

# Froggy ... You Are Outta There!



This activity center is part of the **Water Protection** theme.

## What's the purpose of this activity?

Students are introduced to amphibians and the concept of limiting factors in a fun and an active baseball simulation game. Using frogs as the amphibian example, students investigate the life cycle of amphibians and limiting population factors, such as habitat loss and pollution. Students become "frogs" and attempt to make it around the life cycle "bases" (egg, tadpole, sub-adult, and adult) without being caught by students representing limiting factors.

## Key messages:

- Amphibians are ectotherms that spend part of their life living in water and part living on land.
- Amphibians include frogs, toads, newts and salamanders
- Amphibians are able to breathe through their skin making them very sensitive to environmental changes
- Habitat Loss and pollution are limiting factors that affect amphibian populations

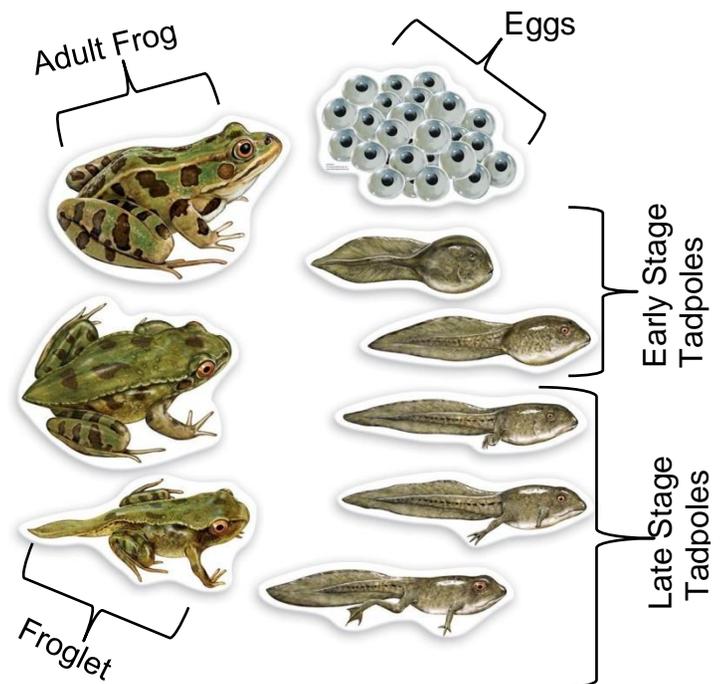
## Materials:

- Baseball Bases
  - Home Plate = Adults
  - 3 bases
    - 1<sup>st</sup> = Eggs
    - 2<sup>nd</sup> = Tadpoles
    - 3<sup>rd</sup> = Froglets
  - Pitcher's Mound = Limiting Factors
- 6-8 armbands
- 120 bioaccumulation chips (red poker chips)
- Magnetic Frog Life Cycle
- Laminated Photo Cards of Toad & Frogs

- Whiteboard
- White Board Markers & Eraser

## Activity Set Up:

1. This activity requires a large area with level ground for set up.
2. Set up bases similar to a baseball diamond: home plate, 3 bases and a pitcher's mound.
3. Place white board on a stand or chair and place frog life cycle parts on it. Label stages: eggs, early stage Tadpoles (first 2 tadpoles), late stage Tadpoles (last 3), froglet, adult. Draw a circular arrow with white erase marker to demonstrate the order of the cycle. Similar to diagram below but with suggested extra labels.



***This game requires at least 10 participants, so encourage different groups to play together as school break up their classes into groups of 5.***



of 3 amphibians “safe” at each base.

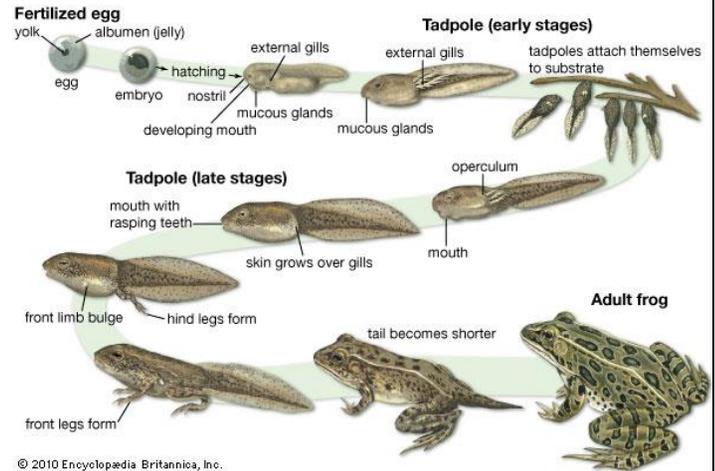
- Toads & Frogs can only stay “safe” on a base for 5 seconds and then must advance to the next life cycle stage (base)
  - Limiting Factors cannot “guard” the bases!
- **REMINDE** the students that tagging is done gently, no body-contact, pushing or running as the grass can be wet from dew or rain making it very slippery!
  - **Play the game for about 5 minutes**, gauging the time (the whole station should run about 15 minutes)
  - Call the Game to an end and collect bioaccumulation chips
6. Wrap Up by asking the group:
- **How many amphibians made it through their life cycle?**
  - **What other limiting factors might affect their populations?**
  - **What can we do to help conserve and protect amphibian populations?**

### Additional Background Information:

Amphibians are vertebrates that are ectotherms (cold blooded), meaning that their body temperature is dependent on the temperature of the environment around them. They are able to breathe through their skin which makes them very sensitive to changes in their environment such as pollution and human contact. Amphibians include frogs, toads, newts and salamanders.

Amphibians have a unique life cycle; half of their lives are spent living under water (breathing with gills) and the other half living on land (breathing with lungs). Most Ontario amphibians share similar life cycles: egg, tadpole, sub-adult and adult. Eggs are laid in water and then the amphibian gradually changes into an adult. The egg, tadpole and sub-adult stages typically live in the water and the adult spends much of its time on land. Therefore the habitat needs of amphibians include both land and water. The one exception is the Red Backed Salamander that does not lay its eggs in water but in moist forested areas, such as under logs.

Amphibian populations have experienced global declines over the past number of years. Ontario populations are also in decline. Breathing through their skin makes them very susceptible to pollution. They absorb half of their air for breathing throughout their skin and the other half through their nostrils. Frogs also absorb water in through their skin rather than drinking it like we do.



If the environment becomes polluted, it affects the amphibian’s habitat and as they eat, breathe and drink water chemical pollutants can accumulate in their bodies over time. These harmful chemicals will not only negatively affect them, but will move up the food chain and the creatures at the top of the food chain will likely have the highest amounts of contaminants. This is called **bioaccumulation**. Harmful chemicals will affect the health of all the animals living and sharing the same habitat.

Habitat loss and pollution are some of the **limiting factors** that affect amphibian populations. We can use amphibian populations as indicators or environmental health, to help determine how healthy our environment is. If the population is declining, this cautions us that something is wrong and that the environment that they are living in is not healthy.

### Clean Up Procedures:

- Take magnetic frog life cycle pieces off of whiteboard and put into container/bag
- Collect & count armbands
  - If dry, put into bag/container
  - If wet, take to volunteer sign out area for drying
- Collect all bioaccumulation chips and put into container
- Collect all bases (total 5)
- Put all items into activity center container
- Wipe off white board and put make sure markers and eraser/paper towel are put into activity centre container