

Adaptations & Ecosystems

Amazing Earth - 3rd

Quick-Start Notes for Parent Presenters:

- **Visual Action Cues:** Highlighted in **[BOLD AMBER BRACKETS]** so you know exactly when to click to advance slides or play videos.
- **Student Participation:** Questions to ask the class are highlighted in **[BLUE CALLOUT BOXES]** along with answer keys and guidance.

VISUALS	SPOKEN SCRIPT + CLASS INTERACTION + ACTION

SLIDE 01: Adaptations & Ecosystems



Adaptations & Ecosystems Amazing Earth - 3rd

(On-Screen: Bullfrog hiding among lily pads in a pond habitat)

This quarter, you are investigating how plants and animals have special traits called adaptations that help them live in their ecosystems.

Let's see adaptations in action right here in Reston, Virginia!

[STUDENT PARTICIPATION]

"Look closely at this pond picture for the critter hiding among the lily pads. Does anyone know who this critter is?"

Tip: Let a few students answer

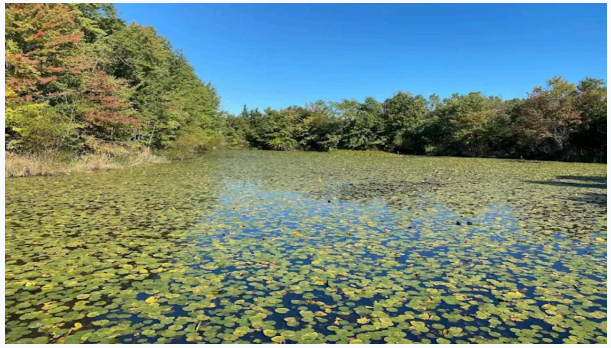
Answer Key: The American Bullfrog

This is Virginia's largest native frog, the American Bullfrog.

Their primary native ecosystems are wetlands with freshwater ponds, lakes, and swampy areas.

[CLICK: Advance to Slide 02]

SLIDE 02: Wetland Ecosystem (Sunrise Valley)



(On-Screen: Sunrise Valley Wetlands densely covered with lily pads. This is also known as the Herndon Monroe Wetland Preserve.)

This photo shows a beautiful wetland right down the road called the Sunrise Valley Wetlands.

Let's think about the nonliving features of this wetland.

We see that a wetland is an aquatic ecosystem where the land is saturated or covered with shallow water. Water is one of the primary nonliving features.

Because the dirt is always under water, it is very muddy and wet. It is also packed with nutrients from dead leaves that help new life grow.

And the sunlight that shines through the shallow water gives energy to plants.

The living community is filled with a huge diversity of organisms.

Producers such as cattails and water lilies that make their own food using water and sunlight.

Consumers like bullfrogs, snapping turtles, and dragonflies must eat other living things for energy.

Decomposers including microbes and fungi found deep in the mud break down dead leaves to recycle healthy nutrients back into the soil.

[CLICK: Advance to Slide 03]

VISUALS	SPOKEN SCRIPT + CLASS INTERACTION + ACTION

SLIDE 03: Physical Adaptations



(On-Screen: Bullfrog resting in shallow muddy water showing camouflage)

The American Bullfrog has specific physical structures built into its body to survive and reproduce in this wet environment.

Coloration: Its green and brown skin acts as camouflage to blend in with pond plants and hide from predators.

Eyes: Large, bulging eyes sit at the top of its skull. This gives the frog a wide frame of vision, which is critical because they cannot move their heads from side to side.

Skin: Frogs can actually absorb oxygen directly through their skin! To work, their skin must stay wet, so specialized glands secrete a slippery mucus to keep it functional.

[CLICK: Advance to Slide 04]

VISUALS	SPOKEN SCRIPT + CLASS INTERACTION + ACTION
SLIDE 04: Behavioral Adaptations & Sounds  *(On-Screen: Bullfrog sitting on wetland edge ready to call)*	Bullfrogs also rely on behavioral adaptations—the actions they take to survive in wetlands. **Hibernation**: In the freezing winter, bullfrogs dig themselves deep into the wetland mud to hibernate. **Defensive Sounds**: When grasped, bullfrogs will often emit a high pitched call that is believed by some scientists to attract mammals or birds which may interrupt the attack. **Croaking**: Only male bullfrogs croak, making a loud 'jug-o-rum!' sound. They do this to attract mates and establish their territory. **[CLICK: Advance to Slide 05]**

VISUALS	SPOKEN SCRIPT + CLASS INTERACTION + ACTION
SLIDE 05: Behavioral Adaptations & Sounds  *(On-Screen: Black screen with video play button that plays a video of a Bullfrog and bullfrog mating calls)*	Let's listen to what a local bullfrog sounds like right now! **[CLICK & PLAY: 10 Sec. Video]** **[CLICK: Advance to Slide 06]**

SLIDE 06: Adapting Over Generations



(On-Screen: Arid desert ecosystem with saguaro cacti)

The bullfrog's structure and behavior has adapted across many generations so that this species can survive in a wetlands ecosystem.

But what if we dropped a bullfrog right into this dry, desert ecosystem?

> **[STUDENT PARTICIPATION] "Raise your hand if you think the desert meets its survival needs? Would this individual bullfrog be able to adapt to the desert?"**
>
> *Tip: Let a few students answer before revealing*
>
> ***Answer Key: No! An individual plant or animal cannot adapt to changes in their ecosystem within their lifetime.***

In science, adapting means changes occur in the physical structures or behaviors of a whole population over many generations.

Some animals can move to a new location, and humans can design materials to survive, but a single frog cannot change its own traits.

[CLICK: Advance to Slide 06]

VISUALS	SPOKEN SCRIPT + CLASS INTERACTION + ACTION
SLIDE 07: Beast Lab Activity  *(On-Screen: Beast Lab owl logo and activity prompt)*	The physical structures and behaviors we observe in organisms today are present because the species adapted to changes in the ecosystem. These structures and behaviors are not random—they are perfectly connected to the ecosystem. But what would happen if they were random? Let's find out! Today, we are going to become scientists in the Beast Lab and create our very own custom creatures with random traits. Then, we will 'drop' our creations into the Sunrise Valley schoolyard ecosystem and determine how our creatures would interact with the living plants and animals and the nonliving environment. Let’s get to work!