

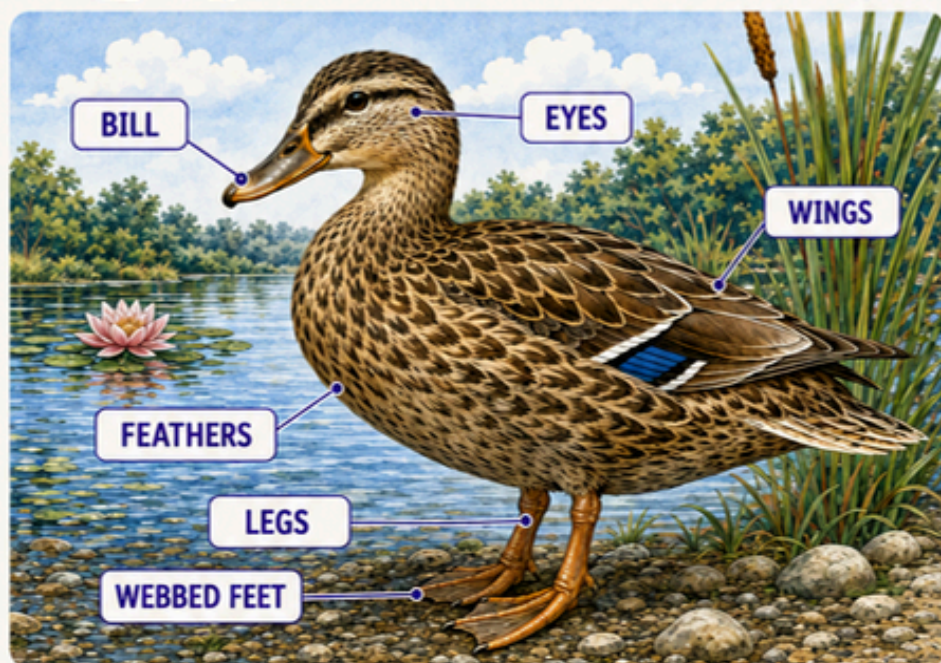


DUCK BODY STRUCTURES

Parts with important jobs

A mallard's external parts work together.

1



1 BILL

A broad bill gathers food.

2 EYES

Eyes help detect surroundings.

3 WINGS

Wings move air.

4 FEATHERS

Feathers protect and help manage water.

5 LEGS

Legs support walking.

6 WEBBED FEET

Webbed feet push water.



PADDLING



FEEDING

VOCABULARY

structure — a body part

function — the job a part helps perform

webbed — joined by skin



EXPLORER MISSION

Read the labels. Complete both sentences. Circle one visible detail that supports each answer.

The duck uses its _____ to _____.

The duck uses its _____ to _____.



THINK LIKE A SCIENTIST

How does the shape of one body part help it do its job?



CAREGIVER/TEACHER NOTE: Ask the child to point to the visible evidence before explaining an answer.



NGSS: BUILDS TOWARD 1-LS1-1 — External structures help animals survive, grow, and meet needs.



COMMON CORE: RI.1.1 — Ask and answer questions about key details; **RI.1.5** — Use text features to locate information.



Big Idea: A mallard's body structures have important functions.



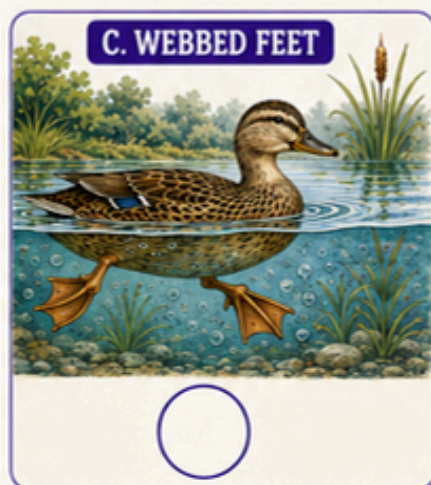
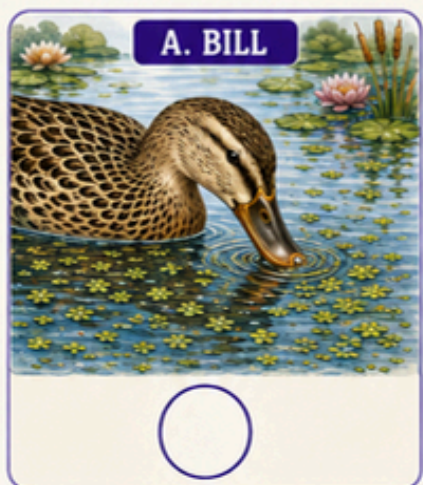


DUCK BODY DESIGN DETECTIVE

2

Learn from a mallard!

People can study animal structures and use similar shapes to solve problems.



pushes water



gathers food

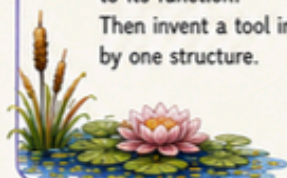


moves air



EXPLORER MISSION

Match each duck structure to its function.
Then invent a tool inspired by one structure.



THINK LIKE AN ENGINEER

How will the shape or feature from the duck help your tool solve the problem?



CAREGIVER/TEACHER NOTE:

Ask the child to explain how the animal structure inspired the design.



K-2-ETS1-2 — Develop a sketch, drawing, or model showing how an object's shape helps it function.



COMMON CORE: W.1.2 — Write an explanatory response;
SL.1.5 — Add drawings or visual displays.

INVENT A DUCK-INSPIRED TOOL

Human problem I want to solve: _____ Duck structure that inspires me: _____

Draw and label your tool.

My tool works because _____



Big Idea: Animal structures can inspire useful designs.





DUCK EGGS

3

— A growing family begins inside. —

A female mallard's behaviors help protect developing ducklings.



- 1 A female lays one egg at a time until the clutch is complete.
- 2 Clutch size varies. Many mallard nests contain about 8–13 eggs.
- 3 The female incubates the eggs, covering them with her body to keep them at a suitable temperature.
- 4 She may cover the nest with down when she briefly leaves. Incubation lasts about four weeks.

FROM LAYING TO HATCHING



EXPLORER MISSION

Study the nest picture. Record one detail you can see. Then make a careful inference.

VISIBLE EVIDENCE: _____

I INFER: _____

BECAUSE: _____



THINK LIKE A SCIENTIST

How might covering the eggs help when the female briefly leaves?



CAREGIVER/TEACHER NOTE:

Ask the child to separate what can be seen from what is inferred.



