Living Non Living Mobile

The purpose of this lesson is to introduce the concept of living and nonliving organisms in general. There is a starter activity where students will build their own definitions of living and nonliving organisms. They will then sort organisms into living and nonliving categories. They will finally, create a mobile of the two organisms, distinguishing the living and nonliving organisms with different shaped and colored backgrounds. For a closing activity students will reevaluate their definitions of living and nonliving. Homework will give more practice with living and nonliving organisms and it will prepare students for the second part of lesson plan.

Grade Level: 3rd grade

Utah State Core Curriculum Standards

Science Benchmark

For any particular environment, some types of plants and animals survive well, some survive less well and some cannot survive at all. Organisms in an environment interact with their environment. Models can be used to investigate these interactions.

Standard II:
Students will understand that organisms depend on living and nonliving things within their environment.

Objective 1: Classify living and nonliving things in an environment.

a. Identify characteristics of living things (i.e., growth, movement, reproduction).
b. Identify characteristics of nonliving things.
c. Classify living and nonliving things in an environment.

Instructional Time: 50 Minutes. (10 minutes for Instruction, 15 for definitions and 25 minutes for activity.)

Materials:
Handouts, (living/ nonliving/ once living), three pages of picture cards consisting of living and nonliving objects, construction paper, (a pole, stick or clothes hanger), and string.

Terminology:
Environment: The complex of social and cultural conditions affecting the nature of an individual or community.
Interaction: Mutual or reciprocal action or influence.
Living: Ability to grow, reproduce and move.
Nonliving: Not able to grow, reproduce and move.
Organism: Something that is necessary for the cycle of life.
Survive: To be able to sustain life.
Observe: Look at what you see in front of you.
Terrarium: underground environment
Aquarium: water environment
Temperature: The variation of hot or cold something is.
Moisture: The amount of water is contained in something.
Small–scale: Smaller than real life.
ILO’s:

1) **Use Science Process and Thinking Skills**
   a) Observe simple objects and patterns and report their observations.
   b) Sort and sequence data according to a given criterion.

2) **Manifest Scientific Attitudes and Interests**
   a) Demonstrate a sense of curiosity about nature.

3) **Understand Science Concepts and Principles**
   a) Know science information specified for their grade level.
   b) Distinguish between examples and non-examples of science concepts taught.
   c) Explain science concepts and principles using their own words and explanations.

4) **Communicate Effectively Using Science Language and Reasoning**
   a) Record data accurately when given the appropriate form and format (e.g., table, graph, and chart).
   b) Report observation with pictures, sentences, and models.
   c) Use scientific language appropriate to grade level in oral and written communication.

**Background:** The characteristics of a living organism is something that is able to move, able to reproduce and able to grow. (Example: plant, animal, etc…). Nonliving characteristics are organisms that were never alive. (Example: Rock, water, air, steel etc…). The background of an ecology system is the importance of understanding the connection between living and nonliving organisms. All living things are dependant on nonliving organisms for shelter, warmth, and food in an inter-connected web. Example: The soil along with the sun grows the algae in the water. The alga is a hiding place for the fish. The fish is eaten by the hawk. The bones of the fish are discarded and degenerate back into the soil, starting the cycle over again. This activity will help students develop a fuller understanding of the components that make up an ecosystem.

**Invitation to Learn:**
   Ask students if any students have been to the Jordan River. Ask them what they saw there. Have students come up with a list of things that they would think that they would see at the Jordan River. Ask students if they know what an ecosystem is. Have them describe the different components that they would find there. Explain that we are all surrounded by many different ecosystems that we depend on for our survival. Ask the students to come up with some ideas of different ecosystems that are in their neighborhoods or community.
   The instructor will say, “For the next week we are going to learn about ecosystems. Today we are going to come up with a definition for the components of an ecosystem and then we are going to create an example of those components.”

**Prior Knowledge Assessment:**
   By posing the questions in the invitation to learn, we are assessing the students’ prior knowledge. The warm up activity also helps to assess prior knowledge as well as build a foundation for the activities that will follow.

