



Diving into the Life Cycle of a Frog

Written by Linda Rae Liss
4 Photographs by Kim, Peg, & Nestor, Student Conservationists
Illustrations by George Carrara & Genn Lotysh

A colorful illustration of a pond scene. In the foreground, a green frog is diving into the water. Several tadpoles are swimming in the pond. In the background, a person is sitting on the grass using a laptop. The scene is set in a lush green environment with trees and grass.



Kim



Nestor



Peg

Kim, Nestor, and Peg invented a robot frog sub. It will help them reach and observe frogs in their pond **habitat**.

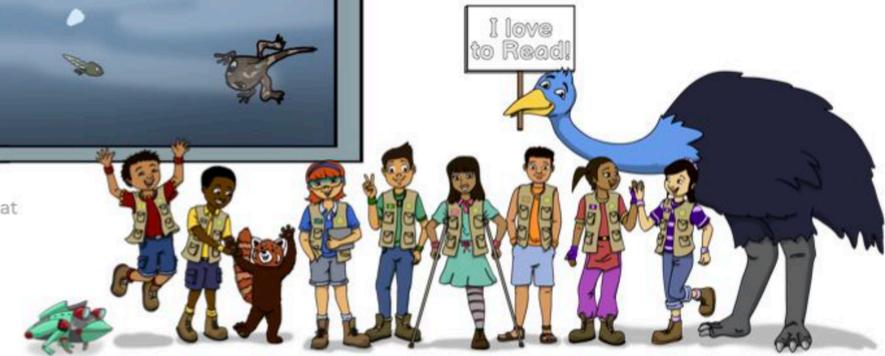


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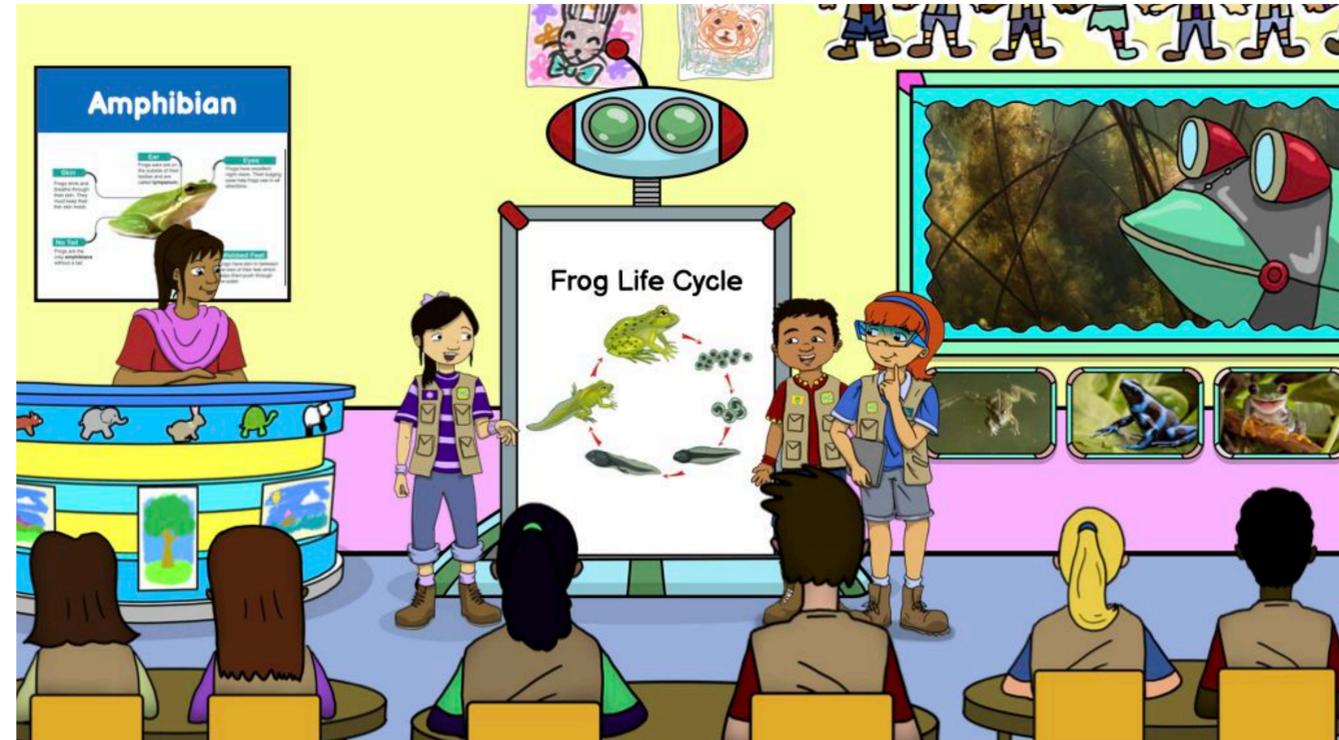
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Vowel Syllable Pattern Chart

