

Grade Level: 1

Title: Soil Matters (July/August/ September)

Purpose:

To recognize that plants thrive in different types of soil and how roots and stems grow through soil and absorb water.

Subject Area(s) Addressed:

Science, Language Arts

Common Core/Essential Standards:

Science

1.E.2.1 Summarize the physical properties of Earth materials, including rocks, minerals, soils and water that make them useful in different ways.

1.E.2.2 Compare the properties of soil samples from different places relating their capacity to retain water, nourish and support the growth of certain plants.

ELA:

W.1.8 With guidance and support from adults, recall information from experiences or gather information from provided sources to answer a question.

SL.1.1 Participate in collaborative conversations with diverse partners about grade 1 topics and texts with peers and adults in small and larger groups.

SL.1.1a Follow agreed-upon rules for discussions (e.g., listening to others with care, speaking one at a time about the topics and texts under discussion).

SL.1.1b Build on others' talk in conversations by responding to the comments of others through multiple exchanges.

SL.1.1c Ask questions to clear up any confusion about the topics and texts under discussion.

SL.1.5 Add drawings or other visual displays to descriptions when appropriate to clarify ideas, thoughts, and feelings.

SL.1.6 Produce complete sentences when appropriate to task and situation. (See grade 1 Language standards 1 and 3 here for specific expectations.)

L.1.1 Demonstrate command of the conventions of standard English grammar and usage when writing or speaking.

L.1.5c Identify real-life connections between words and their use (e.g., note places at home that are cozy).

Vocabulary:

air
roots
stem
water

Materials Provided:

“Strawberry Plant Diagram”

Materials Needed:

Straws (1 straw per pair of students)
pipe cleaners (1 pipe cleaner per pair of students)
pots of each type of earth material (topsoil, gravel, sand, clay soil)
water
damp towels for wiping the straws and pipe cleaners

Teaching Strategy:

Because our strawberry plants are going to be put into soil, we need to decide which soil would be best for the strawberries. Strawberries can grow in many different soils, but some soils are better because they provide the space for roots to easily spread and hold water because the roots need to absorb water from the soil. Today we are going to do a demonstration to see how roots react in different soils.

Show students the “Strawberry Plant Diagram” – and/or an actual plant (removed from the soil). Have them locate the roots on the plant. Review the purpose of the roots and the stems for the plant. Show the students a pipe cleaner. Tell the students the pipe cleaners represent the roots. Show how the pipe cleaner is strong and can push through soil. For example, push it through the sand and it will push through the grains. If it were the roots, the roots do the same thing as the plant grows. The straw represents the stem. The stems are like the highways of the plant and take the water and nutrients from roots to leaves, flowers, fruits and the “food” from the leaves back to the roots to help them grow into the soil. The teacher demonstrates how each pair will “grow roots and stems” in the soil by gently pushing the straw and the pipe cleaner into the each pot. Then model a drawing of the “stem” and the “root” when you pulled them out. (The pipe cleaner will bend as it goes into the rocky soil, will slide easily into the sand and vary as it goes into the clay and topsoil.)

Put the students into pairs, giving each pair one straw and one pipe cleaner. Have the pairs move around to the different pots of dry soil. In their science journals, write observations of the pipe cleaner and the straw as they pushed them into the different pots. What happened to the shape of the pipe cleaner? What is in the straw? Gently clean the straws and pipe cleaners before experimenting with soil in a different pot.

After the students have observed each of the types of soil, add a measured amount of water to each pot. Repeat the observation with the wet soil. Write the observation in your science notebook. How is the “stem” observation in the wet soil different from the dry soil? How are the “root” observations different?

Why would these observations be important to a farmer? If you were a farmer, which soil would you use for your strawberry plants? Why? Do farmers always have a choice of soils?

Extension Activity:

Contact your county’s Cooperative Extension office to obtain information about sending a soil sample. Locations of all of these offices can be found at www.ces.ncsu.edu/local-county-center/. Send a sample of soil from the location chosen. Ask one of the extension agents about coming to your classroom and interpreting the results with your students.

Background Information:

For the farmer, the soil is very important if the plants are to grow healthy and produce many strawberries. Plants will grow best if the right balance of nutrients, minerals, elasticity (how well the soil sticks together), water absorbency, and air is achieved. Strawberries are able to grow in a variety of soils, but the farmer must be aware of the characteristics of soil in the field so s/he knows how often to water, what fertilizer or supplements needs to be added and when to add them. Strawberry growers add materials like lime, fertilizer, and compost to the field in the summer before they make the beds and cover them with plastic. Then, while the plants are growing, they usually add soluble nutrients to the water that is delivered to the plants through their drip irrigation tape.

