The Canadian Ecology Centre
Centre écologique du Canada
O.W.L.S.
OUTDOOR WAYS OF LEARNING & SHARING

Pond Math: Catch, Count, and Compare

JK-Grade 1

Dive into hands-on fun with three engaging pond stations! Students become scientists and anglers as they "fish" for species to sort by size, discover life cycles from egg to adult, and match numbers to ten frames with frogs and turtles. This interactive activity blends science, math, and teamwork, while sparking curiosity about the animals that call our ponds home.

Learning Objectives	By the end of the activity, students will: • Identify and sort different pond species. • Sequence life cycle stages of pond organisms. • Match numbers to ten frames. • Practice fine motor skills and hand-eye coordination. • Work cooperatively in groups.
Curriculum Connections	**Science** • Life Systems: Characteristics of living things • Life cycles of animals (frog, duck, fish, dragonfly) **Math** • Number sense: Recognize and represent numbers 1–20 • Use of ten frames • Sorting and ordering by size **Phys. Ed** • Gross and fine motor coordination
Materials	• Blue tarps (or chalk to draw pond shape) • Fishing rods (bamboo sticks, string, magnets) • Laminated pieces (fish, life cycles, animals with numbers) • Binder clips, Velcro, magnets • Cookie trays, hula hoops, clothespins
Prep/Pre Set-up required	Lay 3 blue tarps on the ground to represent 3 ponds, leave enough space around each for students' groups to work without getting in the way of the other stations; peg it down or weigh corners (alternative: draw pond shapes with chalk on pavement or use rope). **Station 1: Fish Sort & Size Compare** • Print and laminate: ○ 3 fish species (catfish, rainbow trout, largemouth bass) with 7 different sizes each. • Attach small binder clips to the mouth of each fish. • Spread fish face up on the pond. • Set out 4–5 fishing rods. • Place 3 hula hoops on the ground near the pond—one for each species. **Station 2: Pond Life Cycles** • Print, laminate:

	○ Wood frog, Mallard duck, Brook Trout, Dragonfly (4 stages each) • Attach binder clips to each stage of each species. • Add a magnet to the back of each stage of each species. • Spread all stages face up on the tarp. • Place 4 metal cookie trays labeled with the animal names around the pond. • Provide 4–5 magnetic fishing rods. **Station 3: Pond Math Match** • Print and laminate: ○ Leopard Frogs numbered 1–10 ○ Painted Turtles numbered 11–20 ○ Write numbers on the back before laminating ○ Attach binder clips to each • Print and laminate: ○ Lily pads (1–10) with corresponding ten frames ○ Logs (11–20) with corresponding ten frames • Stick Velcro onto the lily pads and logs. • Pin lily pads and logs to trees, fences, or tables using clothespins. • Place 4–5 fishing rods near the tarp. • Spread frogs and turtles face up on the pond.
Introduction	Welcome students and introduce the concept of pond ecosystems. Explain that they will rotate through 3 stations to explore animals, life cycles, and numbers in a fun, hands-on way using magnetic fishing rods.
Main Activities	**Station 1: Fish Sort & Size Compare** • Students use rods to “fish” for species from the pond. • After catching a fish, they bring it to the appropriate hula hoop for that species. • Once a species set is caught, students work together to line them up from smallest to largest. **Prompt Questions**: • What differences do you notice between the species? • How can you tell which fish is the largest?
	Station 2: Pond Life Cycles • Students fish for life cycle stages (frog, duck, fish, dragonfly). • Once caught, they place each piece on the correct cookie tray and arrange them in life cycle order. • Encourage collaboration to figure out the correct sequence. ○ **Wood Frog:** Egg → Tadpole → Froglet → Frog ○ **Mallard Duck:** Egg → Hatchling → Duckling → Duck ○ **Brook Trout:** Egg → Embryo → Juvenile → Adult ○ **Dragonfly:** Egg → Nymph → Nymph molting → Adult **Prompt Questions**: • What comes first in this life cycle? • Do all pond animals start as eggs?
	Station 3: Pond Math Match • Students fish for frogs (1–10) and turtles (11–20), then match them to the correct ten frame lily pad or log using Velcro.

	Prompt Questions: • How do the dots help you find the number? • Can you count the ten frame out loud?
Free/Inquiry Play Focus	Students can freely explore and revisit stations after initial rotations. They may invent new games using the rods or make up pond stories with the animals they've caught.
Closing and Wrap-up	Gather students in a circle. Invite them to share something new they learned about ponds. Share some fun facts about the species from the activities (see appendix) Ask guiding questions such as: • 'What animal was your favorite to catch?' • 'What surprised you about life cycles?' • 'What did you learn about pond life today?' • 'How can we help protect real ponds and animals?'
Social/Emotional Skills Targeted	**Leadership, Cooperation, Teamwork, Communication** • Group sorting promotes leadership and negotiation • Peer support in life cycle and math matching encourages teamwork • Cooperation and turn-taking at stations • Communication while sorting and matching • Confidence-building through successful fishing and matching **Resiliency, Accountability, Adaptability** • Adapting to new rules at each station • Building confidence in motor and cognitive skills through play • Taking responsibility for organizing and returning pieces **Environmental Stewardship** • Students learn about local pond species and their life cycles, laying the foundation for respect and care for wetland environments.
Application Next Steps, Connections, applications, variations, extensions	**Math** • Extend the sorting by asking students to graph their results (bar graph of fish sizes, pie chart of species caught). • Use the laminated fish and ten-frame logs/lily pads to practice addition, subtraction, multiplication, or division. • Challenge students to calculate the average size of each fish species or compare ranges (largest vs. smallest). **Science** • Connect to life cycles by discussing how the size of fish relates to growth and survival. • Explore habitat needs: Why do some species grow bigger than others? What role does each animal play in a pond ecosystem? • Compare numbers and sizes of animals to real-world populations — which animals are more common and why? **Outdoor Learning** • Move beyond the tarp pond to a real pond or wetland visit, recording actual observations of species seen.

	• Use chalk or ropes to make “giant ten frames” on the ground for full-body math games.
	• Combine with storytelling: create a “day in the life” of a fish, frog, or turtle.
	
	Variations
	• Add time challenges: how many fish of one species can you sort in two minutes?
	• Work in teams vs. individually and compare strategies.
	• Use different “rules” for fishing (e.g., only catch even-numbered frogs, or only fish over a certain size).
	
	Extensions
	• Literacy:
	  ○ Write a short story or journal entry about “the fish I caught today.”
	  ○ Read *"Over and Under the Pond"* by Kate Messner or *"From Tadpole to Frog"* by Wendy Pfeffer.
	• Art:
	  ○ Have students design their own pond animals with unique sizes, then add them to the activity.
	  ○ Draw the life cycle of a frog.
	• Technology:
	  ○ Record data digitally (tablets or spreadsheets) and analyze patterns.
	• Social Studies:
	  ○ Discuss how humans use fishing and sorting in the real world (commercial fishing, conservation, Indigenous fishing practices).
	• Problem-solving:
	  ○ Ask students to design a fair fishing game — what rules would make sure no species disappears?

Appendix: Fun Facts!