**Procedure:**
   • **Warm Up:** Living Non living definitions (Terminology introductions)
   **For each handout:** Ask for a definition of what living/nonliving is writing their ideas on the board ask students to give examples of both living and nonliving organisms then move into the handouts.
   1) Go over living/ nonliving and once living handouts. Talk about expectations for each category and ask students what they should be thinking about for each handout.
      o Have students get into groups and complete four categories for each sheet. The categories are:
      o Must have characteristics.
      o Might have characteristics.
      o Examples.
      o Non-examples.
2) Allow students to work on these for about 5 minutes for each sheet, stopping between each handout to have a class discussion on what the students came up with.

**Activity:** Living non-living mobiles (re-enforcing definitions)
1) Pass out the picture cards.
2) Sort the pictures into living and nonliving categories by using their definitions that they created.
3) Have students color, cut and glue onto construction paper pre cut into squares or circles of different colors, (Use square shape for living and circle for nonliving). Make sure shapes are pre punched to save time and floor.
4) Pass out string and mobile (a pole, stick or clothes hanger).
5) Have the students assemble their mobile by tying string to the picture cards and fixing securely to their mobile.

**Closing activity:**
1) Review with students the definitions of living and non living organisms and ask for at least three examples of each.
2) Talk to students about ecosystems being a connection of living and nonliving objects in a specified area.
3) Give homework assignment.

**Homework:**
1) Have students make another list of things that they would think to find at a river.
2) Have students take a trip to a local river or stream and observe.
3) Ask the students to make a list of everything that they see is in or around the river separated into living and nonliving categories.
4) Attached to the homework have a handout with two categories in a table.

**Adaptations and Modifications for Special Learning Needs:**
For English language learners I really think that they can fully participate in the activity.

**Assessment:**
Informal: Questions and responses during invitation to learn, warm up activity and closing activities
Observations with students in their groups, redirecting when needed.
Formal: Turned in homework, activity mobile and definition sheets.

**Rubric:**
There are three categories: Participation, Teamwork, and Completed Projects.
Participation is worth 30 points, 15 by peers 5 per each peer, and 15 by teacher.
Teamwork is worth 30 points, 15 by peers 5 per each peer, and 15 by teacher.
Completed Projects are worth 40 points, 5 for each definition handout, 15 for mobile and 10 for homework.
For a Grand total of 100 points possible
100-87= Excellent
86-73 = Average
72- 58 = Poor
References:
Adapted from:
    Investigation #1 Intro to living & Nonliving Section 9.2 11-6, 11-7;
    Going on a Living Non-living Hunt 3-30, 3-31, 3-32

Homework Sheet:
1. In the table provided, make a list of living, nonliving organisms that you think you would find at a river.
2. Take a trip to a local river or stream and observe.
3. Make a list of everything that you see in or around the river. Use the table on the next page that is separated into the categories of living and nonliving organisms.

<table>
<thead>
<tr>
<th>Living Organisms</th>
<th>Nonliving Organisms</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Living and nonliving Homework Assignment

<table>
<thead>
<tr>
<th>Living organisms</th>
<th>Nonliving organisms</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Vocabulary Sheet

Living Things

Word/Topic/Concept

Might Have Characteristics:

Nonexamples:

Must Have Characteristics:

Examples:
Nonliving Things

Might Have Characteristics:

Must Have Characteristics:

Examples:

Nonexamples:
Picture Cards
Living and Nonliving

<table>
<thead>
<tr>
<th>Tiger</th>
<th>Clock</th>
<th>Hamburger</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cat</td>
<td>Dog</td>
<td>Snail</td>
</tr>
<tr>
<td>Fish</td>
<td>Bread</td>
<td>Cake</td>
</tr>
<tr>
<td>Phone</td>
<td>Sound</td>
<td>Banana</td>
</tr>
</tbody>
</table>
Picture Cards
Living and Nonliving

