



Lesson Plan: Vertebrates - Animals with Backbones

Grade Level: 4

Subject: Life Science

Duration: 45–60

4-LS1-1: Construct an argument that plants and animals have internal and external structures that function to support survival, growth, behavior, and reproduction.

Learning Objectives

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

- **Identify** the five main classes of vertebrates: fish, amphibians, reptiles, birds, and mammals
- **Describe** the distinct physical characteristics and structures of each vertebrate class
- **Compare** warm-blooded and cold-blooded animals and how they regulate body



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temperature around it.

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

- Study Guide (<https://newpathworksheets.com/api/guide/study-guide-science-grade-4-vertebrates-animals-with-backbones.pdf>)
- Activity Lesson (<https://newpathworksheets.com/api/activity-lesson/activity-lesson-science-grade-4-vertebrates-animals-with-backbones-vertebrates-animals-with-backbones-4.pdf>)



- Practice Worksheet 1 (<https://newpathworksheets.com/api/worksheet/worksheet-science-grade-4-vertebrates-animals-with-backbones-0.pdf>)
- Practice Worksheet 2 (<https://newpathworksheets.com/api/worksheet/worksheet-science-grade-4-vertebrates-animals-with-backbones-1.pdf>)
- Vocabulary Set 1 (<https://newpathworksheets.com/api/vocabulary/vocabulary-science-grade-4-vertebrates-animals-with-backbones-1.pdf>)

Lesson Procedure

Step 1: Introduction (5 minutes)

- Ask students: "If you reach around and feel the middle of your back, what do you feel? Do you think all animals have a backbone?"
- Explain that scientists classify animals into two main groups: vertebrates (with backbones) and invertebrates (without backbones).



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Step 4: Independent Practice (15 minutes)

- Have students complete Practice Worksheet 1 to independently test their knowledge of amphibian, reptile, and bird characteristics. (<https://newpathworksheets.com/api/worksheet/worksheet-science-grade-4-vertebrates-animals-with-backbones-0.pdf>)
- Circulate the room to provide assistance and check for understanding as students classify the animals.

Step 5: Assessment (10 minutes)



- Administer Practice Worksheet 2 to evaluate comprehension of all five vertebrate classes and body temperature regulation.
(<https://newpathworksheets.com/api/worksheet/worksheet-science-grade-4-vertebrates-animals-with-backbones-1.pdf>)
- Review the answers together as a class to correct any remaining misconceptions.

Differentiation Strategies

For advanced learners:

- Challenge students to research a unique vertebrate that breaks typical rules (e.g., a mammal that lays eggs like the platypus) and present it.
- Have students compare and contrast the respiratory systems of fish and mammals using a Venn diagram.

For lower-achieving students:



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Complete List of Available Resources:

- Topic: Vertebrates - Animals with Backbones
(<https://newpathworksheets.com/science/grade-4/vertebrates-animals-with-backbones>)
- Study Guide (<https://newpathworksheets.com/api/guide/study-guide-science-grade-4-vertebrates-animals-with-backbones.pdf>)
- Activity Lesson (<https://newpathworksheets.com/api/activity-lesson/activity-lesson-science-grade-4-vertebrates-animals-with-backbones-vertebrates-animals-with-backbones-4.pdf>)
- Practice Worksheet 1 (<https://newpathworksheets.com/api/worksheet/worksheet-science-grade-4-vertebrates-animals-with-backbones-0.pdf>)



- Practice Worksheet 2 (<https://newpathworksheets.com/api/worksheet/worksheet-science-grade-4-vertebrates-animals-with-backbones-1.pdf>)
- Practice Worksheet 3 (<https://newpathworksheets.com/api/worksheet/worksheet-science-grade-4-vertebrates-animals-with-backbones-2.pdf>)
- Practice Worksheet 4 (<https://newpathworksheets.com/api/worksheet/worksheet-science-grade-4-vertebrates-animals-with-backbones-vertebrates-3.pdf>)
- Vocabulary Set 1 (<https://newpathworksheets.com/api/vocabulary/vocabulary-science-grade-4-vertebrates-animals-with-backbones-1.pdf>)
- Vocabulary Set 2 (<https://newpathworksheets.com/api/vocabulary/vocabulary-science-grade-4-vertebrates-animals-with-backbones-2.pdf>)
- Vocabulary Set 3 (<https://newpathworksheets.com/api/vocabulary/vocabulary-science-grade-4-vertebrates-animals-with-backbones-3.pdf>)
- Vocabulary Set 4 (<https://newpathworksheets.com/api/vocabulary/vocabulary-science-grade-4-vertebrates-animals-with-backbones-4.pdf>)



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NEW PATH LEARNING

VERTEBRATES: ANIMALS WITH BACKBONES

Five Classes of Vertebrates

Scientists classify animals into two categories depending on if the animal has a backbone or not. As you know, **invertebrates** are animals that do NOT have a backbone and **vertebrates** are animals that DO have a backbone.



