Warm Up

Use the word list to fill in the blanks below. *Words may be used once or not at all.*

environment **aquatic** **trait** **survive** **adaptation**

An _____ is a physical, chemical, or behavioral _____ that helps an organism to _____ in a particular _____.

There are three major types of adaptations. See the examples below.

Physical adaptations: hollow bones in birds, hollow fur in polar bears, skin flaps on a flying squirrel
Chemical adaptations: proteins, poison, venom, melanin (protects skin from UV light), digestive enzymes
Behavioral adaptations: whale migration, lizards sitting in the sun, bird mating dance, bear hibernation

Take a look at the adaptations of the aquatic invasive species below:

	Zebra mussel	North American bullfrog
Physical adaptation(s)	Planktonic larvae, razor sharp shells	Big eyes, webbed feet, camouflage
Chemical adaptation(s)	Byssal protein threads	Slime on skin
Behavioral adaptation (s)	Filter feeds at all hours	Ambush predation

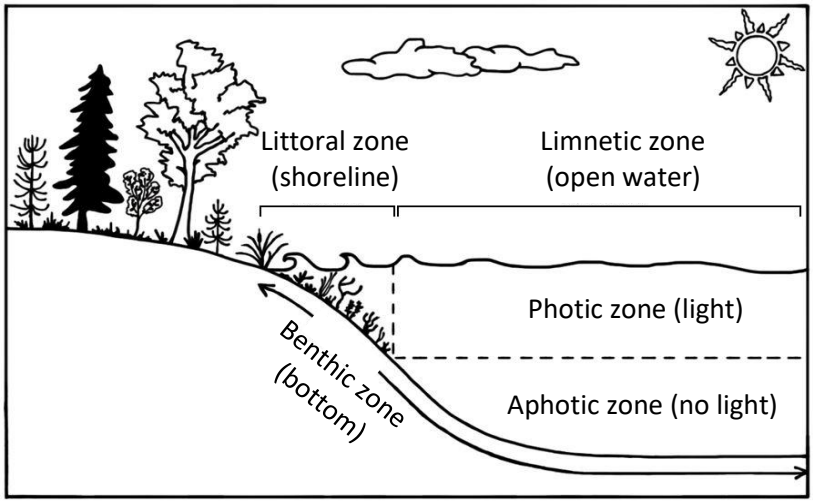
30 second brainstorm…Think of a physical, chemical, and behavioral adaptation for another animal.

Animal: _____

Physical: _____
Chemical: _____
Behavioral: _____

Use the diagram to compete the tasks below.

Every aquatic habitat has unique physical characteristics of temperature, light, pH, wave action, depth, water current direction/speed, and dissolved oxygen that impact the organisms in that habitat. As a result, the animals have adaptations that help them to survive. For example, many species use countershading camouflage to hide from predators. Invasive species often have traits that give them an advantage over the native species.



Select one lake zone and think of one animal that lives there.

Zone: _____

Animal: _____

List two adaptations this animal would need to survive in that aquatic habitat?

-
-

Amazing AIS Adaptations

Name _____

Project Summary

Student Worksheet (2 of 6)

All organisms have amazing adaptations that help them to survive and reproduce. Typically, only those organisms with advantageous traits will reproduce and carry their genes to the next generation. In this activity, you will be provided with specific adaptations for an aquatic invasive species (AIS). Using these traits, you will design an AIS that DOES NOT already exist, rather a creature of your imagination. Look over the three required tasks below.

TASK 1: Design your aquatic invasive species by completing the "story planning sheet."
TASK 2: Use the "story outline" to write a 1-page adventure story from the **perspective of another organism that encounters your aquatic invasive species** (ex. moose, osprey, beaver, duck, fish, human, etc.). This should include the invasive organism's name, habitat, physical traits, food/energy source and means of energy collection, reproduction strategies, dispersal mechanism(s), and any other interesting facts. *Describe how your organism's adaptations allow it to live in a wide range of conditions, grow fast, reproduce quickly, outcompete other species, and disperse easily.*

TASK 3: Draw an 8 ½" x 11" color portrait of the animal encountering your invasive organism in its habitat. Have fun, be creative, and surprise your classmates with your creation!