Station 1:

Rainbow Trout:

- They get their name from the **pinkish-red stripe** that runs along their sides — just like a rainbow!
- They need **cold, clear water** to stay healthy — they're a sign of a clean environment.

Catfish:

- Those long things around their mouths are called **barbels**, and they look like cat whiskers — that's how they got their name!
- They use their barbels to **taste and smell** their surroundings — even in **dark or muddy water**.
- Catfish are mostly **nocturnal**, which means they like to hunt for food at night.
- Some catfish can **"wriggle" across land** for short distances if their pond dries up — they use their fins and body to scoot along!

Largemouth Bass:

- The **largemouth bass** gets its name because its mouth is so big, it can open wide enough to **swallow prey half its own size**!
- Largemouth bass are at the **top of the food chain** in many ponds and lakes — they eat fish, frogs, crayfish, and even small birds!
- Largemouth bass can change their colour a bit to **blend in with their surroundings** — like underwater camouflage!

Station 2:

Leopard Frog:

- Leopard frogs are named for their **dark spots** that look just like a **leopard's spots** — every frog's pattern is unique!
- Leopard frogs are carnivores — they eat **insects, spiders, worms, and even small frogs** by flicking them up with their sticky tongue!
- Leopard frogs are sensitive to pollution and water changes — so their presence means the **pond is clean and balanced**.

Brook Trout:

- Brook trout have beautiful **light squiggly lines** (called vermiculations) on their back and dorsal fin — like nature's doodles!
- Brook trout need **cool, clear, oxygen-rich water** — they're often found in forest streams, spring-fed creeks, and shaded ponds.
- Their speckles and dark backs help them **blend in with rocks and shadows**, making them hard for predators to spot.

Mallard Duck:

- Mallards can **shut down one half of their brain** to rest while keeping an eye out for danger — literally!
- Mallard ducklings **leave the nest within a day** of hatching and can swim right away. They follow their mother everywhere.
- Mallards eat insects and plants, which helps keep pond ecosystems in balance — they're important pond community members!

Dragonflies:

- Dragonflies have been around for **over 300 million years** — way before dinosaurs!
- Dragonfly babies, called **nymphs**, live in ponds and streams for up to **2–3 years** before becoming adults.
- A single dragonfly can eat **hundreds of mosquitoes in a day** — making them great natural bug zappers!

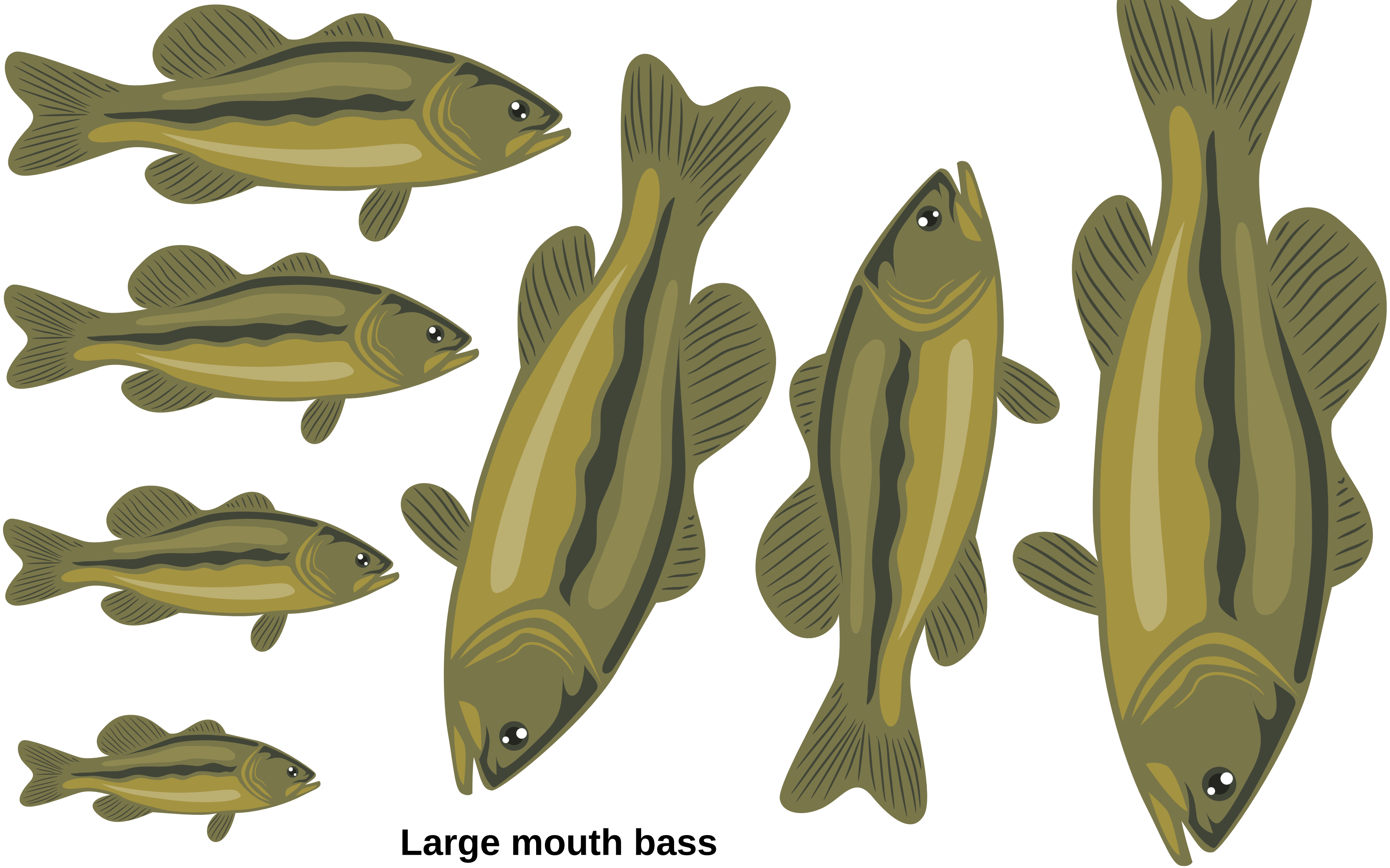
Station 3:

Wood Frogs:

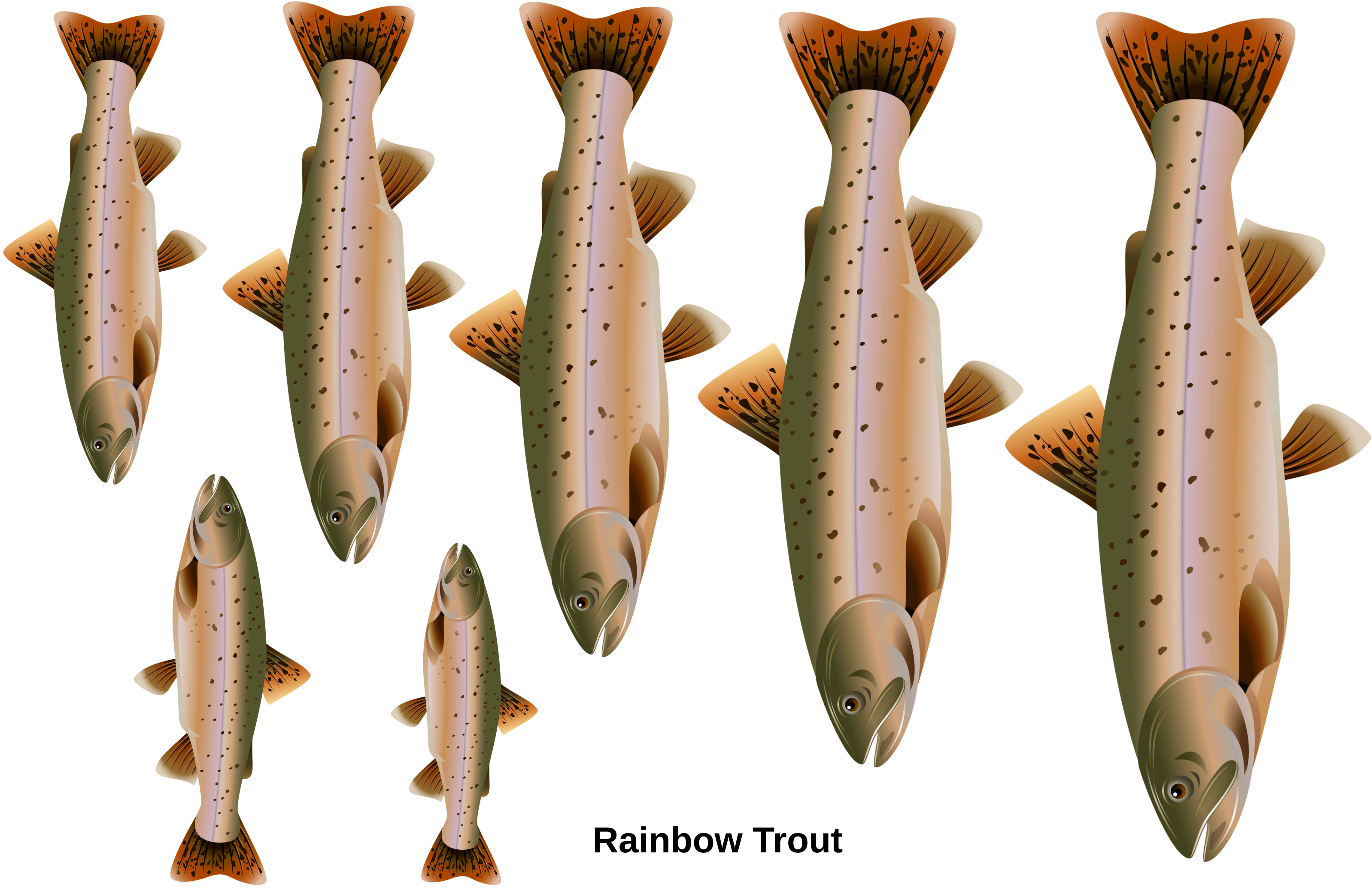
- Wood frogs are amazing because they can **freeze in the winter** — their heart stops beating and they stop breathing — then **thaw out and hop away in spring**!
- Seeing wood frogs in an area is a good sign — it usually means the environment is **clean and healthy**.

Painted Turtles:

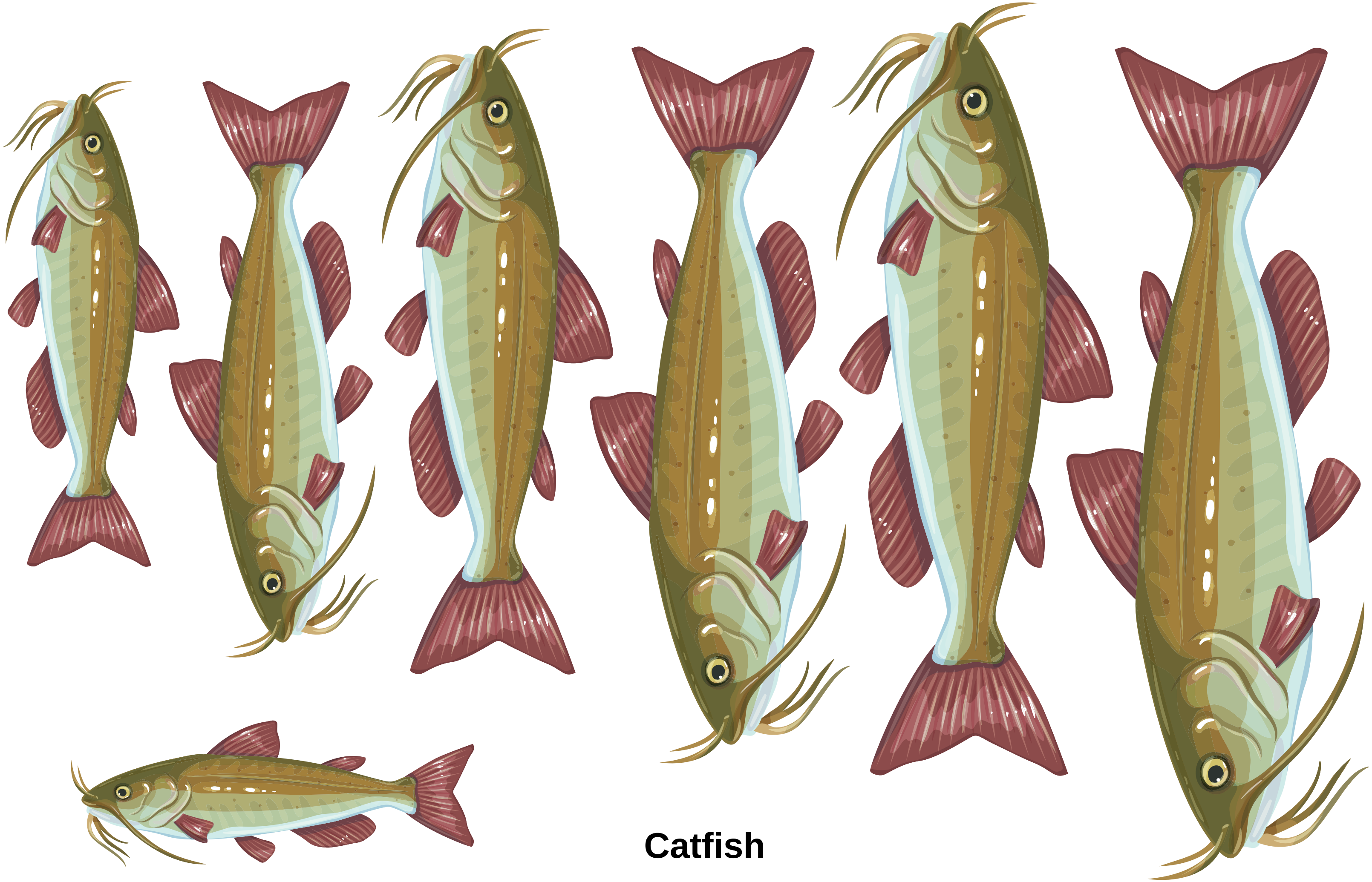
- Painted turtles get their name from their beautiful, **bright red, yellow, and orange markings** on their shells, legs, and necks — they look like they've been painted!
- In cold water, painted turtles can **stay underwater for up to 5 hours** — and in winter, they can survive **months without breathing air** by slowing down their body!
- Painted turtles **spend the winter under frozen ponds**, buried in the mud, where they absorb oxygen through their skin and the lining of their throat!
- Painted turtles can live to be **20–40 years old** in the wild — and even longer in captivity!