Long Vowel Digraph Vowel Team		Variant Vowel Vowel Team		Diphthong Vowel Team			
							
reach	near	know	school	few	stood	about	around
needs	least	below	troop	goeey	shook	bound	count
squeak	see	floating	boost	proof	took	scout	proud
hear	screen	growing	unscrews	scoots	looks	out	found
speak	breathe	grown	mood	too	good	sound	recount
each	three	rays	looms	smoothly	saw	ground	points
sees	leave	wait	soon	toots		frowns	join
beams	feel	straight	zooms			now	
heap		tail	whooping			mounds	



Peg, Nestor, and Kim tell the students in their school about the life cycle of a frog. They are bound for a wetland habitat to scout out frogs in different **stages of development**. They have an invention to help them observe a frog's life.



Glossary

Illuminate (*verb*) to make (something) visible or bright by shining light on it; light up.

Stage of Development (*noun*) a period of time when appearance, needs, behaviors are different from other age periods.

Stealth (*noun*) a design with technology that makes detection by radar or sonar difficult.
(*adjective*) designed in accordance with technology that makes detection by radar or sonar difficult.

Surface (*noun*) the outside part or uppermost layer of something.

Tadpole (*noun*) the young stage of an amphibian, living in water; it has a tail and breathes through gills.

The troop arrives at the wetland pond. Kim needs a boost to get up onto the robot frog. Then, she unscrews the doors so she can get in. The sub doors squeak open. She is in a brave mood. She doesn't know what looms below the **surface** of the pond. Soon she will find out.

Glossary

Clutch (*noun*) group of eggs produced by birds, amphibians, or reptiles, often at a single time, particularly those laid in a nest.

Encounter (*verb*) to run into, to come across.

(*noun*) a meeting with someone or something.

Enlarge (*verb*) become or make bigger or more extensive.

Globule (*noun*) a small round particle of a substance; a drop.

Habitat (*noun*) the natural home or environment of an animal, plant, or other organisms.



Nestor pushes the button on the Zapper and zooms in on the frog. The shrinking rays hit the robot frog submarine. They hear a whooping sound as the robot frog sub gets smaller and smaller. With the final zap, it stood only a few inches off the ground.