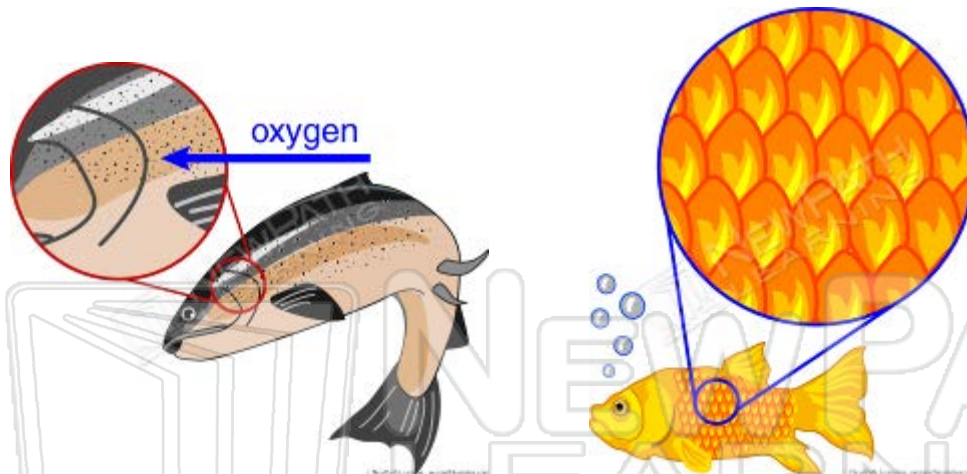
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Lesson Checkpoint:
What does it mean to be cold-blooded?

Fish

Let's discuss some characteristics of the different classes of vertebrates. Let's begin in the water. **Fish** most often have bodies that are covered with **scales** and breathe using their **gills**. Most fish lay eggs. Fish are cold-blooded animals.

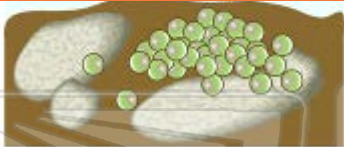


Lesson Checkpoint:
What are the bodies of fish covered with?



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Lesson Checkpoint:
What is so unique about where amphibians live during their lifetime?

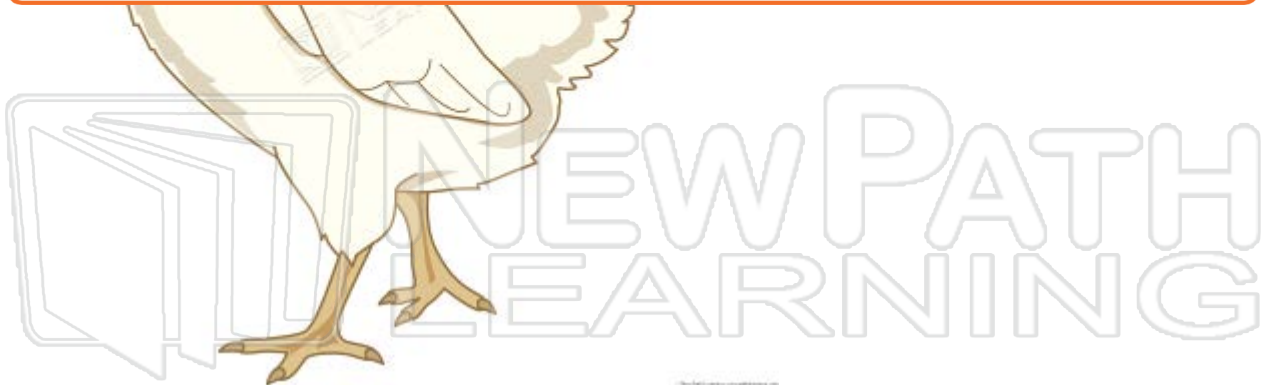
Reptiles

Reptiles are amphibians that have bodies that are covered in scales. The majority of **reptiles** live on land. Alligators and snakes are examples of reptiles. **Reptiles** use their lungs to breath.

