



HOP INTO ACTION

The Amphibian Curriculum Guide for Years F-4

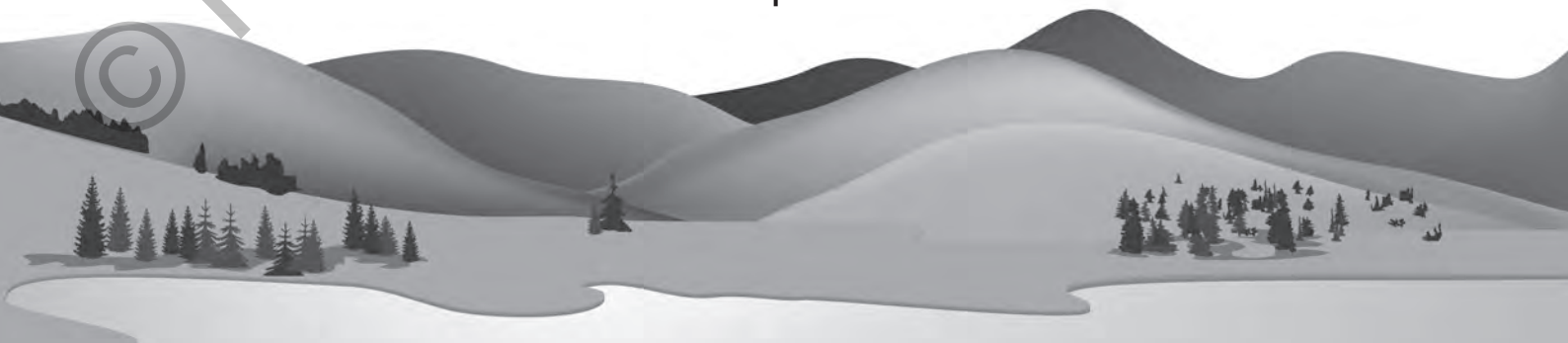
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Preface

Amphibian education and community involvement is critical at this time. We face a global amphibian extinction crisis. Of the more than 6 000 recognised species of amphibians, more than one third are suffering serious declines or have recently become extinct, despite having survived millions of years. If we do not educate our youth to appreciate, understand and take action for amphibians and their environments, the amphibians are destined to go the way of the dinosaurs. The *Hop Into Action* curriculum guide was developed in response to this urgency in order to arm educators from a variety of settings with tools they can use to incorporate effective environmental education for learners in Years F–4.

As an educator, you are the audience for this guide, which offers 20 lessons that can be used individually or as a curriculum. In addition it

- includes interdisciplinary approaches to curriculum areas
- is designed for classroom teachers, home school educators, naturalists and camp leaders
- provides lessons geared for Years F–4, with some appropriate content and extensions for younger and older year levels
- was created from the firsthand experience of educators in both formal and informal learning environments.

Because amphibians form a link between aquatic and terrestrial environments, they offer exciting opportunities for education and also can be used to educate across multiple subject areas. Educating students about these species will be critical to foster awareness and social concern that may one day lead to stewardship and conservation. Lessons provide opportunities for students to build skills as environmental advocates and understand the vital need to protect our living world.

Through active, hands-on learning about the environment, children develop the knowledge and skills to address challenges in their communities while contributing to their own academic achievement.



Lesson 1:

How to Identify an Amphibian

Objectives

Students will be able to identify the physical characteristics of an amphibian and explain that amphibians come in a variety of forms, colours and adaptations.

Method

Students in Years F–2 will observe and discuss the characteristics of an amphibian. Students in Years 3 and 4 will also collect and analyse data based on their observations.

Year Level: F–4

Subject Area: Science, English, The Arts

Skills: description, identification, drawing, small-group work

Setting: Inside and outside

Lesson Duration: 30 minutes

Group Size: no minimum size

Materials

Display board, *Amphibian Structure* worksheet, *Amphibian Identification* worksheet, clipboard, pencil, photographs of amphibians

Background Information

Amphibians are animals that generally live both on land and in water. Amphibians first appeared in the Devonian Period hundreds of millions of years ago and were around before, during and after the time of the dinosaurs (Duellman and Trueb 1986). Evolutionary amphibians are the first tetrapods (four-legged animals) and were ancestors to the dinosaurs. Amphibians have adapted to survive around the world in a variety of habitats, including forests, fields, wetlands, prairies, deserts and even your own backyard. People who study amphibians are called herpetologists.