Frog Facts

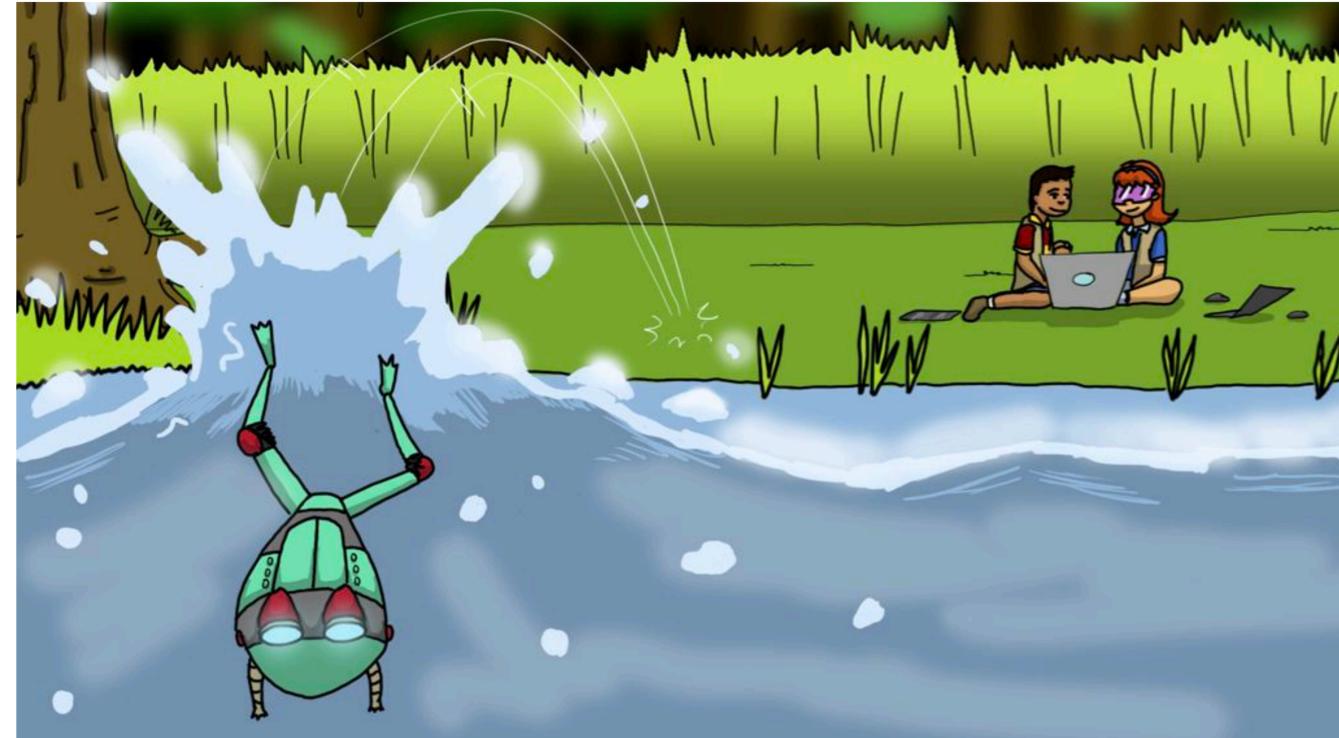
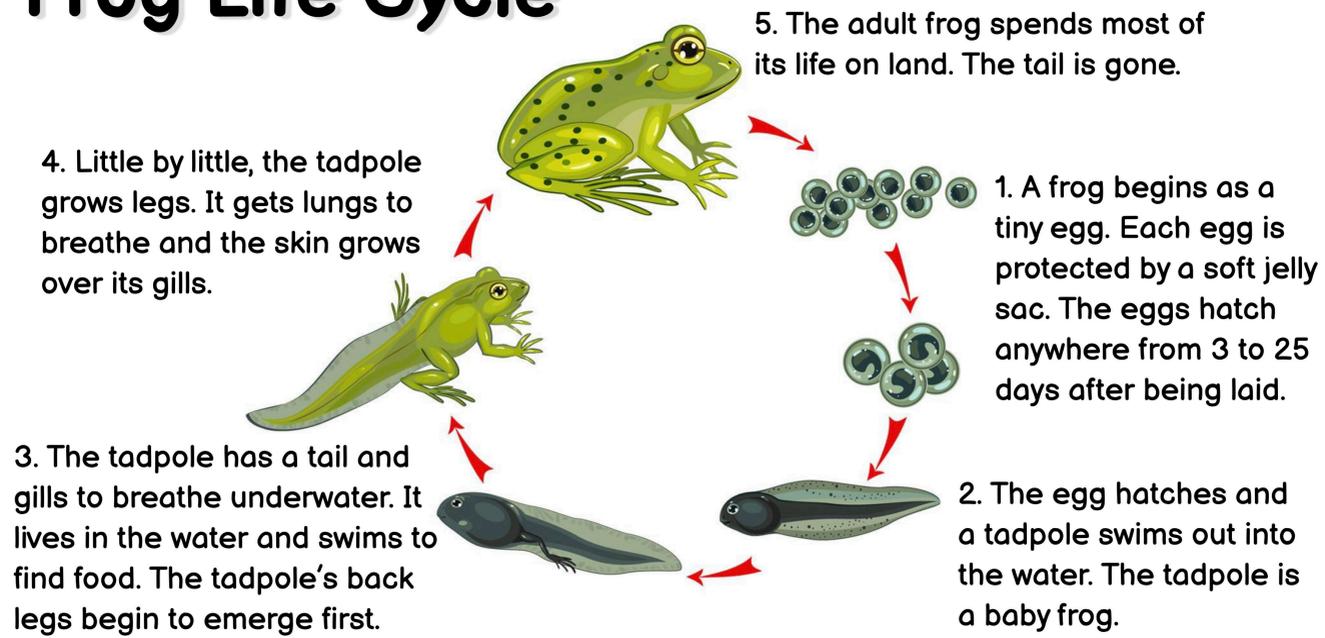
Frogs live where it is wet. Frogs eat bugs. They catch bugs with their tongue. They lay their eggs where it is wet. Frogs grow and change. As a tadpole they have gills to breathe under water, but as an adult they have lungs to breathe the air. As a tadpole they have a tail to swim, but as an adult they have legs to jump. There are less and less frogs because of toxins in the water.



As the rays shook the robot frog, it took only a few seconds for it to shrink to the size of a real frog.