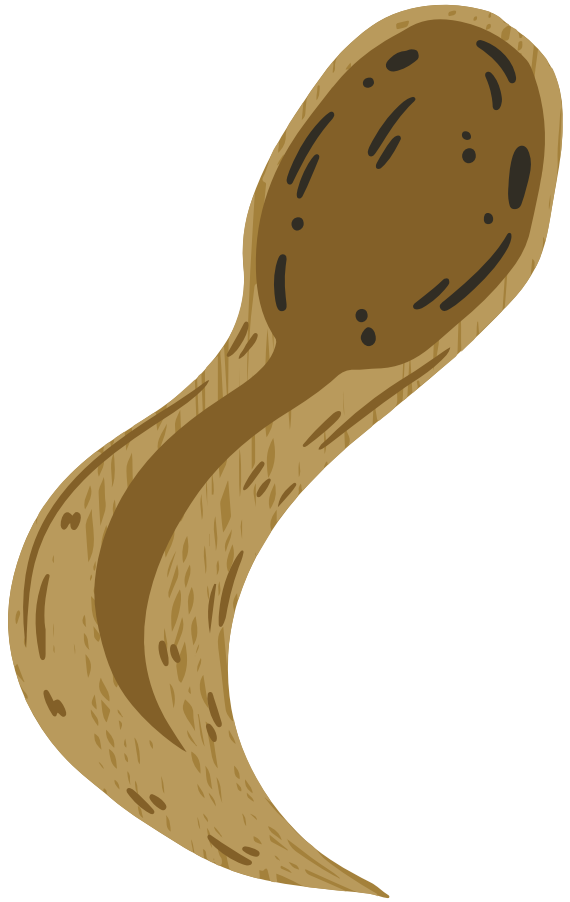
Large mouth bass



Rainbow Trout

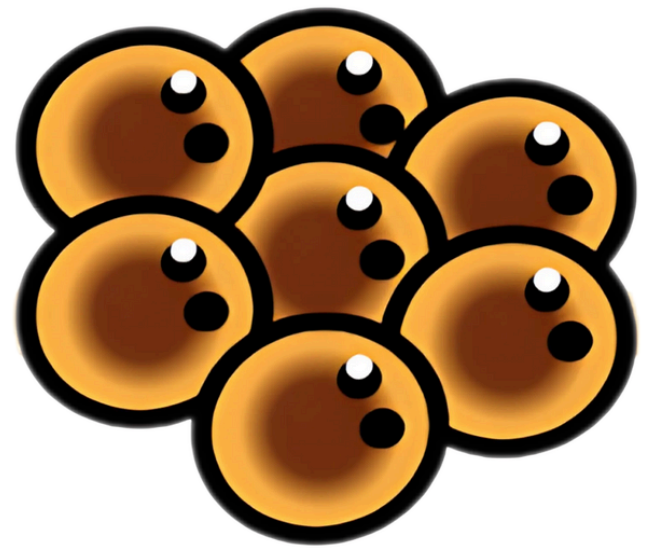


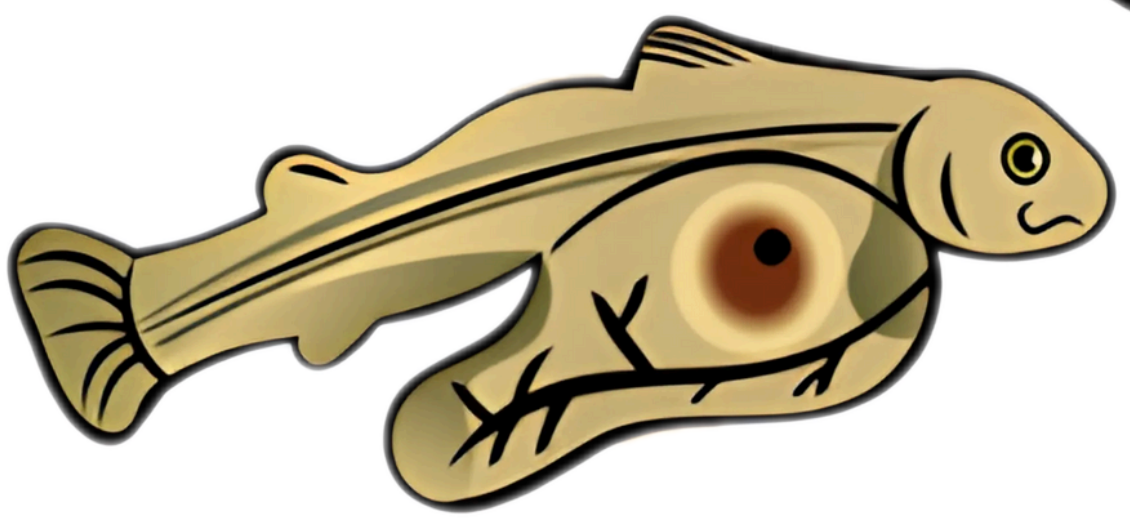
Catfish