1 How to Identify an Amphibian

Amphibians are cold-blooded creatures and therefore must use the environment to help regulate their body temperatures. Most amphibians spend part of their lives in water and part on land. They hatch from eggs and change as they grow.

Most adult frogs, salamanders and caecilians share similar physical characteristics, such as soft, moist, slimy, permeable skin. However, they also can be differentiated by their physical characteristics to determine if they are a frog, salamander or caecilian. With careful observation of photographs, drawings or live amphibians, students will be able to categorise frogs as having webbed feet and a round tailless body; students will recognise salamanders as having a longer body than a frog and a tail; and students will note that caecilians have grooves that form rings around the body and no legs.

Amphibians that make up each order may appear similar at first glance but with practice students will begin to describe and differentiate between their identifiable characteristics – such as shape, colour and pattern – to determine their specific species.

Procedure

1. Show students photographs of amphibians using books and other resources listed at the end of this lesson. Ask students to point out the similarities and differences between our bodies and theirs. For example, we share many of the physical characteristics of frogs and salamanders, including eyes, nose, mouth, feet, head and legs.
2. Draw an amphibian on the board and ask students to come up and name the parts they recognise. Provide students in Years 2–4 with the *Amphibian Structure* worksheet and ask them to write the descriptive words that match the body parts after they are discussed and written out on the display board. Pre-writers can colour in the body parts of each amphibian as they are labelled on the board. The parts of an adult frog that can be labelled include head, webbed feet, ears, mouth, nose, eyes and body. The parts of an adult salamander that can be labelled include mouth, nose, eyes, tail, toes, head, front legs, hind legs and body. The parts of a caecilian include eyes, mouth and grooves that form rings around the body.
3. Discuss how the amphibian's body parts help it function. For example, some have webbed feet to swim, ears to hear and a mouth to eat.
4. Discuss with students the importance of amphibians. Answers may include that they are fun to catch and observe, they eat bugs and they are eaten by other animals for food.
5. If an outside environment is available, discuss expectations and outdoor safety inside before you take students in search of live amphibians in their habitat. Instruct students in Years 2–4 to act as herpetologists and follow the instructions on the *Amphibian Identification* worksheet to



Lesson 5: Frog Hop Relay Race

Objectives

Students will be able to describe the characteristic movements of amphibians.

Method

Students describe and demonstrate the movement of amphibians and reptiles through a relay race.

Materials

Cones, hula hoops, soft flooring

Year Level: F-2

Subject Area: Science, Health and Physical Education

Skills: analysis, application, description, small-group work

Setting: inside or outside

Lesson Duration: 30 minutes

Group Size: 10 or more

Background Information

Amphibians have many different ways of moving around on land and in water. Depending on the type of amphibian, it might hop, leap, glide, climb, run, walk or even burrow. Some frogs have sticky suction-disked fingers that make them excellent acrobats and allow them to climb trees, while others have webbed feet that look like flippers and strong back legs, making them powerful swimmers and leapers. Some frogs can even stretch their webbed feet wide, parachuting or “plopping” into the air and gliding from one area to another (Stebbins and Cohen 1995).

Salamanders may not be able to jump as far or high as frogs, but they can scurry quickly and will leap with surprising grace to avoid capture, as the red-backed salamander does. The caecilians will push head first with worm-like

5 Frog Hop Relay Race

contractions into the soil. The head is moved up and down with a ramming action to burrow in their direction of travel (Stebbins and Cohen 1995).

Amphibians will move for a variety of reasons, including capturing prey; avoiding becoming prey; finding a mate or egg-laying location; and finding suitable habitat that has food, water, shelter and space.

Procedure

1. Begin a discussion with students about how amphibians move at different life stages and how their movements help them avoid predators. Discuss how each movement is an adaptation that allows the animal to survive.
2. Bring students to an open area and ask them to demonstrate the movements made at each life stage.
3. Split the students into two teams so that they can hop like a frog, slither like a salamander and wiggle like a caecilian in a relay race. The instructor may choose the movement pattern or ask the teams to decide.
4. Instruct teams that only one student from each team will act out the prescribed movement at a time while it's their turn to race through the relay course. When the student returns to the line, the next player may take their turn. The first team to have all players participate wins.
5. Players will race through the course around cones or hop into and out of hula hoops and back to the group, where the next student will race, until all students have had a chance to participate.