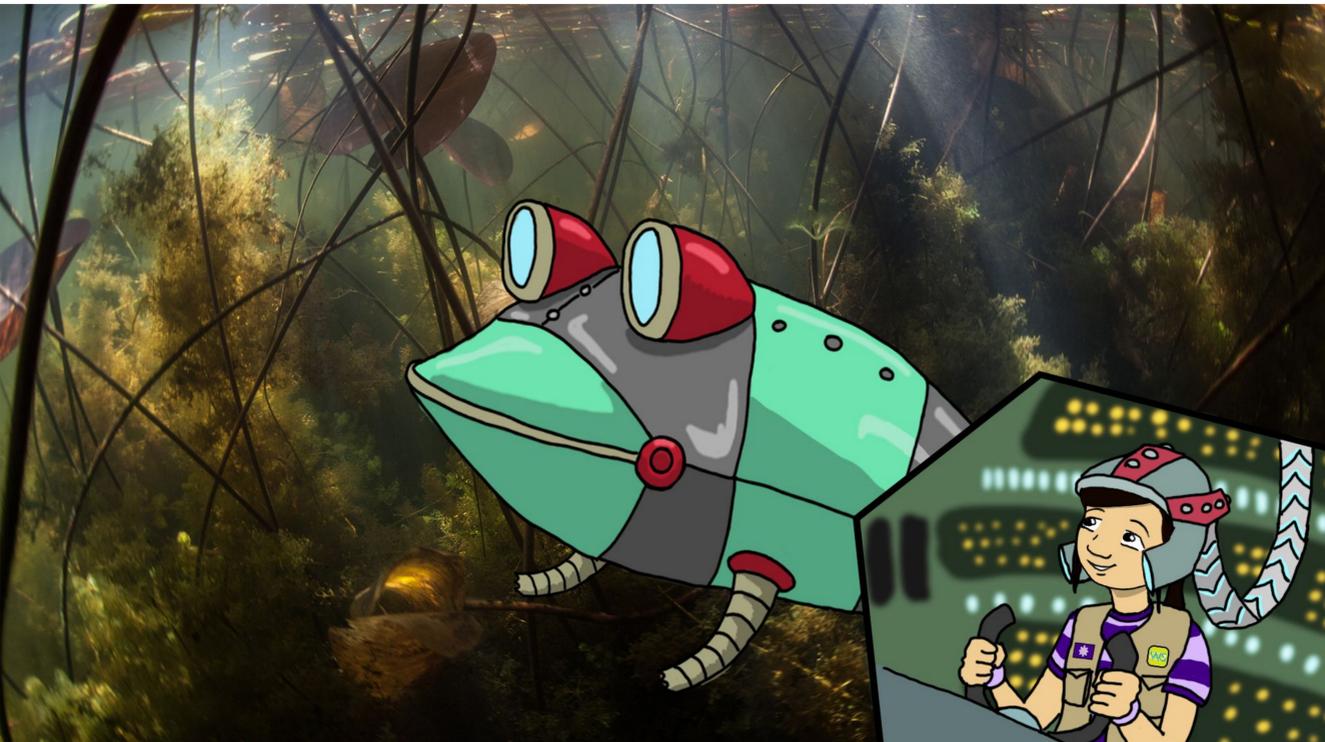
Peg frowns a bit as she thinks about the fact that Kim is inside the frog. So now Kim is tiny, too. Peg lets out her breath and mutters to herself, "I hope our invention is safe." Soon, they will be able to speak to Kim through the computer.

