

K0 Lesson Plan

Science

Standard: 2.1.1, 2.1.1a, 2.1.1d, 2.1.1.f, 2.2.2, 2.2.2.a

Outdoor field trip to green roof

Materials: Drawing paper and pencils

Objective: Green roof observation

Anticipatory: Ask students where they are and what they see. Students will respond with they are standing on the roof, and they see a garden with plants, flowers, soil, birds, etc. Lead students to observe the plants in the garden, and have them draw what they see. Divide the class into groups of 3 to 4 students and have them introduce to each other what they drew. Ask them some questions about how to maintain the garden and what keeps the plants alive. Students will respond with rain, bees coming to pollinate flowers, someone coming to water the plants, sunshine, etc. Conclude class with a brief explanation of what plants need to grow and survive.

Procedure: 1. Divide the class into small groups of 3 to 4 students. 2. Give each student drawing paper and a pencil. 3. Ask them about some of the scientific questions above. Provide time to discuss within the group. 4. Have them draw what they see in the garden and introduce their sketch within the group. Groups will be allowed to discuss the similarities and differences they see. Ask the students if they can think of any SCIENTIST QUESTIONS.

Summary: Observe objects on the green roof. Using multiple senses and correct terms, describe the location of the green roof and objects within it, allow each group enough time to brainstorm answers, come back together as a group and share answers with the whole class.

K1 Lesson Plan

Science

Standard: 2.4.2, 2.4.2.a, 2.3.1, 2.3.1.c

Outdoor field trip to the bioretention garden

Materials: Paper chart and pencil

Objective: Bioretention observation

Anticipatory: Before making observations about the bioretention garden, distribute paper charts and pencils to each student. Divide the class into groups of 3 to 4 students. Lead students to observe and touch objects in the bioretention garden. Ask students to record the texture and color of objects they touch and observe, and guess the identity of each object. Collect the answers within the groups; report to the teacher as a group - especially the reason behind the object identification. After all the groups have reported, give them the ultimate answers for each object they identified. Ask them to pick one flower from the bioretention garden, and take it back to the classroom. When students come back to the classroom, ask them what do we know about flowers? Accept student responses and record on chart paper. Now you have told me the things you already know about flowers. During this class, we are going to be learning a lot about the parts of flowers, not just how they look. Today I will be giving your table group several different kinds of flowers and a magnifying lens. You will have time to examine the flowers. I would like you to pay attention so that when we are done, you can tell me what all of these flowers have in common or maybe even something that is different on each of the flowers.

Procedure: 1. Divide the class into groups of 3 to 4 students. 2. Give each student a paper chart and a pencil. 3. Ask them to touch the soil and sand in the bioretention garden and record the texture and color on the paper chart. 4. Take students back to classroom 5. Give each table group a magnifying lens. 6. Give each group 10-15 minutes to examine the flowers. 7. Groups will be allowed to discuss the similarities and differences they see. They may also think of scientific questions that they want to find an answer to.

Summary: Observe the objects in the bioretention garden, then identify them as an Earth material. Observe flowers with a magnifying lens and be able to identify individual parts.

K2 Lesson Plan

Science

Standard: 2.1.1, 2.1.1.a, 2.1.1.b, 2.1.1.d, 2.1.1.f.

Outdoor field trip to the bioretention garden

Materials: Pencils and paper charts

Objective: Bioretention observation

Anticipatory: Before observing the bioretention garden, distribute paper charts and pencils to each student. Divide the class into groups of 4 to 5 students. Lead students to observe and touch objects in the bioretention garden. Ask students to observe all the objects within the bioretention garden, then write down their name, and describe the physical shape on the paper chart. Ask them to identify objects using each of their five senses and record their findings on the paper chart in their own words. Collect answers from different groups. After all the groups have reported, then ask them to think where the stormwater in the bioretention garden goes when it rains, and how can they find out. Give students 5 minutes to discuss; students can use their pencil and paper chart if they need. After that, ask each group to report the scientific investigation process about where the stormwater will go when it rains and where they think the water will go.

Procedure: 1. Divide the class into several groups with 4 to 5 students. 2. Give each student a paper chart and pencil. 3. Ask them to write down what they see in the bioretention garden and record the characteristics of objects they saw. 4. Ask them to conduct a simple scientific investigation to figure out where stormwater goes once it enters the bioretention garden. 5. Ask students to report their results as a group. 6. Tell the students where stormwater goes when it rains and once it enters the bioretention garden.

Summary: Observe objects in the bioretention garden, then identify them and describe them. Conduct scientific investigation as a group to find out where stormwater goes when it rains.

