

## **Junior Naturalists**

**Overview:** Students K-1 will participate in a Sensory Walk, using four senses to observe the shape, color, texture, smell, and sound of the upland habitat's organisms. 2<sup>nd</sup> Graders will fill out a Nature Journal, record observations and compare them between the Refuge, their home, and a natural space (park, forest, beach, etc.).

**Next Generation Science Standards:** 2-LS4-1

### **TIME FRAME FOR CONDUCTING THIS ACTIVITY**

- **Introduction (5 minutes)**
- **K-1 Sensory Walk (20 minutes)**
  - Students take a walk on the Marsh View Trail, using their senses to make observations about plants and animals along the way.
- **2<sup>nd</sup> Grade Nature Journaling (20 minutes)**
  - Students will participate in solitary nature journaling, using their keen senses to draw, write about, and ask questions about things they see.
- **Wrap-Up Discussion (5 minutes)**

### **HOW THIS ACTIVITY RELATES TO THE REFUGE'S RESOURCES**

- Observing nature stimulates environmental stewardship and creates a bond between the student and the earth. Students will develop an awareness and appreciation of the Refuge's resources. This activity helps support the National Wildlife Refuge System's Guiding Principles to promote "love and respect for the land."

**Key Concept:** Naturalists study the environment and make observations to better understand the world. Keen observation skills and a deep appreciation for the earth will help students later in life. Nature journals provide an inquiry-based approach to learning.

**Objectives:** After the Sensory Walk (K-1) students will be able to:

- Describe 2 characteristics of a naturalist.
- List 4 senses used in making observations.
- Describe 3 characteristics of 1 plant that lives in the upland habitat.

After Nature Journaling (2<sup>nd</sup> Grade) students will be able to:

- Describe 2 characteristics of a naturalist.
- Name 4 kinds of things that could be recorded in a nature journal.
- Suggest 2 reasons why to keep a nature journal.

**Materials:**

Provided by the Refuge:

K-1

- 6 hand lenses
- 6 discovery scopes

2<sup>nd</sup> Grade

- 12 hand lenses
- 12 discovery scope
- 12 boxes of colored pencils

Provided by the Instructor:

2<sup>nd</sup> Grade

- 12 nature journals

## **Mud Exploration**

**Overview:** Students will observe mud and organisms from the mudflat habitat. Using puppets, they will explore the mudflat food pyramid.

**Next Generation Science Standards:** K-ESS3-1, 1-LS1-1, 2-PS1-1, 2-LS4-1

### **TIME FRAME FOR TEACHING THIS ACTIVITY**

#### **K-1**

- **Mud Exploration (5 minutes)**
  - Explore a container of mud, observing its smell, color, texture, etc.
- **Mud Creature Zoos (13 minutes)**
  - Examine mud creatures using hand lenses.
- **Mudflat Food Pyramid (2 minutes)**
  - Show the students how a food pyramid works.
- **Mudflat Puppets (8 minutes)**
  - Students will fit puppets into the mudflat food pyramid and learn their role in the food chain.
- **Wrap-Up Discussion (2 minutes)**

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

- **Mud Exploration (13 minutes)**
- **Mud Creature Zoos (5 minutes)**
- **Mudflat Food Pyramid (2 minutes)**
- **Mudflat Puppets (8 minutes)**
- **Wrap-Up Discussion (2 minutes)**

### **HOW THIS ACVITIVY RELATES TO THE REFUGE'S RESOURCES**

The purpose of this activity is to create an awareness and appreciation of the Refuge's. Observing the properties and creatures found in the mudflat habitat creates a bond between the student and the earth, and could promote environmental stewardship in the future.

**Key Concepts:** Mud creatures live in high abundance in the mudflats, providing food for migratory birds and the endangered California Ridgway's rail. When the tide is out, the mudflats are revealed and birds land on the mudflats to feed.

**Objectives:**

Students will be able to:

- Name and describe 2-3 mud creatures
- Describe the mudflat food pyramid
- Name 1 animal that finds food in the mudflats
- Explain 1 reason the mudflats are important

**Materials:**

**Provided by the Refuge:**

- 1 set mud creature puppets
  - Phytoplankton (green fuzzy balls)
  - 5 Zooplankton
  - 1 clam
  - 1 mussel
  - 2 crabs
  - 2 Ridgway's rails
  - 1 peregrine falcon
- 4 large containers of mud
- 12 white measuring spoons
- 12 hand lenses
- 4 large petri dishes (Mud Creature Zoos)
- Prepared slides
- 1 video microscope
- 1 mudflat food pyramid poster
- 1 large wooden food pyramid display

## **Nature Play**

**Overview:** The benefits of playing in nature are numerous. Studies have shown that children who play in nature on a regular basis are healthier, more decisive, feel better, and develop an appreciation for the natural world. In this activity, students will participate in unstructured nature play time, using stumps, sticks, and leaves to build forts or other structures in order to develop problem-solving and cooperation skills.

**Next Generation Science Standards:** K-ESS2-2, 2-PS1-2

This activity supports the NGSS value of scientific inquiry. It also supports the following NGSS Connection Statements: 1) science and engineering involve the use of tools to observe and measure things, 2) every human-made product is designed by applying knowledge of the natural world and is built by using natural materials, and 3) taking natural materials to make things impacts the environment.

### **TIME FRAME FOR CONDUCTING THIS ACTIVITY**

- **Introduction to the Rules (2 minutes)**
  - Students will be introduced to the idea of playing in nature and learn the rules associated with this activity.
- **Nature Play (28 minutes)**
  - Students can use natural items to build forts, construct obstacle courses, pretend to be animals, play house, etc.