Frog Life Cycle

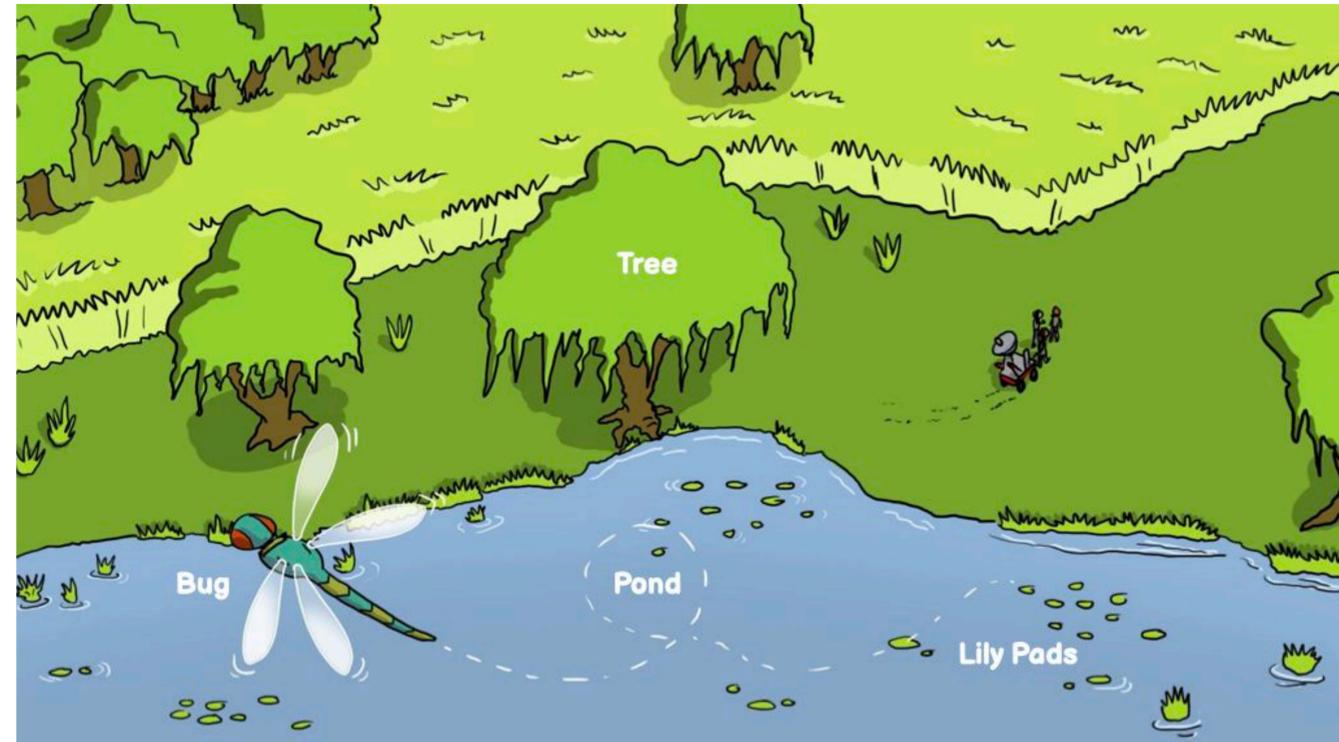


Kim is in the control center of the robot frog sub. She points the robot frog right at the pond. Then she programs the sub to dive into the murky waters.

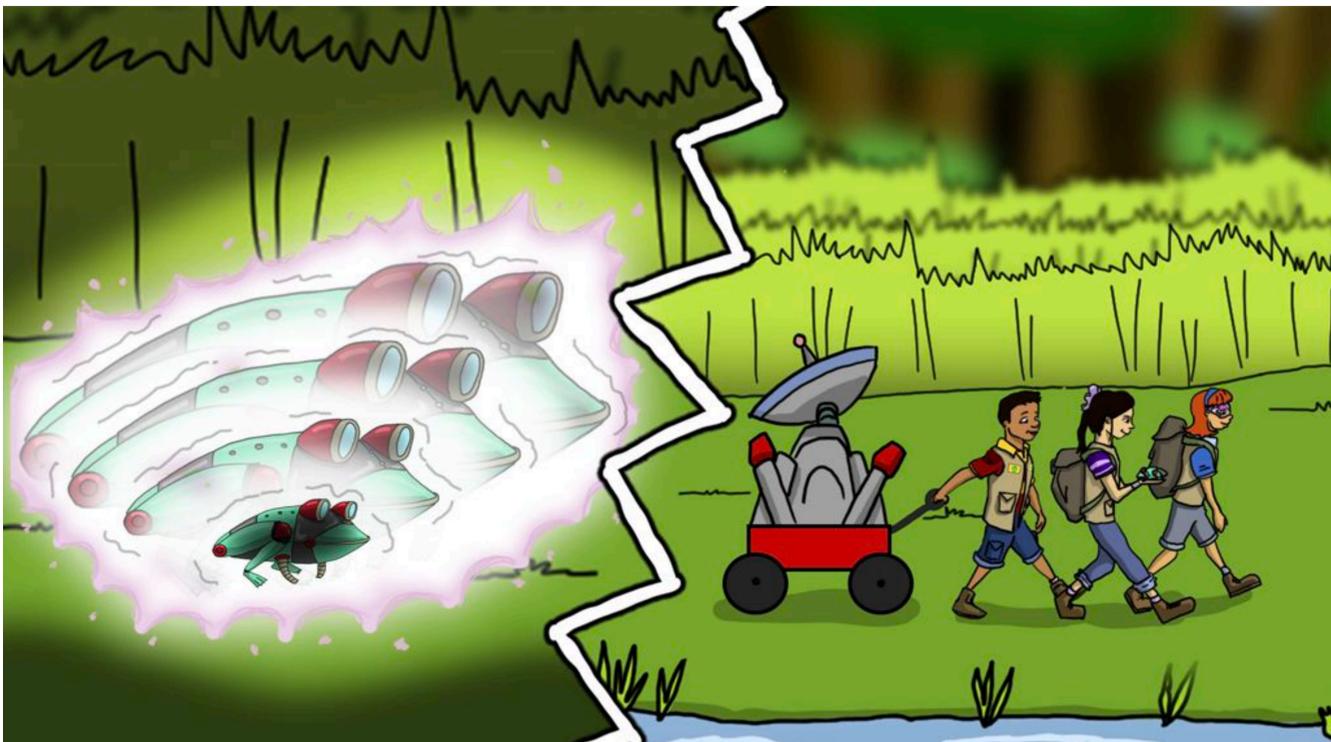
Nestor and Peg wonder what Kim will **encounter** in the pond. They can observe on their laptop what Kim comes in contact with. They will document the evidence of each stage of the frog life cycle. They will take notes and photos of what Kim sees through the window of the submarine.