VOCABULARY

clutch — all the eggs laid for one nesting attempt
incubate — to keep eggs at a suitable temperature as young develop
inference — an idea based on evidence



NGSS: 1-LS1-2 CONNECTION —
Parent behaviors can help offspring survive.



COMMON CORE: RI.1.1 — Use details from text;
RI.1.3 — Describe connections between ideas or events.



Big Idea: A female mallard's behaviors help developing ducklings survive.





EGG INVESTIGATION

4

Count, compare, and explain.

Different nests can contain different numbers of eggs.

NEST A



My count: _____

NEST B



My count: _____

NEST C



My count: _____



EXPLORER MISSION

Count and record the eggs in each nest. Use the totals to solve the challenges.



MATH CHALLENGES

1 EQUATION 1

Use two nests to write an addition or subtraction equation.

_____ = _____

2 EQUATION 2

Write a different addition or subtraction equation.

_____ = _____

3 COMPARE

Nest _____ has _____ more eggs than Nest _____.

4 ORDER

Write the nest letters from least to greatest.

_____, _____, _____



THINK LIKE A SCIENTIST

What pattern do you notice when you compare the three totals?



CAREGIVER/TEACHER NOTE:

Encourage the child to touch or point to each egg once while counting, then explain how the totals support an answer.



VOCABULARY

compare — to look for how quantities are alike or different

total — the whole amount

difference — how many more or fewer



NGSS: SCIENCE PRACTICE CONNECTION —
Analyze observations.



CROSSCUTTING CONCEPT: PATTERNS —
Use patterns in observations as evidence.



COMMON CORE: 1.OA.A.1; 1.OA.C.6 —
Solve addition and subtraction situations and add or subtract within 20.



Big Idea: Scientists use numbers to compare observations.



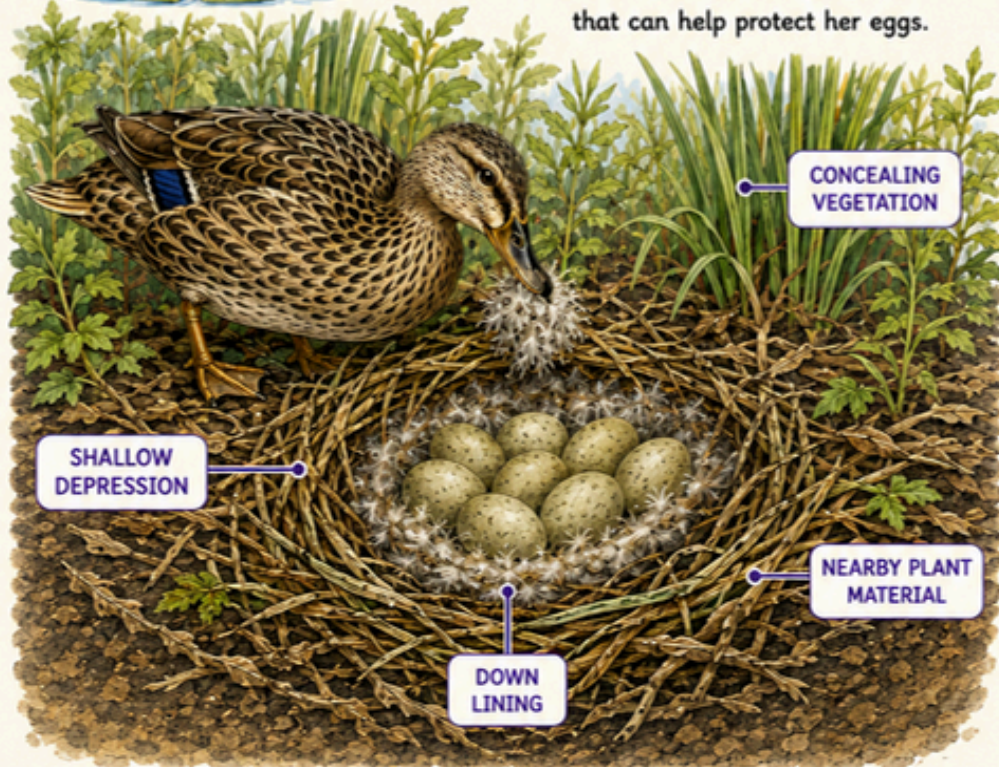


MALLARD NESTS

5

Hidden, warm, and protected.

A female mallard chooses a place and materials that can help protect her eggs.



- 1 The female chooses a concealed site on the ground.
- 2 She forms a shallow depression that helps hold the eggs together.
- 3 She gathers grasses, leaves, and other nearby plant material.
- 4 She adds down from her body. The materials cushion the eggs, retain warmth, and make the nest less noticeable.

EXPLORER MISSION

Read the evidence labels. Choose two nest features. Explain how each may help protect eggs or developing young.

Feature 1: _____

How it helps: _____

Feature 2: _____

How it helps: _____

THINK LIKE A SCIENTIST

Why might using materials from nearby help conceal the nest?



CAREGIVER/TEACHER NOTE

Encourage more than one reasonable answer when the child supports it with visible evidence.



VOCABULARY

conceal — to hide or make less noticeable

cushion — to soften and protect from pressure

lining — material that covers the inside of something



NGSS: 1-LS1-2 CONNECTION —
Parent behaviors can help offspring survive.



COMMON CORE: RI.1.1; RI.1.3 —
Use details from text and describe connections between ideas or events.



Big Idea: A nest's place and materials help protect developing young.





NEST ENGINEER

6

Design a safe place for eggs.

Choose materials. Draw two views of your nest.

Explain how your design protects eggs.



EXPLORER MISSION

Select materials, draw and label a top view and a side view, explain your choices, and tell how you could test your design.

☐ DRY GRASS



☐ LEAVES



☐ DOWN /
SOFT FIBER



☐ TWIGS



☐ MUD



☐ SMOOTH
PEBBLES



TOP-VIEW PLAN

Draw and label what the nest looks like from above.

SIDE-VIEW PLAN

Draw and label how the nest is shaped from the side.

I chose _____ because _____.

My nest protects eggs by _____.

I could test my design by _____.

THINK LIKE AN ENGINEER

How will the shape and materials work together to protect the eggs?



CAREGIVER/TEACHER NOTE

Ask the child to explain each design choice and describe a fair way to test the model.

VOCABULARY

engineer — a person who designs solutions
model — something made to show an idea
test — to try something and observe what happens



NGSS: K-2-ETS1-2 —
Develop a sketch, drawing, or
model to show how shape helps
something work.



NGSS: 1-LS1-2 CONNECTION —
Parent behaviors can help
offspring survive.



