

# Engagement and Empowerment in Natural Science at Klehm Arboretum

## Journey into the Field

### The Circle of Life

#### Backpack Tour Detail

##### **Part 1: Observation**

- Arrive and Examine Klehm's Pond: What Do you See? (5 min)
  - Guiding questions may include: What do you notice about the pond? Do you see waves? Who lives here? Who are predators and prey?

##### **Part 2: Pond Plants**

- Predict what you might find in Klehm's pond. (15 min)
- Examine plants (based upon season). Look for rooted plants growing from the pond. What are characteristics of the rooted plants you find? How are these plants similar/different than plants living outside of water. How does this plants protect the animals of the pond? (15 min)
- Student Choice & Inquiry: Choose another plant. Compare the new plants to the previous plant. Students will record the plant on the recording document to create a model of their work. How does this plants protect the animals of the pond? (30-40 min)
- Record, compare and discuss findings in small groups (20 min)

##### **Part 3: Pond Animals**

- Examine animals found in the pond. (5 min)
- Activity: Locate a Koi fish. Notice where the fish is in the lake (based upon season). Students sketch the Koi fish, noting its key features that make it different from a goldfish. (10 min)
- Activity: Look for lines of symmetry in pond life. Radial and Bilateral symmetry are discussed and examined.

##### **Part 4: Water Sample**

- Collect and Examine water samples from Nancy Olson Children's Garden Pond, leader will demo how to sample water --video in pre-arrival work will show teacher and/or students in advance (15 min)
- Student Choice & Inquiry: Choose another water sample. Collect additional water samples from a different location in the garden pond, from a puddle on the ground, fountain garden, water fountain, or other water source. Compare the new sample to Garden Pond sample. Students will record where they sampled on a map recording document to create a model of their work. (30-40 min)
- Record, compare and discuss findings in small groups (20 min)

##### **Part 5: Grassland Study**

- Examine plants and animals found in grasses garden (5 min)
- Activity: Look for lines of symmetry in the garde. Radial and Bilateral symmetry are discussed and examined. (15 min)

##### **Field Adventurer Supplies:**

- 1 Backpack
- Klehm Map
- Pencil
- Clipboard
- Paper Handout/School Journal



















***Each Curriculum Component will Cycle Through:***

<b>Discuss</b>	Participants brainstorm and activate prior knowledge
<b>Listen, Watch &amp; Predict</b>	Participants build knowledge and make predictions based upon experience
<b>Explore</b>	Participants engage in activities like a scientist or engineer to test and create
<b>Think About It</b>	Participants activate schema through prompts related to the activities
<b>Extension (read &amp; write)</b>	Participants extend their thinking and knowledge through various media

Curriculum Symbol Key:

(\*NGSS: Next Generation Science Standards. Modern K-12 Science Standards, adopted in Illinois in 2014)

<b>Instruction Practices:</b>								
	<b>Gross Motor</b>	<b>Fine Motor</b>	<b>Visual Motor</b>	<b>Sensory</b>	<b>Language</b>	<b>Literacy</b>	<b>Social</b>	<b>Mathematics</b>
<b>NGSS Practices:</b>								
	<b>Ask &amp; Answer Questions</b>	<b>Develop &amp; Use Models</b>	<b>Investigation</b>	<b>Using Data</b>	<b>Math Thinking</b>	<b>Explanations &amp; Solutions</b>	<b>Arguments with Evidence</b>	<b>Obtain Information</b>





## Drilling Deeper: A Look at One Activity

### Analysis of Plant Life

Part 2 of *The Life Cycle* (3-5)

**Observe** the plant life and **examine** its characteristics. Look for specific details many of which can be seen with the naked eye. Attempt to identify unique features. Record features found in a single tree

Learner Experience Paths & Objectives	Instructional Skills	NGSS* Skills
<p><b>Learners will:</b></p> <ul style="list-style-type: none"> <li>• <b>Experience</b> and <b>investigate</b> the many plants living in pond water.</li> <li>• <b>Analyze</b> rooted plants</li> <li>• <b>Evaluate</b> plant characteristics</li> <li>• <b>Identify</b> plants in the water</li> <li>• <b>Observe</b> and <b>analyze</b> water movement</li> <li>• <b>Create</b> a map model and <b>indicate</b> where they found different samples</li> <li>• <b>Evaluate</b> locations and <b>determine patterns</b> in microorganism location, resources, needs, etc</li> </ul> <p><b>Design</b> a plan for comparing features of plants. <b>Collect</b> information about pond life plants. Compare plants and discuss</p>		
<p><b>Embedded Vocabulary:</b> Sample, Elements, Habitat, Movement, Patterns, Locomotion, Compare, Analysis, Model, Map, Resources</p>		

Materials	Inquiry Procedure
<ul style="list-style-type: none"> <li><input type="checkbox"/> Pencil</li> <li><input type="checkbox"/> Clipboard</li> <li><input type="checkbox"/> Paper</li> <li>Handout/School Journal</li> </ul>	<ol style="list-style-type: none"> <li>1. Predict what you might find in Klehm's pond. (15 min)</li> <li>2. Examine plants (based upon season). Look for rooted plants growing from the pond. What are characteristics of the rooted plants you find? How are these plants similar/different than plants living outside of water. How does this plants protect the animals of the pond? (15 min)</li> <li>3. Student Choice &amp; Inquiry: Choose another plant. Compare the new plants to the previous plant. Students will record the plant on the recording document to create a model of their work. How does this plants protect the animals of the pond? (30-40 min)</li> <li>4. Record, compare and discuss findings in small groups (20 min)</li> </ol>

















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Instruction Practices:	 Gross Motor	 Fine Motor	 Visual Motor	 Sensory	 Language	 Literacy	 Social	 Mathematics
NGSS Practices:	 Ask & Answer Questions	 Develop & Use Models	 Investigation	 Using Data	 Math Thinking	 Explanations & Solutions	 Arguments with Evidence	 Obtain Information