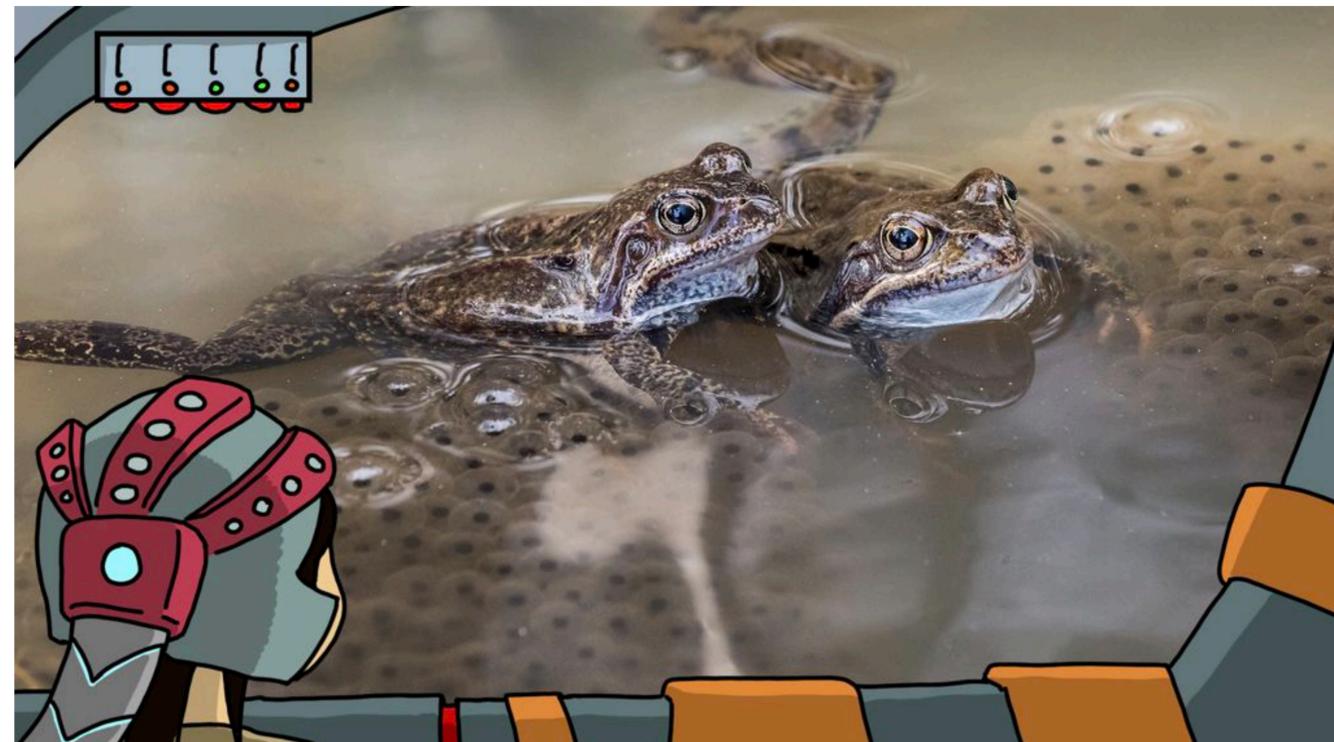
Kim scopes out the pond as beams of light, from the surface, illuminate the murky water. It was not clear like the water we drink. At first, she could not catch sight of any frogs. But wait, she locates the first stage of development straight ahead. She drives the sub forward. There is a heap of something gooey spread out in the distance...