COMMON CORE: W.1.2; SL.1.5 —
Explain ideas and add drawings
or visual displays.



Big Idea: Engineers use evidence to design and test solutions.





HATCHING

A gradual journey out.

Hatching is a sequence of changes that takes effort and time.

7



TEMPORARY EGG TOOTH



A tiny temporary point helps make the first crack.

- 1 Near the end of incubation, the duckling makes the first crack, called a pip.
- 2 The duckling may rest, then works gradually around the shell.
- 3 It pushes free after effort and time.
- 4 A newly hatched duckling is wet. Its down becomes fluffy as it dries.

EXPLORER MISSION

Use the word bank. Write one event word beneath each picture. Then complete the cause-and-effect sentence.

WORD BANK

PUSH

PIP

DRY

REST



THINK LIKE A SCIENTIST

Why does the opening become larger?

The opening becomes larger because

CAREGIVER/TEACHER NOTE

Encourage the child to use details from the pictures and text when explaining the sequence.

VOCABULARY

pip — the first small crack in an eggshell
egg tooth — a temporary point that helps a duckling crack the shell
emerge — to come out



NGSS: SCIENCE PRACTICE CONNECTION —
Observe patterns of change.



COMMON CORE: RI.1.3; W.1.2 —
Describe connections between events
and write an explanatory response.



Big Idea: Hatching happens through a sequence of small changes.



Pond Explorers
Deeper Discoveries

HATCHING SEQUENCE — INVESTIGATION —

8

Put the evidence in order.

Scientists use visible clues to place changes in order.

EXPLORER MISSION

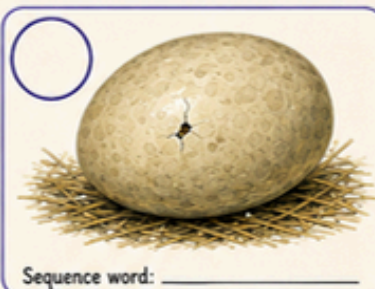
Study the five cards. Number the stages 1–5.
Write a sequence word beside each stage.

SEQUENCE WORDS

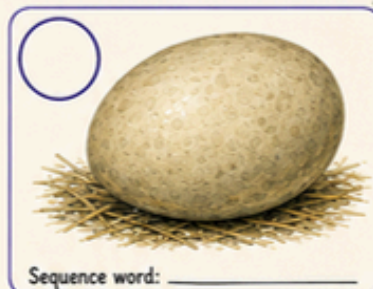
first • next • then • after that • finally



Sequence word: _____



Sequence word: _____



Sequence word: _____



Sequence word: _____



Sequence word: _____

DRAW A MISSING TRANSITION CLUE

Draw one small change that could happen between two stages.

EXPLAIN YOUR EVIDENCE

My clue belongs between stages _____ and _____
because _____

THINK LIKE A SCIENTIST

What visible clue helped you decide which stage came first?

CAREGIVER/TEACHER NOTE

Ask the child to explain the order using changes in the shell opening and the duckling's position.

VOCABULARY

sequence — events arranged in order
stage — one part of a process
transition — a change from one stage to another



NGSS: SCIENCE PRACTICE CONNECTION —
Construct a sequence from observable evidence.



COMMON CORE: RI.1.3; W.1.2 —
Describe connections between events and explain evidence in writing.



Big Idea: Visible changes provide evidence about sequence.

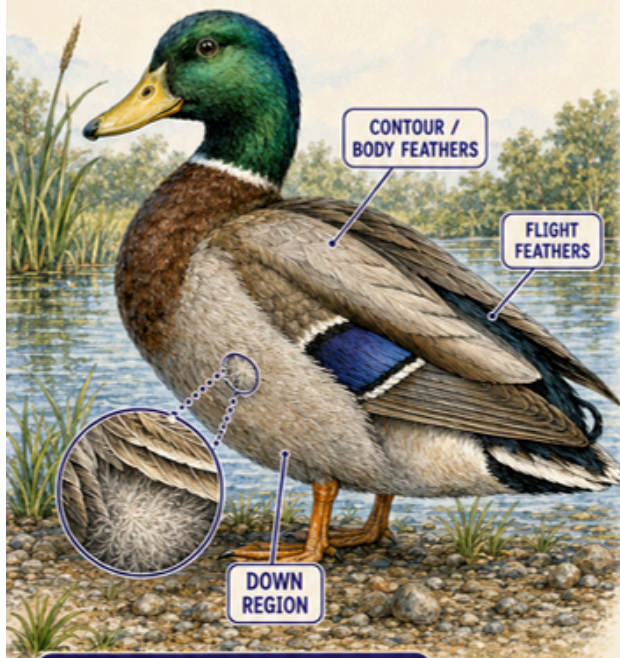


FEATHERS

9

— Different structures, different jobs. —

Mallards have several feather types that work together.



1 DOWN



2 CONTOUR / BODY FEATHER



3 FLIGHT FEATHER



4 INTERLOCKING STRUCTURE

FACTS

- 1 Soft down traps air and insulates.
- 2 Contour or body feathers cover and shape the body.
- 3 Strong flight feathers help control movement through air.
- 4 Tiny interlocking structures help form a smooth feather surface.
- 5 Feather structure, overlapping layers, preening, and oils work together to help resist water.

EXPLORER MISSION

Use the pictures and facts to complete the chart. Record one visible trait and one function for each feather type.

FEATHER TYPE	VISIBLE TRAIT	FUNCTION
Down		
Contour / body feather		
Flight feather		

THINK LIKE A SCIENTIST

The _____ feather has _____, which helps it _____.

CAREGIVER/TEACHER NOTE

Ask the child to point to visible feather evidence before explaining its function.



VOCABULARY

down — soft feathers that trap air
 contour feather — an outer feather that covers and shapes the body
 flight feather — a strong feather on the wing or tail
 preen — to clean and realign feathers with the bill



NGSS: BUILDS TOWARD 1-LS1-1 — Structures have functions that help animals survive and meet needs.



COMMON CORE: RI.1.1; RI.1.5 — Use key details and text features to locate information.



Big Idea: Feather structures help mallards stay warm, protected, and able to move.



FEATHER FUNCTION LAB 10

— Observe, test, and design. —

Different feather structures perform different jobs.
Models can help us test ideas.

A. DOWN



Visible clue: _____

B. CONTOUR / BODY FEATHER



Visible clue: _____

C. FLIGHT FEATHER



Visible clue: _____

MATCH THE FUNCTION



FLIGHT CONTROL



INSULATION



BODY COVERING /
WATER SHEDDING



EXPLORER MISSION

Match each feather type to a function.
Record one visible clue that supports
each match.

