
WOODLAND PARK ZOO SAVES WILDLIFE AND INSPIRES EVERYONE TO MAKE CONSERVATION A PRIORITY IN THEIR LIVES.

ZOO.ORG

# Wild Wise:
# Ready, Set, Discover

Problem-based Science Learning Across Settings

# Agenda

- Welcome and introductions
- WW: Ready, Set, Discover program
- Program Outcomes
- Problem-based learning &  Curricular Connections
- E1: Meet the Problem
- E2: Outdoor Exploration & Inquiry Kits
- Break
- E3: Zoo Exploration

# Agenda

- E4 & E5: Sharing Solutions
  - In-class preparation with students
  - Rubric
  - Review student work samples
  - Structuring your Sharing Solutions event for success
- Zoo visit registration and logistics
- Other themes
- Final questions and evaluation

# Introductions

- Your name
- Your school
- What you are most looking forward to with this PBL unit

# Why Use Problem Based Learning?

*Supports critical thinking

*3 dimensional learning

*Prepares students for the WCAS

# Why PBL?

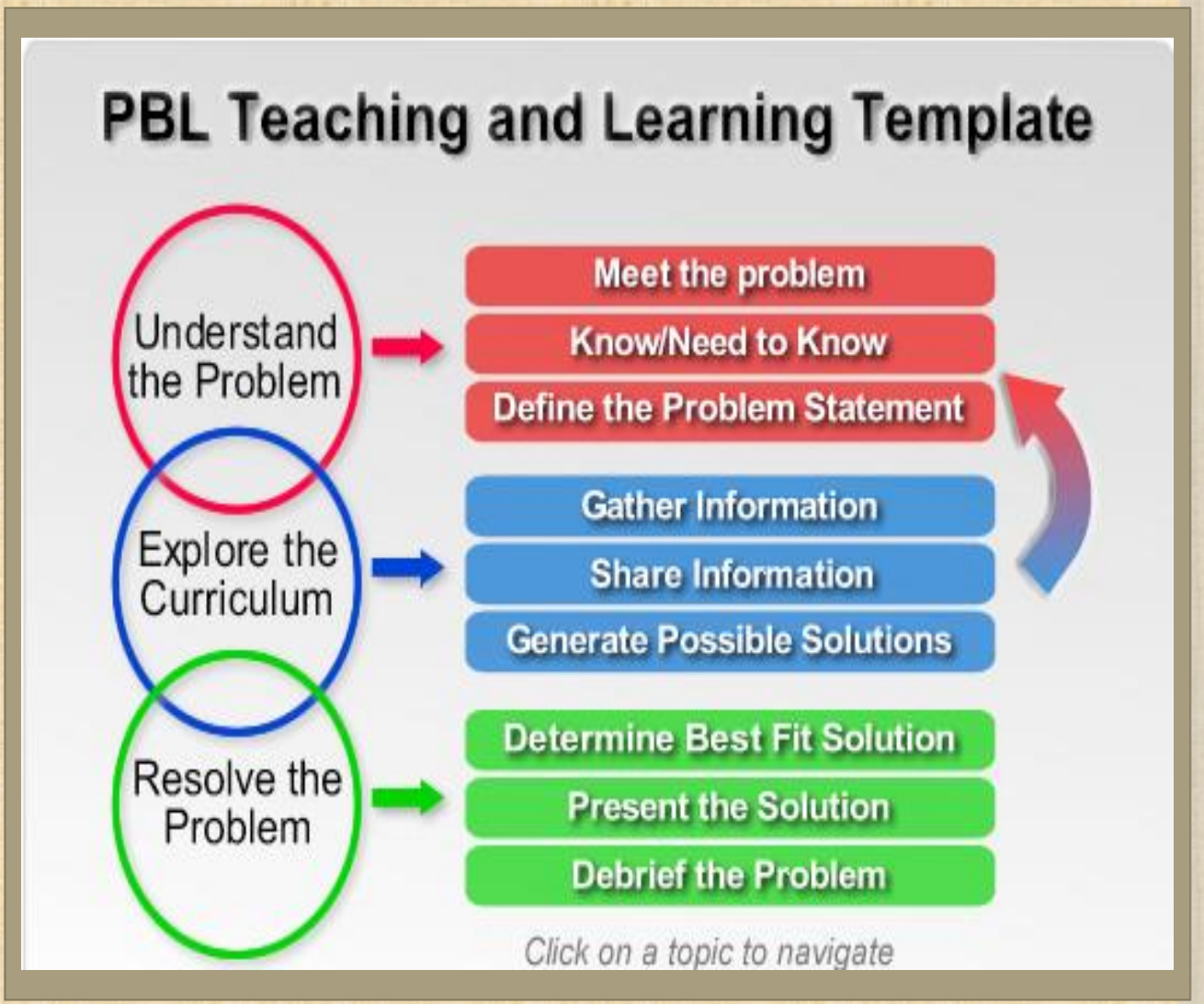
- **Activities are focused on real world problems.**
- **Teaching and learning is collaborative.**
- **Activities are relevant, practical and transferable to the classroom.**
- **Content is focused on big ideas, fosters scientific and mathematical attitudes, and develops skills.**
- **The process is a hands-on/minds-on instructional approach.**
- **Teaching strategies, perspectives, and materials show sensitivity to diversity.**

# PBL provides the skills students need to succeed

**According to leading companies, obtaining and holding a good job requires that you be able to do seven basic things:**

1. **Learn to learn**
2. **Communicate and collaborate with others**
3. **Think creatively to solve novel problems**
4. **Be technically competent**
5. **Understand the opportunities and constraints of the global economy**
6. **Lead as well as follow, always taking initiative**
7. **Manage your career to develop new skills and knowledge.**

# Overview of the sequence of PBL



# How does the Ready, Set, Discover PBL program connect with….

**NGSS 3 dimensions**

- **Cross Cutting Concepts**
- **Disciplinary Core Ideas**
- **Science and Engineering Practices**

**CCSS**

- **ELA- Expeditionary Learning Module**

Grade 5 conections between EL module 2A, FOSS Living Systems and H2M (Hand Out)

**FOSS**

Living Systems Unit Overview (Hand Out)

**Hand2Mind Engineering Kit**

Food Deserts Teacher Guide (Hand Out)

# Grade 5 connections (Hand Out)

**Grade 5 Expeditionary Learning Module 2A: Biodiversity in Rainforests of the Western Hemisphere and Module 4: Natural Disasters in the Western Hemisphere**

- Informational text describes the work of scientists documenting the biodiversity of rainforests. The focus is on reading scientific and technical text as well as writing to inform and explain.
- Students build basic background knowledge about the rainforest (particularly those of the Western Hemisphere), and begin to examine how scientists closely observe the natural world to then help them communicate their research.
- Students then analyze the structure and function of scientific field guides and field journals to determine what quality field guides and journals look like.
- Students research a living organism, using examples similar to the rainforest organisms in the author's research, and write (with clear and effective word choice) about their chosen insect of the rainforest. As the final performance task, students produce an informational report using field journal–style pages intended for younger readers.