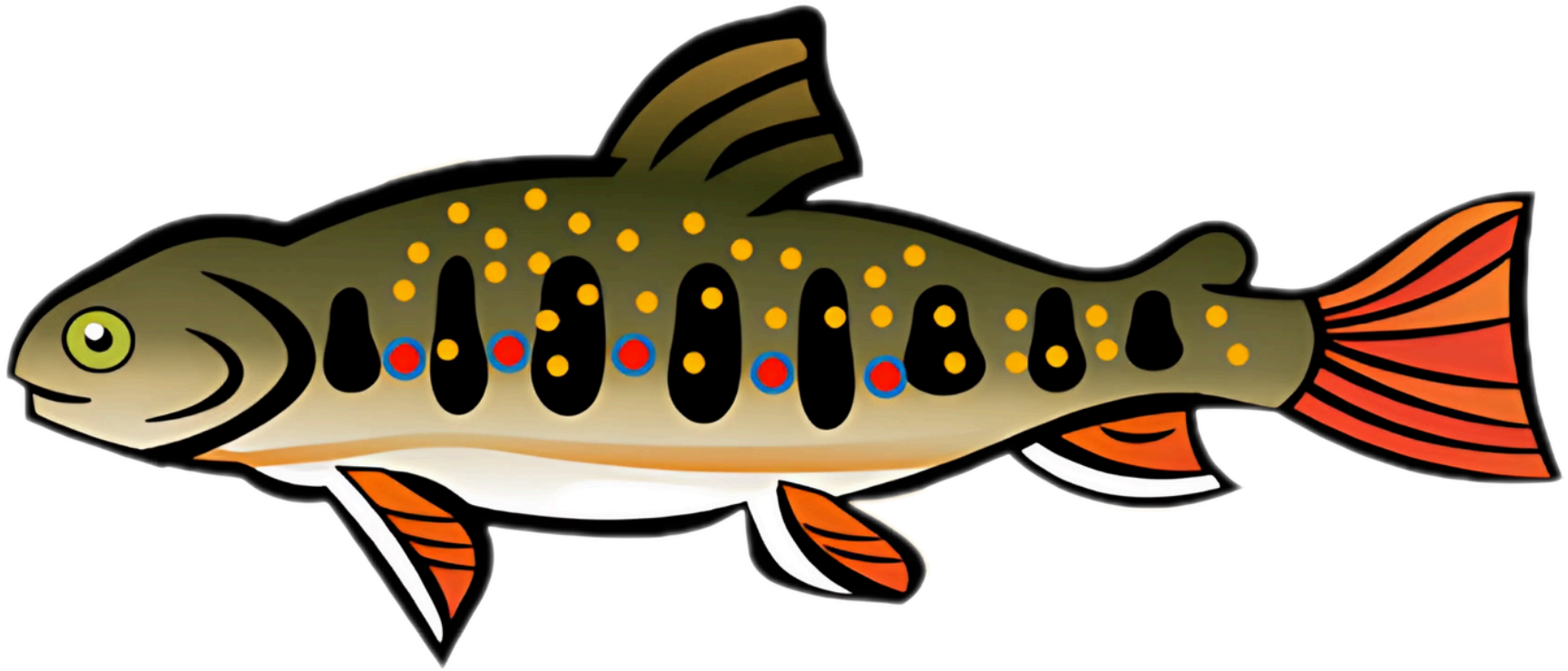


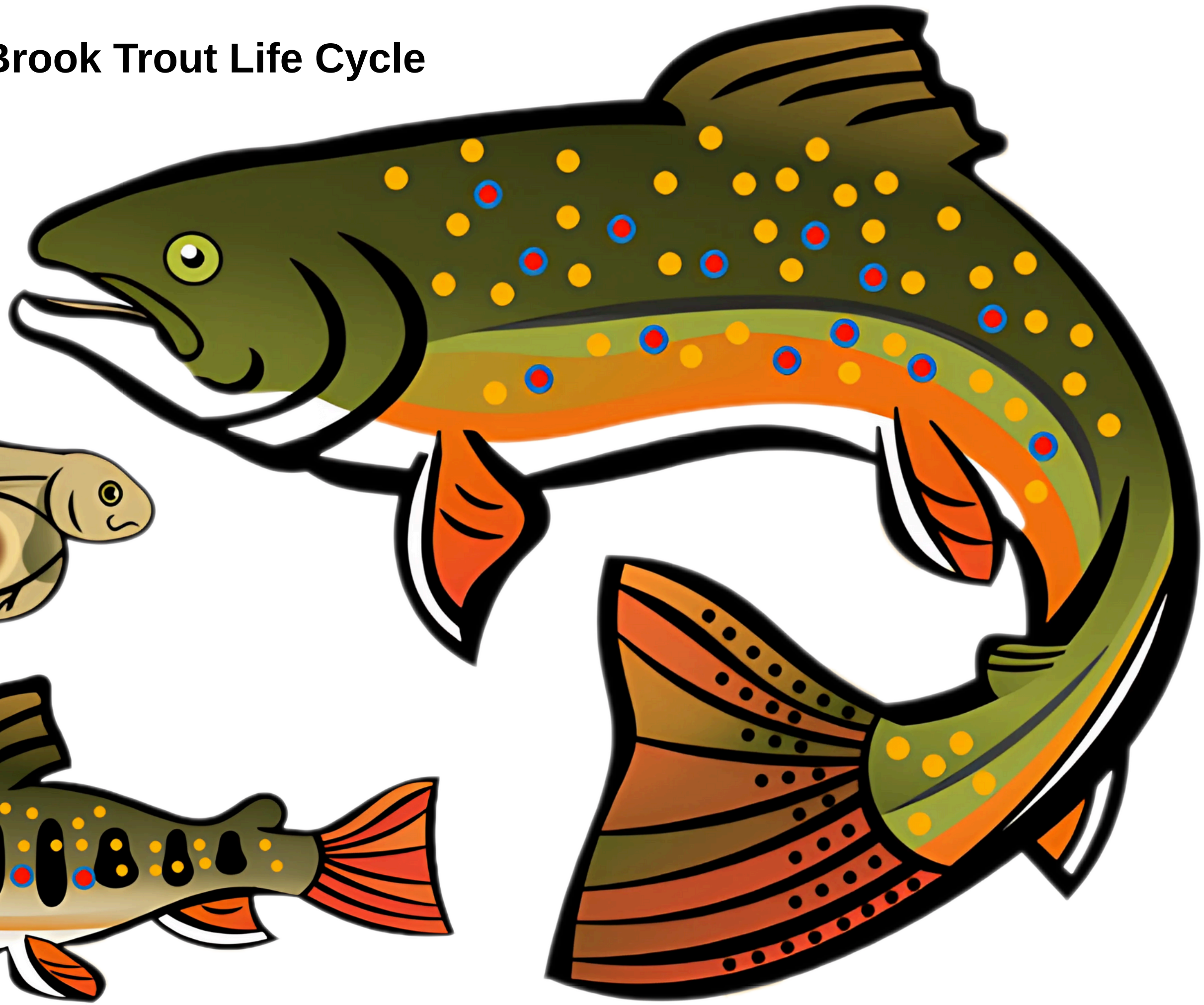
Wood Frog Life Cycle

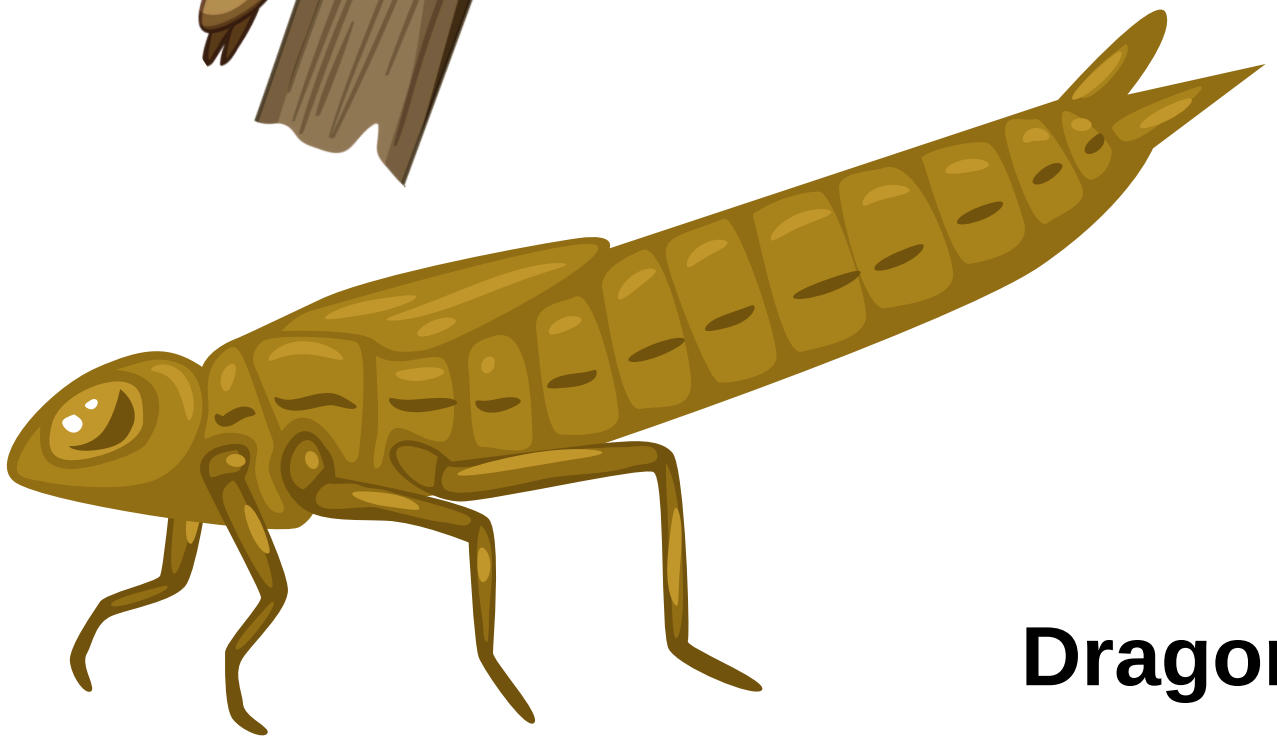
Brook Trout Life Cycle



