🦅 Lesson Plan: Birds and Mammals

Grade Level: 6
Subject: Life Science
Duration: 45–60
NGSS MS-LS1-1: Conduct an investigation to provide evidence that living things are made of cells; either one cell or many different numbers and types of cells.

🎯 Learning Objectives

By the end of this lesson, students will be able to:

- **Identify** the unique characteristics that distinguish birds from mammals.
- **Describe** the adaptations of birds and mammals for flight, feeding, and survival in different environments.

- **Down feather:** A soft, fluffy feather found next to a bird's skin that traps air and insulates the bird to keep it warm.
- **Gizzard:** The muscular part of a bird's stomach that squeezes and grinds down food, making up for the lack of teeth.
- **Placental mammal:** A mammal whose young develop completely inside the mother's body, receiving nutrients through an organ called the placenta.
- **Marsupial:** A mammal that is born at an early stage of development and usually continues development in a pouch on the mother's body.

💼 Materials Needed: (all links are included in this PDF)

- Printed copies of the Study Guide (https://newpathworksheets.com/api/guide/study-guide-science-grade-6-birds-and-mammals-1.pdf)
- Activity Lesson handouts (https://newpathworksheets.com/api/activity-lesson/activity-lesson-science-grade-6-birds-and-mammals-1-birds-mammals-4.pdf)
- Worksheet 0 (assessment) (https://newpathworksheets.com/api/worksheet/worksheet-science-grade-6-birds-and-mammals-1-0.pdf)
- Worksheet 1 (practice) (https://newpathworksheets.com/api/worksheet/worksheet-science-grade-6-birds-and-mammals-1-1.pdf)
- Vocabulary matching worksheet (https://newpathworksheets.com/api/vocabulary/vocabulary-science-grade-6-birds-and-mammals-1-1.pdf)
- Feather samples (contour and down feathers if available)
- Mammal fur or hair samples (rabbit fur, cat hair, or similar)
- Bird skeleton diagram or model

- Use the Study Guide to explain bird characteristics: feathers, beaks, four-chambered hearts, hollow bones, and air sacs for efficient oxygen intake. (https://newpathworksheets.com/api/guide/study-guide-science-grade-6-birds-and-mammals-1.pdf)
- Pass around contour and down feather samples so students can feel the difference in texture and understand insulation versus flight structure.
- Explain mammal characteristics: fur or hair, mammary glands, diverse teeth types (incisors, canines, premolars, molars), and live birth in most species. (https://newpathworksheets.com/api/guide/study-guide-science-grade-6-birds-and-mammals-1.pdf)

- Discuss the three groups of mammals (monotremes, marsupials, placental mammals) using examples from the Study Guide. (https://newpathworksheets.com/api/guide/study-guide-science-grade-6-birds-and-mammals-1.pdf)

Step 3: Guided Practice (15 minutes)

- Distribute the Activity Lesson handouts and work through the bird classification activity as a class, matching birds to groups (song birds, raptors, birds that swim, birds that don't fly). (https://newpathworksheets.com/api/activity-lesson/activity-lesson-science-grade-6-birds-and-mammals-1-birds-mammals-4.pdf)
- Complete the mammal sorting activity together, categorizing animals into monotremes, marsupials, and placental mammals using the cut-out images. (https://newpathworksheets.com/api/activity-lesson/activity-lesson-science-grade-6-birds-and-mammals-1-birds-mammals-4.pdf)
- Review vocabulary terms using the matching worksheet, reinforcing definitions of bird, mammal, endothermic, and key anatomical terms. (https://newpathworksheets.com/api/vocabulary/vocabulary-science-grade-6-birds-and

characteristics, adaptations, and vocabulary. (https://newpathworksheets.com/api/worksheet/worksheet-science-grade-6-birds-and-mammals-1-0.pdf)

- Review answers as a class, clarifying any misconceptions about four-chambered hearts, feather types, or mammal groups.
- Have students classify real-world examples: Is a penguin a bird that doesn't fly? Is a dolphin a placental mammal? Is a platypus a monotreme?