**Discovery Ed Videos to support EL module 2A**

- The Canopy
- The Understory
- A World of Wonders: The Amazon Rainforest
- Forest Diversity

**Ready, Set, Discover! Program with the Woodland Park Zoo**

- Woodland Park Zoo is asking you to learn more about our native amphibians and design a model or real life example of an ideal amphibian habitat.
- Students research a living organism, then write recommendations on how we, as a region, can take action to help native amphibian species thrive.
- Students need to understand many ethical and environmental issues related to amphibian and human interactions in our community.

**Grade 5 FOSS Living Systems Kit**

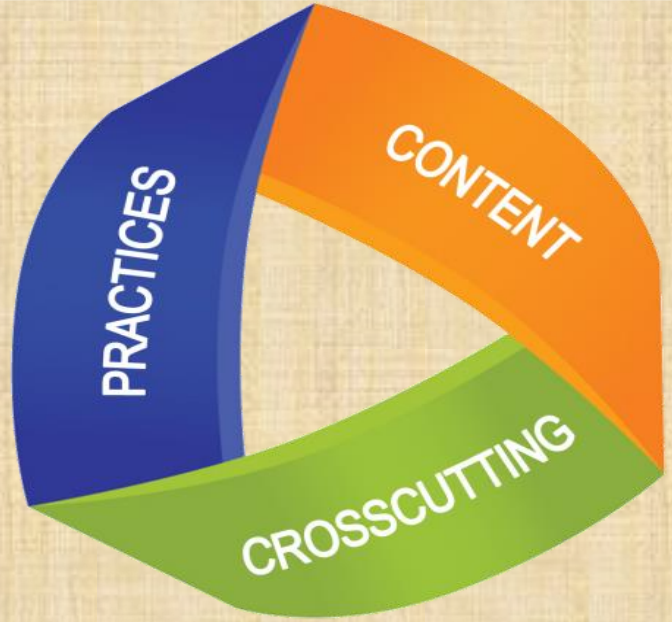
- Students are introduced to a system as a collection of interacting parts that work together to make a whole or produce an action. They explore Earth as a system, focusing on the biosphere and describing ecosystems by looking at feeding relationships and energy transfers, described as food webs. Students model food chains and food webs in a wood ecosystem and a marine ecosystem. Each group of students sets up a red worm habitat to study detritivores and the role of decomposition in ecosystems.
- P1:
  A system is a collection of interacting objects, ideas, and/or procedures that together define a physical entity or process.
  A subsystem is a small system that is inside a larger system.
- P2:
  Earth can be described as the interaction of four earth systems: the rocky part (the geosphere), the atmosphere, the water (the hydrosphere), and the complexity of living organisms (the biosphere).
  Food webs are made up of producers (organisms that make their own food), consumers (organisms that eat other organisms to obtain food), and decomposers (organisms that consume and recycle dead organisms and organic waste).
- P3:
  A kelp forest has similarities to a rain forest (vertical layering).
  Phytoplankton are the major producers in most aquatic systems (both marine and freshwater).
  Food webs and competition for resources exist in marine systems.
- P4:
  Food webs are made up of producers (organisms that make their own food), consumers (organisms that eat other organisms to obtain food), and decomposers (organisms that consume and recycle dead organisms and organic waste).

**Grade 5 Food Deserts Challenge**

- Students will learn about growing plants and how the engineering design process can guide them through working as a team to formulate a solution to a problem. Students will use what they learn to design a hydroponic system that can be used to grow food in a limited space.
- Students build basic background knowledge about designing a hydroponic system, and demonstrate how scientists and engineers closely observe the natural world to then help them communicate their research.

# NGSS

https://www.nextgenscience.org/



# NGSS Disciplinary Core Ideas

**5-LS2.A:**
**Interdependent Relationships in Ecosystems**

- The food of almost any kind of animal can be traced back to plants.
- Organisms are related in food webs in which some animals eat plants for food and other animals eat the animals that eat plants. Some organisms, such as fungi and bacteria, break down dead organisms (both plants or plants parts and animals) and therefore operate as “decomposers.” Decomposition eventually restores (recycles) some materials back to the soil.
- Organisms can survive only in environments in which their particular needs are met. A healthy ecosystem is one in which multiple species of different types are each able to meet their needs in a relatively stable web of life.
- Newly introduced species can damage the balance of an ecosystem. (5-LS2-1)

# NGSS Disciplinary Core Ideas

**5-ESS3-1.**
Obtain and combine information about ways individual communities use science ideas to protect the Earth's resources and environment**.**

**5-ESS3.C:**
**Human Impacts on Earth Systems**

- Human activities in agriculture, industry, and everyday life have had major effects on the land, vegetation, streams, ocean, air, and even outer space. But individuals and communities are doing things to help protect Earth's resources and environments. (5-ESS3-1)

# Crosscutting Concepts

1. Patterns
2. Cause and effect: Mechanism and explanation
3. Scale, proportion, and quantity
4. Systems and system models
5. Energy and matter: Flows, cycles, and conservation
6. Structure and function
7. Stability and change

# Science and Engineering Practices

1. Asking questions and defining problems
2. Developing and using models
3. Planning and carrying out investigations
4. Analyzing and interpreting data
5. Using mathematics, information and computer technology, and computational thinking
6. Constructing explanations and designing solutions
7. Engaging in argument from evidence
8. Obtaining, evaluating, and communicating

**W**ashington
**C**omprehensive
**A**ssessment of
**S**cience

The WCAS will assess all three dimensions of the learning standards (Science and Engineering Practices, Disciplinary Core Ideas, Crosscutting concepts).

What do I need to know about PBL before we get started?