Kim marks on a map where they embarked on the voyage. They head back across the meadow. They will have a lot to recount to their classmates about the stages of development they observed in the pond.



Nestor shrinks the heavy robot frog so it will fit back into the wagon. The troop is ready to head back to the lab. They feel proud of their teamwork and their invention. They found proof of frogs at all stages of their life-cycle. Peg takes a deep breath. She can finally relax.



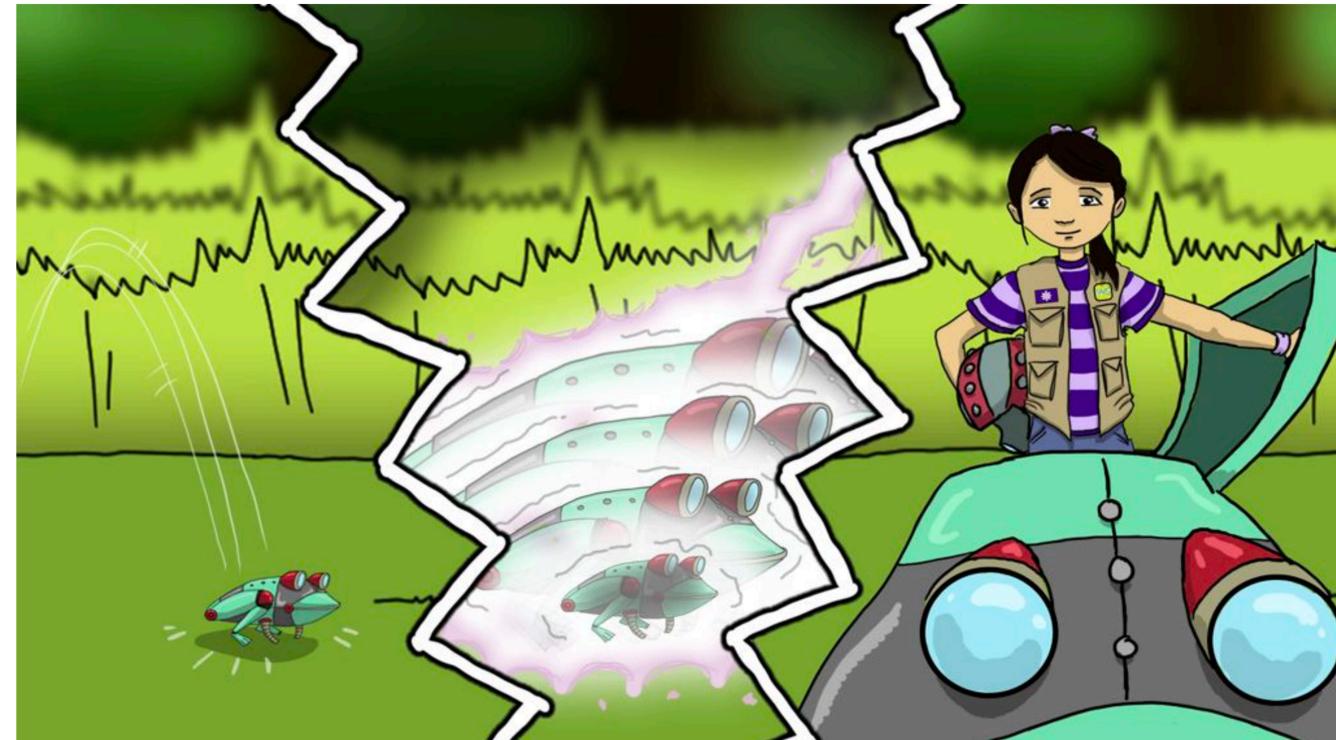
Kim spots mounds of frog eggs floating near the surface of the pond. It is the first stage of the frog life cycle. Female frogs lay a **clutch** of eggs. A clutch can contain hundreds or even thousands of eggs. The tiny dot in the middle of each egg is a baby **tadpole**.

Kim wonders if the adult frogs are protecting their eggs. Insects are a threat to the tiny eggs. Now, she has proof of two stages of the frog life cycle: eggs and adult frogs.



The frog sub scoots in for a close-up of the eggs. The gel-like stuff around each egg forms a **globule** to protect the baby tadpole growing inside.

Kim exclaims, "The black dot in each of the gel-sacs is a tadpole." There are at least a few hundred, but too many to count."



After that, Kim programs the robot frog sub to emerge from the pond. Nestor scoots back to the Zapper!

The robot frog gets larger and larger. Finally, the door opens and Kim climbs out. The voyage into the pond was a success.