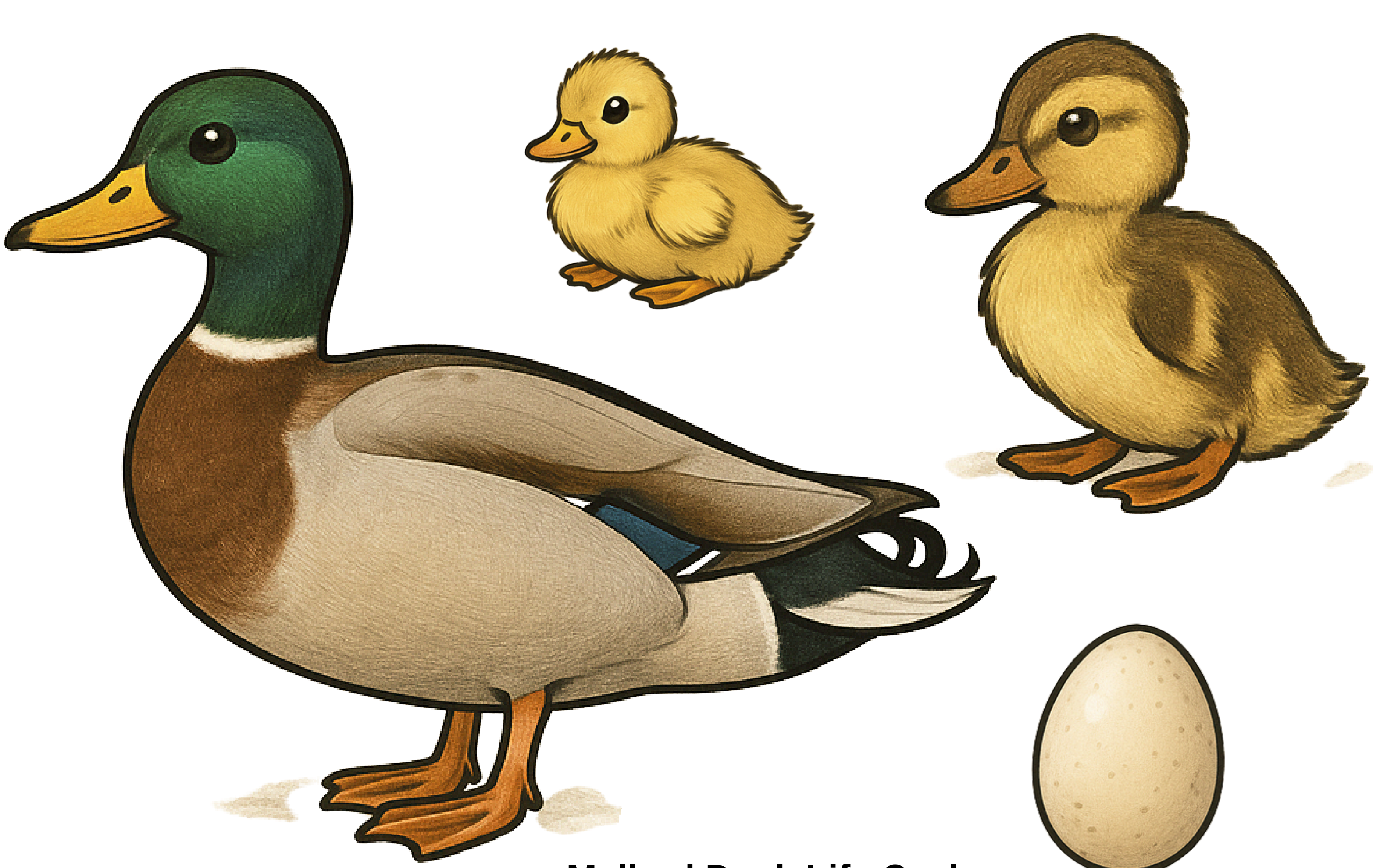




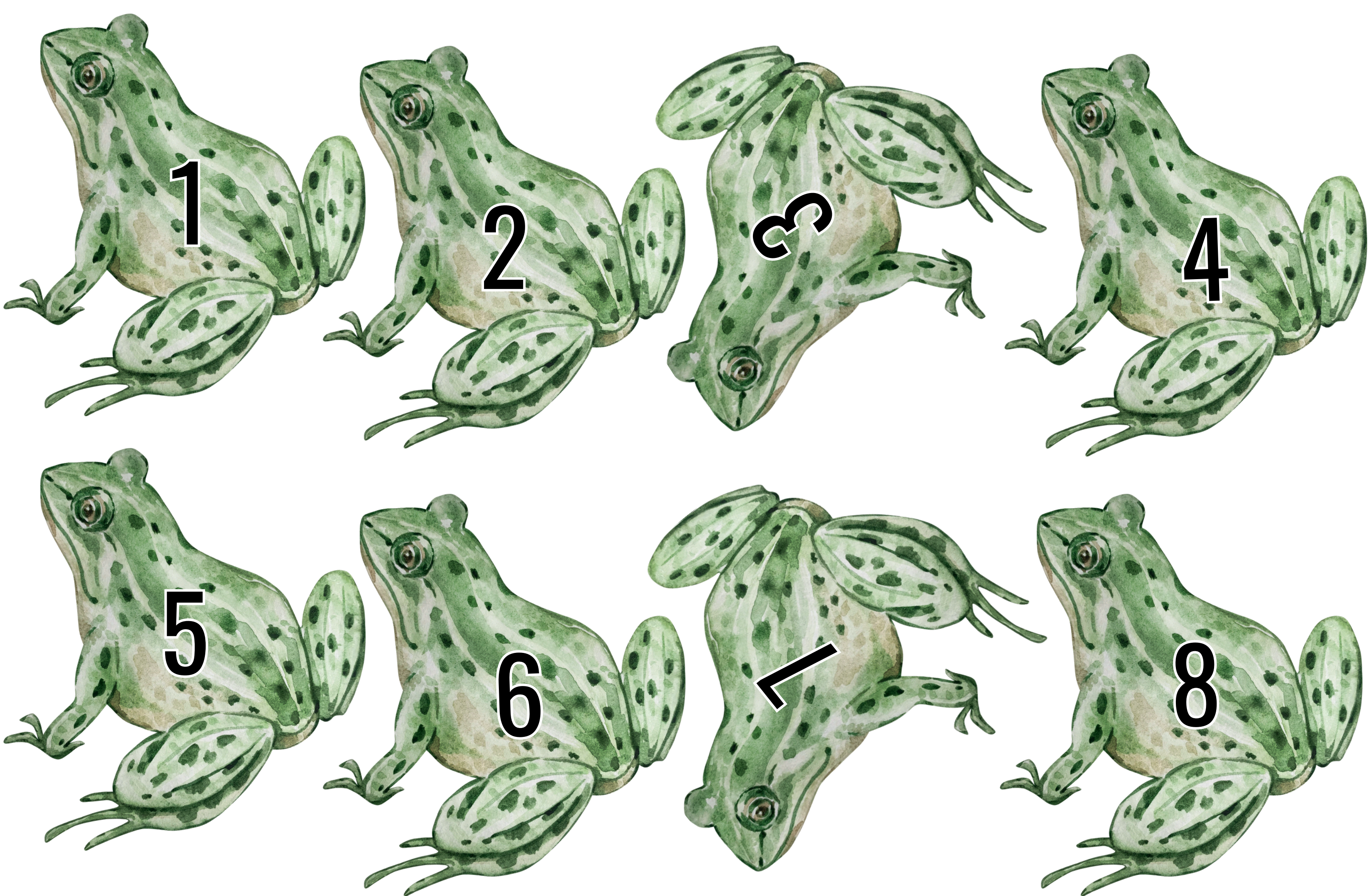




Dragonfly Life Cycle



Mallard Duck Life Cycle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