1. **Don't think too "big".**
2. **Stay focused**
3. **Plan carefully- use the support materials!**
4. **Limited technology needed**

# RSD Student Outcomes

- Understand components of ecosystems and how they interact
- Gain appreciation for local habitats and wildlife
- Capable of defining a problem, designing a solution and using evidence to make a claim about the solution
- Understanding of human impacts on ecosystems
- Understanding how communities use science ideas to protect the environment

# RSD Teacher Outcomes

- Demonstrate confidence in using PBL model effectively
- Increased comfort in taking students outdoors for science learning
- Understanding of human impacts on ecosystems
- Ability to make cross-curricular connections between RSD, Rainforests in Western Hemisphere ELA unit, and FOSS Living Systems Kit

WOODLAND PARK ZOO

WOODLAND PARK ZOO SAVES WILDLIFE AND INSPIRES EVERYONE TO MAKE CONSERVATION A PRIORITY IN THEIR LIVES.

ZOO.ORG

# Meet the Problem – Session 1

- Student pre-assessment
- Identifying the problem
- “Knows” and “Need-to-knows”

- Launch RSD unit
- Introduce the problem
- Identify task
- List existing, new and needed knowledge about amphibians
- Develop problem statements

# Formative Assessment

## WILD WISE: READY, SET, DISCOVER

Name _____ Teacher _____ Date _____

1. How much do you agree with the statements below? (Check the box that represents how much you agree or disagree.)

| | I strongly disagree | I disagree | I don't agree or disagree | I agree | I strongly agree |
|---|---|---|---|---|---|
| I try to tell others that wetlands are important. | ☐ | ☐ | ☐ | ☐ | ☐ |
| I like to sit by a pond and watch dragonflies. | ☐ | ☐ | ☐ | ☐ | ☐ |
| I like to go on trips to places like forests away from cities. | ☐ | ☐ | ☐ | ☐ | ☐ |
| People have a right to change the environment. | ☐ | ☐ | ☐ | ☐ | ☐ |
| I know I can help save wetland environments. | ☐ | ☐ | ☐ | ☐ | ☐ |
| I think amphibians and wetland animals are cool. | ☐ | ☐ | ☐ | ☐ | ☐ |
| I'm glad that I live in an area that has wetlands. | ☐ | ☐ | ☐ | ☐ | ☐ |
| People's actions can negatively impact or affect the environment. | ☐ | ☐ | ☐ | ☐ | ☐ |

2. The area next to a wetland pond has been bought by a company who wants to clear some of the trees and bushes to build a golf course. How will this affect the wetland negatively?
   a) The wetland will become polluted.
   b) Animals that live in or near the wetland will have their homes taken away.
   c) The remaining trees and plants will die off from not having the resources they need to survive.
   d) A and C are correct.
   e) All of the above are correct.

Pre Turn Over! ©2017-2018

3. Look at the illustration of a wetland ecosystem and answer the following questions.

Along with fish, birds, and insects, frogs also live in wetland ecosystems. In the table provided below, there are 2 different parts of an ecosystem (animal, plant, or environment) identified. Explain how frogs would interact with that part of the ecosystem. Then explain why that interaction is so important to frogs that live in this environment.

Example

| Parts of the ecosystem | How would frogs interact with this part of the ecosystem? | Why is this so important to frogs? |
|---|---|---|
| Fish | Frogs would stay away from fish, because fish eat them. | In order to survive, Frogs have to avoid fish and lay their eggs where fish can't get to them. |

Your turn!

| Parts of the ecosystem | How would frogs interact with this part of the ecosystem? | Why is this so important to frogs? |
|---|---|---|
| 1. Dragonfly | | |
| 2. Hollowlog | | |
| 3. Clean water | | |

4. What is something you can do to help save the wetlands? _____

_____

_____

Pre You're all done! Thanks for taking the time to complete this! © 2017-2018

# Introduction to the Problem

## While you read the letter from Woodland Park Zoo please pay special attention to the following:

- What is the problem?
- How do you know this is a problem?
- Who is responsible for solving this problem?
- What is your job?

# Meet the Problem Letter

January 7, 2019

Dear Kent School District 5th grade students,

Have you ever seen a frog, toad, or salamander? All of these animals are amphibians found in local parks and wetlands in Kent. However, amphibian populations are shrinking and Washington's native amphibians need your help!

Amphibians, like all living things, depend on their habitat to meet their needs. Wetlands are one important habitat for amphibians, and unfortunately, Washington's wetlands are disappearing. Since the 1780s, Washington State has lost 31% of its wetland area, from 1.35 million acres to 938,000 acres.

Over 1,900 species of frogs, toads, and salamanders, 30% of the world's amphibians, are at risk of extinction. To save the world's amphibians, we need to quickly learn more about their needs. The future of amphibians isn't just in the hands of scientists and government officials; you can help play an important role in saving these animals.

Woodland Park Zoo wants to know how you plan to protect Washington's native amphibians. This year, you will learn about amphibians, wetland habitats and how using scientific ideas can help protect the environment. You will use your knowledge to develop scientific, feasible, affordable and ethical solutions for how people in your community can help native amphibians thrive in Kent. Your ideas can inspire your community to take action in protecting amphibians and wetland habitats. Thank you for your help!

Sincerely,
Woodland Park Zoo

# Knows/Need to Knows

WOODLAND PARK ZOO

**Know / Need to Know**

| Know | Need to Know |
|---|---|
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |
| | |

# What do you Already Know?

## What do you know about this issue?

•Animals:

•Location:

•Problem:

•Our role:

•Knowledge you already had:

# What do you Need to Know?

## What do you need to learn in order to solve this problem?

1.

2.

3.

4.

5.

6.

# Meet the Problem Video

## While watching the video pay attention to the following:

- What is the problem?
- What evidence do you have?
- Why should you care?
- What is your job?

# What do you know now?

Do you need to expand on any of these topics?

•Animals:

•Location:

•Problem:

•Our role:

What further information did you gain?

# What do you Need to Know?

## What further information do you need to solve this problem?

1.

2.

3.

4.

5.

6.

WOODLAND PARK ZOO

WOODLAND PARK ZOO SAVES WILDLIFE AND INSPIRES EVERYONE TO MAKE CONSERVATION A PRIORITY IN THEIR LIVES.

ZOO.ORG

# Meet the Problem – Session 2

- Developing a problem statement

# Local Amphibians

Western toad

Rough-skinned newt

Northwestern salamander

Long-toed salamander

Red-legged frog

Pacific treefrog

Oregon spotted frog

# Problem Statement

- Defining the problem is critical to problem-solving and can be the most difficult step.