Roots of plants are actually more like snakes or worms pushing through the soil than like pipecleaners. The growing tips are very fine and sensitive, and can work their way through organic matter and around obstacles like rocks. The texture of soil, or “tilth”, however, is a very important consideration in cultivation and irrigation. Farmers often speak of soil as “heavy” (lots of clay) or “light” (sandy).

www.youtube.com/watch?v=M2pqy3E8XAs
www.youtube.com/watch?v=d26AhcKeEbE

Assessment:

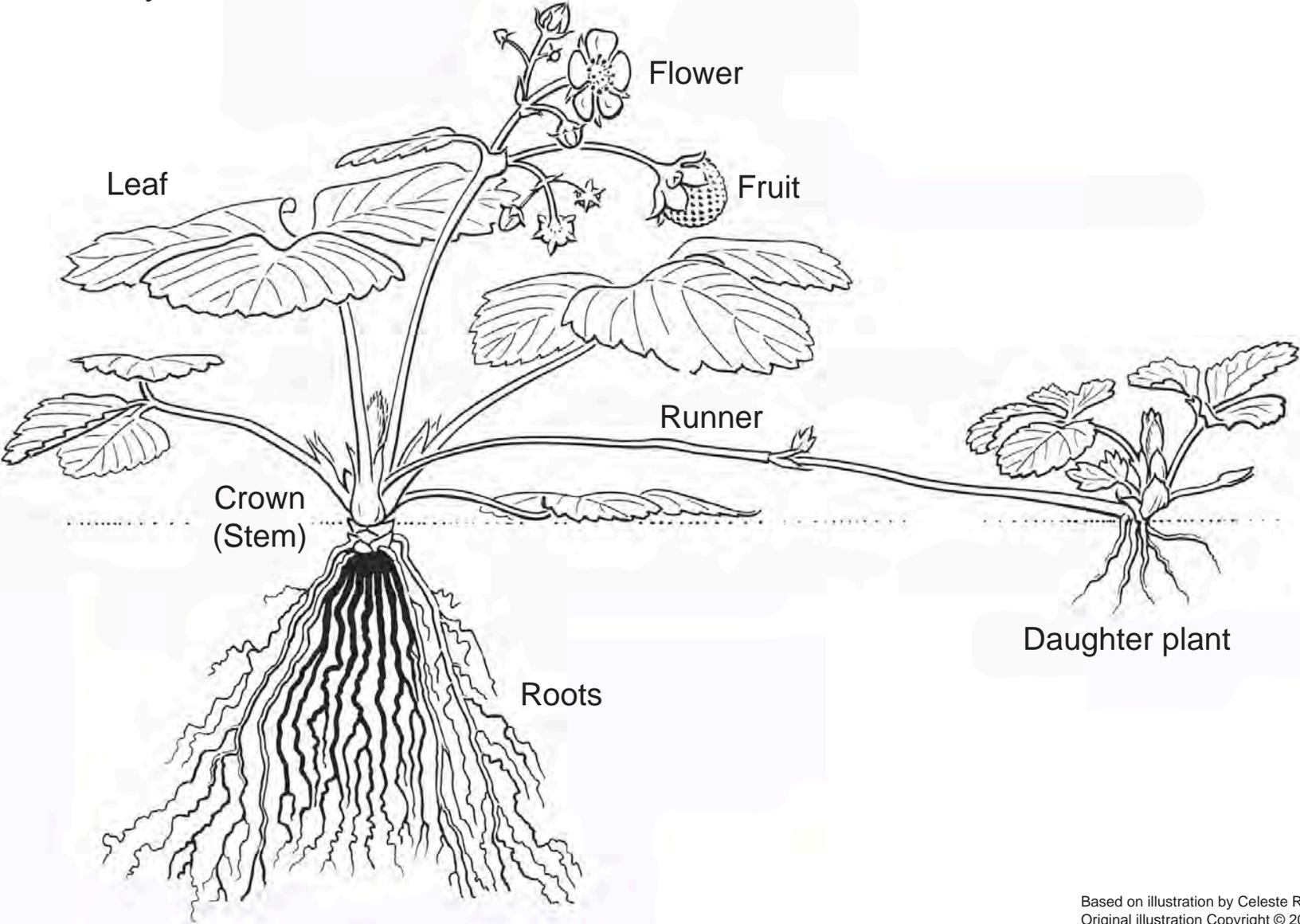
Journal entries, drawings and conclusions