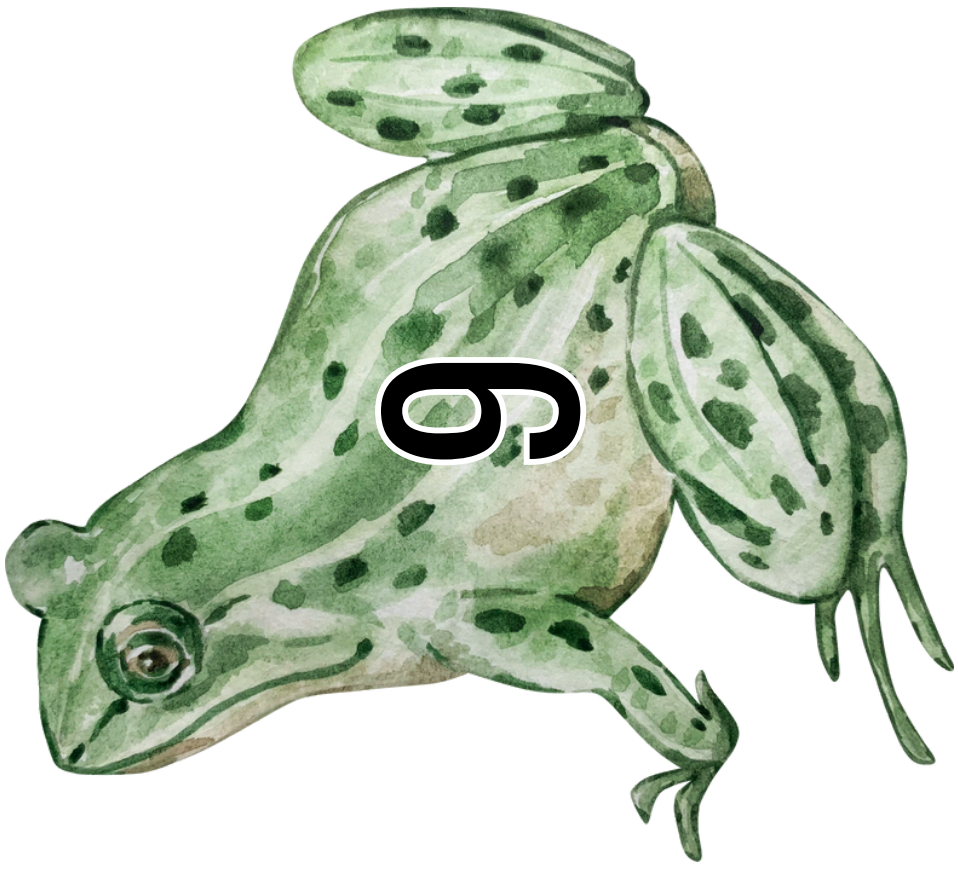
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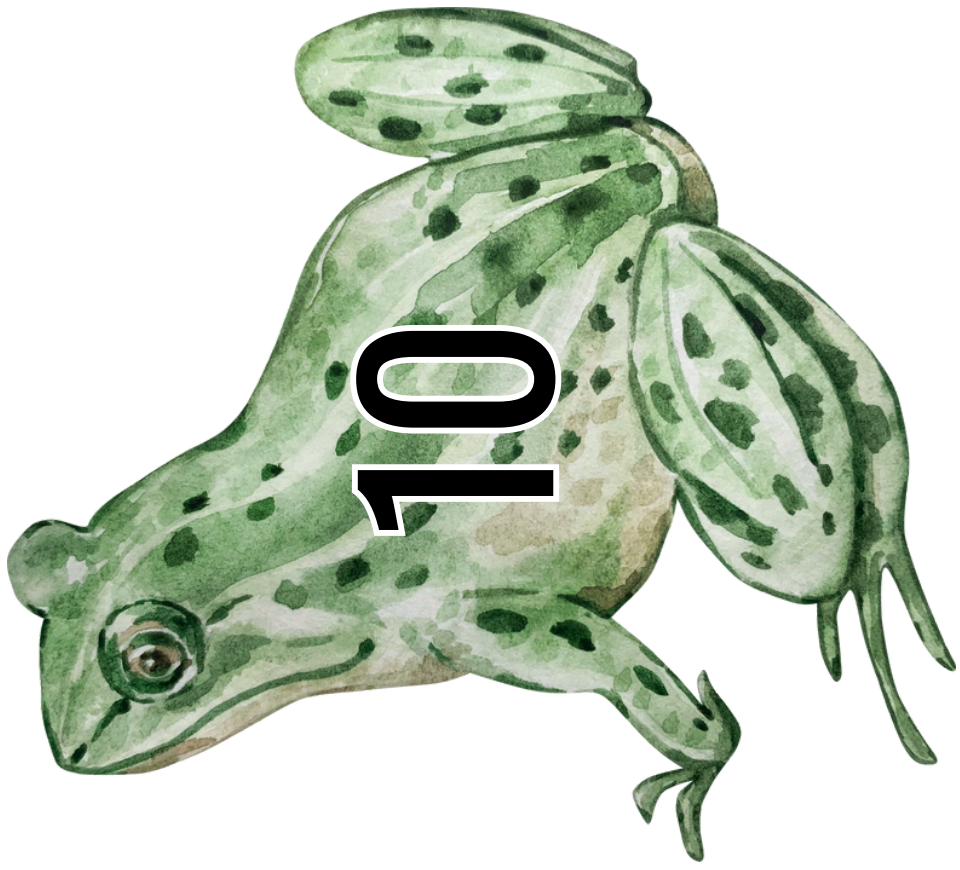
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