Predict, test, record, and design.

WATER-DROP MODEL TEST

Use two clean classroom craft materials or paper models.
Do not collect or use wild bird feathers.
Ask an adult to help with water.

MODEL A



MODEL B



Prediction: Model _____ will shed the drop better
because _____

MODEL	WHAT HAPPENED TO THE DROP?
A	_____
B	_____

Which model shed the drop better? _____

Evidence: _____

FEATHER-INSPIRED COVERING

Draw a lightweight covering inspired by feather structure.
Label how it traps air, overlaps, or sheds drops.

My design uses _____.

It works because _____.

THINK LIKE AN ENGINEER

What feather property will your design mimic?

CAREGIVER/TEACHER NOTE

Use only clean classroom craft materials.
Ask the child to connect test evidence
with the final design.

VOCABULARY

property — a quality that can be observed
overlap — to cover part of another layer
insulate — to slow the movement of heat



NGSS: 1-LS1-1 / K-2-ETS1-3 CONNECTIONS —
Use structure evidence and test results
to improve a design.



COMMON CORE: W.1.2; SL.1.5 —
Write an explanation and
add a labeled drawing.



Big Idea: Observations and tests can guide a feather-inspired design.



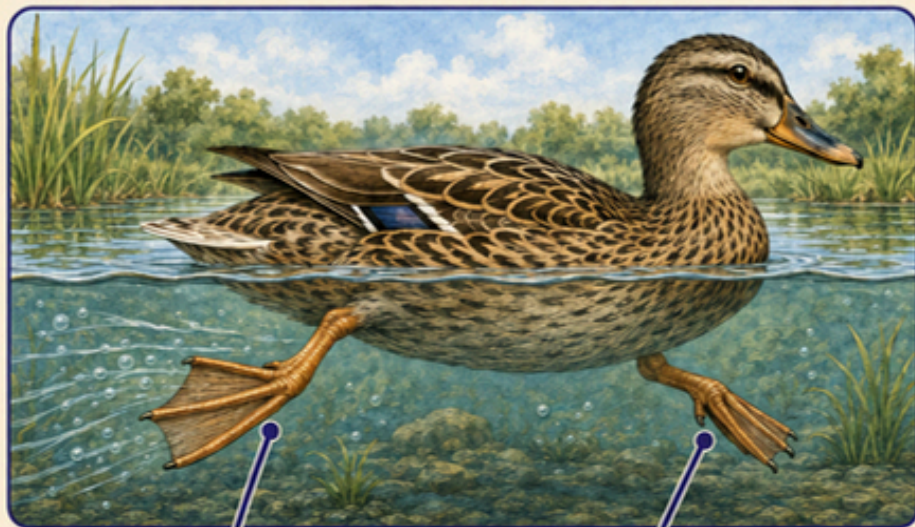
Pond Explorers
Deeper Discoveries

WEBBED FEET

— Built for pushing water. —

11

A mallard's foot changes shape during each swimming stroke.



RECOVERY STROKE

POWER STROKE

- 1 A mallard's three forward toes are joined by skin called webbing.
- 2 During the backward push, the toes spread and the broad foot moves water.
- 3 As the foot moves forward, it can fold or turn narrower to reduce resistance.



Stroke: _____



Stroke: _____



EXPLORER MISSION

Use the word bank to label the two stroke insets.
Then explain how foot shape helps the mallard swim.

The wide foot helps because _____.



THINK LIKE A SCIENTIST

Why might the foot become narrower
as it moves forward?

_____.

CAREGIVER/TEACHER NOTE

Ask the child to compare the two foot shapes
and point to visible evidence before explaining.

VOCABULARY

webbing — skin joining the forward toes
power stroke — the backward push that moves water
recovery stroke — the forward return of the foot
resistance — a force that slows movement



NGSS: BUILDS TOWARD 1-LS1-1 —
External structures have functions that
help animals move and survive.



COMMON CORE: RI.1.1; RI.1.7 —
Use text details and illustrations
to explain ideas.



Big Idea: A webbed foot changes shape during swimming.

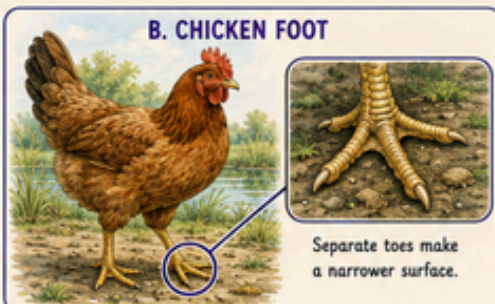


PADDLE DESIGN CHALLENGE

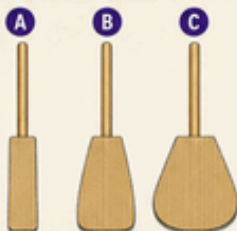
— Test, compare, and improve. —

12

Surface area affects how much water a paddle can push.



PREDICT AND TEST



Predict: Which paddle will push the most water?



With an adult, test the three models in a tub of water. Use the same motion each time.

Adult supervision is required around water.

	Tally marks	What happened?
Paddle A		
Paddle B		
Paddle C		

MY REVISED PADDLE

Draw and label your improved paddle.

Change I made: _____ My design should push more water because _____

EXPLORER MISSION

Compare the foot shapes. Predict, test, record results, and improve a paddle design.

CAREGIVER/TEACHER NOTE

Provide three safe cardboard or plastic paddle models. Keep the material and motion the same so blade surface area is the main difference. Supervise all water testing.

THINK LIKE AN ENGINEER

How did the test results help you change your design? _____

VOCABULARY

surface area — the amount of outside space a shape covers
paddle — a tool used to push against water
result — what happened during a test



NGSS CONNECTION — 1-LS1-1
 Design a solution to a human problem by mimicking an animal's external part.



K-2-ETS1-3 CONNECTION
 Compare test results.



COMMON CORE CONNECTION — W.1.2 AND 1.MD.C.4
 Explain using facts; organize and represent data with up to three categories.

