

**Warm Up**

What is an adaptation?

**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, snake venom, melanin (protects your skin from UV light)

Behavioral adaptation: whale migration, lizards sitting in the sun, bird mating dance, bear hibernation

**Fill in the adaptations below:**

	Zebra mussel	North American bullfrog
Physical adaptation(s)		
Chemical adaptation(s)		
Behavioral adaptation (s)		

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

Animal: \_\_\_\_\_

Physical: \_\_\_\_\_

Chemical: \_\_\_\_\_

Behavioral: \_\_\_\_\_

**Label the diagram below with the following terms:**

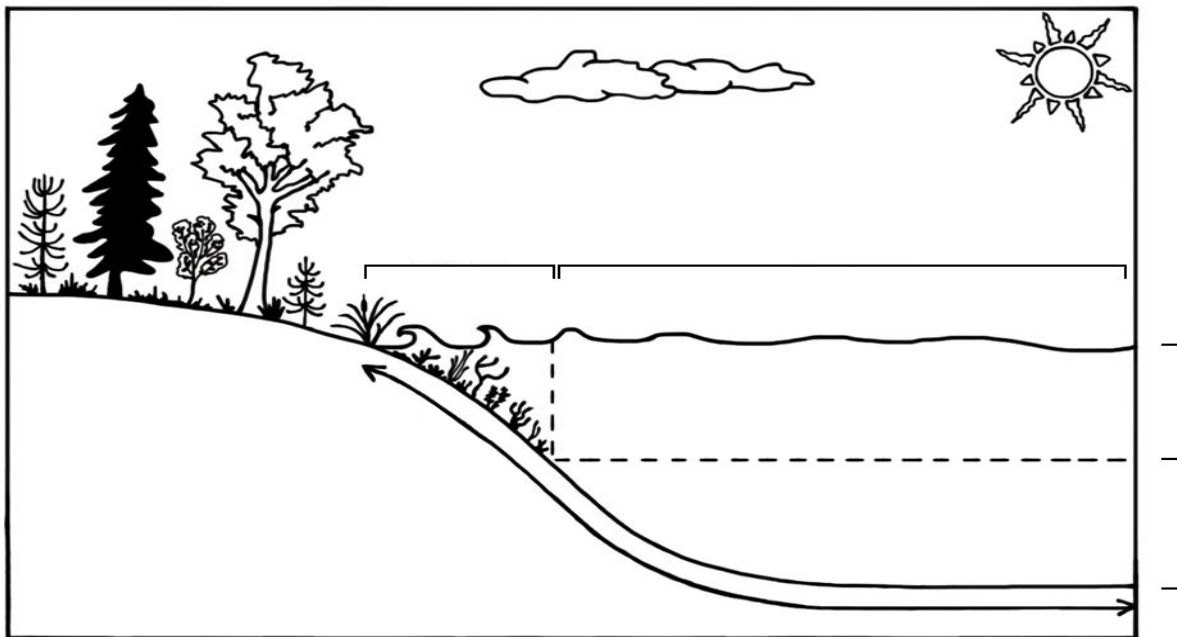
Photic zone (light)

Aphotic zone (no light)

Benthic zone (bottom)

Littoral zone (shoreline)

Limnetic zone (open water)



**Project Summary**

Student Worksheet (2 of 8)

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 two required tasks below.