Differentiation Strategies

For advanced learners:

- Challenge students to research and present on a unique bird or mammal adaptation, such as echolocation in bats or the specialized bill of a woodpecker.
- Introduce more complex mammal classifications, such as the differences between carnivores, herbivores, and omnivores based on tooth structure.

For learners needing support:

- Provide a pre-labeled diagram of bird anatomy with key terms highlighted for students who need visual support.
- Offer one-on-one assistance during the sorting activity, using physical manipulatives like printed animal cards to make classification more concrete.
- Pair struggling students with peer buddies during guided practice to reinforce vocabulary and concepts.

- Study Guide PDF (https://newpathworksheets.com/api/guide/study-guide-science-grade-6-birds-and-mammals-1.pdf)
- Activity Lesson PDF (https://newpathworksheets.com/api/activity-lesson/activity-lesson-science-grade-6-birds-and-mammals-1-birds-mammals-4.pdf)
- Worksheet 0 PDF (https://newpathworksheets.com/api/worksheet/worksheet-science-grade-6-birds-and-mammals-1-0.pdf)
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- Worksheet 2 PDF (https://newpathworksheets.com/api/worksheet/worksheet-science-grade-6-birds-and-mammals-1-2.pdf)

- Worksheet 3 PDF (https://newpathworksheets.com/api/worksheet/worksheet-science-grade-6-birds-and-mammals-1-3.pdf)
- Vocabulary 1 PDF (https://newpathworksheets.com/api/vocabulary/vocabulary-science-grade-6-birds-and-mammals-1-1.pdf)
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- Vocabulary 3 PDF (https://newpathworksheets.com/api/vocabulary/vocabulary-science-grade-6-birds-and-mammals-1-3.pdf)
- Vocabulary 4 PDF (https://newpathworksheets.com/api/vocabulary/vocabulary-science-grade-6-birds-and-mammals-1-4.pdf)
- Vocabulary 5 PDF (https://newpathworksheets.com/api/vocabulary/vocabulary-science-grade-6-birds-and-mammals-1-5.pdf)

BIRDS AND MAMMALS

Characteristics of Birds

A **bird** is an endothermic vertebrate that lays eggs, has feathers, and has a four-chambered heart. Most birds have the ability to fly and have scales on their legs and feet. This is evidence that they are closely related to reptiles.

Our modern birds, including those that are not able to fly, evolved from organisms that could fly.

Lesson Checkpoint:
What adaptation allows a bird to fly?

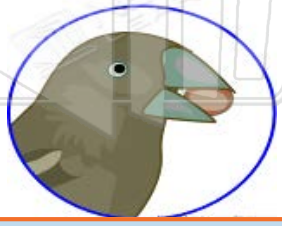
A bird's body is adapted for flight. Their bones are lightweight and

The other type of feather is called a down feather. **Down feathers** trap heat and keep a bird warm in its environment.

Down feathers are found next to a bird's skin and overlap, trapping air and insulating the bird. An **insulator** does not conduct heat and therefore keeps warm air from escaping.

Digestion

If you remember seeing a bird, chances are that you noticed that a bird does not have teeth. Instead, they have a structure called a bill. As we learned in Topic 8, a bird's bill is adapted to the type of food that it eats.



Breathing

Because birds are endothermic, they need to use a lot of energy to maintain body temperature. This means that they must eat a large amount of food to be able to produce a high amount of energy daily. The high energy demand means birds have a high demand for oxygen to be able to release the energy stored within the food. This requires a very efficient method of getting oxygen to the cells. Birds evolved air sacs, which allow them to take in more oxygen for every breath of air.

Circulatory System

The circulatory system of birds is also adapted to be efficient in supplying the cells with plenty of oxygen. The hearts of birds have four chambers that consist of two atria and two ventricles.

The advantage of the four-chambered heart is that the oxygen-poor blood is not able to mix with the oxygen-rich blood. This increases the

This means that the eggs need to be incubated by the parent bird to keep the eggs at a temperature that is nearly the same. The length of time that it takes for an egg to hatch varies between the different species. When the bird is ready to hatch out of its shell, it will peck its way through the shell.