An illustration of a row of twelve diverse children standing on a green patch of grass. Above them are four thought bubbles containing various educational icons: a cube, a microscope, a protractor; a beaker, a globe, a compass; an atom, a pie chart, and the letters 'ABC'; and a bar graph, a pencil, and mathematical symbols (+, -, x, =).

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Mammals

One more class of vertebrates. **Mammals** are vertebrates that have hair or fur and produce milk for their young.



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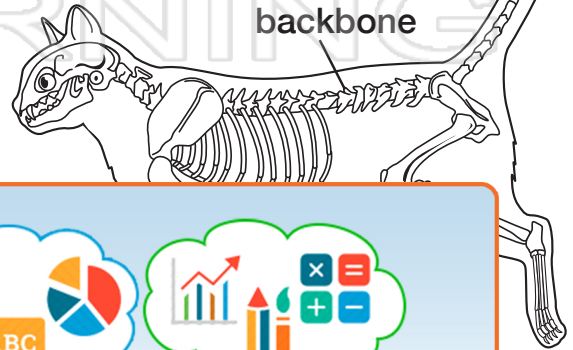


Name _____ Class _____ Date _____

Animals can be **classified**, or grouped together, by the things they have in common, like by how they act, where they live, or how they look. Scientists separate animals into **two main groups** called vertebrates and invertebrates.

Vertebrates are animals that have a **backbone**. There are **five main groups** of vertebrates based on specific animal traits and characteristics.

Animals with Backbones



Birds & bees can fly.



feed on plants.

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Fish breathe with gills.

Fish have scales.

They breathe with lungs.



Animals without Backbones

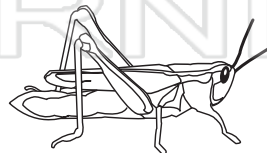
Invertebrates are animals that **do not have a backbone**. Invertebrates have liquid sacs or shells that they use as support for their bodies instead of bones.



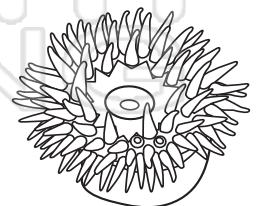
worms



mollusks



arthropods



cnidarians

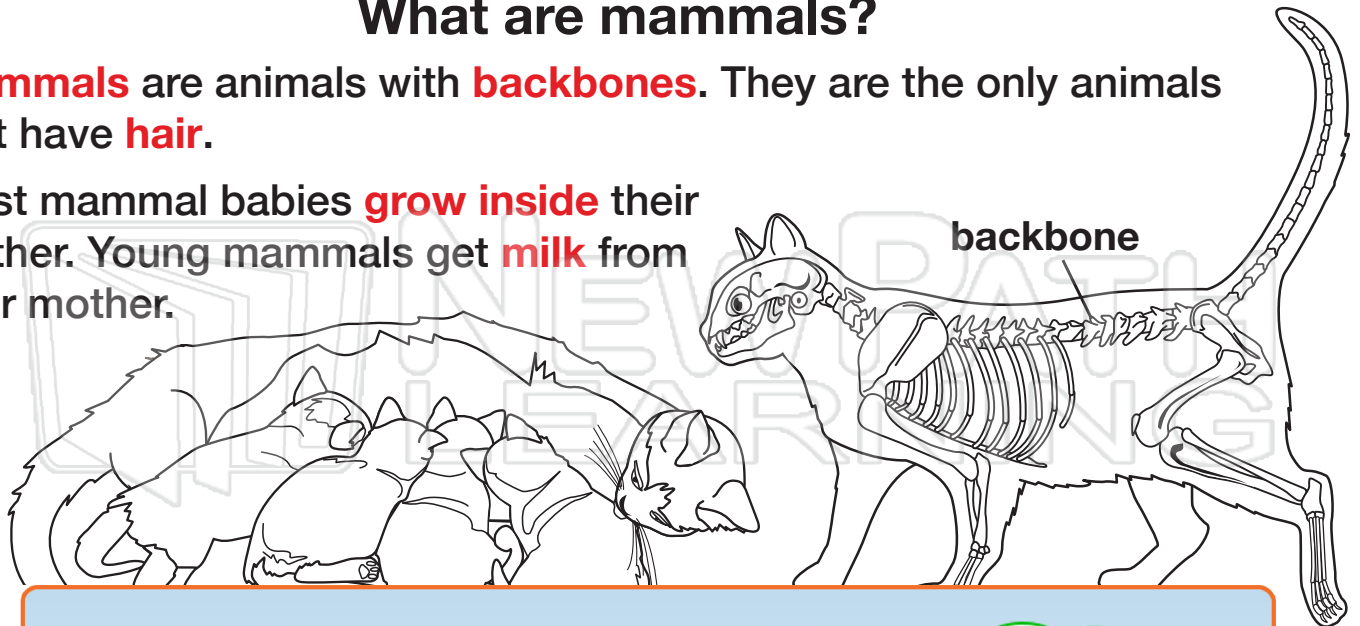


Name _____ Class _____ Date _____

What are mammals?