- Problem statements
  - Used by whole class with small groups generating their own unique solutions and projects
  - Developed by small groups independently

- **Recommended Format:**
  - How can we (*state the task*) in such a way that we consider (*the constraining factors*)?
  - Problem Statement graphic organizer (p. 26)

# Problem Statement Facilitation Tips

- Draft an anticipated problem statement yourself
  - ***For practice, not to give to students***
  - Opportunity for you to practice and prepare for facilitation

- Engage students in an open-ended process to develop their problem statement.
  - What have we been asked to do? (task)
  - What might we consider when finding a solution? (constraints)

# Practice Problem Statement

- Our school is adding a fifth grade classroom and needs to select furniture for students.
  - What is our task (problem)?
  - What factors might limit possible solutions (constraints)?
  - Draft a problem statement using your task and constraints:
    - How can we (*state the task*) in such a way that we consider (*the constraining factors*)?

# Developing a Problem Statement

- Review Knows and Need to Knows
- Identify the task/problem
- Identify constraining factors
- Write a problem statement
- Generate additional Need to Knows and Need to Dos

# Problem Statement Graphic Organizer

## Problem Statement

How can we (state the task here) in such a way that we consider (state the factors, criteria, and constraints here).

How can we

_____

_____

_____

_____

in such a way that we consider:

_____

_____

_____

_____

_____

_____

_____

_____

_____

# Problem Statement Facilitation Tips

- Post the draft problem statement and reinforce that it can be revisited and revised.
- Add on to your existing chart of Knows, Need to knows, and Need to Do as well.
- Have students begin their research to start exploring their need to knows.
  - Sources and Notes graphic organizer
  - Possible research resources

WOODLAND PARK ZOO

# Outdoor Exploration

WOODLAND PARK ZOO SAVES WILDLIFE AND INSPIRES EVERYONE TO MAKE CONSERVATION A PRIORITY IN THEIR LIVES.

ZOO.ORG

# Outdoor Exploration Goals

- Increase familiarity with local habitats and wildlife needs
- Gather information necessary to solve the problem
- Gain comfort in natural settings

# Introduction to local amphibians and wetland ecosystems

- Identifying local amphibians
- Native vs. invasive amphibians and impacts to ecosystems
- Exploring how wetlands are beneficial for amphibians and humans

WOODLAND PARK ZOO

# What is an amphibian?


# Schoolyard habitat investigation

- Identifying amphibian habitat needs
- Using technology to identify habitat features in their schoolyard
- Complete a schoolyard habitat assessment
- Determine if their schoolyard has habitat for the Pacific tree frog

# Macroinvertebrate and water quality investigation

- Clean, healthy water contributes positively to amphibian survival
- Exploring macroinvertebrates as indicators of healthy aquatic ecosystems
- Identifying and describing macroinvertebrates
- Conducting water quality testing

# Wetland Ecosystems Game

- Interactions between non/never-living (abiotic) components and living (biotic) components of a wetland ecosystem
- Human impacts to ecosystems
- Teamwork, communicating science ideas, and community building

# Resources for Guided Outdoor Explorations

- SHADOW Lake Nature Preserve
  - Guided programs available.
  - Contact SHADOW for pricing and availability.

- Nature Vision
  - In-class field programs at local parks on a variety of topics including watersheds
  - Some subsidized programs available including guided field program “Watershed Field Experience”.

# Resources for Self-guided Outdoor Explorations

- Pacific Education Institute

https://pacificeducationinstitute.org/work/#guides

- Beetles – Science and Teaching for Field Instructors

http://beetlesproject.org/

**(see “For Classroom Teachers” tab)**

WOODLAND PARK ZOO

# Inquiry Kits

WOODLAND PARK ZOO SAVES WILDLIFE AND INSPIRES EVERYONE TO MAKE CONSERVATION A PRIORITY IN THEIR LIVES.

ZOO.ORG

- Materials to support self-guided outdoor explorations on and off school grounds

- Scientific tools and resources about local wildlife

## Get to know the kits!

1. In your table group, pick 2-3 items from the kit.
2. Write the items you select on the white board (pick different ones than other groups)
3. Brainstorm how these tools could be used in a habitat exploration or habitat assessment activity.

WOODLAND PARK ZOO

# Break

WOODLAND PARK ZOO SAVES WILDLIFE AND INSPIRES EVERYONE TO MAKE CONSERVATION A PRIORITY IN THEIR LIVES.

ZOO.ORG

WOODLAND PARK ZOO

# Zoo Exploration

WOODLAND PARK ZOO SAVES WILDLIFE AND INSPIRES EVERYONE TO MAKE CONSERVATION A PRIORITY IN THEIR LIVES.

