

BACKPACK THE PARKS

Expeditions in Education



Backpack the Parks!



At Expeditions in Education, we believe that learning extends far beyond the classroom walls. That's why we're thrilled to introduce our "Backpack the Parks" initiative, designed to ignite students' curiosity and love for the great outdoors while fostering a deeper understanding of our national parks.

With "Backpack the Parks," educators have the unique opportunity to curate and pack 8 engaging activities into backpacks, making it easier than ever for students to check out and explore the wonders of our national parks. From hands-on science experiments to wildlife scavenger hunts, each activity is carefully crafted to immerse students in the beauty, history, and natural wonders of these treasured landscapes.

Join us in empowering the next generation of park enthusiasts and conservationists as they embark on unforgettable learning adventures in our nation's most cherished natural spaces. With "Backpack the Parks," the journey to discovery begins with the turn of a backpack strap, and the possibilities for educational exploration are endless.

Backpack the Parks!



Instruction

Step 1: Ask for Donations of Backpacks and Clean Them Up

- Reach out to parents, local businesses, or the school community to request donations of gently used backpacks.
- Inspect the donated backpacks for any damage or excessive wear.

Step 2: Print the Activity Cards and Laminate

- Prepare activity cards that detail each of the educational activities you plan to include in the backpacks.
- Print these activity cards on durable cardstock paper.
- Laminate the activity cards to protect them from wear and tear during use.

Step 3: Put Cards on Rings

- Hole punch each laminated activity card.
- Use rings or zip ties to secure the cards together, creating a set of instructions for each activity.

Step 4: Purchase or Collect the Materials Needed for the Activities

- Create a list of materials required for each activity, as outlined in your activity plan.
- Gather all the necessary materials for each activity. This may include items such as magnifying glasses, sketchbooks, rocks, clay, flashlights, and more.

Step 5: Put Materials in Ziplock Bags

- Organize the materials for each activity into separate ziplock bags.
- Ensure that each bag contains all the necessary materials, making it easy for students to access and use them.

Step 6: Attach the National Park Tag to the Outside of the Bag

- Create or print a National Park-themed tag that identifies the backpack as part of the Backpack the Park program.
- Attach this tag securely to the outside of the ziplock bag or backpack.

Redwood National Park

Activity 1: Redwood Tree Model

Materials:

- Craft paper
- Green paint
- Brown paint
- Brushes
- Scissors

Instructions:

1. Take a sheet of craft paper.
2. Paint the trunk brown and the leaves green.
3. Cut out your tree and share with your classmates the unique features of redwood trees.

Activity 2: Redwood Forest Diorama

Materials:

- Shoebox
- Craft supplies (clay, paint, construction paper, toy animals)
- Glue

Instructions:

1. Find a shoebox.
2. Use clay, paint, construction paper, and toy animals to create a redwood forest inside the shoebox.
3. Include redwood trees, plants, and toy wildlife.
4. Share your diorama with the class and discuss biodiversity.

Activity 3: Redwood Tree Growth Rings

Materials:

- Craft paper
- Colored pencils
- Ruler
- Scissors

Instructions:

1. Take a sheet of craft paper and draw concentric circles.
2. Use colored pencils to mark significant events or years in the rings.
3. Discuss how redwood tree rings provide information about their age and history.

Activity 4: Redwood Leaf Impressions

Materials:

- Leaves
- Paper
- Colored pencils

Instructions:

1. Collect redwood leaves from outside.
2. Place the leaves under a piece of paper.
3. Gently rub with colored pencils to create leaf impressions.
4. Discuss the importance of leaves for photosynthesis and transpiration.



Activity 5: Redwood Wildlife Scavenger Hunt

Materials:

- Pictures or cards of wildlife species found in Redwood National Park

Instructions:

1. Use pictures of wildlife species found in the park.
2. Match the pictures to the correct names and habitats.
3. Discuss the importance of biodiversity.

Activity 6: Salmon Life Cycle Model

Materials:

- Craft paper
- Markers
- Scissors

Instructions:

1. Create a model of the salmon life cycle.
2. Include stages like eggs, fry, smolt, adult, and spawning.
3. Discuss the role of salmon in the park's ecosystem.
4. Read about the Lower Elwha Dam

Activity 7: Topographic Map of Redwood

Materials:

- Topographic map of Redwood National Park
- Markers
- Colored pencils
- Clay

Instructions:

1. Study a topographic map of the park.
2. Identify features like rivers, mountains, and trails.
3. Discuss the park's geology and terrain.
4. Use clay to build up the rivers, mountains, and trails on the map.

Activity 8: Redwood Ecosystem Food Web

Materials:

- Poster board
- Pictures of organisms
- Yarn or string

Instructions:

1. Create a food web with pictures of organisms from the redwood ecosystem.
2. Connect the pictures with yarn or string to show energy flow.
3. Discuss the interconnectedness of species in the ecosystem.