<table>
<thead>
<tr>
<th>Hair</th>
<th>Toaster</th>
<th>Cherries</th>
</tr>
</thead>
<tbody>
<tr>
<td>Apple</td>
<td>Salt and Pepper Shakers</td>
<td>Soup</td>
</tr>
<tr>
<td>Book</td>
<td>Scissors</td>
<td>Snowflake</td>
</tr>
<tr>
<td>Computer</td>
<td>Seahorse</td>
<td>Detective</td>
</tr>
<tr>
<td>Water</td>
<td>Fire</td>
<td>Tree</td>
</tr>
<tr>
<td>-----------</td>
<td>-----------</td>
<td>-----------</td>
</tr>
<tr>
<td>Sun</td>
<td>Rain</td>
<td>Snowman</td>
</tr>
<tr>
<td>Car</td>
<td>Airplane</td>
<td>Bee</td>
</tr>
<tr>
<td>Cow</td>
<td>Sandwich</td>
<td>Butterfly</td>
</tr>
<tr>
<td>Participation</td>
<td>Teamwork</td>
<td>Completed projects</td>
</tr>
<tr>
<td>---------------</td>
<td>----------</td>
<td>-------------------</td>
</tr>
<tr>
<td><strong>30 points</strong></td>
<td><strong>30 points</strong></td>
<td><strong>40 points</strong></td>
</tr>
<tr>
<td>Evaluation by peers and teacher.</td>
<td>Evaluation by peers and teacher.</td>
<td>• Definition worksheets worth 5 points each.</td>
</tr>
<tr>
<td>• 15 points from peers. 5 points per peer.</td>
<td>• 15 points from peers. 5 points per peer.</td>
<td>• Mobile worth 15 points</td>
</tr>
<tr>
<td>• 15 points from teacher.</td>
<td>• 15 points from teacher.</td>
<td>• Homework worth 10 points.</td>
</tr>
<tr>
<td>Excellent</td>
<td>• Actively participates in group and classroom discussions.</td>
<td>• Completes and hands in three definition worksheets. Neat legible handwriting, organized notes.</td>
</tr>
<tr>
<td></td>
<td>• Gives productive responses both in group and classroom discussions.</td>
<td>• Completes Mobile. Neat and accurate.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Completes Homework. Neat, legible handwriting. Organized observation notes.</td>
</tr>
<tr>
<td>Average</td>
<td>• Participates in group and classroom discussions.</td>
<td>• Definition worksheets are completed but not well organized or legible.</td>
</tr>
<tr>
<td></td>
<td>• Responds to group and classroom discussions.</td>
<td>• Mobile is complete but not accurate.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• Homework turned in on time but is messy and not legible.</td>
</tr>
<tr>
<td>Poor</td>
<td>• Does not participate in discussions.</td>
<td>• Does not work with group at all.</td>
</tr>
<tr>
<td></td>
<td>• Does not give little or any response in any discussions.</td>
<td>• Homework is not turned in</td>
</tr>
</tbody>
</table>
The Jordan River Ecosystem

Abstract:
In this lesson, over a several week period, students will have the opportunity to learn about the living and non-living things of the Jordan River Ecosystem. After research and a couple field trips, students will be able to work in groups and choose their own group inquiry question about one of the living or non-living things from that ecosystem. Then they will be able to gather supplies and materials for an experiment which will allow them to answer their own question. At the conclusion of their experiment, each group will present what they have learned to the rest of the class.

Grade Level: 3rd

Utah State Core Curriculum Standards:

Science Benchmark

For any particular environment, some types of plants and animals survive well, some survive less well and some cannot survive at all. Organisms in an environment interact with their environment. Models can be used to investigate these interactions.

Standard II:

Students will understand that organisms depend on living and nonliving things within their environment.

Objective 1: Classify living and nonliving things in an environment.

d. Identify characteristics of living things (i.e., growth, movement, reproduction).
e. Identify characteristics of nonliving things.
f. Classify living and nonliving things in an environment.

