





## Lesson Plan 1. **Nighttime Science** - *Nature Exploration at a National State Park*

**How can I be prepared for the State Park?**

### Alignment with **STEM Framework**

Tinkerer  Investigator  Inventor  Conservationist 

### Overview

This lesson will provide detailed instructions for facilitators to follow before embarking on the trail at a State Park. This document includes guidelines, safety measures, and materials needed for this journey. Additionally, you will find essential meeting times, key safety points, and preparation methods to ensure facilitators & staff are aware of what to expect exploring the park. This document will educate you on the natural world before you participate in the Nighttime Science Nature Exploration.

#### **The lesson plan for your mission will include:**

- An introduction to Night Time Science.
- Meeting times & location for activities.
- Important points & tasks for facilitators to follow.
- Prepping information for Station 1 - Station 6.

Facilitators must familiarize themselves with potential dangers before embarking on the trail; this could include chiggers, ticks, poison ivy, etc.

### Content Goal

- What should I know before entering the park?
- How can I best prepare for the trail?
- How can I stay safe while at the park?
- What animal sounds do I hear?
- What do I smell?
- What do I see?

## Practice Goal

- Asking questions and defining problems
- Developing and using models
- Engaging in argument from evidence
- Obtaining, evaluating, and communicating evidence

## Purpose

This lesson is intended for facilitators just before beginning the walk at a State Park. Guidelines, safety measures, and preparation methods will be stated to ensure that everyone (both facilitators and volunteers) are informed on what to expect when exploring the park. The goal here is to educate ourselves on the natural world before participating in the Nighttime Science Nature Exploration.

## Teacher Background Information

Facilitators should familiarize themselves with poison ivy, black widows, chiggers, ticks, and copperheads at the park before continuing with this lesson (see Nature: Nasty and Nice lesson).



## Materials

### Totes:

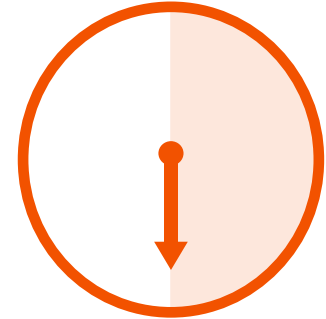
- Frog Necklace Cards
- Night Vision
- Frog Call Activity
- Echolocation
- Activities about the Night Sky

### Field Bags for Sunday Night Nature Exploration:

- Phones with skyview app
- A way to record frog calls or cricket calls or bird calls
- HerpMapper app
- Lots of baggies

## Time Needed

TBD



## Instructional Sequence

### Introduction to Night Time Science

- ▶ Focus on Safety (humorous but detailed); no more than 30 minutes – Points below are important for facilitators to remember:
  - ▷ *Don't touch what you don't know*
  - ▷ *Don't touch venomous animals even if you know what they are*
  - ▷ *Don't touch random plants*
  - ▷ *Don't eat random berries*
  - ▷ *Take care of yourself but don't fret about it*
  - ▷ *Watch where you're walking*
  - ▷ *Don't sleep with food in your bunk unless you want ants in your bed*
  - ▷ *Here's how to do a tick check – look at & feel yourself – everywhere! If you think you have a tick get a trusted same sex partner to see what they think, if you have a tick the nurse will remove it.*
  - ▷ *If you are itchy, did you get into poison ivy? Chiggers? Mosquitos?*
  - ▷ *Ask for help if you need it*
  - ▷ *Drink lots of water*
  - ▷ *Have a wonderful time in the out-of-doors enjoying the Natural World – it's good for you & it makes you healthy – mentally & physically.*

## Meet at the cabins & begin activity there

- ▶ Start at your assigned station and move in a clockwise (on the map) route.
- ▶ Plan to spend at least 10 minutes at each of 6 stations.
- ▶ Return to the area outside the classroom with all groups by 9:45 PM.

## Generally, points and tasks to keep in mind throughout the exploration

- ▶ Make sure youth are all comfortable and have what they need for the hike (flashlight, long pants, long sleeve shirt, hat, water, insect lotion/spray on clothes, face but NOT hands, a way to collect some form of data (can be drawing, taking photos, recording calls, 'things in ziplock baggies but must agree to return living things to exact place where captured' etc.)
- ▶ Before beginning hike tell group members where you are going (around the lake), how long you'll be gone (less than two hours), the purpose of the hike (to look, smell, touch and listen to/for 'nature') and to enjoy the out-of-doors and share the experience with others in their group. Cover your flashlights with red cellophane.
- ▶ Start at your group number and walk clockwise (for example...group 3 starts at stop 3 and continues clockwise through stops 4, 5, 6, 1 and 2 and then they return to the classroom).
- ▶ Silently walk for periods of time and occasionally stand in place to listen. Discuss the sounds group members heard. Did you hear crickets? Birds? Frogs calling? Leaves rustling? Water running? Can you find the animals that are calling?
- ▶ Walk with flashlights on and at other times with lights off. Use light or a laser pointer to point out specific calling animals, spider eyeshine, or any other natural history phenomena.
- ▶ Stop and smell. Have youth share what they smell. If you see a millipede out and about capture it and gently shake it with your hands closed into a fist. Then sniff. Find a mint plant and let youth all take a leaf and crush it.
- ▶ Encourage youth to feel the leaves of plants and trees, and describe how they feel.
- ▶ Give group members a few minutes on their own to find, and mark with flagging tape or bring back, an item, a sound, a smell that they want to share with others.
- ▶ Meet back outside the classroom and pair into two groups (1 & 2; 3 & 4; 5 & 6). Pair two individuals, one from each group and let them talk to each other about what they saw, heard, smelled, and how they felt and what they learned. Then have each share one thing about the trip with the two combined groups.
- ▶ Mention that tomorrow night youth will be learning frog calls and taking a hike to collect data on the types and numbers of frogs that are calling.

## Prepping for stations

- ▶ All groups will start at different points (Station 1 – Station 6), stops are marked with a surveyor pin and/or flagging tape) and travel in a clockwise direction. Groups should move at about the same speed but if one group is busy the approaching group should wait a good distance behind them until they move.

**Station 1** Boardwalk— pull 3 minnow traps per group, 1 at a time. First group starts with traps numbered 1 – 3, nearest the river and the last group finishes with traps numbered 15 – 18, furthest from the river. Empty these, record and discuss finds and replace traps; listen for animal sounds here, how fast is the river flowing? How do you feel here?

**Station 2** Transition Zone, Tote A— Youth will wear frog necklace cards until the activity ends. Read the cards and have youth suggest ways they might identify ‘their’ frog if they see it or hear it tonight. If the frog call is on the card can youth mimic the call? This area of the park is called a transition zone (Why is it called that? What transitions does it represent?).

**Station 3** Lake Stop #1 - Tote C— Frog Call Canisters. Do the activity here. Discuss temperature and how it is changing between stops 1 & 3. Where is it cooler? Windier? Quieter? Do any of these variables affect calling frogs?

**Station 4** Lake Stop #2- Tote D— Echolocation. Play the game Marco Polo and discuss echolocation. Do you see any bats? Are they catching insects? If so, watch a bit.

**Station 5** Dam Stop – Tote E— (Sky Observers) Night sky. Moon phases; 5 circumpolar constellations that we can always see in the night sky. Discuss naked eye astronomy and finding your way around the universe.

**9:45 pm** Goodnight closing— Brief meeting in the classroom to share finds as a Whole Group.