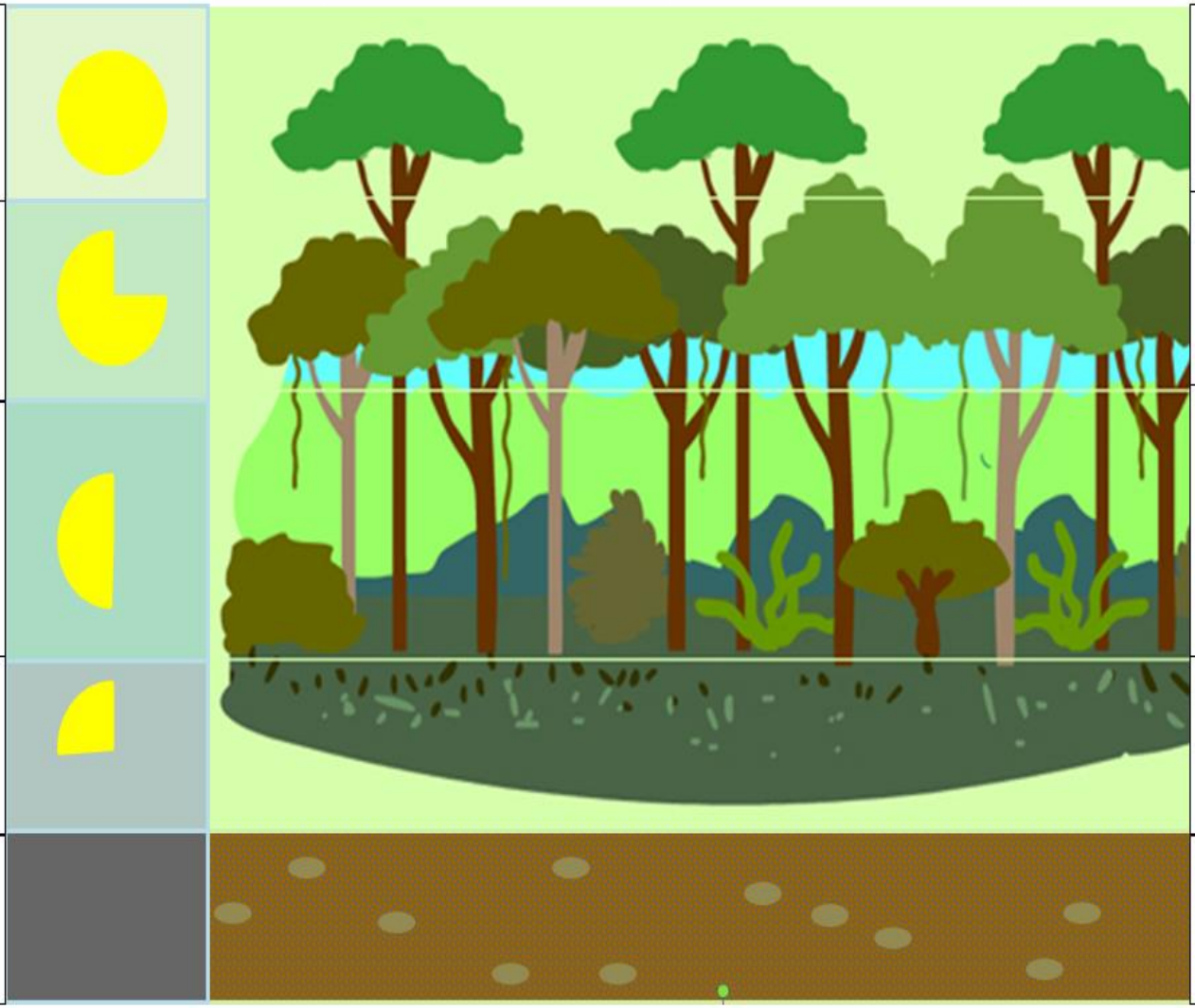
ZOO.ORG

# Zoo Exploration Goals

- Learn about different ecosystems
- Observe animal characteristics
- Practice scientific observation and naturalist skills
- Connect to ELA Rainforest Unit

# Tropical Rainforest Guided Tour

- **Guiding question:** How are different amphibians uniquely adapted to meet their needs in the different layers of a tropical rainforest?
  - Review forest layers (forest floor, understory, canopy)
  - Discuss amphibian adaptations for animals that live in each layer of the forest

| | | |
|---|---|---|
| Full Sunlight |  | Emergent Layer |
| ¾ Sunlight | | Canopy |
| ½ Sunlight | | Understory |
| ¼ Sunlight | | Forest Floor |
| No Sunlight | | Underground |

# **Forest Layer:** Forest Floor

**Amphibian:** Leaf litter frog

- **Food:** Ants, beetles
- **Water:** Forest pools, the edges of streams
- **Shelter:** Under leaves
- **Space:** Smaller than your classroom

**Adaptations:** Brown and black patterns help it blend into the leaf litter, colors form a dead leaf pattern.

# **Forest Layer:** Canopy

**Amphibian:** Red-eyed Tree Frog

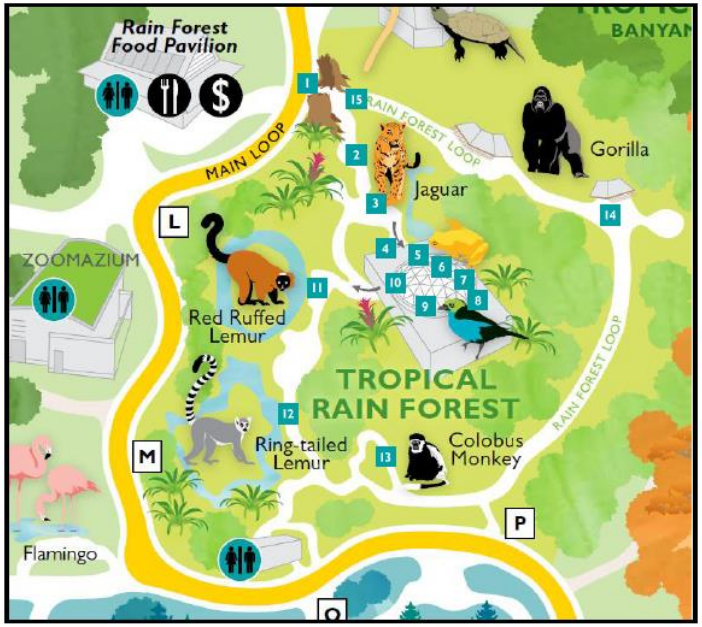
- **Food:** Crickets, moths, and flying insects
- **Water:** Water collected in bromeliads and other hollow plants, humid air.
- **Shelter:** Leaves, bromeliads,
- **Space:** Burrows up to 3 meters deep

**Adaptations:** Bright green color provides camouflage amongst the leaves. Sticky cups on toes help it to cling to tall branches while it climbs.

# Tropical Rainforest Self-Guided Tour

## TROPICAL RAIN FOREST
SELF-GUIDED TOUR FOR TEACHERS AND CHAPERONES

This guide provides questions and suggested answers to help teachers and chaperones guide their students through Woodland Park Zoo's Tropical Rain Forest bioclimatic zone. The text includes questions (in italics) to share with students. Some of these questions have no right or wrong answer, but allow students to express a variety of responses, including sensory impressions as well as factual knowledge and observations. Chaperones should encourage students to think, to feel, and to observe as they progress through the exhibit from the forest floor to the canopy and the outdoor exhibits.




### EXHIBIT OVERVIEW

The Tropical Rain Forest bioclimatic zone at Woodland Park Zoo reflects the complexity and diversity of a tropical rain forest through mixed species exhibits. The first part of the exhibit, beginning with Jaguar Cove and continuing through the building, focuses on animals found in the Americas, and is divided into layers—forest floor, understory and canopy. The emergent layer is represented by the fallen kapok tree at the entrance to the exhibit area. This layering is representative of a tropical rain forest. When you leave the building, you will be discovering tropical rain forest animals of Africa.

