

# SMALL WORLD

## Indiana 5<sup>th</sup> Grade Lesson Plan

### Objectives:

1. To understand the concept of habitat and how that differs from community as evidenced by identifying two habitats within the same community.
2. To learn what food chains and webs are as evidenced by participation in the food web activity.
3. To increase observation skills as evidenced by collection of small creatures and description of their characteristics.

### Key Vocabulary:

1. **Community** = A group of several or many species living together and interacting with one another in the same locality.
2. **Habitat** = The place where an organism lives.
3. **Hypothesis** = An idea that can be tested by observation or experiment.
4. **Invertebrates**: Animals without a backbone.

**Equipment:** 5 gallon bucket of water and muck collected from the waterway (the more muck the better, think green is good, brown and clear is not as exciting), pipettes, trays, ladle to scoop out muck onto trays, 3'- 10' string for each camper or group of campers, hand lenses, collecting jars, ball of string, food web name cards, and rulers. Also need the Food Web cards and yarn. There are macro invertebrates posters labeled for visual aid.

### Pre-Class Procedures:

1. Determine area that the students will be working in.
2. Make sure that all the equipment is laid out and in working condition. Set up trays, bucket, pipettes, collecting jars, ladle, and posters up inside at tables (working in pairs). Identify where you are going to take them for the outside bug hunt.
3. Make copies of the worksheet and display any visual aids for the activity, making sure that identification books are available for the students.

### Procedures and Activities:

1. **Getting started (5min)**
  - Tell the students that they will be visiting a very small-scale community.
  - Define the term 'community'. Define the term 'habitat' and how that differs from 'community.'
  - Identify as many habitats as possible within the study area community.
  - Begin by having the students fill in the hypothesis boxes on the handout with what they think they will find.
  - Explain that when a scientist explores anything they use the scientific method. They make an educated guess (hypothesis) and then they run tests or make observations. Then they make a conclusion using their observations and finally check their conclusion with their hypothesis to see if they were right. If they were not right then they look at why they thought it might be different.

## 2. Explore and capture (15min)

- Have students sit in pairs at a tray.
- You will go around and deposit a scoop of the muck on their tray (helps to put it on one side, adding clean water as needed to the other side).
- They will spread the scoop out on the trays and sift through seeing if there is anything in it using their pipettes to sift and hand lenses to look closer.
- Have the students use their pipettes to suck up anything they find and put it in a jar.
- Have students try to identify what it is that they caught.
- If students do not see anything encourage them to look closer as this is the most populated of the habitats they will look at today. Often they are expecting huge bugs and worms, but most are pin head size.

## 3. What's the difference (5min)

- Explain the general distinction between plant and animal. Green plants use sunlight to make their own food, and animals consume energy-rich foods.
- At the same time not all living beings can be classified under these terms. Give examples of organisms that cannot be neatly classified as either plants or animals, such as fungi and bacteria.
- If possible try to show the difference between plant and animal cells. Plant cells are more rigid (cell wall) and have chlorophyll.

## 4. Explore and capture (15min)

- As the students study their area they should try to catch any animals they find and keep them in containers.
- Students might imagine that they are an ant, spider, or other small creature exploring what is around them.
- Call the group back together and allow everyone to look at the other groups' finds. Make charts of animals and plants found.
- Have a discussion of what the students found and observed. Topics could include relationships between populations. How objects interact in the system. Practice active learning. Let student observations lead discussions.

## 5. Conclusion and evaluation of hypothesis (5min) How close were the student's guesses to what they actually found. Why did they make those guesses and why might they have been right or wrong with their guess?

## 6. Food Web Activity (10min)

- Hand out name cards, one to each person. Form the group in a circle.
- Give ball of string to someone and have them hold the string and choose someone who is holding a card that affects them. The ball of string is then passed to that person (the first person keeps hold of the loose end of the string). Repeat this as often as you wish.
- Emphasis that all the organisms get their energy either directly or indirectly from the sunlight. Also have the children realize they are looking at common patterns of relationships among populations.

- Tell the students that they have created a food web. All of the creatures which they discovered and caught (members of a community) are connected to each other through food webs.
- Talk about what happens when one part of the web is disturbed. Create a scenario using drought or human-related disturbances such as pesticides or herbicides. Have the creatures affected by the event pull on their strings and see what happens to the web. Who is affected or feels the pull from the organism pulling the string? Have the organisms affected by the first tug pull on their strings; continue this until all the organisms are feeling the pull. Emphasize that when one part of a food web changes, everyone is affected.