Objective 2: Describe the interactions between living and nonliving things in a small environment.

a. Identify living and nonliving things in a small environment (e.g., terrarium, aquarium, flowerbed) composed of living and nonliving things.
b. Predict the effects of changes in the environment (e.g., temperature, light, moisture) on a living organism.
c. Observe and record the effect of changes (e.g., temperature, amount of water, light) upon the living organisms and nonliving things in a small–scale environment.
d. Compare a small–scale environment to a larger environment (e.g., aquarium to a pond, terrarium to a forest).
e. Pose a question about the interaction between living and nonliving things in the environment that could be investigated by observation.
**Instructional Time:**
50 min. of instruction and research, one long field trip, one short field trip, and several days to conduct experiment. 2-3 weeks all together

**Materials:**
- Mobiles from opening lesson the day before
- Class set of science discovery bags (each consisting of a science discovery journal, poncho, mini magnifying glass, and pencil. Bag should be attached to a string so that students can hang it around their necks)
- Whatever materials students need for their inquiry experiment
- Microscopes
- Internet access
- Poster board for each group
- Markers
- Construction paper
- Glue
- Class set of Jordan River Ecosystem Presentation Checklists

**Terminology:**
Ecosystem: All of the living and non-living things (trees, birds, animals, dirt, rocks, etc.) in a specific area
Food Chain: The way one species eats another, who eats another, who eats another, in order to survive
Food Web: A graphic representation that shows how the organisms in an ecosystem need each other to survive

**Intended Learning Outcomes:**
1. **Use Science Process and Thinking Skills**
   c. Make simple predictions and inferences based upon observations.
   f. Conduct a simple investigation when given directions.

2. **Manifest Scientific Attitudes and Interests**
   a. Demonstrate a sense of curiosity about nature.
   b. Voluntarily read or look at books and other materials about science.
   c. Pose questions about objects, events, and processes.

4. **Communicate Effectively Using Science Language and Reasoning**
   b. Report observation with pictures, sentences, and models.
   c. Use scientific language appropriate to grade level in oral and written communication.
   d. Use available reference sources to obtain information.

**Background Information:**
An ecosystem is composed of many living and non-living things such as rocks, plants, trees, animals, and soils. All of these things connect to form an ecosystem. There are river ecosystems, desert ecosystems, ocean ecosystems, even the ecosystems in an aquarium or terrarium. Ecosystems come in all sizes. Plants use sunlight, carbon dioxide in the air, and water to create simple sugars. Animals eat the plants and are eaten by other animals, thus forming a **food chain**. A food chain is part of an ecosystem. For example, a seed uses sun and soil to grow into a plant, which is eaten by a mouse, which is eaten by a hawk. When animals and plants
die, their bodies become organic matter, which eventually becomes part of the soil. All of these components depend upon one another for life. A **food web** describes the interconnection of the food chains in an ecosystem.

The Jordan river is 60 mi long, or 97 km long. It drains into the Great Salt Lake. It passes through Salt Lake City, and it is fed by numerous streams flowing off the Wasatch Range. It is used for irrigation. (*The Columbia Electronic Encyclopedia*, 6th ed. Copyright © 2005, Columbia University Press. All rights reserved.)

The Jordan River has its own unique ecosystem. It is a river ecosystem, which is also called a riparian ecosystem. Some of the living things that make up the Jordan River ecosystem are cattails, grasses, willow, cottonwood trees, red worm, crayfish, mayflies, dragonflies, water striders, mosquitoes, gnats, fisher spiders, snails, minnows, suckers, trout, frogs, toads, garter snakes, mallard ducks, swallows, raccoons, muskrats, and beavers. These living organisms depend on non-living organisms that also form part of the Jordan River ecosystem. For example, the plants require water to live. To learn about other ways the components of the ecosystem connect, see the Common Organisms of the Jordan River Ecosystem chart.

To learn more about some species native to the Jordan River ecosystem, visit [http://137.77.133.41/native/native.html](http://137.77.133.41/native/native.html)

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**Common Organisms of the Jordan River Ecosystem**