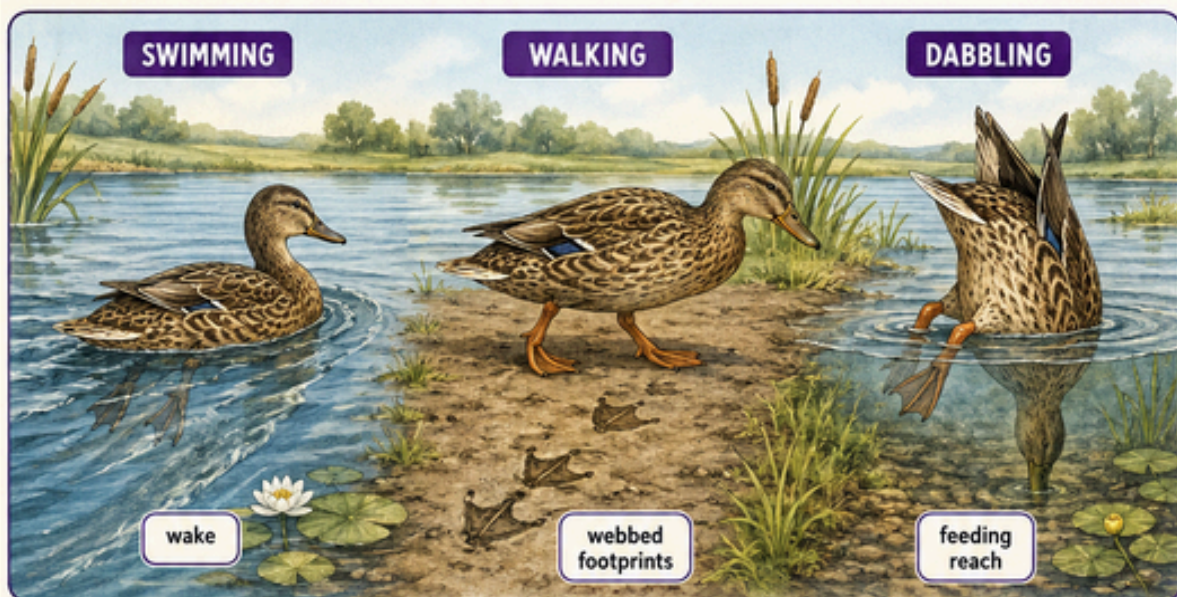


Big Idea: A broader surface can push more water, and test results help engineers improve designs.

SWIMMING, WALKING, AND DABBLING 13

Three ways a mallard moves.

Mallards use body structures in different ways to swim, walk, and find food.



SWIMMING

Webbed feet push water backward. The body moves forward and leaves a wake.

WALKING

Legs take alternating steps. Wide feet support the mallard on soft ground.

DABBLING

The mallard tips tail-up and reaches with its bill for food in shallow water.

★ Dabbling is surface feeding—not deep diving.

COMPARE THE MOVEMENTS

	SWIMMING	WALKING	DABBLING
POSTURE			
FOOT POSITION			
ENVIRONMENTAL CLUE			



EXPLORER MISSION:

Study each mallard. Use the panorama to complete the comparison strip.



OBSERVE CLOSELY:

What changes about the feet, legs, bill, and posture?



THINK LIKE A SCIENTIST:

Which visible clue best shows how one mallard is moving? Explain why.



CAREGIVER/TEACHER NOTE:

Ask the child to name a visible clue before explaining each movement. Accept evidence from posture, water, or tracks.



EXPLORER VOCABULARY:

dabble — to tip forward and feed in shallow water • wake — a trail of moving water behind a swimmer • posture — the way a body is positioned



NGSS CONNECTION — BUILDS TOWARD 1-LS1-1

External structures support different movements and needs.



COMMON CORE ELA CONNECTION — RI.1.3 AND RI.1.7

Describe connections between ideas; use visual details to demonstrate understanding.



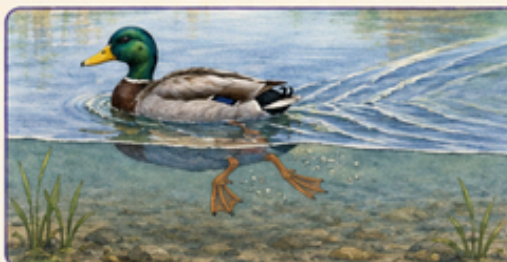
Big Idea: Mallards change how they use their structures and posture for different movements.

DUCK MOVEMENT DETECTIVE 14

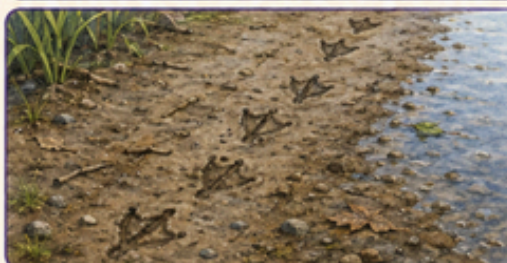
Scientists **infer** what happened by connecting several observations.



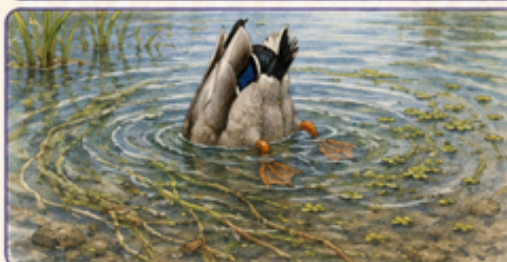
DIRECTIONS: Study each mystery scene. Name the movement, record two clues, and explain your inference.



MOVEMENT: _____
CLUE 1: _____
CLUE 2: _____
 I infer _____
 because _____
 and _____.



MOVEMENT: _____
CLUE 1: _____
CLUE 2: _____
 I infer _____
 because _____
 and _____.



MOVEMENT: _____
CLUE 1: _____
CLUE 2: _____
 I infer _____
 because _____
 and _____.



MOVE LIKE A MALLARD!

Choose one movement. Act it out.
 What clues would a partner notice?



VOCABULARY:

infer • clue • evidence

NGSS: SCIENCE PRACTICE CONNECTION — Construct an explanation from observations.

CROSSCUTTING CONCEPT — Cause and effect.

COMMON CORE: W.1.2 — Write an informative explanation; SL.1.4 — Describe with relevant details.

POND HABITAT

15

Resources mallards need.

A habitat is the place where an animal lives.

A suitable pond habitat provides resources mallards need: water, food, shelter, and space.

Mallards use open water for swimming and escape. They use shallow water and mud to find food. Seeds, plants, and small aquatic animals can provide food. Reeds and shoreline plants can provide cover and nesting places.

The parts of a habitat work together as a system.



WATER

Mallards drink water and use pond water for swimming and feeding.

FOOD

Mallards can eat seeds, plant material, and small aquatic animals.

SHELTER

Dense plants can provide cover and help conceal nests and young.

SPACE

Mallards need room to swim, feed, rest, and move.

NEED	RESOURCE	POND LOCATION
Water		
Food		
Shelter		
Space		

One habitat relationship is _____
because _____.