Diversity of Birds

Birds are the most diverse land vertebrates with almost 10,000 different species.

Birds have adapted to their environments by the size and shape of their eggs, claws, and bills. Woodpeckers feed on the insects that they find in holes they make in the sides of trees.

PREVIEW

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Flight-less birds like the ostrich of Africa are the largest modern bird. Instead of flight, it adapted to its environment by having the ability to run at high speeds. Bee-eaters catch their insect prey while flying through the air. Long-legged waders generally catch prey by combing the water with its long bill. Owls adapted to hunting at night. Their eyesight and hearing are very sharp and help them to find prey in the darkness.

Characteristics of Mammals

A **mammal** is an endothermic vertebrate that has skin covered with fur or hair, a four-chambered heart, a wide arrangement of teeth, and young that are born alive and feed by milk that was produced by the mother's body.

All mammals have hair or fur during the course of their lives. Hair and fur is an adaptation to prevent the loss of heat in

Hair or fur growth are adaptations that allow mammals to live in cold climates. Without the hair or fur it would not be possible.

Feeding

Mammals gain the energy to produce heat for their bodies from the food that they eat. Teeth have adapted to increase the efficiency of digesting the food that is eaten.

Four Types of Teeth in Mammals

There are four different types of teeth among the species of mammals.

There are **incisors**, which have a flat edge and are used to cut and bite their prey. **Canines** are teeth that have a sharp point and are used to stab and tear food. The **premolars** and **molars** are teeth that grind and shred food into smaller and smaller pieces.

The teeth of a species indicate the type of food that a species feeds on. The presence of developed canine teeth normally means that the species are carnivores because canines are used to stab and hook into

Fertilization occurs in mammals internally. There are a few species that lay eggs that are shelled, but most offspring are developed within the mother. Milk is also produced within the mother and is fed to the offspring after being born. Mammals got their name from the glands that produce milk, called **mammary glands**.

Diversity of Mammals

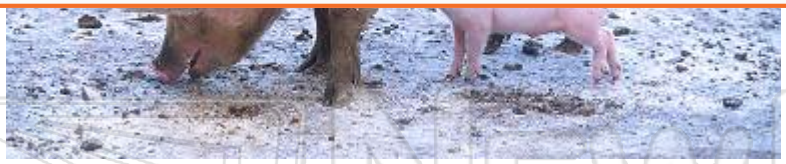
There are approximately 6,000 different species of mammals that exist today. The majority of mammals live on land, but some species adapted to live in the air and in the oceans. There are three groups of mammals, according to how their young develop.

Three groups of mammals

They are **monotremes**, **marsupials**, and **placental** mammals.

The **monotremes** are very strange mammals that lay eggs. There are only three montreme species: two are spiny anteaters and the other is a duck-billed platypus.

