

Build a Bird

See how seemingly silly adaptations actually make perfect sense!

Grade Level: 5-8

Subject Areas:
science, art

Activity Duration:
3 - 40-50 minute sessions

Setting:
Classroom

Group Size:
any size group

Materials:

- copies of “Bird Adaptations Worksheet” (one copy per group);
- copies of Adaptation Artistry cards (one “beak,” “feet,” “legs,” and “coloration” card per group);
- copies of “Key to Adaptations” (one copy per group);
- makers or crayons, paper,
- play dough (optional)

Skills Used:
critical thinking, creativity, group work

Vocabulary:
adaptation

OBJECTIVES

- Students will identify and describe advantages of bird adaptations.
- Students will discuss the importance for bird adaptations in helping the bird survive.
- Students will design and create an imaginary bird and explain how the bird’s adaptations help it survive.

BACKGROUND

If you were to head outside on a snowy winter day, you would not wear your swimsuit. On the other hand, if you were to head outside on a hot summer day, you would not wear your snow suit. You adapt!

Animals adapt, too. Over long periods of time (generations) animals adapt to their environment. A duck that needs to swim to find its food has adapted to having webbed feet. A cardinal which must crack open seeds has adapted a short, round beak like a nutcracker. A crane which walks through shallow water to find its food has adapted long legs.

An **adaptation** is a change that an animal has developed over time to help it survive. There are two kinds of adaptations: physical and behavioral. Physical adaptations are something the animal has that help it survive. Examples include: the crane’s long legs, the cardinal’s short, round beak, the duck’s webbed feet. Behavioral adaptations are something the animal does that helps it survive. Examples include: a duck migrating to a warmer climate for the winter, a cardinal cracking seeds to get to the flesh inside, a crane flying away to escape predators. These physical and behavioral adaptations help the animal survive in its habitat.

In this way, the structure of the bird (its physical characteristics) help the bird

function (behave in a way that helps it survive).

ACTIVITY

1. Begin the activity by asking students what an adaptation is. After several suggestions, explain to students that an adaptation is something an animal has (physical) or does (behavioral) to help it survive. Show students a picture of a Peregrine falcon. Ask students to think of all the physical or behavioral adaptations of a peregrine falcon and how these physical adaptations help the peregrine falcon survive. List the adaptations on the board. The list might include:

- sharp, curved beak for tearing food (physical)
- sharp talons for catching food mid-air (physical)
- aerodynamic wings to fly or dive incredibly fast to catch food (physical)
- nesting on cliffs and high locations to avoid predators (behavioral)
- feathers to help regulate temperature; stay warm in cold weather and cool in hot weather (physical)
- migration to avoid crowded breeding grounds (behavioral)
- diving through the air to catch other birds mid-flight (behavioral)
- eyes for seeing prey (physical)

2. Divide students into pairs. Give each pair of students a bird picture and a “Bird Adaptations Worksheet” to complete.

BACKGROUND, continued

Ask each group to look at their bird and determine the bird's physical and behavioral adaptations and how these adaptations help the bird to survive. Instruct students to complete the "Bird Adaptations Worksheet."

3. After students have had time to complete their worksheet, ask each pair to present their bird and the list of adaptations to the class. Student groups should also explain why they think the adaptation helps the bird survive.
2. Explain to students that they are going to work in pairs to create a new bird. Each group will be given 4 cards to build their bird - a feet card, a beak card, a legs card and a coloration card. Using these cards, groups should design a new bird species. Students can build the bird using markers and paper or play dough.
3. When students are done making their bird, they should discuss where their bird lives, what it eats, how each of the adaptations help it survive, and the bird's name.
4. Offer students the opportunity to share their bird with the group explaining where it live, what it eats, how its adaptations help it survive and the name of their species.

EXTENSIONS

- Head outside to look for birds. Identify adaptations of the birds you find and discuss how these adaptations help the bird survive.
- Ask students to write a story from the perspective of their new bird species.



Photo credit: U.S. Fish and Wildlife Service, Roy Lowe

Peregrine Falcon



Photo credit: Caroline Brighton

Peregrine Falcon



Photo credit: National Parks Service, Diego Johnson

Peregrine Falcon nest



Photo credit: Matti Suopajarvi, Flickr

Peregrine Falcon nest

Bird Adaptations Worksheet

Adaptation	How it Helps	Physical or Behavioral



Photo credit: Pixabay

Bald Eagle

Bald Eagle Adaptations

ANSWERS

Adaptation	How it Helps	Physical or Behavioral
curved beak	good for ripping food into smaller pieces	physical
large, sharp talons	good for catching and killing prey	physical
large wings; long and wide	good for flying long distances and soaring over water when looking for food	physical
eyes; keen eye sight	good for looking for food while flying above	physical
broad tail	helps with balance when flying	physical
soaring	an efficient way to look for food from above, requires little energy because the eagle does not flap its wings.	behavioral
migrating	some eagles migrate to warmer climates in the winter to find non-frozen waters (and thus fish for food).	behavioral
caring for young	ensures young will have a higher chance of survival	behavioral
swallows food whole or in large chunks	while an animal is eating, it is vulnerable to predators. By eating its food quickly, eagles spend less time being vulnerable.	behavioral