Reflect and Explain

- Ask students if they could move like any amphibian which would they choose to move like and why?
- Call out different stages of amphibian growth for students to try while the relay race is in motion to test the students understanding of the variety of movement strategies.

Extensions

- Play a game in which students act as frogs that have to cross an open field past a tagger or "predator" without being caught or "consumed". If caught, they instantly become a bulrush and must stand swaying in the breeze.
- Create green headbands with a frog picture attached for students to wear in the relay race.
- Allow students to move like aquatic organisms or macroinvertebrates. For example, aquatic worms wiggle, amphipods swim on their sides and dragonfly nymphs can shoot forward using "jet propulsion" as they push



Lesson 19:

Frogville Town Meeting

Objectives

Students identify and describe the points of view of different stakeholders in a fictitious community dilemma.

Students develop an understanding of how communities are able to solve problems despite citizens with different points of view.

Method

Students take on the roles of various stakeholders in a town meeting.

Materials

Situation statement and information cards; skit materials such as name tags, suit ties (clip-on), construction worker hats and other costumes

Background Information

As citizens in a **democracy** we have the right to identify, investigate, analyse and share our values and beliefs on issues that may cause conflict in our communities.

Year Level: 4

Subject Area: Science, English, Civics and Citizenship

Skills: analysis, application, inference, small-group work, public speaking

Setting: inside

Lesson Duration: 120 minutes

Group Size: 20

The consequences of issues can be minimised when the **stakeholders** or people with varying perspectives take time to evaluate the potential impacts of the issue, recognise tensions that occur between the different beliefs and work together or within the civic system to find an agreement or a solution. In this lesson, students are split into stakeholder groups involved in a sensitive land-use development conflict where senior homes may be built within the wetland habitat of an endangered northern cricket frog. Ideally, the stakeholders will be able to identify proposed solutions to the issue and discuss arguments for and against them to come to a consensus where an alternative approach is agreed upon. This lesson is meant to help learners develop confidence in their effectiveness as citizens and recognise that multiple points of view are acceptable.

Procedure

1. Begin a discussion about decision making by asking students how they solve problems when people don't agree. For example, find a mediator to decide the solution, play "rock, paper, scissors" or negotiate and choose a solution together using collaboration.
2. Provide copies of the situation statement to be read aloud in class.

Frogville Situation Statement

The town of Frogville is a small, friendly, forested town of approximately 5000 people. It has been approached by the Senior Housing Corporation about the construction of a planned community of 210 apartments in town. If built, the development would provide homes for approximately 400 seniors. The senior homes would be built on 95 wooded wetland acres next to the lake in town, within eight kilometres of the local school and on a new road. The proposed site is an undeveloped wooded wetland where some people say, "Mosquitoes will eat you alive" and others say, "It is full of interesting plants and animals". The Frogville Conservation Coalition is opposed to the construction of the facility because it is worried about the traffic and the noise, water and air pollution, and particularly the northern cricket frog (*Acris crepitans*). The frog is listed as an endangered species.

Senior Housing Corporation

The Senior Housing Corporation has proposed the development of a senior housing complex that will create housing for 400 seniors. They maintain the construction will meet the rules and regulations of the town and have little impact on the environment. The corporation also says the construction will bring jobs to the community.

Senior Citizens Group

The senior citizen group wants new housing that meets their needs and provides for their interests. They would like to have their own housing so they do not feel like a burden living with their children. They do not care where the development is built so long as it is built near the community.

Frogville Planning Board

This group is responsible for ensuring that guidelines of building laws are followed and minimal impact is made on the environment. They are unsure of the potential impact of the housing development and have many questions to ask before they inform the town council that they approve the building plans.

Frogville Chamber of Commerce

This group represents local businesses in Frogville and has members that support both the construction of the senior housing and the protection of the habitat. There are many businesses that would benefit from the construction and potential increase in traffic, while others benefit from the tourism of people attracted to the lake for its beauty. Students in this group will represent the different business owners on both sides of the discussion.