### 1. KAPOK (CEIBA) SPIRE

As you approach the Tropical Rain Forest exhibit, you will walk through the hollow trunk of a kapok tree, called ceiba in Central and South America. *What do you think happened to this tree? Why did it fall?*

This model of a kapok tree was designed to look like it was hit by lightning, which knocked the tree over and charred the inside of the stump. Look around at the inside of the trunk. *Why would a plant grow here?* There is sheltered space inside the hollow trunk, and the small animals that live here drop seeds, and also provide fertilizer.

### 2. TRACKS

Look near your feet. *Do you see animal tracks?* Follow the tracks. *Can you figure out what made them? What story do the tracks tell?*

If you look carefully, you will find that the jaguar scratched the wide buttress roots of the kapok tree (on the left side as you face the tree), and then went across the path to the cave. The jaguar rested for a while near the cave, and saw two peccaries (wild pigs) walking into some vegetation nearby. The cat bounded after the peccaries. *How many peccaries came out? Where did the jaguar go next?*

### 3. JAGUAR COVE

*Why is there a big pool in the jaguar exhibit?* Most cats don't like to get wet. Jaguars, however, typically live near water and may wade or even swim to catch turtles and fish. Not many cats have jaws strong enough to break a turtle's shell, but jaguars do!

### 4. ENTRY ROOM

Now that you have entered the building you may feel more like you are in the tropical rain forest. *How does it feel?* The weather in the tropical rain forest is almost always warm and damp—temperatures range between 70 and 80 degrees Fahrenheit (21 to 27 degrees Celsius) and humidity averages 85%. *Look around, can you find some plants that provide us with food?* You may see bananas, coffee, vanilla and chocolate which all come from the tropical rain forest, along with many, many others. Look at the plant on the left side of the path with the very long, large leaves. That is a banana plant. You might also be able to find a coffee plant – these tall shrubs have small, bare trunks with lots of dark green, oval leaves that have prominent veins and wavy edges.

### 5. FOREST FLOOR

As you go through the doors, you are entering the forest floor. *What is it like here? Is it sunny and bright?* No, it is shady—the tall trees block the sun. Only about 1% of the sunlight actually reaches the forest floor. *Can you find an animal that is well camouflaged?* The ocelot has spotted fur to help it to blend into the dappled light on the forest floor. There are many other animals in this area that are also camouflaged!

# Temperate Wetlands Tour and Exploration

- **Guiding question:** Could amphibians meet their needs in the Temperate Wetland exhibit?
  - Review wetlands characteristics
  - Sensory activity
  - Habitat assessment: Would this habitat meet the needs of the Pacific Tree Frog?

# Pacific tree frog

| Food | Water (drinking and reproduction) | Shelter | Space |
|---|---|---|---|
| Ants, beetles, and flies, slugs, snails, any insect smaller than 2 inches | Ponds, wetlands, ditches, puddles, marshes, slow moving streams | Logs, rocks, gardens, bushes, trees, brush piles, animal burrows, drainage pipes | Area smaller than your classroom<br>-For breeding, water must be at least 12 inches deep |
|  |  |  |  |

# Habitat Assessment Activity

| Food | Shelter |
| --- | --- |
| Water | Space |

# Other Resources

Self-guided visit resources are available here:
https://www.zoo.org/resources

### Pre-Visit Sheets

- Arthropods pre-visit sheet
- Birds pre-visit sheet
- Primates pre-visit sheet
- Reptiles and Amphibians pre-visit sheet

### Self-Guided Tours

- African Savanna and African Village
- Northern Trail
- Tropical Asia: Banyan Wilds
- Tropical Asia: Trail of Vines
- Tropical Rain Forest

### Inquiry-Based Activities

- Be A Flamingo Biologist (grades K-5)
- Animal Behavior Observation (grades 6-12)

### Scavenger Hunts

- Bug World Thinking Tour (grades K-3)
- Bug World Thinking Tour (grades 4-8)
- Share the Habitat
- Molbak's Butterfly Garden & Microsoft Pollinator Patio Pollinator Passport
    - Folding Guide

WOODLAND PARK ZOO

WOODLAND PARK ZOO SAVES ANIMALS AND THEIR HABITATS THROUGH CONSERVATION LEADERSHIP AND ENGAGING EXPERIENCES, INSPIRING PEOPLE TO LEARN, CARE AND ACT.

ZOO.ORG

# Sharing Solutions

- Classroom research
- Presentation development
- Sharing the problem-based learning process

# Sharing Solutions

**Students are expected to:**

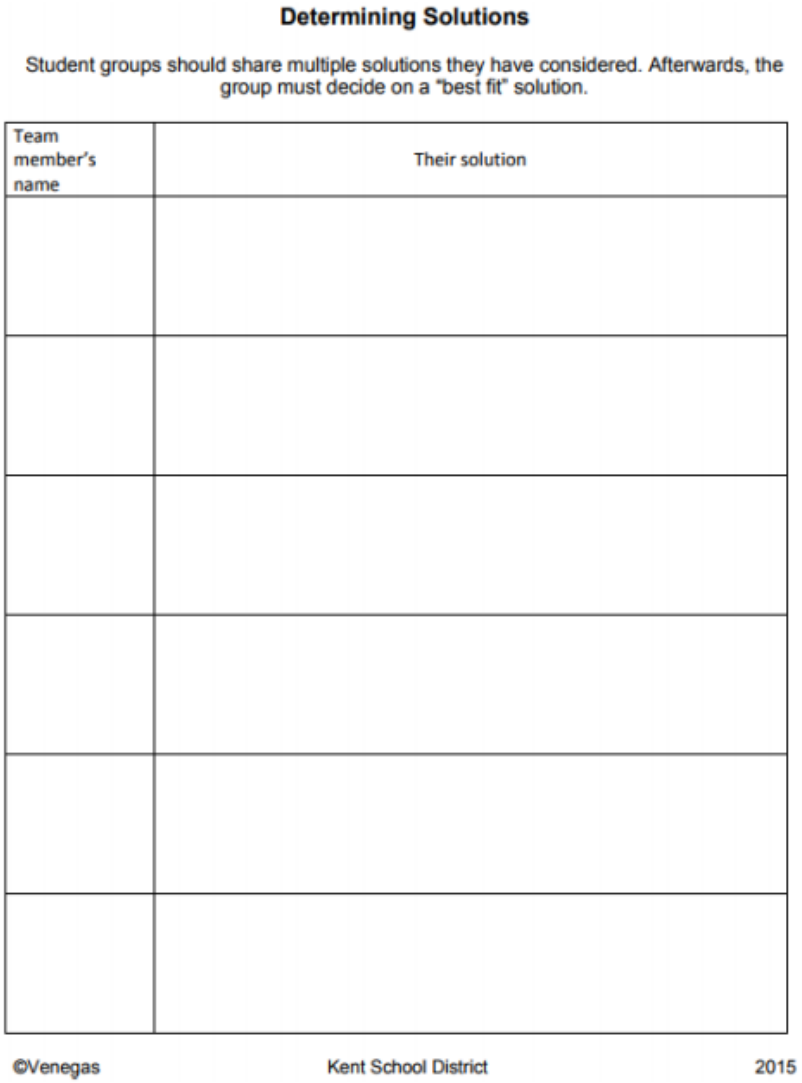
- Generate possible solutions
  - two or more solutions per group
  - solutions should include reasonable suggestions for creating better habitat for amphibians
- Determine a best fit solution that is supported with evidence
- Use Claim-Evidence-Reasoning structure
  - Include reasons that address the constraints identified during Meet the Problem
- Prepare projects to share their solution and PBL process.