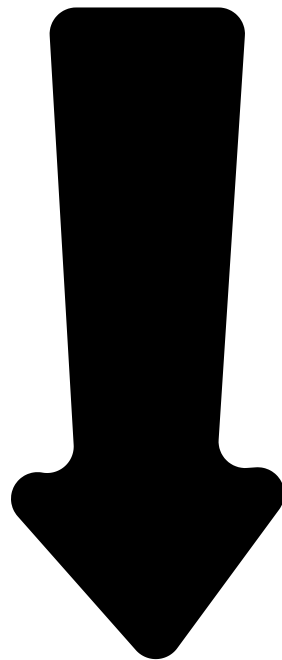
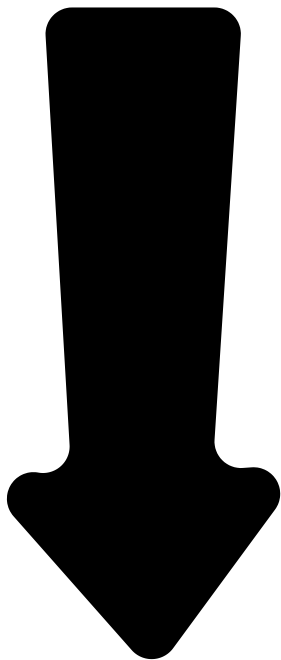


Activity Cards

Print on cardstock

Laminate

Put on rings



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- Craft paper
- Colored pencils
- Ruler
- Scissors

Instructions:

- Take a sheet of craft paper and draw concentric circles.
- Use colored pencils to mark significant events or years in the rings.
- Discuss how redwood tree rings provide information about their age and history.



Activity 4: Leaf Impressions

Materials:

- Leaves
- Paper
- Colored pencils

Instructions:

- Collect redwood leaves from outside.
- Place the leaves under a piece of paper.
- Gently rub with colored pencils to create leaf impressions.
- Discuss the importance of leaves for photosynthesis and transpiration.
- Compare your leaf to a photo of a redwood leaf.





Activity 5: Redwood Wildlife Scavenger Hunt

Materials:

- Pictures or cards of wildlife species found in Redwood National Park

Instructions:

- Use pictures of wildlife species found in the park.
- Match the pictures to the correct names and habitats.
- Discuss the importance of biodiversity.

Activity 6: Salmon Life Cycle Model

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- Craft paper
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BAG TAG BELOW!



**Redwood National
& State Parks
Backpack the Parks!**

#ExploreTheParksWithUs

**"Pack Your Curiosity,
Explore Nature's Beauty!"**

www.expeditionsineducation.org

Salmon Life Cycle

- 1. Eggs:** The salmon life cycle begins with the female salmon laying her eggs in gravel nests called "redds" in freshwater streams and rivers. The eggs are fertilized by male salmon, and they are carefully buried in the gravel to protect them from predators.
- 2. Alevin:** After a few weeks, the eggs hatch into alevin. Alevin are tiny and have a yolk sac attached to their bodies, which provides them with nutrients. During this stage, they remain hidden in the gravel, absorbing their yolk sacs and growing.
- 3. Fry:** Once the yolk sac is absorbed, alevin become fry. At this point, they emerge from the gravel and start swimming and feeding on small aquatic insects and plankton. Fry are very small and vulnerable to predators.
- 4. Parr:** As the fry continue to grow, they develop vertical stripes on their bodies and become known as parr. Parr have a camouflaged appearance, which helps them blend into their surroundings and avoid predators. They continue to feed in freshwater streams.
- 5. Smolt:** After spending several months to a few years in freshwater, the parr undergo a transformation called "smoltification." During this process, they change both physically and behaviorally. Their bodies adapt for life in saltwater, and they develop a silvery appearance. Smolts migrate downstream to estuaries, where freshwater meets the ocean.
- 6. Adult Salmon:** Once in the ocean, the smolts grow rapidly and become adult salmon. They spend several years at sea, feeding on a diet of fish and other marine organisms. Depending on the species, adult salmon can range from one to several feet in length.
- 7. Spawning:** Adult salmon return to their natal streams, the same rivers or streams where they were born. They undergo a challenging journey, swimming upstream against strong currents and leaping over obstacles like waterfalls to reach their spawning grounds.
- 8. Spawning and Death:** Once the adult salmon reach their spawning grounds, they engage in a reproductive ritual. Females lay their eggs, and males fertilize them. After spawning, both male and female salmon usually die. Their bodies provide important nutrients to the ecosystem, supporting the growth of plants and other organisms.
- 9. Beginning of a New Cycle:** The eggs laid by the female salmon in their spawning grounds will eventually hatch into a new generation of alevin, restarting the salmon life cycle.

Tree Rings

1. Seasonal Growth: Trees experience seasonal changes in temperature and moisture levels. During the growing season (spring and summer), when conditions are favorable, trees produce new cells in their trunk and branches. These cells are larger and have thin cell walls, making them less dense.

2. Winter Dormancy: In the colder months (fall and winter), trees enter a period of dormancy. During this time, growth is minimal, and the cells produced are smaller and denser, with thicker cell walls.

3. Annual Growth Cycles: The contrast between the larger, less dense cells formed in the growing season and the smaller, denser cells produced during dormancy creates visible rings in the tree trunk. Each pair of light and dark rings represents one year of the tree's growth.

