air___ + ___water____

Then lead students through the following worksheet, which explains how each material in our potting soil helps our plants' roots get what they need to grow:

Material	What is it?	What does it do to help plants

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		grow?
Compost	*Decomposed organic matter: food, leaves, wood...*	*Provides nutrients*
Perlite	*Volcanic glass that has been heated up*	*Mostly air (also holds water)*
Peat Moss	*Sphagnum (a type of moss) that has slowly decomposed in a bog.*	*Holds moisture.*

Activity 2: Potting Soil Test Set-up (25 min):

Explain the following to students about how they will set up their experiment:

Your control will be a 1 to 1 to 1 ratio of compost to perlite to peat. There is an equal amount of each material in this mixture: ⅓ cup of each.

Ratio 1:1:1	Compost ⅓	Perlite ⅓	Peat ⅓

In addition to the control, you will test the following ratios (display this chart on the board):

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Test	Ratio of compost: perlite: peat	Material #1	Material #2	Material #3
#1	1:2:0	Compost	Perlite	Perlite
#2	1:0:2	Compost	Peat	Peat
#3	1:0:0	Compost	Compost	Compost

Next, walk students through this piece of the worksheet with students:

Problem:

_____
_____

Hypothesis:

_____
_____

Constant:

_____
_____

Control:

_____
_____

Finally, have students set up their experiment. They should be split up into small groups (4-5) and each group will make up 4 tests: control, test 1, test 2, test 3, test 4. When they have all their pots set up, you can give them seeds to plant. Then, all pots should be labeled with their group names and placed under a grow light.

Each week students will measure the inches their plants have grown. At the end of the project, they can graph their results to see which potting soil combination worked best!

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Student worksheet:

The Scientific Method: Potting Soil Experiment

We are growing lettuce for the community garden at the MARC. We want the best possible potting soil mix, so that the plants start off strong and healthy.

We will be testing what ratio (combination) of materials makes the lettuce plants grow the tallest, using ***compost***, ***perlite***, and ***peat moss***.

What do plants' roots need to grow?

___nutrients___ + ____air___ + ___water____

Then lead students through the following worksheet, which explains how each material in our potting soil helps our plants' roots get what they need to grow:

Material	What is it?	What does it do to help plants grow?
Compost		
Perlite		
Peat Moss		

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Your control will be a 1 to 1 to 1 ratio of compost to perlite to peat. There is an equal amount of each material in this mixture: ⅓ cup of each.

Ratio 1:1:1	Compost ⅓	Perlite ⅓	Peat ⅓

In addition to the control, you will test the following ratios (display this chart on the board):

Test	Ratio of compost: perlite: peat	Material #1	Material #2	Material #3
#1	1:2:0	Compost	Perlite	Perlite
#2	1:0:2	Compost	Peat	Peat
#3	1:0:0	Compost	Compost	Compost

Scientific Method:

Problem:

_____

_____

Hypothesis:

_____

_____

Independent Variable: (the thing you are testing)

_____

Dependent Variable: (the thing you are measuring)

_____

Constant:

_____

Control:

_____

_____

How many centimeters did the lettuce grow?

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Data Table				
Time	**Control**	**Test #1**	**Test #2**	**Test #3**
1 week				
2 weeks				
3 weeks				
4 weeks				

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