

A Science lesson on soil types

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Topic : Soil Types:

Inquiry Based Lesson

Grade Level : 4

Objective:

1. Given different soil samples, the students will be able to observe and record the different characteristics and make logical guesses of where each soil is taken from. (Either a field, construction site, a lake, woods, and a driveway.)
2. The students will use the observations and information about the soil samples, which was collected from their group discussion, and the picture of Jack Hanson's boot, to make an inference as to where Joe Frisbee's body is located.

Teacher Materials :

Joe Frisbee's drawn body outline on butcher paper

Joe Frisbee's estate drawn on butcher paper

Jack Hansons' boot and worksheet

overhead projector

overhead transparencies

Student Materials :

notebooks

5 soil samples for each group

Soil A-taken from lake

Soil B-taken from driveway

Soil C-taken from woods

Soil D-taken from field

Soil E-taken from construction site

Teacher Background Information :

This lesson should be introduced after the students have had the opportunity to observe sand, clay, and loam, and have done a soil profile.

Management Strategies :

Students work in groups of 3 or 4

They present their findings individually or as a group

Work area- students remain at their assigned tables

Special needs students may need extra attention with the instructions which may be given individually if needed

This activity may lead to a great deal of debate therefore, the teacher should address the issue of how to disagree with a student politely.

Students also need to be reminded that not everyone may get the opportunity to express their ideas due to the lack of time.

Students need to be reminded to be patient.

Introduction:

This lesson is a follow-up lesson from the soil profile lesson in which the students observed and recorded the three different types of soil. The students will use this previous knowledge to make logical guesses about where each soil sample was taken from.

Explain to the children that there is a problem and the students have to be detectives to help solve the problem. Tell them that there has been a murder! Joe Frisbee, a rich millionaire inventor of the frisbee has been killed and it is the students job to collect data. Show them the drawing of the estate and explain to them that the police found Jack Hanson's shoe on the estate with several soil samples on it. Somehow the samples have been wiped clean from the shoe. The police took soil samples from around the estate but forgot to label them.

Exploration Phase :

It is the students job to actively observe the five different types of soil and decide which soil goes to what part of the estate. The students work together in their groups, discussing possible solutions and stating their evidence for their findings. In this phase, the students will record their findings on the worksheet labeled detective notes.

Concept Introduction :

Using the overhead projector, the transparencies and the estate map, the teacher records the students ideas about each soil. Possible questions the teacher could ask:

1. Who has a guess about where soil A is taken from? Where do you think?
2. What characteristics have you found about soil A that makes you guess that is where it is taken from?
3. Could the soil have been taken from somewhere else? Anyone have any other possible ideas?
4. What do we notice that is similar about Soil C and D? (both are dark soil) What are different about the two soils? (one has leaves, twigs, acorns etc. other doesn't) What can this tell us?
5. Soil E is rather different than any other soil. Who can tell me what type of soil this is? Hint: We looked at this soil in class.

If the students disagree with an answer the teacher tells them, they have to find information to prove their findings. If a student gives an answer without appropriate evidence, the teacher tells the student that it will be thrown out of court and the students ideas will not be able to help solve the case.

Concept Application Phase :

Once the students have identified the soil types, the teacher poses a new problem for the students to solve. They look at the picture of the boot and decide which soil sample goes with which layer on Jack Hanson's boot. The teacher gives a description of each layer of soil because the drawing is hard to read.

She asks them for example:

1. The first layer on the boot has medium size rocks and parts of plastic in it. What possible soil sample could this be? Why do you think so?
2. The next layer has big chunks of a light brown material so where could this sample be from and why?

The teacher does this for each layer.

Then they look at the footprints the teacher has drawn onto the map and discuss possible solutions to where Joe Frisbee's body is buried. The students can take turns coming up to the enlarged picture of the estate and discussing possible solutions in their groups. After the discussion, each group should agree on one possible solution. This means that there will be a great deal of problem solving and debating skills used.

Conclusion :

The class will most likely run out of time but the key to the whole activity is to keep the students thinking and guessing. Do not give them the answer at the end of the class but wait until the next class period. The kids will be talking about the murder in the halls, on the playground, and may even bring the idea home with them.

Extension/Integration :

The students could record their findings and ideas about the murder in narration form.

The estate could be given accurate measurements in which the students would have to manipulate to solve various math problems.

Assessment :

Teacher observations- Are students participating in discussion? Are they making logical guesses based on information found?

Detective Notes sheet- Are the students responses logical and sufficient evidence given for their findings? Did the students discover the correct soil samples?

Source: Laura Zinser, Science Specialist

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