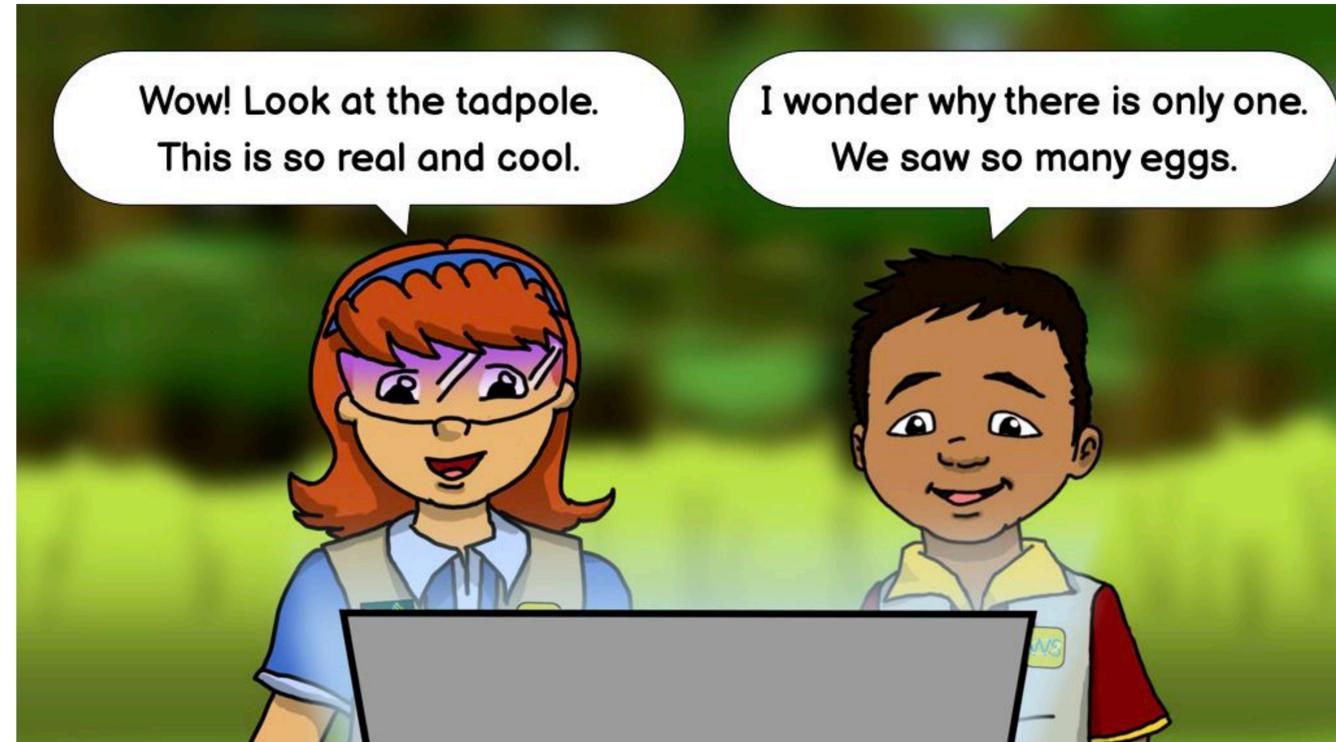
Kim does not want to leave just yet. She just saw something that is not quite a tadpole or a frog. She tells Nestor to take a photo. Kim explains, "I think it is a tadpole that has back legs. Maybe, it is almost a froglet, a third stage of frog development. When the tadpole reaches the froglet stage it is almost full-grown. Once it gets front legs the froglet will be ready to leave the water and live on land. Now I have proof of almost all the stages of development before a frog becomes an adult."



Peg and Nestor think about the frog life cycle chart. They see the adult frogs and the eggs spread across their screen. Peg says, "A tadpole will hatch from each egg." Peg wishes she could join Kim in the robot frog sub to make sure everything is running smoothly.



Next, Kim encounters a tadpole, the second stage of frog development. It looks like a fish. It has a fin and a long tail to swim. It has gills to breathe underwater. Kim remarks, "It looks more like a fish than a frog!" Now, Kim has proof of three stages of the frog life cycle. So far, the trip into the pond is going smoothly. The sub looks like a frog so it is **stealth**, or difficult to detect.



Wow! Look at the tadpole.
This is so real and cool.

I wonder why there is only one.
We saw so many eggs.

Peg and Nestor record notes about the stages of development they witnessed.

Nestor gives Kim a heads-up that time is running out. He reminds her she is almost out of oxygen. The horn in the robot frog toots. They tell Kim it's time to leave the realm of the pond. Peg dreads any problems with **enlarging** the frog sub and Kim back to their real size.