<table>
<thead>
<tr>
<th>Type of Organism</th>
<th>Name</th>
<th>Energy or Food Source</th>
<th>Where it Lives</th>
</tr>
</thead>
<tbody>
<tr>
<td>Plants and Trees</td>
<td>cattails, grasses</td>
<td>organic matter*, sunlight, air</td>
<td>near or in shallow water on or near stream banks</td>
</tr>
<tr>
<td></td>
<td>willow, cottonwood</td>
<td>organic matter, sunlight, air</td>
<td></td>
</tr>
<tr>
<td></td>
<td>trees</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Worms</td>
<td>red worm</td>
<td>decaying organic matter</td>
<td>in soil, under stones or leaves</td>
</tr>
<tr>
<td>Crustaceans</td>
<td>crayfish</td>
<td>plants</td>
<td>stream bottom</td>
</tr>
<tr>
<td>Insects</td>
<td>mayfly</td>
<td>organic matter, small plants and animals</td>
<td>young = stream bottom adult = near stream</td>
</tr>
<tr>
<td></td>
<td>dragonfly</td>
<td>insects, mayflies, and worms</td>
<td>young = in stream adult = near stream</td>
</tr>
<tr>
<td></td>
<td>water strider</td>
<td>insects</td>
<td>surface of water</td>
</tr>
<tr>
<td></td>
<td>mosquito</td>
<td>young = organic matter adult male = fruit adult female = blood</td>
<td>young = surface of water adults = near water</td>
</tr>
<tr>
<td></td>
<td>gnat</td>
<td>young = small insects adults do not eat!</td>
<td>young = surface of water adults = near water</td>
</tr>
<tr>
<td></td>
<td>fisher spider</td>
<td>insects</td>
<td>surface of water</td>
</tr>
<tr>
<td></td>
<td>snail</td>
<td>plants</td>
<td>in grasses at water’s edge, stream bottom</td>
</tr>
<tr>
<td>Fish</td>
<td>minnow</td>
<td>algae, small fish</td>
<td>water</td>
</tr>
<tr>
<td></td>
<td>sucker</td>
<td>young = insect larvae adult = plants, small animals</td>
<td>stream bottom</td>
</tr>
<tr>
<td></td>
<td>trout</td>
<td>insects, small fish, crustaceans</td>
<td>water</td>
</tr>
<tr>
<td>Amphibians</td>
<td>frog</td>
<td>tadpole = algae adult = insects and worms</td>
<td>tadpole = in water adult = land/water</td>
</tr>
<tr>
<td></td>
<td>toad</td>
<td>tadpole = algae adult = insects and worms</td>
<td>tadpole = in water adult = land/water</td>
</tr>
<tr>
<td>Snakes</td>
<td>garter snake</td>
<td>frogs, toads, insects</td>
<td>near water</td>
</tr>
<tr>
<td>Birds</td>
<td>mallard duck</td>
<td>plants, algae</td>
<td>near water</td>
</tr>
<tr>
<td></td>
<td>swallow</td>
<td>flying insects</td>
<td>near water</td>
</tr>
<tr>
<td>Mammals</td>
<td>raccoon</td>
<td>frogs, toads, crayfish, plants, fish</td>
<td>near water</td>
</tr>
<tr>
<td></td>
<td>muskrat</td>
<td>plants</td>
<td>near water</td>
</tr>
<tr>
<td></td>
<td>beaver</td>
<td>tree bark and small twigs</td>
<td>in and near water</td>
</tr>
</tbody>
</table>

* *Organic matter is the nutrients available when animals and plants die and begin to decompose.*

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*Salt Lake County Storm Water Quality Education Lesson and Activity Plans*  
**Invitation to Learn:**
Bring out the mobiles that the students completed along with the definitions of living and nonliving organisms. Review with students the characteristics of living/non-living things. Students should have their homework assignment completed and ready for today’s lesson. Ask the students if they remember what an ecosystem is. Write students’ ideas on the board. Explain to students that an **ecosystem** is “a web of relationships.” It means that all the animals and plants and non-living things in a specific area depend upon one another. Tell students that ecosystems can be big, like an ocean ecosystem or small like a terrarium. Ask students to name some more ecosystems and write them on the board. Ask students “What would happen if all the spiders in our city died because of a weed-killer that people started using?” Have students brainstorm ideas. Draw a food chain on the board, with sun, dirt, and water- plants- insects- spiders- birds-people. Tell students this is called a **food chain**. It is how one species eats another, who eats another, who eats another in order to survive. Explain that if spiders were suddenly gone from this food chain, there would be way too many insects, because there would be no spiders to eat them. At the same time, some kinds of birds would not have enough spiders to eat, so there would be less birds. This could mean less eggs for people. On the board, extend the food chain to show that animals also eat birds, reptiles also eat insects, people also eat animals (draw lines between each thing to show connection). Tell students this is called a **food web**. It shows how everything is connected in an ecosystem. Explain that it is important to know about how ecosystems work, because one little change in the environment can cause big problems, and this is because everything is connected. Tell students they are going to be learning about the Jordan River Ecosystem.