EXPLORER MISSION:

Use the pond picture and information cards to connect each mallard need to a resource and a pond location.

THINK LIKE A SCIENTIST:

Why might a pond with many different resources support more animal needs?

CAREGIVER/TEACHER NOTE:

Encourage the child to support each relationship with visible evidence from the pond scene.

VOCABULARY:

habitat — the place where an animal lives
resource — something a living thing needs
shelter — a protected place
system — parts that interact or work together

NGSS CONNECTION — K-ESS3-1

Use a model to represent relationships between animals' needs and the places they live.

COMMON CORE ELA CONNECTION — RI.1.1 AND RI.1.3

Ask and answer questions about key details; describe connections between ideas.

Big Idea: A pond habitat provides connected resources that help mallards live and grow.

POND RELATIONSHIP MODEL

16

A scientific **model** can show relationships, not just objects.

Directions: Build a model. Draw and label arrows to connect at least four mallard needs to resources and places.



WATER



SEEDS & PLANTS



**AQUATIC
INVERTEBRATES**



OPEN WATER



REEDS & COVER



NESTING AREA



ADULT MALLARD



DUCKLINGS



CHANGE THE MODEL

Imagine one resource is removed.

Resource removed: _____

I predict _____

because _____

★ Label each relationship you show.



VOCABULARY: model • relationship • predict

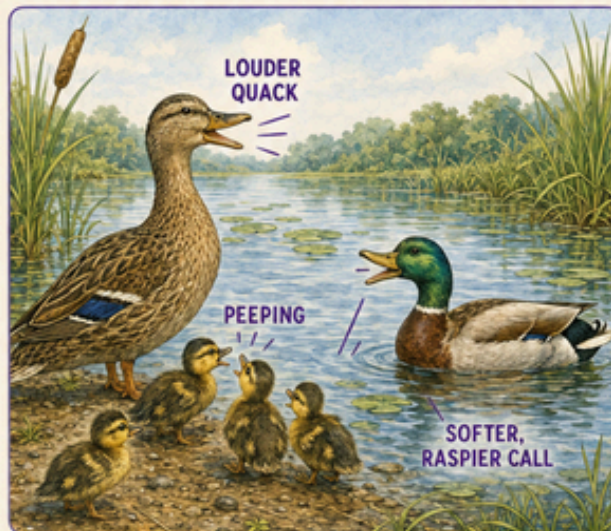


NGSS: K-ESS3-1 — Use a model to represent relationships between animals' needs and where they live.

COMMON CORE: SL.1.5 — Add drawings or visual displays; **W.1.2** — Write an explanatory response.

DUCK SOUNDS AND SIGNALS 17

- Female mallards often make the familiar loud quack.
- Adult males usually make softer, raspier calls.
- Ducklings make peeping calls.
- Mallards also communicate through posture and movement.
- To infer a signal's possible function, **observe** who signals, what happens, and the **surrounding situation**.



★ Observe the scene.

Look at who is signaling, what they are doing, and what others do.

Record three different contexts you notice.



CONTEXT 1 — Sender: _____ Signal: _____

Observable response: _____

CONTEXT 2 — Sender: _____ Signal: _____

Observable response: _____

CONTEXT 3 — Sender: _____ Signal: _____

Observable response: _____

★ This signal may mean _____
My evidence is _____

VOCABULARY: signal • context • response



NGSS: 1-LS1-2 CONNECTION — Use text/media to identify patterns in parent and offspring behaviors;

LS1.D CONNECTION — Information processing.

COMMON CORE: RI.1.3 — Describe connections between events or ideas; SL.1.4 — Describe with relevant details.

COMMUNICATION EVIDENCE CHALLENGE

18

Scientists compare signal and situation before proposing an explanation.

DIRECTIONS: Study each scene. Match one possible function to each scene. Record two pieces of evidence for every choice.



Possible function: _____
Evidence 1: _____
Evidence 2: _____



Possible function: _____
Evidence 1: _____
Evidence 2: _____

**MAINTAIN
CONTACT**

**STAY
TOGETHER**



Possible function: _____
Evidence 1: _____
Evidence 2: _____



Possible function: _____
Evidence 1: _____
Evidence 2: _____

**LOCATE
ONE
ANOTHER**

**WARN OF
POSSIBLE
DANGER**

THINK AGAIN



Another explanation could be _____.

Evidence that could support it: _____.

VOCABULARY: possible • function • alternate

NGSS: 1-LS1-2 — Determine patterns in parent and offspring behaviors that help offspring survive.

SCIENCE PRACTICE — Construct explanations from evidence.

COMMON CORE: W.1.2 — Supply facts to explain; SL.1.1 — Build on others' ideas in discussion.



MALE AND FEMALE MALLARDS

19

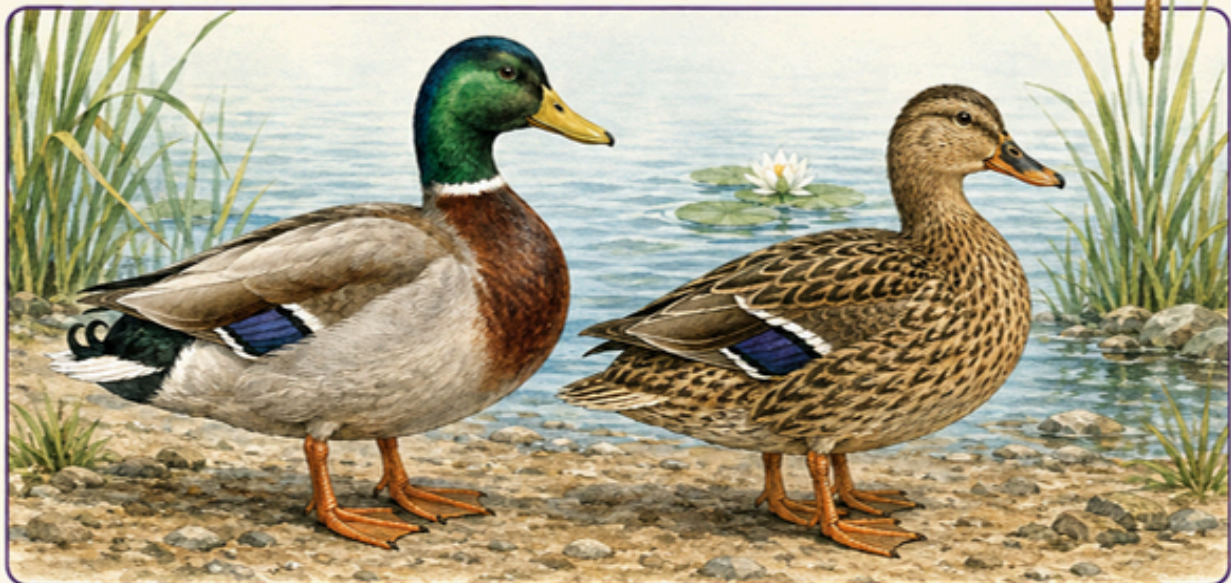
MALE — an adult male duck

FEMALE — an adult female duck

Adult male and female mallards share the same basic body structures. They also usually share a blue-violet wing patch.