Photo credit: Frank Schulenburg

Great Blue Heron

Great Blue Heron Adaptations

ANSWERS

Adaptation	How it Helps	Physical or Behavioral
long, slender beak	good for quickly grabbing prey (like tweezers)	physical
large, broad toes	good for walking on top of mud and grasses; won't sink into the mud	physical
large wings; long and wide	good for flying long distances with less energy	physical
long, slender legs	good for looking for walking through shallow water without getting feathers wet	physical
long neck; specially shaped neck vertebrae	the long neck is necessary for quickly grabbing prey; the special shaped vertebrae mean the heron can curve its neck back when flying to be more aerodynamic.	physical
slowly moving through water; standing still like a statue	an effective way to sneak-up on prey	behavioral
quickly stabbing or nabbing prey	after a heron sneaks-up on its prey, it very quickly grabs its prey with its long, slender neck and beak.	behavioral
nesting in trees	herons often (but not always) nest in trees to ensure predators can not get to the eggs and chicks	behavioral
elaborate courtship behavior	creates a bond between male and female meaning it is more likely they will want to stay together through the breeding season	behavioral



Photo credit: Wallpaper.com

Cardinal (female)

Northern Cardinals Adaptations

ANSWERS

Adaptation	How it Helps	Physical or Behavioral
short, round beak	good for cracking seeds and nuts	physical
small perching feet	good for grabbing on to twigs and branches	physical
short wings	good for navigating in and around shrubs and trees - the cardinals preferred habitat	physical
Bright red feathers for males; brown or grey feathers for females	Males have bright red feathers to attract a mate... the brighter the better! Females have drab brown or grey feathers to help hide them when sitting on the nest.	physical
males defend territory	ensures that there is enough food and resources for the bird, its mate and its young	behavioral
singing and calling	males will sing to attract a mate; they will also make a short "chip-chip" call to defend their territory.	behavioral



Photo credit: Manjith Kainickara

American White Pelican

American White Pelican Adaptations

ANSWERS

Adaptation	How it Helps	Physical or Behavioral
webbed feet	good swimming in lakes and ponds	physical
large, pouch-like beak	good for scooping up fish out of the water	physical
large wings; long and wide	good for flying long distances with less energy	physical
short legs	produce less drag when swimming in the water	physical
fishing for food in groups; herding fish	as a group, many white pelicans will form a line and swim to shore while flapping their wings in the water. This pushes fish towards the shore where they are easier to scoop-up.	behavioral
migrate	pelicans migrate to warmer climates in the winter to find non-frozen waters (and thus fish for food).	behavioral
nest on isolated islands	helps protect young from predators	behavioral
curves neck when flying	a curved position make the pelican more aerodynamic	behavioral



Photo credit: Matt Tillett

Ruby-throated Hummingbird

Ruby-throated Hummingbird Adaptations

ANSWERS

Adaptation	How it Helps	Physical or Behavioral
small body size	allows hummingbirds to get close to small flowers to feed	physical
small, straw-like beak	good for inserting into flowers to drink nectar	physical
long tongue	good for lapping up nectar from flowers through its long, straw-like beak	physical
short, small wings	good for rapid maneuvering around flowers	physical
tiny legs	makes the bird more aerodynamic which is good for quick maneuvering and long migrations	physical
defend territory	ensures there is enough food and resources for the bird	behavioral
migrates	flies to warmer climates in the winter where there will be plenty of flowers throughout the winter to provide nectar.	behavioral
males court females	males will make courting flights to impress females; flights include long dives from as high as 50 ft.	behavioral



Photo credit: Andy Reago and Chrissy McClarren

Red-headed Woodpecker

Red-headed Woodpecker Adaptations

ANSWERS

Adaptation	How it Helps	Physical or Behavioral
strong, pointed beak	perfect for "hammering" at tree bark to find insects to eat.	physical
Zygodactyl feet (two toes pointing forward, two toes pointing backward)	helps birds cling to tree bark and hop up, and down, tree bark looking for insects to eat	physical
straight, long tail feathers	helps birds perch on tree bark, acts like a bike stand to help support weight when climbing to a tree.	physical
long tongue with barbs or hooks on the end	perfect for sticking in holes created by beak to get insects inside, long tongue helps reach insects, hooks help catch insects and pull them out to eat.	physical
building cavity or hole nests in dead branches	provides a warm, safe place for young to grow. Protected from wind, predators and rain.	behavioral
flying	helps protect birds from predators while also allowing them to find food.	behavioral
feathers	helps keep birds warm (and cool). Woodpeckers do not migrate, so good feathers are important to keep warm in the winter months.	physical
bright colors	helps attract a mate	