**Prior Knowledge Assessment:**
Ask students if they have ever been to the Jordan River. Have them brainstorm in pairs, teams, or alone all the components they think would be part of the Jordan River Ecosystem (they should have a pretty good idea from their homework assignment observing a river). Be sure each student gets a blank sheet of paper, and instruct them to fold it into 3 sections. Have them label each section according to the following: Living, Non-Living, Not Sure. Have each student list the things they brainstormed under the appropriate column. Be sure students put their names on the top of each sheet and label it, “Jordan River.” On the back of the paper, have students write for 3 minutes everything they know about the Jordan River. Have them turn in their papers.

From listening to students brainstorm and seeing what they wrote on the papers, you will be able to tell how much each student knows about the ecosystem. You will know from the pre-assessment what information to direct students to in order to increase knowledge or correct misconceptions when it is time for students to do group research. If enough students share the same misconceptions, you may want to have a mini-lesson on them using the resource materials you have collected on the Jordan River.

**Procedures:**

**Before Day 1**

1. Gather information about the Jordan River ecosystem. You should be well-acquainted with it, so you can help and guide students with their inquiries.
2. Find a place along the Jordan River that is safe for students to explore, as well as a good time to go on both the long field trip and the short field trip. Parks are a good idea. Make sure that no events are planned for your selected place at the time that you will take your class on the field trip.
3. Secure a bus or other transportation for your class to get to the selected place. You will need transportation to and from the Jordan River for both the long field trip and the short field trip.
4. Inform parents about what the field trip and experimental activities will involve by sending home notes with students. Be sure to secure signed permission forms for each student to attend the field trips.
5. Gather student-appropriate resources about the Jordan River. Websites, magazines, books, pictures, etc. are all useful. Be sure that if you include websites, students will have class time to research on the web.
6. Make sure that parents/volunteers/aides know what is expected of them on the field trip and throughout the rest of the experiment. Phone calls home or a volunteer information sheet are a good idea to make certain that there is no confusion on the part of those who will be helping you.

7. Conduct prior knowledge assessment to ensure you have resources/materials enough for students to correct misconceptions and learn more about the Jordan River ecosystem.

**Day One**

**Recommended Time: Activities- 1 hour**

**Field Trip- 2 hours**

1. Invite students to share their ideas from the pre-assessment. Allow them to share their ideas with the rest of the class, posting their ideas on the chalkboard or butcher paper and filling in gaps if necessary.

2. Next split the class into cooperative groups of 3-4. Give each group websites or other resources about the Jordan River ecosystem. Instruct groups to collect as much information as possible about the Jordan River ecosystem. Tell class they are going to work in their cooperative groups to come up with a question about one of the living/non-living things from the Jordan River ecosystem, so they should focus their information-gathering on two or three specific aspects of the Jordan River ecosystem. Gently guide groups to two or three specific aspects of the Jordan River ecosystem if the group is struggling to focus. A group with too broad a topic will struggle to stay on task and will easily become overwhelmed.

3. When students have collected their information, tell class that they are going on a field trip to the Jordan River.

4. Get science discovery bags ready for each person. Show students what is inside each science discovery bag. Tell them they need to use their science discovery bags to record information while on the field trip. They can make diagrams or sketch pictures of what they see, or write about what they smell, hear, feel, etc. Remind them to look for as many living and non-living things as they can, and to write them down in their science discovery journals. Tell them they can use the information they learned from their resources.