## **Standards**

### **Indiana-Science**

#### **2<sup>nd</sup> Grade**

2.1.2 Use tools—such as thermometers, magnifiers, rulers, or balances—to gain more information about objects.

#### **3<sup>rd</sup> Grade**

3.1.2 Participate in different types of guided scientific investigations, such as observing objects and event and collecting specimens for analysis.

3.2.4 Appropriately use simple tools, such as clamps, rulers, scissors, hand lenses, and other technology, such as calculators and computers, to help solve problems.

#### **4<sup>th</sup> Grade**

4.1.5 Demonstrate how measuring instruments, such as microscopes, telescopes, and cameras, can be used to gather accurate information for making scientific comparisons of objects and events. Note that measuring instruments, such as rulers, can also be used for designing and constructing things that will work properly.

4.2.5 Write descriptions of investigations, using observations and other evidence as support for explanations.

4.4.2 Investigate, observe, and describe that insects and various other organisms depend on dead plant and animal material for food.

4.4.3 Observe and describe that organisms interact with one another in various ways, such as providing food, pollination, and seed dispersal.

4.4.4 Observe and describe that some source of energy is needed for all organisms to stay alive and grow.

4.4.6 Explain how in all environments, organisms are growing, dying, and decaying, and new organisms are being produced by the old ones.

#### **5<sup>th</sup> Grade**

5.1.4 Give examples of technology, such as telescopes, microscopes, and cameras, that enable scientists and others to observe things that are too small or too far away to be seen without them and to study the motion of objects that are moving very rapidly or are hardly moving.

5.6.1 Recognize and describe that systems contain objects as well as processes that interact with each other.

#### **6<sup>th</sup> Grade**

6.3.19 Investigate that materials may be composed of parts that are too small to be seen without magnification.

6.4.1 Explain that one of the most general distinctions among organisms is between green plants, which use sunlight to make their own food, and animals, which consume energy-rich foods.

6.4.2 Give examples of organisms that cannot be neatly classified as either plants or animals, such as fungi and bacteria.

6.4.5 Investigate and explain that all living things are composed of cells whose details are usually visible only through a microscope.

6.4.10 Describe how life on Earth depends on energy from the sun.

## **Michigan-Science**

### **2<sup>nd</sup> Grade**

S.IP.02.14 Manipulate simple tools (ruler, meter stick, measuring cups, hand lens, thermometer, balance) that aid observation and data collection.

### **3<sup>rd</sup> Grade**

S.IP.03.14 Manipulate simple tools that aid observation and data collection (ruler, meter stick, measuring cups, hand lens, thermometer, balance, spring scale, stop watch/timer).

### **4<sup>th</sup> Grade**

S.IP.04.14 Manipulate simple tools that aid observation and data collection (ruler, meter stick, measuring cups, hand lens, thermometer, balance, spring scale, stop watch/timer, graduated cylinder/beaker).

### **5<sup>th</sup> Grade**

S.IP.05.13 Use tools and equipment (meter stick and tapes, hand lens, spring scale, stop watches, models) appropriate to scientific investigation.

### **6<sup>th</sup> Grade**

S.IP.06.13 Use tools and equipment (meter stick and tapes, hand lens, thermometer, spring scale, stop watch, models, sieves, microscopes) appropriate to scientific investigation.

### **7<sup>th</sup> Grade**

S.IP.07.13 Use tools and equipment (meter stick and tapes, hand lens, thermometer, spring scale, stop watch, models, sieves, microscopes, thermometers, hot plates, pH meters) appropriate to scientific investigation.

# Small World Review Sheet

1. Define habitat. \_\_\_\_\_

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2. Name two habitats from the same community. \_\_\_\_\_

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3. Explain how one change in the food web can affect the entire web. \_\_\_\_\_

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4. What small animals and plants did you collect? \_\_\_\_\_

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5. Name the source of all energy? \_\_\_\_\_

6. List a food chain in your area. \_\_\_\_\_

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Small World  
Work Sheet

Separate things that you find in the Water into these groups:

Plant	Animal	Non-living

Separate things that you find in the Woods into these groups:

Plant	Animal	Non-living

Separate things that you find in the Field into these groups:

Plant	Animal	Non-living

Compare the areas you looked at. Which had the most variety? Why?

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List a food chain in your area.

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Show how the energy flows through the food chain.

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