Mammals are animals with **backbones**. They are the only animals that have **hair**.

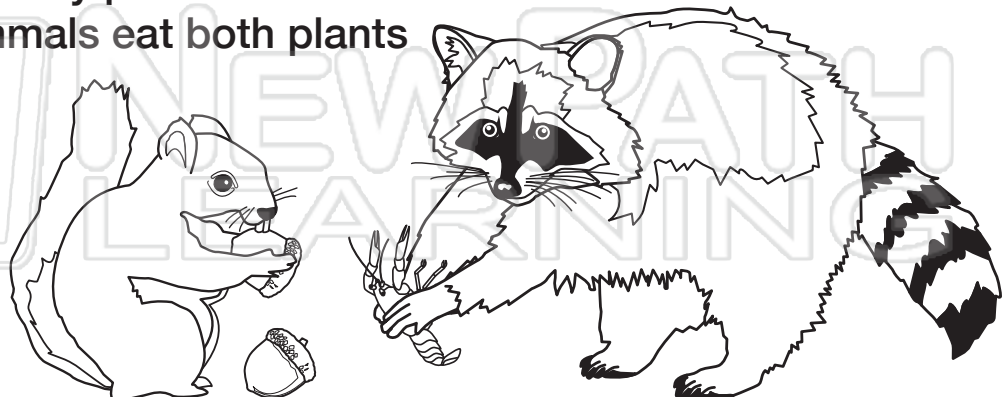
Most mammal babies **grow inside** their mother. Young mammals get **milk** from their mother.



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Some mammals eat only plants. Some eat other animals. Some mammals eat both plants and other animals.

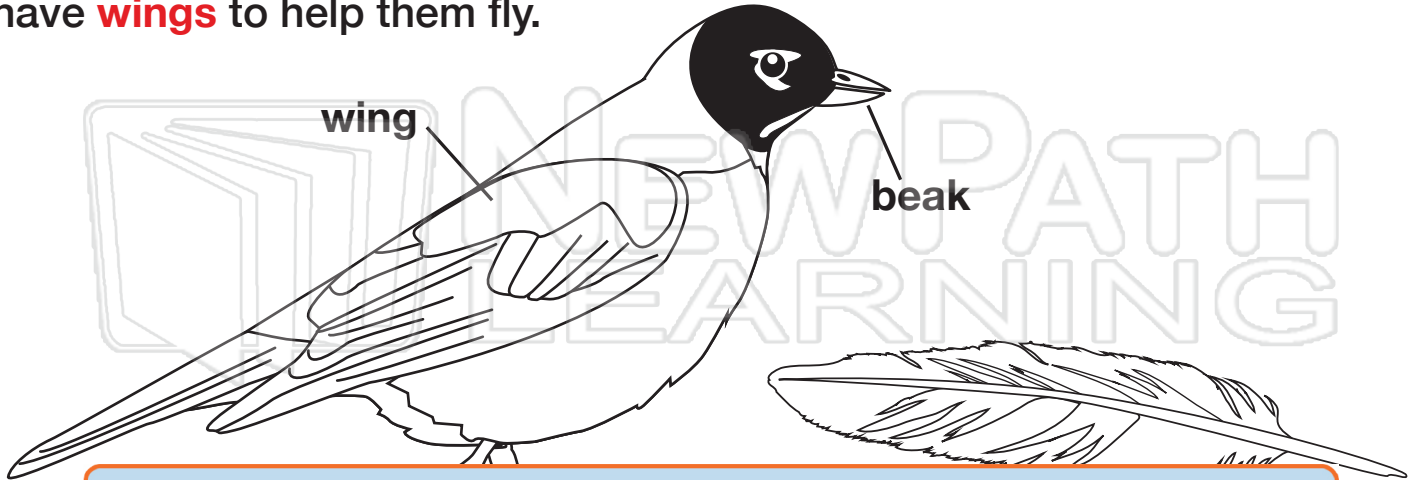




Name _____ Class _____ Date _____

What are birds?