Marsupials are mammals that are born at an early stage of

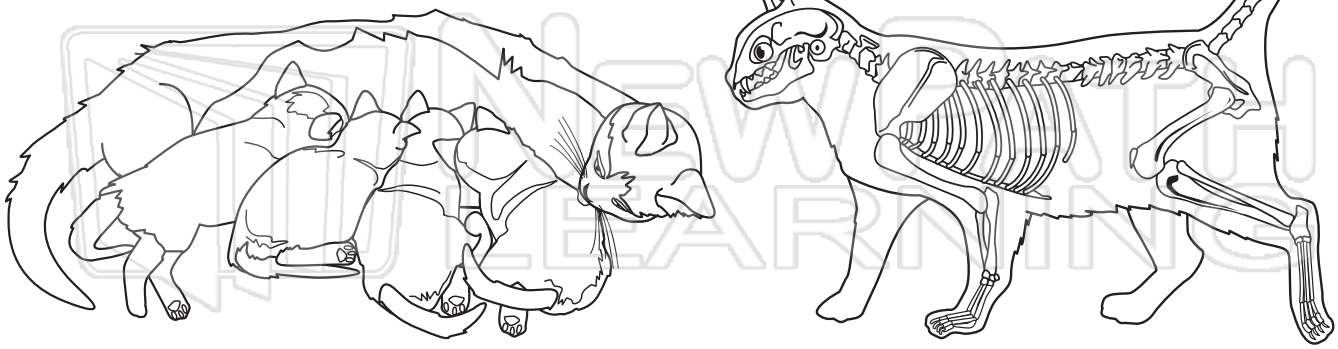


Birds & Mammals

Sci F

Name _____ Class _____ Date _____

A **mammal** is an **endothermic vertebrate** that has skin covered with **fur or hair**, a **four chambered heart** and a wide arrangement of **teeth**. Most mammals are **born alive** and are fed with **milk** produced by the mother's body.



The majority of mammals live on land, but some species have adapted to live in the **ai** **loped** and h

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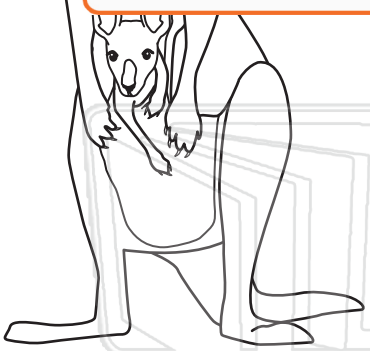
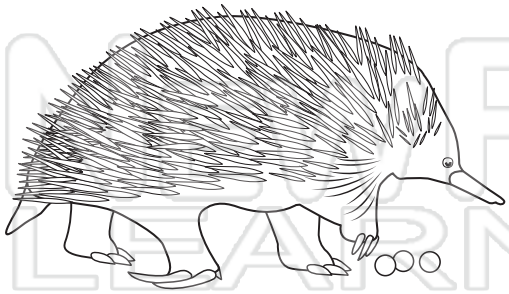


Marsupials complete their development within a **pouch** on the mother's body.



Monotremes are **egg-laying** mammals. Their young develop in shelled eggs.

Placental mammals develop completely inside the mother's body.

Birds & Mammals

Sci F

Name _____ Class _____ Date _____

Birds are **endothermic vertebrates** that **lay eggs**, have **feathers** and a four chambered heart.

The body of most birds is adapted to **flying**. Their nearly **hollow bones** and **feathers** make birds light weight. In addition, birds have large

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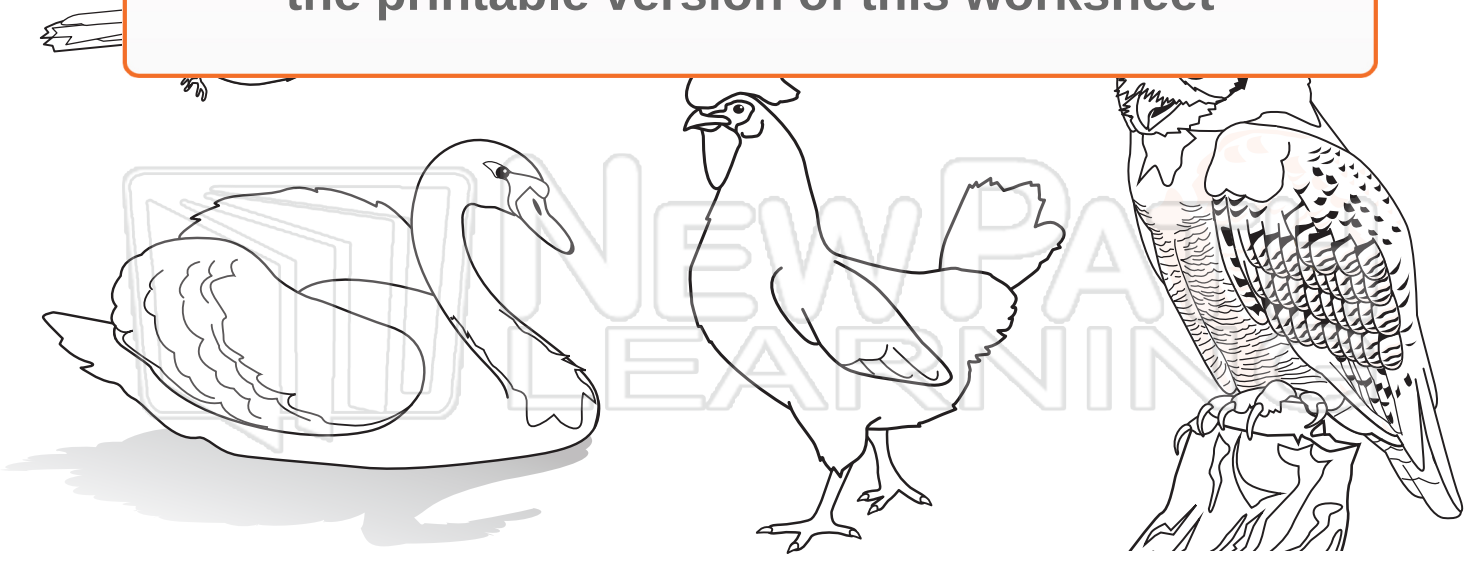