### **HOW THIS ACTIVITY RELATES TO THE REFUGE'S RESOURCES**

- Playing in nature stimulates environmental stewardship and creates a bond between the student and the earth. This activity helps support the National Wildlife Refuge System's Guiding Principles to promote "love and respect for the land."

**Key Concept:** Nature Play is a great way for students to learn how to cooperate, solve problems, use their critical thinking skills, and become independent.

### **Objectives:**

Students will be able to:

- Name 2 different materials found in the Nature Play Space.
- Work as a team to complete a goal.
- Describe 1 thing they learned while participating in Nature Play.

**Materials within the Nature Play Space:**

- Sticks
- Stumps
- Pine cones
- Acorns
- Mulch
- Leaves

**RESOURCES**

Ernst, J.A. and Erickson, D.M. *The real benefits of nature play everyday.* Wonder. NACC Newsletter. Jul/Aug 2011. P. 97-100.

Louv, R. *Last Child in the Woods.* Algonquin Books. New York. 2005.

*What is Nature Play?* National Wildlife Federation. Website. [www.nwf.org/What-We-Do/Kids-and-Nature/Programs/Nature-Play-Spaces.aspx](http://www.nwf.org/What-We-Do/Kids-and-Nature/Programs/Nature-Play-Spaces.aspx)

## **Pollinators & Plants**

**Overview:** Students will sing about the butterfly life cycle, learn that pollinators are attracted to specific plants, and determine what features a habitat must have to attract pollinators.

**Next Generation Science Standards:** K-LS1-1, 1-LS1-1, 1-LS3-1, 2-LS2-2

### **TIME FRAME FOR CONDUCTING THIS ACTIVITY**

- **Butterfly Life Cycle Song & Dance (5 minutes)**
  - Students will act out the stages of a butterfly's life cycle while singing a song.
- **Flower & Pollinator Puppets (10 minutes)**
  - The activity leader will read a story about pollinators, and the students will act it out as he/she reads.
- **Garden Detectives (10 minutes)**
  - The instructor will lead the students around the garden, while the students use the Garden Detective Bingo Worksheets to find important elements in a pollinator habitat.
- **Discussion (5 minutes)**

### **HOW THIS ACTIVITY RELATES TO THE REFUGE'S RESOURCES**

- The Butterfly Garden is an important breeding and feeding ground for pollinators (hummingbirds, butterflies, bees). Students will observe the garden, and inform staff on what needs to be improved to make it a more suitable habitat for pollinators.

### **Why are pollinators important?**

- Over 100 types of crops in the United States, and over 75% of all flowering plants worldwide depend on animal pollinators
- Without pollinators, natural ecosystems can collapse
- Ecosystems need pollinators in order to thrive. A loss of pollination can cause plants to die off, resulting in a collapse of the entire ecosystem.

**Key Concept:** Pollinators (butterflies, bats, bees, hummingbirds, moths, etc.) play an important role in the ecosystem. Their traits determine which flowers they can pollinate. Pollinators need specific things to survive.

**Objectives:** Students will be able to:

- Describe the life cycle of a butterfly
- Name 3 characteristics that make an effective pollinator
- Define 2 features in a habitat that pollinators need in order to survive

**Materials:**

Provided by the Refuge:

- 6 pollinator puppets (bat, hummingbird, butterfly, moth, bee, beetle)
- 6 flower bracelets
- 6 laminated Garden Detective Bingo Worksheets
- 6 dry erase markers
- Bee with pollen photo
- Large Poster with Butterfly Life Cycle Song

## **Salt Marsh Discoveries (K-2)**

**Overview:** Students will observe and describe natural objects found in the salt marsh. Next, they will participate in an interactive habitat hike in which they pretend to be the salt marsh harvest mouse.

**Next Generation Science Standards: K-ESS2-2, 2-LS4-1**

### **TIME FRAME FOR CONDUCTING THIS ACTIVITY**

- **Discovery Box (8 minutes)**
  - Lead the activity to focus attention, build observation and enhance descriptive skills.
- **Walk with Footsteps (20 minutes)**
  - Walk on the boardwalk through the marsh
  - Stop and follow instructions on each “Footstep”
  - The first footstep allows for close observation in the marsh
  - Lead a brief wrap-up about the salt marsh habitat
- **Travel Time (2 minutes)**
  - Walk back to the top of the ramp to meet your next group

### **HOW THIS ACTIVITY RELATES TO THE REFUGE’S RESOURCES**

- By pretending to be a salt marsh harvest mouse, students will get a sense of how difficult it is to be a wild animal. Most of the mouse’s habitat has been destroyed and developed by humans into salt ponds, houses, landfills, and airports.

**Key Concept:** The salt marsh provides a unique habitat for a specialized group of plants and animals. Endangered species, such as the salt marsh harvest mouse, depend on the salt marshes of the San Francisco Bay for their existence.

### **Objectives:**

#### **Students will be able to:**

- Use their senses to observe and describe the salt marsh habitat in terms of what they see, smell, hear, feel, and taste
- Name one plant and one endangered animal that lives in the salt marsh

**Materials:****Provided by the Refuge:**

- Discovery Box containing natural objects
  - Bird sound
  - Pickleweed
  - Fur
  - CA sagebrush
  - Bird wing
- 1 set of 4 footsteps
- 1 key to Salty's Home
- 1 large boundary rope
- 12 hand lenses
- 4 bug boxes
- 2 discovery scopes
- 4 soil thermometers
- 1 scat display
- 1 marsh plant book
- 1 bird ID chart
- Picture of "Salty"