# Generating Solutions

- Student groups brainstorm **at least two different** possible solutions.
  - Address their problem statement and constraints
  - Should be reasonable/doable suggestions to help amphibians in their community

- May use the “Determining Solutions” graphic organizer in the teacher guide.

- Generating Solutions may involve additional research to identify possible solutions.



**Determining Solutions**

Student groups should share multiple solutions they have considered. Afterwards, the group must decide on a “best fit” solution.

| Team member’s name | Their solution |
|---|---|
| | |
| | |
| | |
| | |
| | |
| | |

©Venegas Kent School District 2015

# Determining a Best Fit Solution

- Students consider their possible solutions and select which is their “Best fit” solution.
- Considering Possible Solutions graphic organizer
- This can be used to develop a CER statement for their choice of best fit solution.
  - Research
  - Outdoor and Zoo Exploration
  - Prior knowledge

**Considering Possible Solutions**

**Problem statement:**_____

| Our constratining factors are…. | Solution 1 | Solution 2 | Solution 3 |
|---|---|---|---|
| | _____ | _____ | _____ |
| Factor 1:_____ | | | |
| Factor 2:_____ | | | |
| Factor 3:_____ | | | |
| Factor 4:_____ | | | |
| Pros – What are strengths or benefits of this solution? | | | |
| Cons – What are challenges or problems with this solution? | | | |

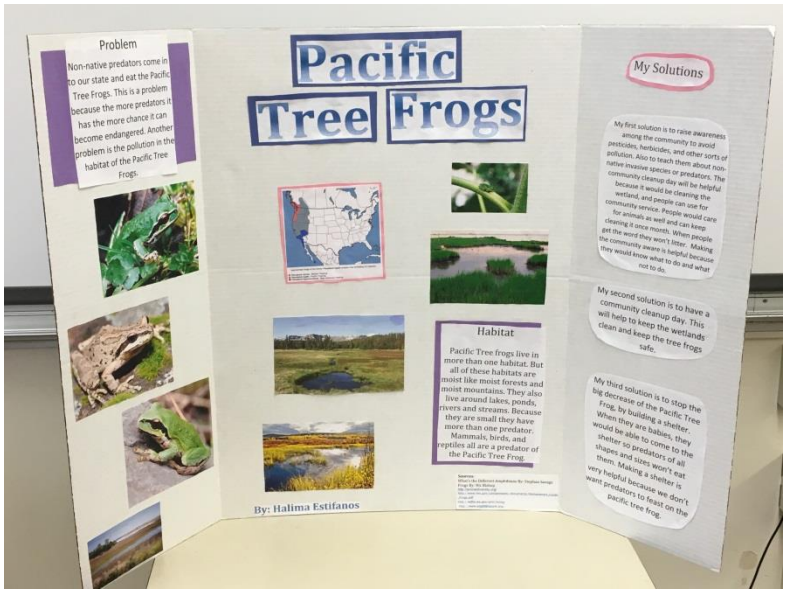
## Career Connections

- Generating solutions is an excellent opportunity to tie in STEM careers.
- Some solutions can be enacted by students, but if not, what career(s) might put these solutions into place?

# Sharing Solutions

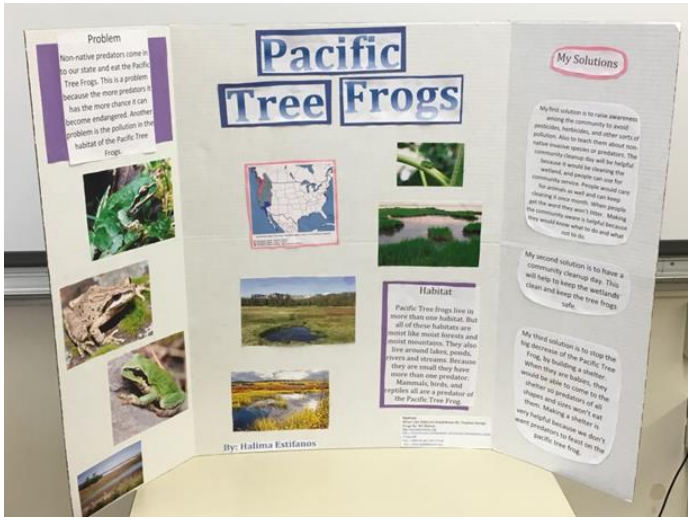

Provide students with an opportunity to share their PBL process, proposed solution, and supporting evidence.