Photo credit: Bert deTilly

Snowy Owl

Snowy Owl Adaptations

ANSWERS

Adaptation	How it Helps	Physical or Behavioral
curved beak	good for ripping food into smaller pieces	physical
large, sharp talons	good for catching and killing prey	physical
large wings; long and wide	good for flying long distances and soaring over water when looking for food	physical
eyes; keen eye sight	good for looking for food while flying above	physical
broad tail	helps with balance when flying	physical
soaring	an efficient way to look for food from above, requires little energy because the eagle does not flap its wings.	behavioral
migrating	Snowy Owls occasionally migrate to warmer climates in the winter to find food.	behavioral
caring for young	ensures young will have a higher chance of survival	behavioral
swallows food whole or in large chunks	while an animal is eating, it is vulnerable to predators. By eating its food quickly, eagles spend less time being vulnerable.	behavioral



Photo credit: PIXINO

Wild Turkey

Wild Turkey Adaptations

ANSWERS

Adaptation	How it Helps	Physical or Behavioral
camouflaged colored feathers	helps birds hide in both forested and prairie areas to avoid predators.	physical
stout, pointed beak	perfect for pecking at the ground for insects, seeds and small mammals to eat.	physical
strong feet with long toes	perfect for scratching at the ground to find food (insects, seeds) and, for males, sparing (fighting) with other males for dominance.	physical
males: sparing or fighting with other males	helps males gain dominance and impress female birds for the chance to mate.	behavioral
short, stout wings	poor for flying long distances, but perfect for helping a large, heavy bird get off the ground and into trees for roosting/resting. Also perfect for short flights to escape predators.	physical
calling or clucking to communicate	the gobble helps the males impress and attract female birds, helps parents communicate with young, helps birds warn of danger to other birds.	behavioral
eyes	helps birds see predators, food and other turkeys.	physical



Photo credit: Shutterstock

Western Meadowlark

Western Meadowlark Adaptations

ANSWERS

Adaptation	How it Helps	Physical or Behavioral
slender, pointed beak	perfect for poking at the soil to find insects and picking seeds.	physical
yellow, brown and cream color	camouflage for hiding in prairie habitats.	physical
long toes and claws/nails	helps with pecking or scratching at the ground for insects and seeds.	physical
males: sitting on fence posts singing	helps establish a territory and attract a female for mating.	behavioral
short, rounded wings	not good for long flights, but perfect for flushing or quickly flying off the ground to avoid predators.	physical
eyes	help birds see predators, food and other meadowlarks.	physical
does not migrate, remains active throughout winter	because migrating takes a lot of energy, meadowlarks save energy by staying in Nebraska year-round. They remain active throughout winter to stay warm.	



Photo credit: Alain Carpentier

Mallard Duck (male)

Mallard Duck Adaptations

ANSWERS

Adaptation	How it Helps	Physical or Behavioral
webbed feet	perfect for swimming in water; the webbing between each toe helps push water and allow ducks to swim faster.	physical
flat beak with a jagged edge	helps mallards gather aquatic (water) plants and insects. The jagged edge allows water to run out of the beak while keeping the plants and insects inside to eat.	physical
short, stout wings	perfect for strong flying. This helps the bird get into the air from water without having the ground to push off. Also good for migrating long distances.	physical
migrating for the winter	most ducks - including mallards - migrate to warmer areas in the south for the winter months. This allows them to find open/not frozen water to swim in and find food.	behavioral
oily feathers	help repel water off feathers to keep the bird dry. Keeping water off the bird also makes the bird lighter and allows them to fly out of water.	physical
calling or "quacking"	helps bird communicate with other mallards. This allows them to warn of danger, establish a territory and communicate with their young.	behavioral



Photo credit: Frank Schulenburg

Long-billed Curlew

Long-billed Curlew Adaptations

ANSWERS

Adaptation	How it Helps	Physical or Behavioral
long legs	helps the bird wade through shallow water to find food while keeping their body feathers dry.	physical
long, curved beak	perfect for poking and probing in shallow water and mud to find insects to eat. Also works to find insects in grasses like grasshoppers.	physical
spotted feathers	helps camouflage from predators.	physical
migrating for the winter	most water birds - including Long-billed Curlews - migrate to warmer areas in the south for the winter months. This allows them to find open/not frozen water to wade/walk in and find food.	behavioral
feathers	helps keep birds warm (and cool). Woodpeckers do not migrate, so good feathers are important to keep warm in the winter months.	physical
long, slender toes	good for walking on top of mud and grasses; won't sink into the mud	physical
rest with one leg up (like a flamingo)	to provide a rest for one leg, the bird will raise one leg and tuck it under their shoulder. Then, they will switch legs.	behavioral
poking/probing the ground and shallow waters.	allows curlews to find their food - aquatic (water) insects or grassland insects.	behavioral