Birds & Mammals

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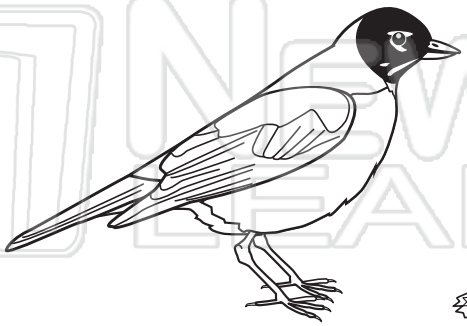
Name _____ Class _____ Date _____

Birds are the **most diverse** land vertebrates with almost **10,000** different species. Draw a line to match each bird to a group. Some match more than one group.

birds that don't fly

birds

ors



birds that swim

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Birds & Mammals

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Name _____ Class _____ Date _____

Color and cut out the animals. Draw or find more pictures. Make a chart to organize the **3 types** of **mammals**.

Birds & Mammals

Sci F

Name _____ Class _____ Date _____

Color and cut out the animals. Draw or find more pictures. Make a chart to organize the **3 types** of **mammals**.

PREVIEW

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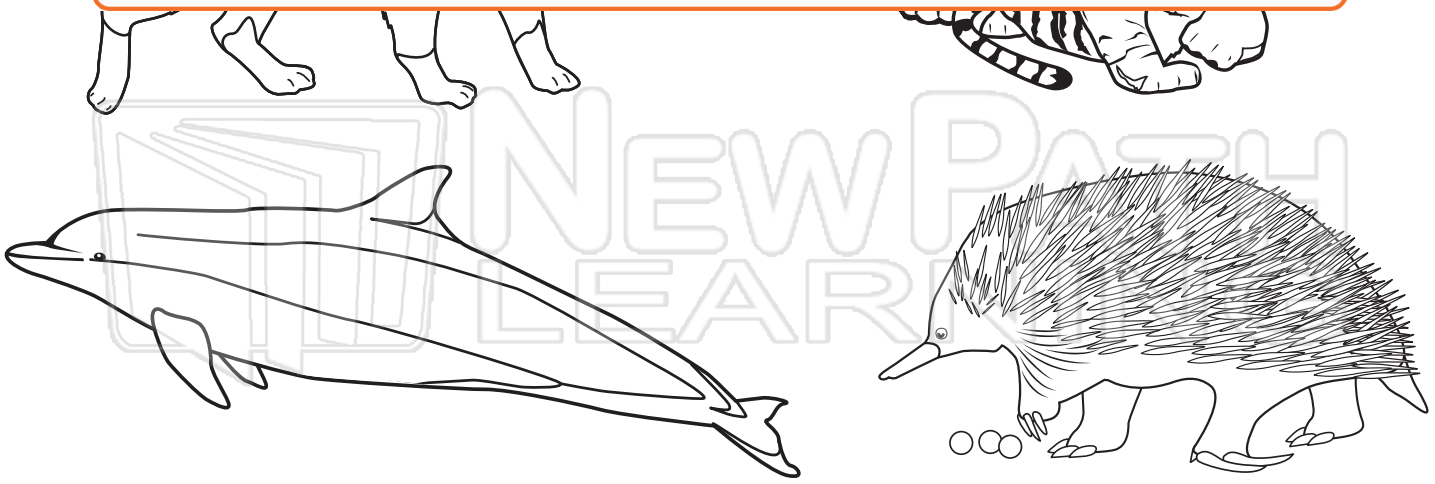