Birds are animals with **backbones**. They are covered with **feathers** and have **wings** to help them fly.



Many
where

Birds
They



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Many birds eat seeds, fruit, insects and worms.

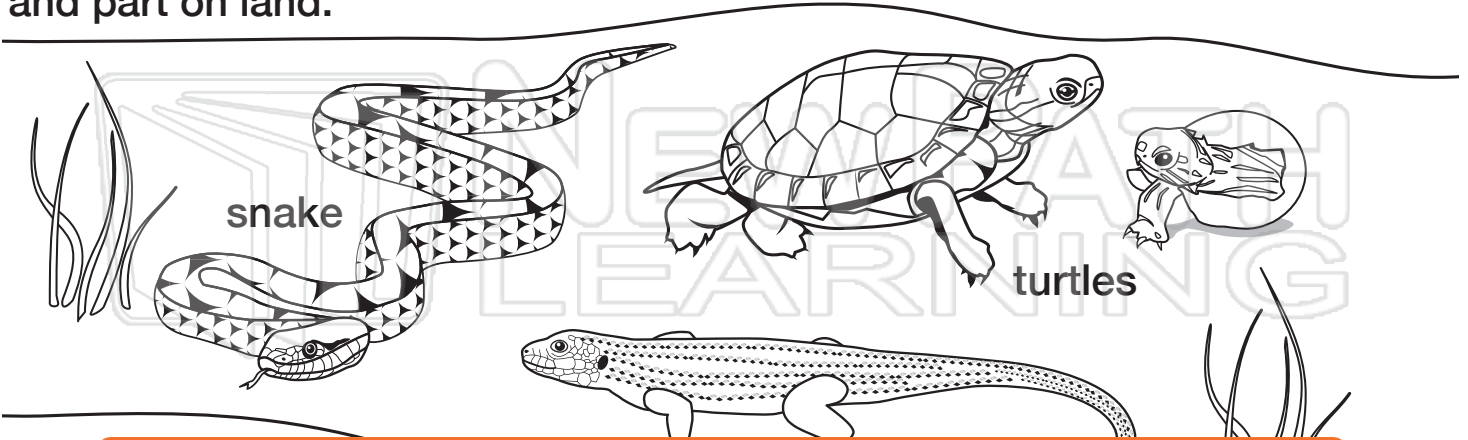


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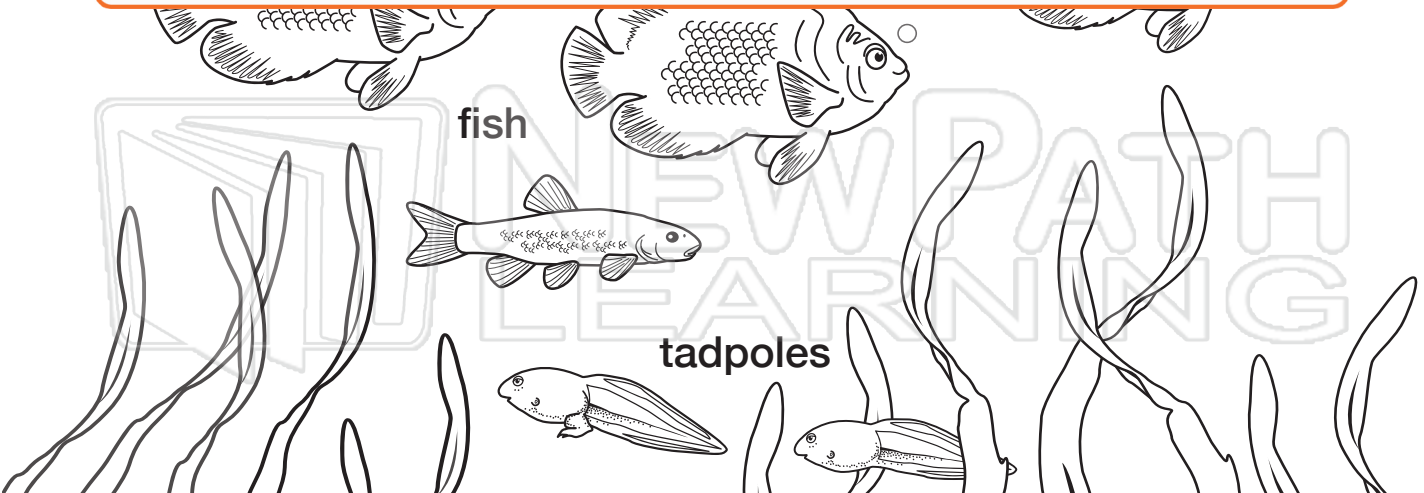
Name _____ Class _____ Date _____

Reptiles are born on land and usually live near water. They have **scales**.
Fish live in the water their entire life. They have **fins** that help them swim.
Amphibians are special because they spend part of their life in the water and part on land.