5. Tell students that by the day after the field trip, their group needs to have come up with a living or non-living thing from the Jordan River ecosystem that they would like to study. They need to come up with a question about that thing that they can investigate by using an experiment in the classroom. Give them examples, such as, “Could mayflies live without light?” or “What would happen if the fisher spider didn’t have anything to eat?” Also give examples of questions that could not be answered in a simple classroom experiment, such as “Could we raise trout in hot water?” (trout would be difficult to secure for an experiment).

6. Go over any necessary instructions so that students will know what is expected of them. Examples of this might be: Do not step in the Jordan River” and “Be sure that you can always see your group leader.”

7. Be sure that each group of students has an adult volunteer/parent/aide with them. Be sure to remind volunteers/parents/aides about what time you will meet back at the bus and any other relevant information.

8. Hand out science discovery bags to each student. Go on field trip.

Note: Day 1 and Field Trip may be split into 2 different days.
Day 2
Recommended Time: Activities: 45 minutes
Field Trip: 1 hour

Procedure:
1. Introduce each group to their group leader for the experiment (this may or may not be the same group leader they had on the field trip, depending on how available your parent/volunteer/aides are. Explain to students that their group leaders will help them gather supplies and will oversee that they are staying on-task during the time they are working with their experiments. Again, be sure ahead of time that group leaders are aware of what their role in the classroom is.
2. Meet with each group to make sure their question can be answered with a simple in-class experiment. If students are having difficulty generating an inquiry question, you may want to give them more time to go through the Jordan River resources you have collected to help them get inspiration. You may even want to teach mini-science lessons for the class that connect with what the group(s) choose to study. This can be especially valuable if several students share a misconception.
3. Have each group write up in discovery journal
   a. Their question
   b. Their hypothesis
   c. How they will conduct the experiment
   d. Materials they will need
4. Meet with each group once more to make sure they know what they will need to get from the Jordan River ecosystem on the next short field trip. Coordinate with the students and group leaders about how supplies will be transported from the Jordan River to the school, and how they will be stored once they reach the school. It may be a good idea to assign each student a few things to collect. All supplies will need to be secured by the time you start the activities for Day 3.
5. Go over any necessary instructions so that students will know what is expected of them. Examples of this might be: Do not step in the Jordan River” and “Be sure that you can always see your group leader.”
6. Be sure that each group of students has an adult volunteer/parent/aide with them. Be sure to remind volunteers/parents/aides about what time you will meet back at the bus and any other relevant information.
7. Take students on a short field trip to the Jordan River ecosystem to get supplies.

Note: Day 2 and the short field trip may take place on 2 different days.

The Experiment
Recommended Time: 45 minute periods at least 3 times a week for at least 2 weeks (depending on the types of inquiry questions the groups in your class generate.)

1. Have each group set up their experiments with their group leader.
2. Tell groups they will have 45 minutes a day (or 30 or whatever you have time for) to observe their experiments. Tell them they need to keep good records of what is happening in their experiments in their science discovery journals, because at the end, they are going to make a presentation for the class about what they studied and what they learned. What each group studies and records will depend on their inquiry question and the experiment they have chosen. But some ideas are
   a. For groups focusing on a plant…..
      i. How does the plant change from day to day?
      ii. Does the plant change color?
      iii. Does the plant feel different?
      iv. What is happening to the soil around the plant?
      v. Does the plant smell different?
      vi. Does your plant look different from day to day when you use a microscope?
   b. For groups focusing on an insect/animal…..
      i. How does the insect/animal change from day to day?
ii. Does the insect/animal seem to be eating? What does it eat? How much?
iii. What behaviors do you see the insect/animal doing?
iv. Does the insect/animal smell different?
c. For groups focusing on non-living things…..
   i. Does your specimen seem to be changing?
   ii. Does your specimen smell different?
   iii. Does the temperature of your specimen change?
   iv. Does the weight of your specimen change?
   v. Does your specimen look different from day to day when you use a microscope?

3. Walk around during science time and observe what each group is investigating. Be sure they are staying on task and keeping good records of what they are observing. If a number of students have a misconception or are using illogical thinking, you may want to guide them to resources that could remedy the problem. You may also consider teaching mini-lessons for a group or the whole class.
4. Periodically meet with each group (and if possible, group leader) to ensure that they are collecting useful information to use for their presentations at the end of the experiments.