Birds & Mammals

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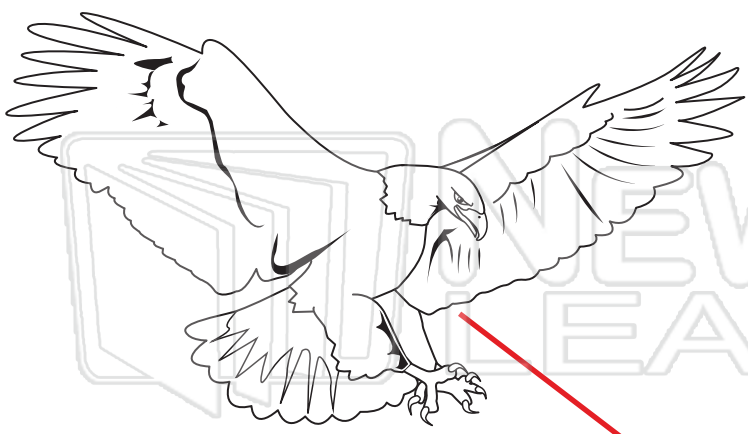
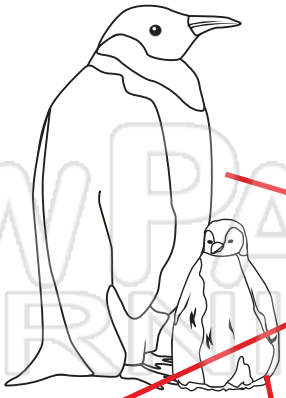
Answer Key

Birds are the **most diverse** land vertebrates with almost **10,000** different species. Draw a line to match each bird to a group. Some match more than one group.





birds that don't fly

birds

ors

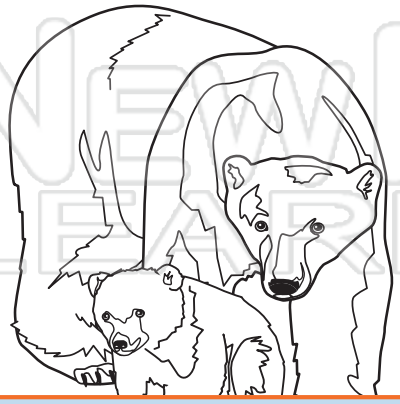
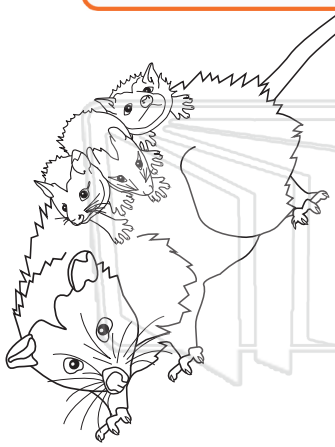
birds that swim

Birds & Mammals

Sci F

Answer Key - Example

Color and cut out the animals. Draw or find more pictures. Make a chart to organize the **3 types** of **mammals**.

Marsupials	Placental	Monotremes
		
		

Birds and Mammals

Sci F

Name_____ Class_____ Date_____

1 Which is a characteristic of **birds**?

A three chambered heart
B feathers
C able to fly
D ectothermic

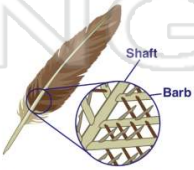
2 What characteristic did the **ancestors of birds** have?

A three chambered heart
B unicellular
C ability to fly
D ectothermic

3 A **bird** has **adapted bones** that are lightweight and nearly hollow, **large chest muscles**, forelimbs that form **wings**, and are the only animal with **feathers**.

A true

4 **Contour** feathers _____.