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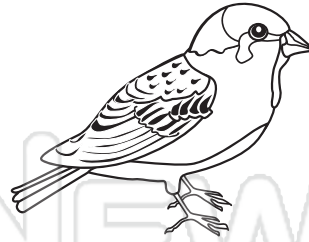
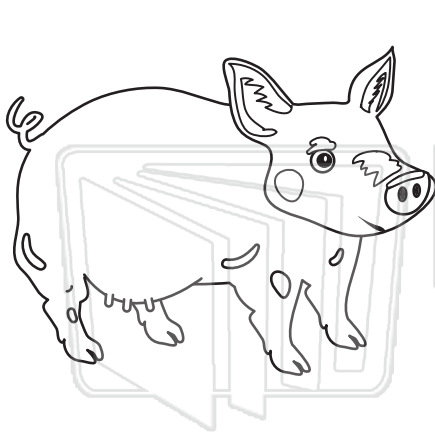


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Name _____ Class _____ Date _____

Draw a line to match each **vertebrate** with the correct group.



mammals



amphibians



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fish



These animals are all _____ because they have _____.



Vertebrates - Animals with Backbones

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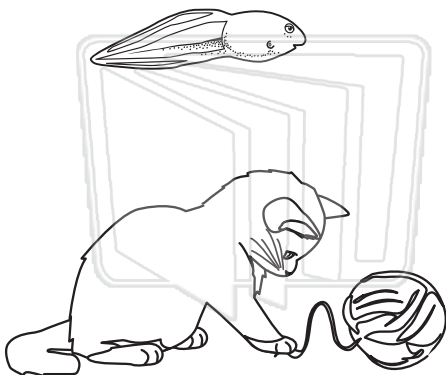
Name _____ Class _____ Date _____

Match each young animal to its parent. Some change a lot as they grow.



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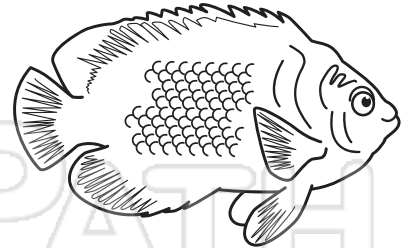
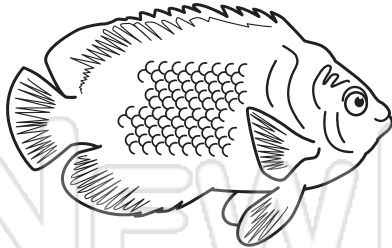
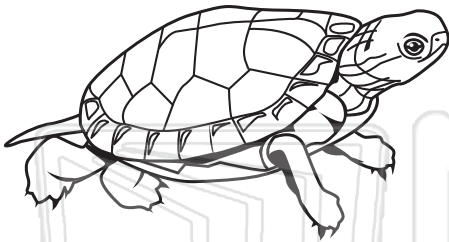
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Name _____ Class _____ Date _____

Circle the **reptile**.



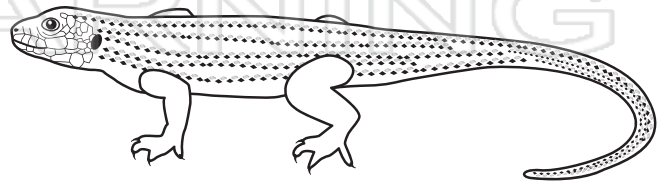
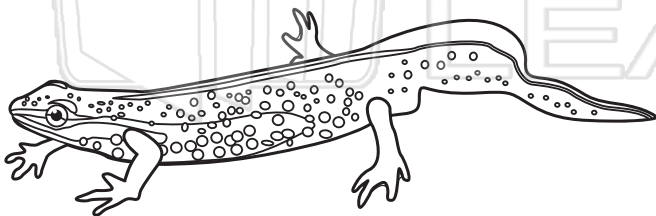
Circle the **amphibian**.