North Carolina Strawberry Association – www.ncstrawberry.com

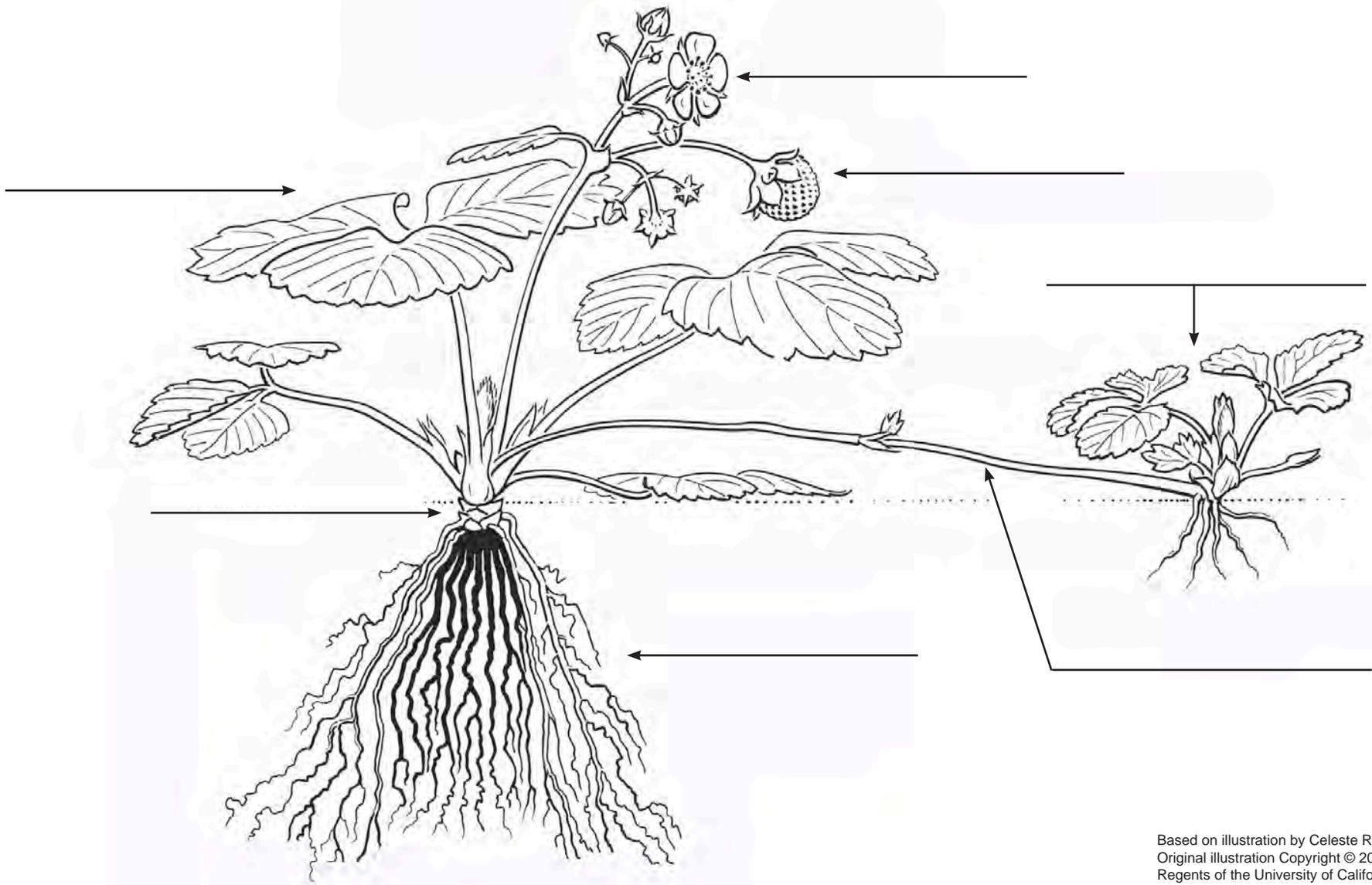
This project was supported by the North Carolina Department of Agriculture and Consumer Services Specialty Crop Block Grant Program.



Strawberry Plant



Based on illustration by Celeste Rusconi.
Original illustration Copyright © 2013
Regents of the University of California.



Based on illustration by Celeste Rusconi.
Original illustration Copyright © 2013
Regents of the University of California.