Adaptation Artistry Key to Adaptations

BEAKS

Adaptation	Example Bird(s)	Advantage of Adaptation
sharp curved	eagle, owl, hawk	helps in tearing food into pieces
short straw-like	hummingbird	helps in sucking nectar from flowers
short round	cardinal, finch	helps cracking seeds and nuts
large pouch	pelican	helps in scooping fish from water

FEET

Adaptation	Example Bird(s)	Advantage of Adaptation
webbed	duck, pelican, goose, swan	good for swimming
long toes	heron, crane	aids in walking on mud
sharp talons	eagle, owl, hawk	good for grabbing and killing prey
grasping	cardinal, finch, chickadee	aids in sitting and roosting on branches

WINGS

Adaptation	Example Bird(s)	Advantage of Adaptation
long, narrow	heron, crane,	good for flying long distances
triangular	falcon, swift, barn swallow	good for quick maneuvering & hunting
long, wide	eagle, hawk, albatross	good for soaring in the sky
short, fat	turkey, grouse,	good for quick take-off and short flights

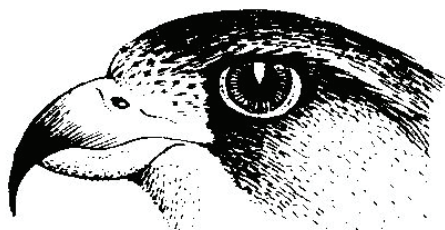
Coloration

Adaptation	Example Bird(s)	Advantage of Adaptation
bright male plumage	male cardinal, male goldfinch	helps male attract a female mate
dull female plumage	female cardinal, female goldfinch	helps female camouflage while nesting
stripes	Barred Owl, Prairie Chicken	helps camouflage in trees & grasses
mottled (spotted)	Great Horned Owl, Northern Flicker	helps camouflage in trees

Adaptation Artistry Adaptation Cards

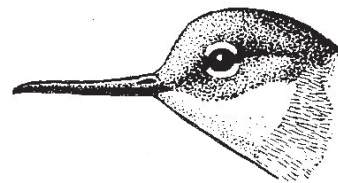
BEAK

sharp, curved



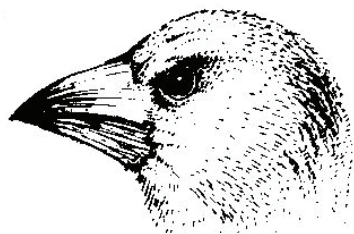
BEAK

short straw-like



BEAK

short, round



BEAK

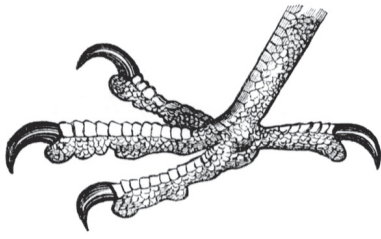
large pouch



Adaptation Cards, continued

FEET

sharp talons



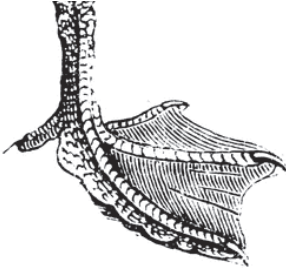
FEET

long toes



FEET

webbed



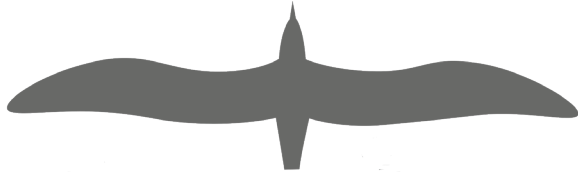
FEET

grasping



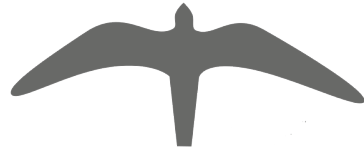
WINGS

long, narrow



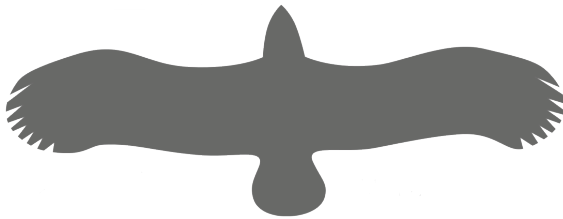
WINGS

triangular



WINGS

long, wide



WINGS

short, fat



COLORATION

bright male



COLORATION

drab female



COLORATION

stripes



COLORATION

mottled (spotted)