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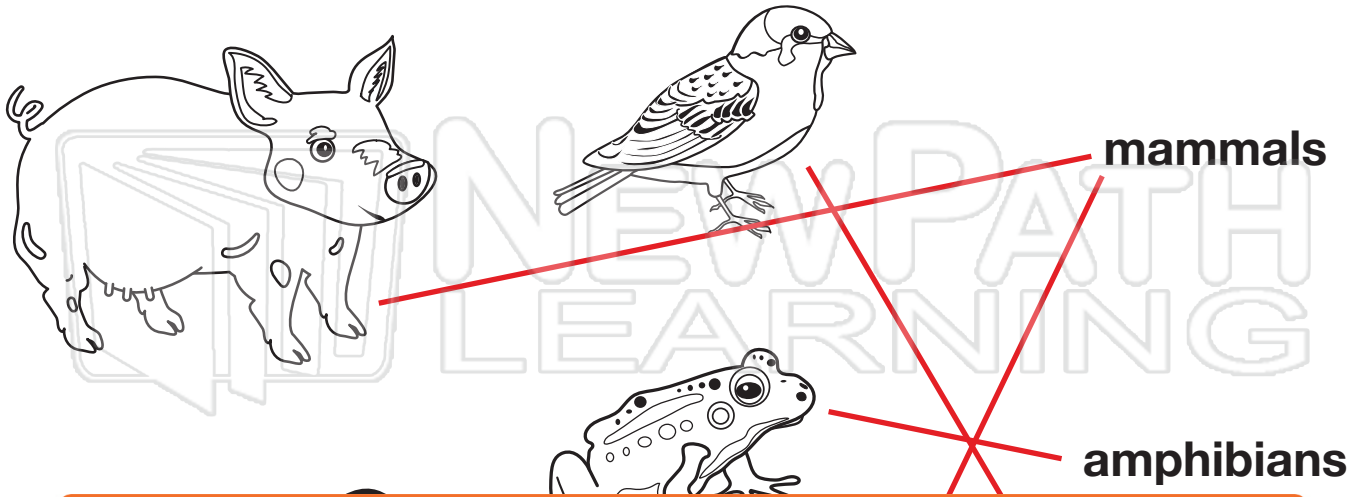
Circle the **amphibian**.





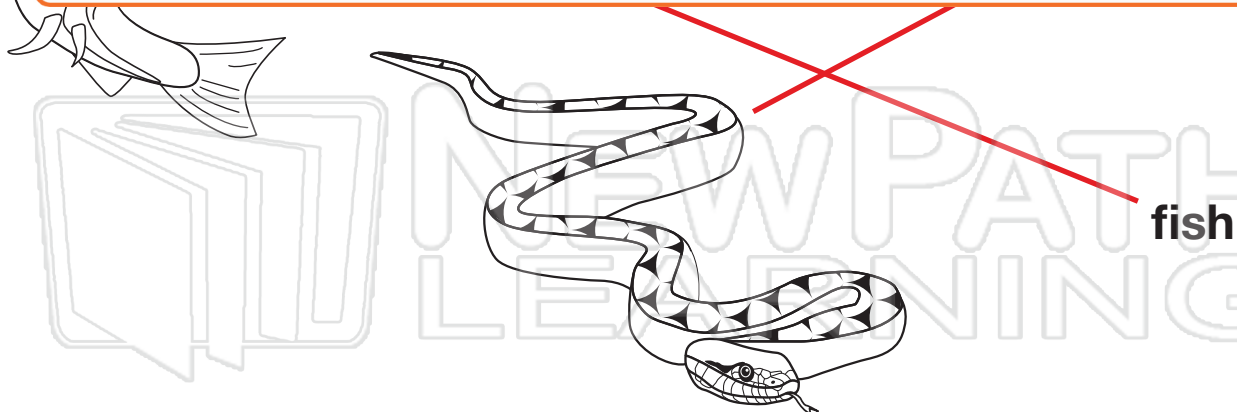
Answer Key

Draw a line to match each **vertebrate** with the correct group.