In breeding plumage, the male usually has a glossy green head, white neck ring, chestnut breast, gray body, and yellowish bill.

The female has mottled brown plumage and an orange-and-dark bill.



ECLIPSE PLUMAGE

After breeding, an adult male's feathers change. For a time, he looks browner and more like a female.



SAME AND DIFFERENT

SAME — Shared trait 1: _____

Shared trait 2: _____

DIFFERENT — Trait 1: _____

Trait 2: _____

I know the mallards are alike/different because _____

VOCABULARY: male • female • breeding plumage • eclipse plumage

NGSS: BUILDS TOWARD 1-LS3-1 — Individuals of the same kind share traits and can vary.

COMMON CORE: RI.1.3 — Describe connections between ideas; **RI.1.7** — Use illustrations and details.



Big Idea: Male and female mallards share structures but can have different visible traits.

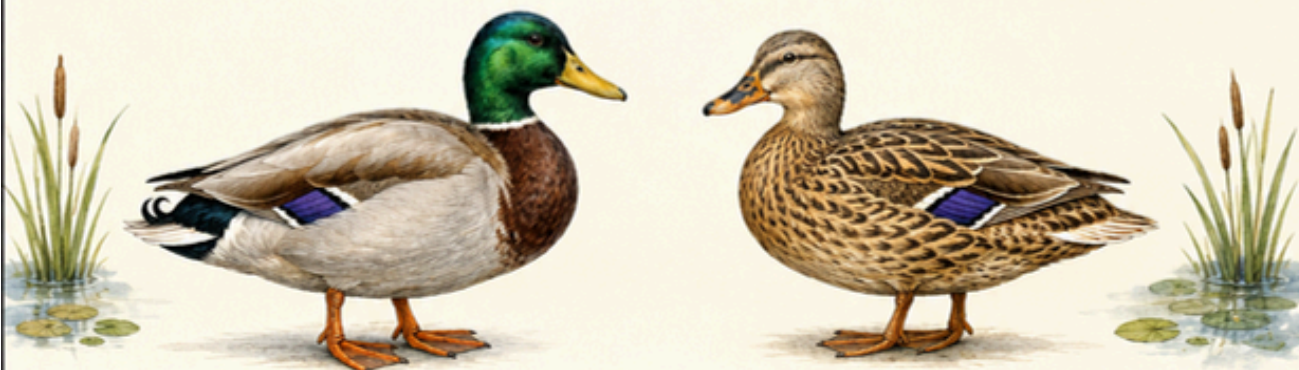


MALLARD EVIDENCE CHALLENGE

20

Classification decisions should be supported by visible evidence.

DIRECTIONS: Study the two adult mallards. Sort each trait into Male, Female, or Both. Then explain two choices with visible evidence.



MALE

FEMALE

BOTH

WEBBED FEET



GREEN BREEDING HEAD



WINGS



ORANGE-AND-DARK BILL



YELLOWISH BILL



BLUE-VIOLET WING PATCH



MOTTLED BROWN BODY



BROAD BILL



JUSTIFY TWO CLASSIFICATIONS

Choice 1: I classified _____ as _____
because I observe _____.

Choice 2: I classified _____ as _____
because I observe _____.

One trait that can change with season is _____.

THINK LIKE A SCIENTIST:

Why should a scientist use more than one visible trait when classifying an animal?

CAREGIVER/TEACHER NOTE:

Ask the child to point to visible evidence before explaining a classification. Remind the child that shared structures belong in Both.

VOCABULARY:

classify — to arrange by shared characteristics
trait — a characteristic that can be observed
shared — belonging to both
vary — to be different

NGSS: BUILDS TOWARD 1-LS3-1 — Observe similarities and variation within the same kind of animal.

SCIENCE PRACTICE — Classify using evidence.

COMMON CORE: W.1.8 — Gather information from provided sources; SL.1.1 — Participate in collaborative discussion.

Big Idea: Scientists classify mallards by comparing several visible traits.

GROWING AND CHANGING 21

Young mallards resemble adults in some structures: bills, wings, legs, and webbed feet.

They differ in size, proportions, down covering, and developing flight feathers.

Ducklings can walk and swim soon after hatching, but they still rely on the female for warmth, guidance, and protection.

As mallards grow, juvenile feathers replace down. Later, adult plumage develops.

Ducklings depend on an adult female for warmth, guidance, and protection.



1 —
NEWLY HATCHED
DUCKLING



2 —
GROWING
DUCKLING



3 —
FEATHERED
JUVENILE



4 —
ADULT
FEMALE



ADULT MALE COMPARISON

The adult male is shown for comparison. Young mallards are not identified as male or female by green or brown adult plumage.

EVIDENCE FROM THE PICTURES

One way a young mallard resembles a possible adult parent is _____.

One difference I observe is _____.

One trait that changes during growth is _____.



VOCABULARY: juvenile • resemble • develop



NGSS: 1-LS3-1 — Make observations to construct an evidence-based account that young animals are like, but not exactly like, parents.

COMMON CORE: RI.1.3 — Describe connections and sequence; W.1.8 — Gather information to answer a question.



Pond Explorers —
Deeper Discoveries

GROWING-UP EVIDENCE DETECTIVE

22

Use visible clues to put the stages in order.

Directions: Study mystery cards A–E. Number the stages from youngest to oldest. Then explain your evidence.

A	B	C	D	E

ADULT MALE COMPARISON



Use the adult male only for comparison. Young mallards are not identified as male or female by adult plumage.

NEIGHBORING-STAGE CLUE

I placed Card ____ next to Card ____.

One visible clue is _____.



CLAIM • EVIDENCE • REASONING

CLAIM: The order from youngest to oldest is _____.

EVIDENCE: I observed _____.

REASONING: This evidence shows growth because _____.



THINK LIKE A SCIENTIST

Which visible trait changes most across the five stages?



CAREGIVER/TEACHER NOTE

Ask the child to compare neighboring stages using size, proportions, down, and developing feathers.