K3 Lesson Plan

Science

Standard: 5.1.1, 5.1.1.d, 5.1.1.g.

Outdoor field trip to permeable pavement and indoor lecture

Materials: Pencils and paper charts, permeable material cylinder, ruler

Objective: Permeable pavement observations

Anticipatory: Before going outside to make observations, distribute paper charts and pencils to each student. Divide the class into groups of four to five students. Lead students to observe the permeable parking area. Ask students to observe the surfaces of the parking lot with permeable material and the non-permeable material, then write down the difference between permeable and non-permeable material such as texture and color. Ask them to record the differences on paper in their own words, and then report them as a group.

After all the groups have reported, take them back to the classroom, and hand out a sample material of the permeable pavement to each group, have the students observe closely, and measure the height of the cylinder, then record it on the paper chart. Finally, have students report their findings.

Procedure: 1. Divide the class into several groups with 4 to 5 children. 2. Give each of the students a paper chart and pen. 3. Ask them to write down the differences between permeable material and non-permeable material. 4. Have each group measure the height of a permeable material cylinder with a ruler. 5. Ask students to report their results as a group.

Summary: Identify the difference between permeable material and non-permeable material, and measure the height of permeable sample cylinder.

K4 Lesson Plan

Science

Standard: 5.1.3, 5.1.3.a, 5.1.1.b.

Materials: Pencils and paper chart

Objective: Permeable pavement observation

Anticipatory: Before making observations about the permeable pavement, distribute paper charts and pencils to each student. Divide the class into groups of 3 to 4 students. Lecture is better when it rains the day before. Ask students to look out the window, and bring up the question where did all the stormwater go after it rained? Then ask them to imagine what they would see if all the stormwater stays on the ground and floods all over the places. Ask students to discuss within the group, and either draw or write down what will happen if stormwater spreads out in the city, and report what they think as a group. If any students talk about the negative effects of stormwater flooding the city, extend the discussion as if each student is a staff member working in the City, what will they suggest to solve the stormwater overflow issue. Then discuss within the groups and request them to come up with one solution for each group, then report their solutions. After all the groups have reported, ask them to talk about the issue they are going to face when they implement their proposed solution and talk about that in the class.

Procedure: 1. Divide the class into several groups with 4 to 5 children. 2. Give each student a paper chart and pencil. 3. Ask them to write down or draw the what will happen when stormwater overflows or ponds in the city. 4. Talk about what they think as group 5. Ask each group to come up with a solution to tackle stormwater issues. 5. Share each groups' solution. 6. Discuss what challenges they will face when implementing their solution.

Summary: Discuss the issue that stormwater might bring to the city, especially the negative effect. Then think about a solution to deal with the issue.

K5 Lesson Plan

Science

Standard: 5.3.3, 5.3.3.b, 5.3.3.c.

Materials: Pencils and paper chart

Objective: Bioretention Garden

Anticipatory: Before making observations in the bioretention garden, distribute pencils and paper charts to each student. Divide the class into groups of 4 to 5 students. Ask students to write down all the living things in the bioretention garden and considering that the bioretention garden is a small ecosystem, what food source does each living thing have in the bioretention garden. Report what they write as a group. Then tell them to draw a food chain diagram to show how living things coexist in the bioretention garden. Then present each group's work with the class. Tell them what a decomposer is with textbooks and related educational material. Finally, teach the students the definition of consumer, producer, and decomposer in their diagram. Ask them to identify producers, consumers, and decomposers in their diagram. Ask students to brainstorm in groups on how stormwater in the bioretention garden may impact living organism, and write down their thoughts on the paper chart. Report group answers with the class. Finally, tell them all living things in an ecosystem co-exist, and each species may have a direct or indirect impact on one another and give them some examples in the natural world.

Procedure: 1. Divide the class into several groups with 4 to 5 students. 2. Give each student a paper chart and pencil. 3. Ask them to write down or draw any possible living organisms and what they eat in the bioretention garden. 4. Talk about what they think as a group, then draw a food diagram. 5. Lecture students about producers, consumers, and decomposers. 6. Ask students to identify them in their diagram according to what they learn and say the reason they think so. 7. Ask students to think about how stormwater in bioretention gardens impacts things living in the garden. 8. Report their thoughts as a group. 9. Conclude with the facts that relationships within all living organisms can co-exist, and also impact on each other.

Summary: Students will learn about and have the ability to identify the producers, consumers, and decomposers, and understand their relationship. Know how they impact each other and co-exist.