A keep the bird warm
B are located close to the skin of a bird
C allow the bird to perch on a tree limb

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5

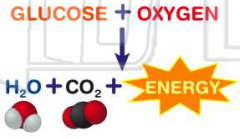
D ventricle

B by flying as little as possible
C by eating as much as possible
D by eating as little as possible

7

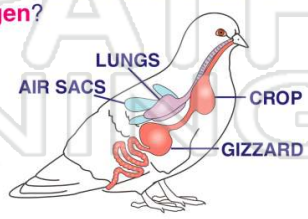
9 Along with food, what do birds need to make **energy**?

A carbon dioxide
B oxygen
C water
D light



10 What structure allows birds to take in more **oxygen**?

A crop
B gizzard
C mouth
D air sacs



Birds and Mammals

Sci F

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A true

A

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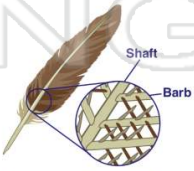

A keep the bird warm
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D

5

B

7

C

D ventricle

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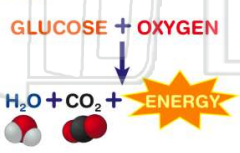


B

10 What structure allows birds to take in more **oxygen**?

A crop
B gizzard
C mouth
D air sacs

D

Birds and Mammals

Sci F

Name_____ Class_____ Date_____

1 How has the **circulatory system** evolved in birds?

A three chambers in the heart
B the ventricle grew larger to hold more blood
C oxygen-rich blood does not mix with oxygen-poor blood
D oxygen-rich blood mixes with oxygen-poor blood

2 For most bird species, who prepares the **nest** for bird eggs?

A male parent
B female parent
C both parents
D one or both parents

3 What does a **bird egg** need from the parent to develop?

A oxygen
B heat
C food
D water

4 How does a young bird **get out** of its shell?

A It pecks it way out using its bill.
B It waits until the parent breaks it open.
C The shell falls apart when

5

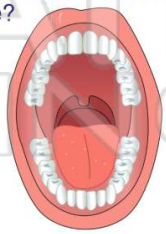
7

C It protects mammals from the cold.
D Mammals don't have hair or fur.

9 Which structures speed up the break down **food** in mammals?

A claws
B hair or fur
C teeth
D muscle

10 How many **different types** of teeth do mammals have?



A 2
B 4
C 6
D 8

Birds and Mammals

Sci F

Name_____ Class_____ Date_____

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B

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C The shell falls apart when

A

5

B

PREVIEW

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7

C It protects mammals from the cold.
D Mammals don't have hair or fur.

D

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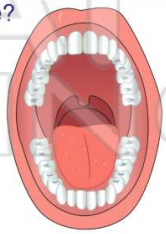

A 2
B 4
C 6
D 8

B

Birds and Mammals

Sci F

Name_____ Class_____ Date_____

Match each of the following terms to its definition:

Algae	Archaebacteria	Mammal	Animal
Canines	Angiosperm	Bird	Autotroph

1. - a warm-blooded (endothermic) animal that lays eggs, has feathers, a four-chambered heart, a beak and no teeth

2. - warm-blooded organisms that have body hair, a four-chambered heart, produce milk for their young ,and breathe air with their lungs

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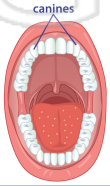
nucleus, some make their own food and some need to obtain food from other sources; often found in harsh environments

7. - a living organism, such as algae, that is capable of producing its own food; also called a producer

8. - teeth that have a sharp point and are used to stab and tear food



Birds and Mammals

Sci F

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Algae	Archaebacteria	Mammal	Animal
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1. bird - a warm-blooded (endothermic) animal that lays eggs, has feathers, a four-chambered heart, a beak and no teeth

2. mammal - warm-blooded organisms that have body hair, a four-chambered heart, produce milk for their young ,and breathe air with their lungs

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5. ani
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6. arc
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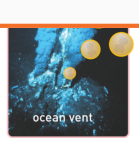

7. autotroph - a living organism, such as algae, that is capable of producing its own food; also called a producer

8. canines - teeth that have a sharp point and are used to stab and tear food