These rings are known as "annual growth rings" or simply "tree rings." By counting these rings, scientists can determine a tree's age, much like counting the rings on a tree stump. Each ring represents a complete cycle of growth for that year.

Beyond age, tree rings provide valuable information about environmental conditions and the health of the tree. For example:

- **Ring Width:** The width of a tree ring can indicate how favorable or harsh the environmental conditions were during a particular year. Wider rings often indicate abundant rainfall and optimal growing conditions, while narrower rings suggest drought, disease, or other stressors.
- **Climate History:** Studying tree rings, a field known as dendroclimatology, helps researchers reconstruct past climate conditions. By analyzing the width and patterns of tree rings in many trees, scientists can gain insights into historical weather patterns and long-term climate trends.
- **Forest Health:** Tree rings can reveal signs of stress, such as insect infestations, fires, or pollution, which can affect tree growth. By examining tree rings in a region, foresters and ecologists can assess the overall health of a forest.
- **Dating Artifacts:** Tree rings can be used for dating wooden artifacts or historical structures, a process called dendrochronology. By matching the ring patterns of a sample from a piece of wood to known sequences in tree ring databases, researchers can determine when the wood was harvested.

References:

1. Stokes, M. A., & Smiley, T. L. (1996). *An Introduction to Tree-Ring Dating*. University of Arizona Press.
2. Fritts, H. C. (1976). *Tree Rings and Climate*. Academic Press.
3. National Park Service. (n.d.). *Tree Rings and Climate*.
<https://www.nps.gov/articles/tree-rings-and-climate.htm>

Redwood National Park Food Webs

Producers:

- Redwood Trees (*Sequoia sempervirens*): Redwoods are the primary producers in this ecosystem, using photosynthesis to convert sunlight into energy.

Primary Consumers (Herbivores):

- Banana Slugs: These large slugs feed on detritus, decaying plant material, and some live vegetation.
- Roosevelt Elk: Herbivorous mammals that graze on a variety of plants, including ferns and grasses.
- Deer Mice: These rodents feed on seeds, fruits, and insects.

Secondary Consumers (Carnivores):

- Black Bears: Omnivorous animals that primarily eat vegetation but also consume insects, small mammals, and fish.
- Bobcats: Predators that feed on small mammals like mice and rabbits.
- Raptors (Hawks and Owls): Birds of prey that hunt smaller birds and mammals.
- Spotted Owls: Specialized predators that primarily prey on small mammals, particularly flying squirrels.

Tertiary Consumers (Top Predators):

- Mountain Lions (Cougars): Apex predators that feed on a variety of animals, including deer, elk, and smaller mammals.
- Gray Wolves (Rare): Historically present but rare in the region; they prey on large mammals like deer.

Decomposers:

- Fungi: Decomposers like mushrooms break down dead organic matter, returning nutrients to the soil.
- Bacteria: Microscopic decomposers that play a crucial role in breaking down organic material.

Scavengers:

- Turkey Vultures: Birds that primarily feed on carrion, helping to clean up the ecosystem by consuming dead animals.

Aquatic Connections:

- Salmon: These fish migrate from the ocean to spawn in freshwater streams, providing nutrients to the ecosystem when they die after reproducing.

Animals

Mammals:

- Roosevelt Elk (*Cervus canadensis roosevelti*) - NPS - Roosevelt Elk
- Black Bear (*Ursus americanus*) - NPS - Black Bear
- Mountain Lion (*Puma concolor*) - NPS - Mountain Lion
- Bobcat (*Lynx rufus*) - NPS - Bobcat
- Gray Wolf (*Canis lupus*) - (Note: Rare in the region) NPS - Gray Wolf
- River Otter (*Lontra canadensis*) - NPS - River Otter
- Red Fox (*Vulpes vulpes*) - NPS - Red Fox

Birds:

- Bald Eagle (*Haliaeetus leucocephalus*) - NPS - Bald Eagle
- Peregrine Falcon (*Falco peregrinus*) - NPS - Peregrine Falcon
- Marbled Murrelet (*Brachyramphus marmoratus*) - NPS - Marbled Murrelet
- Northern Spotted Owl (*Strix occidentalis caurina*) - NPS - Northern Spotted Owl
- Steller's Jay (*Cyanocitta stelleri*) - NPS - Steller's Jay

Amphibians:

- Pacific Tree Frog (*Pseudacris regilla*) - NPS - Pacific Tree Frog
- Rough-skinned Newt (*Taricha granulosa*) - NPS - Rough-skinned Newt

Reptiles:

- Northern Alligator Lizard (*Elgaria coerulea*) - NPS - Northern Alligator Lizard

Fish:

- Coho Salmon (*Oncorhynchus kisutch*) - NPS - Coho Salmon
- Steelhead Trout (*Oncorhynchus mykiss irideus*) - NPS - Steelhead Trout

Invertebrates:

- Banana Slug (*Ariolimax dolichophallus*) - NPS - Banana Slug
- Redwood Sorrel Snail (*Discus rotundatus*) - NPS - Redwood Sorrel Snail