Record the 5 traits from your adaptations card below and then pick one extra trait:

Habitat:	Physical feature(s):
Energy/feeding:	Reproduction:
Dispersal:	Pick one extra trait or behavior:

Project Rubric

	Exceeds	Meets	Does not meet
Story content	☐ Explains in detail how the adaptations allow it to live in a wide range of conditions, grow fast, reproduce quickly, outcompete other species, and disperse easily.	☐ Describes briefly how the adaptations allow it to tolerate a wide range of conditions, grow fast, reproduce quickly, outcompete other species, and disperse easily.	☐ Does not clearly describe how the organism's adaptations make it invasive.
Story format	☐ Entertaining adventure story ☐ Perspective of the animal encountering the AIS. ☐ Creative, descriptive title ☐ Clear beginning, middle, & end ☐ > 1 page in length ☐ Neatly typed (1.5 spaced)	☐ Adventure story ☐ Perspective of the animal encountering the AIS ☐ Title included ☐ Basic beginning, middle, & end ☐ 1 page in length ☐ Neatly handwritten	☐ Adventure story ☐ Title not included ☐ Story confusing ☐ < 1 page in length ☐ Illegible or poorly handwritten
	Exceeds	**Meets**	**Does not meet**
Portrait design	☐ Creative colorful design showing the animal and AIS in its habitat ☐ All adaptations depicted; labeled ☐ Organism name included	☐ Simple colorful design showing the animal and AIS in its habitat ☐ All adaptations depicted ☐ Organism name included	☐ Black & white design ☐ <6 adaptations ☐ Name missing

COMMENTS:

 Name _____

Story Planning Sheet – Animal

Your task is simple: design your own aquatic invasive species. Describe your organism's traits and how your organism lives in its environment. Be thorough because you will use this outline to complete your one-page story! *Be sure to explain how your aquatic invasive species:*

- *Grows fast and reproduces quickly*
- *Spreads easily*
- *Outcompetes other organisms*
- *Lives in a wide range of conditions*

A. TYPE OF ORGANISM

What type of animal (ex. snail, mussel, crustacean (crayfish, zooplankton), fish, parasitic worm, amphibian, aquatic insect, etc.) is your aquatic invasive species?

B. HABITAT

Describe, in detail, your animal's habitat. Where specifically in the habitat does it live (shallow water along the shoreline, under rocks, along the bottom of a stream, attached to surfaces, within the photic zone, drifting with the currents, in the sediment, etc.)? Which abiotic or physical/non-living conditions (temperature, currents, light, wave action, etc.) impact where it lives? **What does it do to increase its ability to live in those conditions?**

C. PHYSICAL FEATURES

What does it look like? **How quickly does it grow and how big does it get?** How does it sense its environment (eyes, chemoreceptors to sense chemicals in the water, electromagnetic waves, etc.)? How does it blend into its environment (shell pattern, camouflage, warning coloration, etc.)? How does your animal move about? Appendages (limbs/legs), in groups, alone? When does it need to move? How does it use movement to catch prey or to avoid predators? Is it more active during a certain time of the year or day? How does the animal protect itself? From what does it need to be protected?

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Story Planning Sheet – Animal (cont.)

D. ENERGY/FEEDING

How does your animal get energy? What does it eat? How does it get food? How does it feed its offspring? When does it eat? How often? Are there any special or unusual feeding behaviors? **How does it compete with other organism in the environment for limited food resources?**

E. REPRODUCTION

Does your animal reproduce sexually, asexually, or both? Does it have mating seasons or behaviors it uses to attract a mate? Does it use internal or external fertilization? Does it produce eggs or have live birth? If so, how many? **How often or fast does it reproduce?** Does it have spawning grounds? Is there any parental care of young? If so, how long does it occur and by whom?

F. DISPERSAL

How does your animal spread throughout the environment? Can it travel long distances? If so, how? Can it survive out of water for a period of time? If so, how long?

G. OTHER

Please describe all other important adaptations (traits and/or behaviors) the animal uses for survival. For example, does it migrate, hibernate, or change its coloration during the year? **Be creative and enhance its invasive characteristics!**

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Name _____

Story Outline

Title: _____

Attention grabber
(Call to adventure)

Introduce main character

Set the stage
(Time, place, mood, engage the 5 senses)

Rising action
(Main character faces a series of conflicts)

Climax
(Main character faces major problem and a main conflict arises)

Falling action
(Main character finds a way out of the adventure)

Conclusion

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A Portrait of: _____

Organism's name

Zoom in on ONE AIS adaptation! Explain!

* Include labels for the 5 traits from your adaptation card!

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