VOCABULARY: sequence • juvenile • evidence • reasoning

NGSS: 1-LS3-1 — Make observations to construct an evidence-based account that young animals are like, but not exactly like, their parents.

COMMON CORE: W.1.2 — Write an informative explanation; **W.1.8** — Recall and gather information to answer a question.



Big Idea: Visible traits provide evidence of how mallards grow and change.



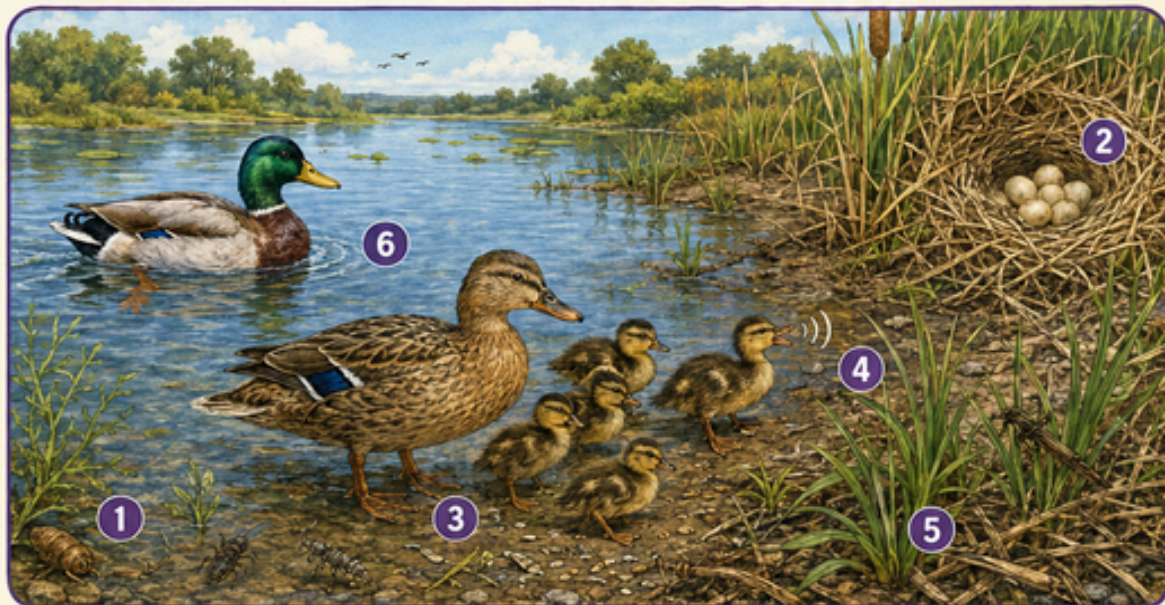


ALL ABOUT MALLARDS

23

Many parts of mallard life work together.

Mallards **survive** because structures, behaviors, growth, communication, and habitat resources work together.



1 STRUCTURES PERFORM FUNCTIONS — Bills gather food, feathers protect, and webbed feet help mallards move.

2 FEMALES NEST AND INCUBATE — A female builds a concealed ground nest and keeps developing eggs warm.

3 DUCKLINGS HATCH AND GROW — Young have down and small proportions; feathers and adult traits develop over time.

4 MALLARDS COMMUNICATE — Adults and young use sounds, posture, movement, and context.

5 HABITATS PROVIDE RESOURCES — Water, food, shelter, and space help mallards meet their needs.

6 MALLARDS SHARE AND VARY — Mallards share basic structures but can differ in age, size, sex-linked adult plumage, and individual traits.

MY MALLARD CONCEPT WEB

Directions: Read each synthesis idea. Find matching evidence in the panorama. Record one word or short phrase for every category.

STRUCTURES: _____

GROWTH: _____

HABITAT: _____

MALLARDS

NESTING: _____

COMMUNICATION: _____

VARIATION: _____

THINK LIKE A SCIENTIST

Which two ideas are most closely connected? Explain.

CAREGIVER/TEACHER NOTE

Ask the child to point to panorama evidence before completing each part of the concept web.



VOCABULARY

survive — to stay alive
behavior — something an animal does
resource — something a living thing uses to meet a need
variation — a difference among living things of the same kind



NGSS: CUMULATIVE NGSS CONNECTIONS — 1-LS1-1, 1-LS1-2, 1-LS3-1, and K-ESS3-1.

This synthesis page connects ideas; it does not independently fulfill every performance expectation.

COMMON CORE: RI.1.2 — Identify the main topic and retell key details; **RI.1.7** — Use illustrations and details.



Big Idea: Mallard structures, behaviors, growth, communication, variation, and habitat resources work together.



POND EXPLORERS
— Deeper Discoveries —

POND EXPLORER EXPERT CHALLENGE

24

Use the pond scene as evidence. Complete all five missions!



MISSION 1 — FIND AND MARK 12 TARGETS



ADULT MALE

☐


ADULT FEMALE

☐


DUCKLINGS

☐


NEST & EGGS

☐


SWIMMER

☐


WEBBED TRACKS

☐


DABBLER

☐


WING PATCH

☐


COMMUNICATION CLUE

☐


FOOD

☐


SHELTER

☐


OPEN WATER

☐

MISSION 2 — CLASSIFY

Choose four structures or traits from the scene.
Write Male, Female, or Both.

Trait: _____ Class: _____

Trait: _____ Class: _____

Trait: _____ Class: _____

Trait: _____ Class: _____

MISSION 3 — POND MATH

There are 7 ducklings near the reeds.
4 more swim over. How many ducklings are there now?

Equation: $\underline{\quad} + \underline{\quad} = \underline{\quad}$

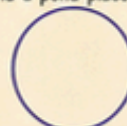
Answer: _____ ducklings

MISSION 4 — MODEL A RELATIONSHIP

Show how one mallard need connects to a resource and a pond place.



NEED



RESOURCE



PLACE

MISSION 5 — EXPLAIN WITH EVIDENCE

A structure helps a mallard because _____.

A young and adult mallard are alike/different because _____.

My strongest evidence was _____.



VOCABULARY: investigate • classify • model • explain



NGSS: CUMULATIVE APPLICATION — Connections to 1-LS1-1, 1-LS1-2, 1-LS3-1, and K-ESS3-1 through distinct missions.

COMMON CORE: RI.1.1 — Answer questions about details; W.1.2 — Explain using facts;
1.OA.A.1 — Solve addition and subtraction situations within 20; SL.1.1 — Discuss evidence.

Big Idea: Pond explorers observe, classify, model, calculate, and explain with evidence.