**TASK 1:** 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 2:** 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
<b>Story content</b>	<input type="checkbox"/> 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.	<input type="checkbox"/> Describes briefly how the adaptations allow it to tolerate a wide range of conditions, grow fast, reproduce quickly, outcompete other species, and disperse easily.	<input type="checkbox"/> Does not clearly describe how the organism’s adaptations make it invasive.
<b>Story format</b>	<input type="checkbox"/> Entertaining adventure story <input type="checkbox"/> Perspective of the animal encountering the AIS. <input type="checkbox"/> Creative, descriptive title <input type="checkbox"/> Clear beginning, middle, & end <input type="checkbox"/> > 1 page in length <input type="checkbox"/> Neatly typed (1.5 spaced)	<input type="checkbox"/> Adventure story <input type="checkbox"/> Perspective of the animal encountering the AIS <input type="checkbox"/> Title included <input type="checkbox"/> Basic beginning, middle, & end <input type="checkbox"/> 1 page in length <input type="checkbox"/> Neatly handwritten	<input type="checkbox"/> Adventure story <input type="checkbox"/> Title not included <input type="checkbox"/> Story confusing <input type="checkbox"/> < 1 page in length <input type="checkbox"/> Illegible or poorly handwritten
	Exceeds	Meets	Does not meet
<b>Portrait design</b>	<input type="checkbox"/> Creative colorful design showing the animal and AIS in its habitat <input type="checkbox"/> All adaptations depicted; labeled <input type="checkbox"/> Organism name included	<input type="checkbox"/> Simple colorful design showing the animal and AIS in its habitat <input type="checkbox"/> All adaptations depicted <input type="checkbox"/> Organism name included	<input type="checkbox"/> Black & white design <input type="checkbox"/> <6 adaptations <input type="checkbox"/> Name missing

**COMMENTS:**



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)

Handwriting lines for the first section of the story outline.

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

Handwriting lines for the second section of the story outline.

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

Handwriting lines for the third section of the story outline.

**Conclusion**



A Portrait of: \_\_\_\_\_

Organism's name

Zoom in on ONE AIS adaptation! Explain!

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



## Story Planning Sheet – Animal

Student Worksheet (5 of 8)

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?



## Amazing AIS Adaptations

### Story Planning Sheet – Animal (cont.)

Student Worksheet (6 of 8)

#### 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!**



FLATHEAD LAKE  
BIO STATION  
UNIVERSITY OF MONTANA

© 2019 AIS Unit created by the Flathead Lake Biological Station and the Flathead Lakers.  
Funded by the Montana Department of Natural Resources and Conservation and FLBS.



Story Planning Sheet – Plant / Algae

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 plant, algae, or phytoplankton is your aquatic invasive species?

B. HABITAT

Describe, in detail, your organism’s habitat. Where specifically in the habitat does it live (shallow water along the shoreline, along the bottom of a stream, attached to surfaces, within the photic zone, drifting with the currents, 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

**General:** What does it look like? **How quickly does it grow and how big does it get?** Does anything eat it? Does it produce defensive spines, chemicals, or toxins?

**Plant:** Does it grow close together or spread out? Does it have roots that anchor it to the bottom or does it float on the surface? Is it a fully submerged plant or does it partially emerge from the surface? What do its leaves look like?

**Algae:** Does it grow on the bottom, in floating mats, or is it plankton that drifts with the currents?



## Amazing AIS Adaptations

### Story Planning Sheet – Plant / Algae (cont.)

Student Worksheet (8 of 8)

#### D. ENERGY/FEEDING

**How does it compete with other organisms in the environment for limited sunlight?** How do its leaf and/or growth pattern help it to get as much sunlight as possible? What is its seasonal growth pattern? Does it grow earlier in the season and/or at a faster rate than the organisms? Does it shade other organisms?

#### E. REPRODUCTION

**General:** Does your organism reproduce sexually (with flowers) or asexually (via mitosis, such as fragmentation), or both? When does it reproduce (all year, seasonally)? **How fast does it reproduce?**

**Plant:** Does it produce flowers? If so, what do they look like, how many are produced, and when do they bloom? Does it have traits that attract pollinators? Does it produce seeds? If so, how many?

#### F. DISPERSAL

**How does the organism spread throughout the environment?** If it produces seeds, how do they spread (ex. water currents, attached to bird feathers, eaten and then dropped in feces elsewhere, etc.)? Does it fragment? Does it produce bulbils or vegetative tissue that can pop off and grow? 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 or traits the organism uses for survival. For example, does it form a symbiosis with other organisms, grow on the surface of other organisms, or change its grow pattern during the year? **Be creative and enhance its invasive characteristics!**



FLATHEAD LAKE  
BIO STATION  
UNIVERSITY OF MONTANA

© 2019 AIS Unit created by the Flathead Lake Biological Station and the Flathead Lakers.  
Funded by the Montana Department of Natural Resources and Conservation and FLBS.