# Sharing Solutions

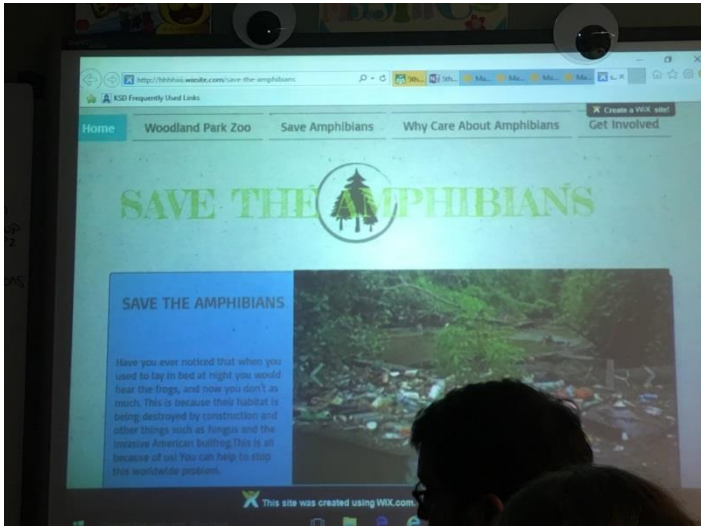


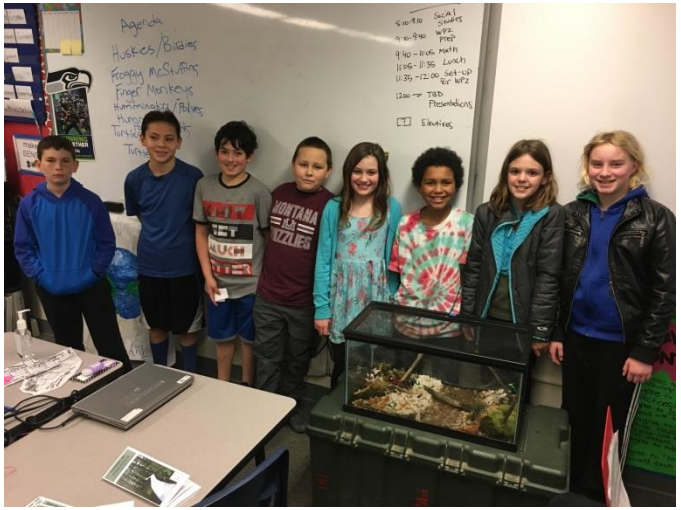

Students share projects through a combination of an oral presentation and visual means of their choice.

# Student Project Format







# Student Projects

Student presentations should include:

- Problem statement
- Research and information gathered
- Possible solutions considered
- Best fit solution and supporting evidence
- Viability of solution

# Student Project Checklist

WOODLAND PARK ZOO

**CONTENT**

- ☐ We shared our problem statement about amphibians in Washington.
- ☐ Our problem statement included **two or more** factors or constraints.
- ☐ We shared two connections between amphibians and other ecosystem parts (plants, animals or the environment) that help amphibians survive.
- ☐ We shared **two or more** possible solutions we considered to solve this problem.
- ☐ Our best fit solution included a way that we could help Washington amphibians.
- ☐ We explained why this solution would work the best using evidence from our research Outdoor Exploration and Zoo Exploration.
- ☐ We explain if our project would be easy or hard to do and how it might help or harm people and wildlife.
- ☐ We shared the **3 or more** sources where we got our information (such as names of books or websites)

**DELIVERY**

- ☐ We presented our ideas in order, so they were clear to the listener.
- ☐ We provided evidence to support our ideas.
- ☐ We shared responsibility for the presentation, so every group member got to talk about part of the project.

# Sharing Solutions Rubric

## WILD WISE: READY, SET, DISCOVER
SHARING SOLUTIONS
*Presentation Rubric*

**Date:** **Interviewer:** **Teacher/School:** **Group:**

**Problem Statement:**

| Prompts | 2 - Meets Expectations | 1 - Approaching Expectations | 0 - Below Expectations | Total |
|---|---|---|---|---|
| **Clear statement of problem** | | | | |
| • What problem did you focus on for your project?<br>• What factors (e.g. benefit for wildlife, cost) did you consider? | ❒ Problem statement clearly identifies an issue relevant to both local amphibians and local ecosystems. | ❒ Problem statement identifies an issue relevant to either a local amphibian or the local ecosystem. | ❒ Problem statement not included or problem statement identifies an issue that is not relevant to either a local amphibian or a local ecosystem. | |
| | ❒ Included two or more factors/constraints. | ❒ Included one factor/constraint. | ❒ Factors or constraints not included. | |
| | ❒ Demonstrated an understanding of:<br>❒ 2 connections between amphibians and other ecosystem components (plants, animals, environment) that help the | ❒ Demonstrated limited understanding of either:<br>❒ 2 connections between amphibians and other ecosystem components (plants, animals, environment) that help the | ❒ Understanding of ecosystem connections not addressed | |

- Rubric is provided, but is not intended for use by students in preparation or self-assessment of their projects
- Optional resource – designed for assessment of student projects and presentations

# Sharing Solutions Practice

To provide a clearer understanding of how zoo staff will use the rubric to assess the presentations, we will present two examples of student work

Please use the rubric to score the presentations.

- Note any questions about criteria

# Pacific Tree Frogs

by Kelly

# A Pacific Tree Frog

# What they look like

- 2-5 cm
- Green, grey or reddish brown with small dark splotches along sides
- Has a dark mask across the eyes from nose to shoulders and a Y shaped mark between eyes

# The Problem

- Main threat to Pacific Tree Frogs is fish in breeding ponds that eat eggs and tadpoles
- Water in ponds is polluted
- Their habitat is being destroyed

# How can we help the Pacific Tree Frogs?

- Remove invasive fish
- Move them to ponds with no Pacific Tree Frogs
- Get a lot of people together to go and catch all the fish and move them

# Fun Facts About Pacific Tree Frogs!

- Can change skin color quickly from light to dark or vice versa to blend with environment.
- Have glands in skin that secrete a waxy substance that protects their skin from drying out.
- They are diurnal, being active day and night.

# The End!

# Sharing Solutions Presentations

On the day of your Sharing Solutions event:

- Consider inviting guests to be an outside audience for students
- Presentations:
  - 5 minutes for presentation
  - 5 minutes for questions

# Field Trip Registration & Logistics Q&A

WOODLAND PARK ZOO

## FIELD TRIPS

Everything you need to plan and book your zoo field trip in one place, including homeschool resources.

## BOOK YOUR TRIP

The steps below will guide you through the process of planning your visit, connecting your trip to your curriculum and preparing your students and chaperones for their time at the zoo.

*(Click to expand)*

- ⊞ Step 1: Education Rate Eligibility
- ⊞ Step 2: Check for Date Availability
- ⊞ Step 3: Submit Your Registration
- ⊞ Step 4: Receive Confirmation
- ⊞ Step 5: Plan for Curriculum Connections
- ⊞ Step 6: Gather Materials and Prepare for a Successful Visit

# Review the Guide

# Other themes

- Insects
- Pollinators
- Birds
- Mammals

WOODLAND PARK ZOO

# Questions?

# Thank you!

Kelly Lindmark
Learning Facilitator, Woodland Park Zoo
kelly.lindmark@zoo.org
206-548-2553

Katie Remine
Manager, Youth and Adult Learning, Woodland Park Zoo
katie.remine@zoo.org
206-548-