Note: Volunteers/parents/aides will not need to be present for every 45 minute investigation period. But they are of course, very useful. Setting aside specific times for specific days of the week help accommodate these volunteers/parents/aides. If, however, they cannot come each time, be sure that students know they are expected to work on their experiments and act appropriately and with respect for all equipment and materials.

When All Experiments are Finished
Recommended Time: 2 45-minute periods

1. Have students write in their science discovery journals the conclusion to their experiment. Have them write 2-3 sentences about what they learned.
2. Give each group of students a poster board, glue, paper, markers, etc. Give students the Jordan River Ecosystem Presentation Checklist. Have them make a poster of what they have learned from their experiment. Be sure to hand out the rubric so students will know what you are expecting.
3. It’s a good idea to walk around the class as students work and guide them in the right direction if they are straying from the Presentation Checklist.
4. Give each group 2-5 minutes to present what they learned to the class, using their poster and any other materials they would like. Make sure that the groups know that each student needs to speak.
5. Collect students’ science discovery journals and posters for assessment.

Adaptations and Modifications for Special Learning Needs:

Students will work in groups to help those with language disabilities
Students with limited mobility will still be able to participate in the experiments in the class room even if they are not able to attend the field trips.
Be sure that students with poor eyesight are working in well-lit areas.
Parents/aides/other volunteers could be assigned to assist specific students on the field trip if there was a need.

Assessment:

Check student science discovery journals and bags to see that they were on task in collecting information from the Jordan River (sketches, ideas, samples, etc.) Assess students’ posters and presentations according to rubric.

References:
This lesson was adapted from the Salt Lake County Storm Water Quality Education Lesson and Activity Plans found on http://www.stormwatercoalition.org/pdf/Lesson%20Plans/lesson_07.pdf
It was modified by Cassie Nielsen and Denise Alatrista
(The Columbia Electronic Encyclopedia, 6th ed. Copyright © 2005, Columbia University Press. All rights reserved.)
Jordan River Ecosystem Presentation Checklist

Please include the following on your poster and be sure to cover them in your group presentation:

1. What part of the Jordan River ecosystem did your group study?

2. What was the question you chose to investigate?

3. How did you go about investigating it? (What was your procedure?)

4. What materials did you use?

5. What was your hypothesis?

6. What was your conclusion?

7. What was the most interesting thing about your experiment?

8. What did you learn from this experiment?

9. Anything else you think is important to include on the poster- charts, graphs, pictures, etc.

See rubric before beginning this project!
<table>
<thead>
<tr>
<th>Participation 30 points</th>
<th>Poster Appearance 30 points</th>
<th>Completed projects 40 points</th>
</tr>
</thead>
<tbody>
<tr>
<td>• Out of 30 points from teacher.</td>
<td>• Out of 30 points from teacher.</td>
<td>• Out of 40 points from teacher.</td>
</tr>
</tbody>
</table>

**Excellent**
- Everyone in group spoke during the presentation.
- Everyone in group gave relevant or interesting information during the presentation.
- Poster has no more than 4 spelling/grammatical errors.
- Poster is easy to read.
- Poster uses at least two of the following: several different colors, diagrams, pictures, or charts.
- All of the components from the Jordan River Ecosystem Presentation Checklist are present in the poster and the group presentation.

**Average**
- All but one person spoke during the presentation.
- All but one person gave relevant or interesting information during the presentation.
- Poster has 5-10 spelling/grammatical errors.
- Most of the poster is easy to read.
- Poster uses at least one of the following: several different colors, diagrams, pictures, or charts.
- Only 1-2 of the components from the Jordan River Ecosystem Presentation Checklist are missing from the poster and the group presentation.

**Poor**
- More than one person did not even speak during the presentation.
- Group gave little relevant or interesting information during the presentation.
- Poster has more than 10 spelling/grammatical errors.
- The poster is difficult to read.
- Poster uses none of the following: several different colors, diagrams, pictures, or charts.
- More than two of the components from the Jordan River Presentation Checklist are missing from the poster and the group presentation.