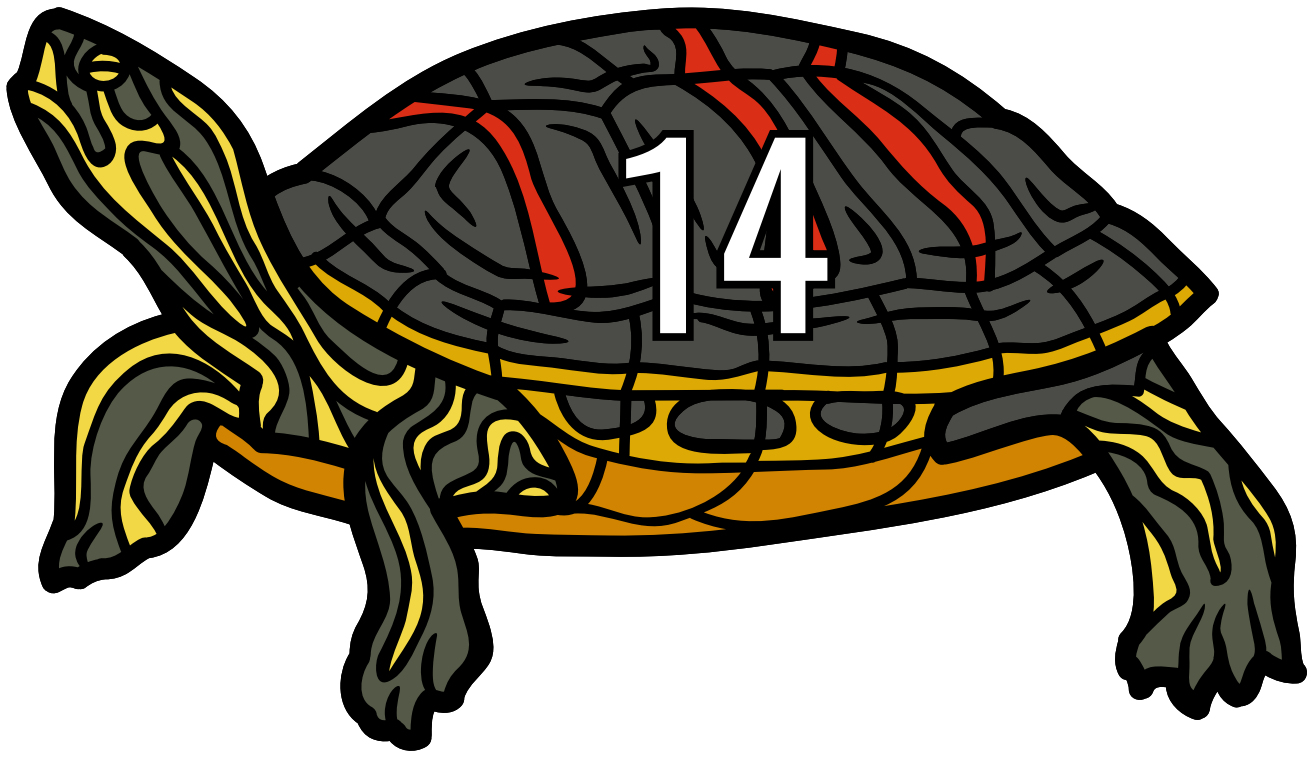
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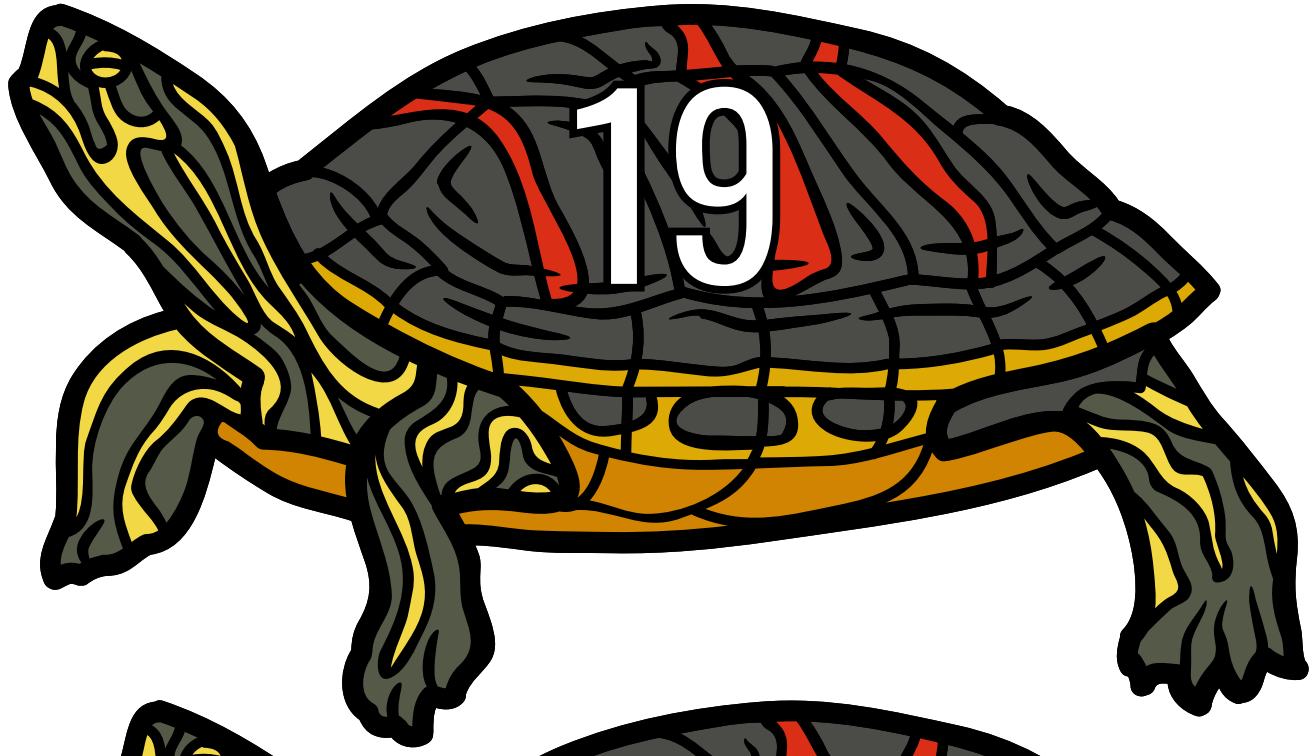
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