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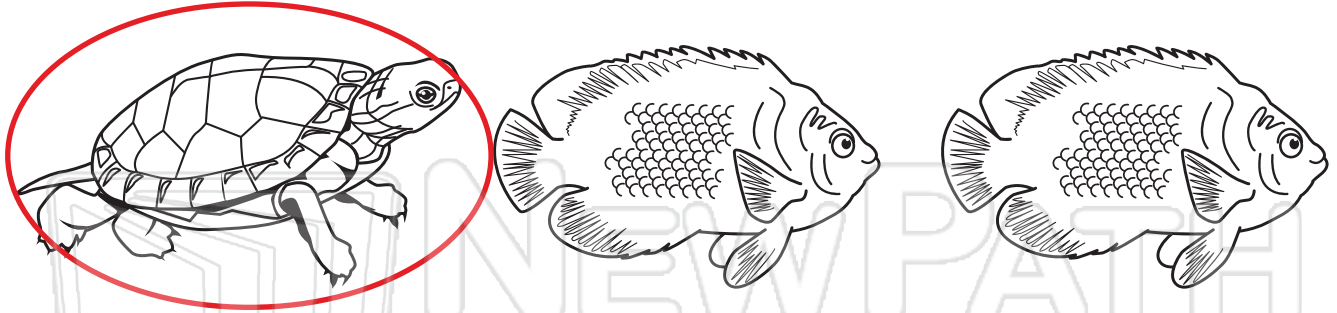
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Answer Key

Circle the **reptile**.

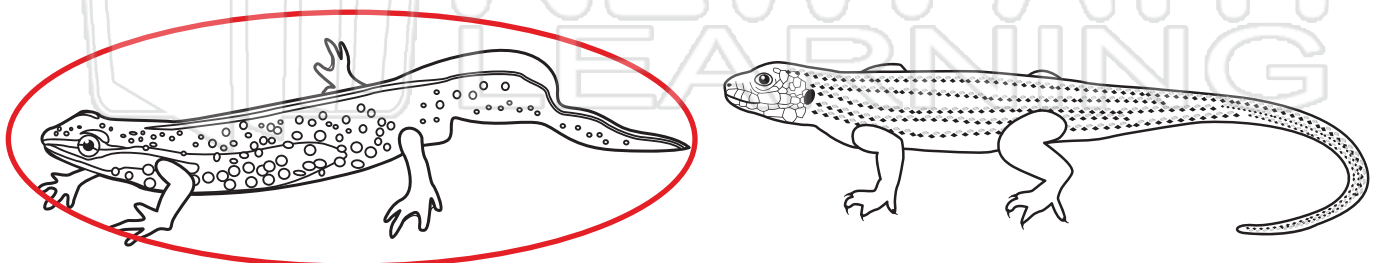


Circle the **amphibian**.

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Circle the **amphibian**.



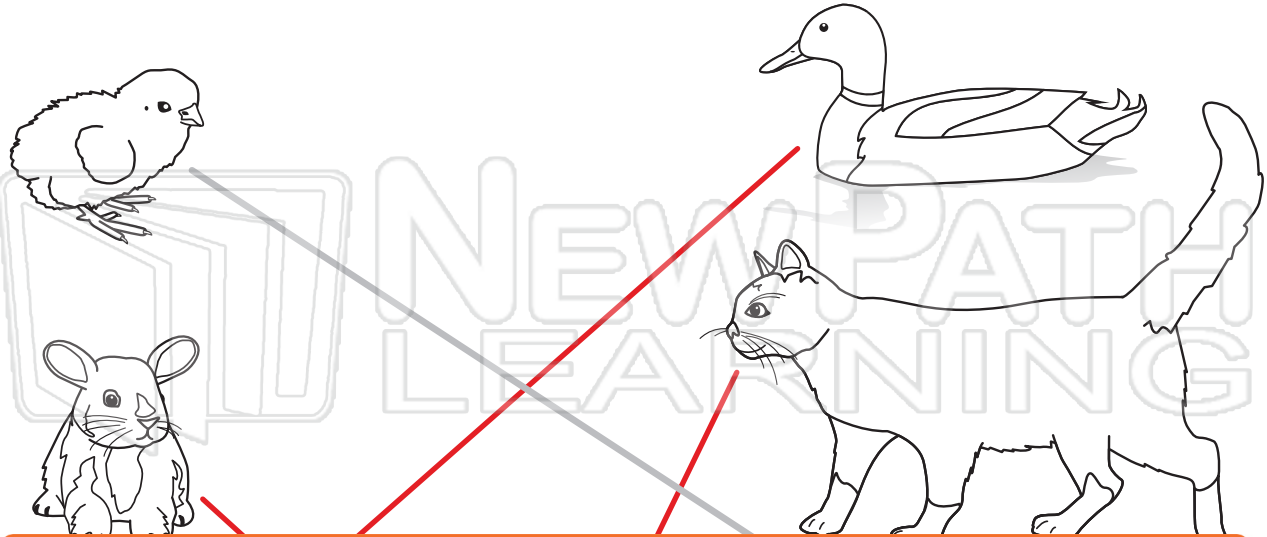


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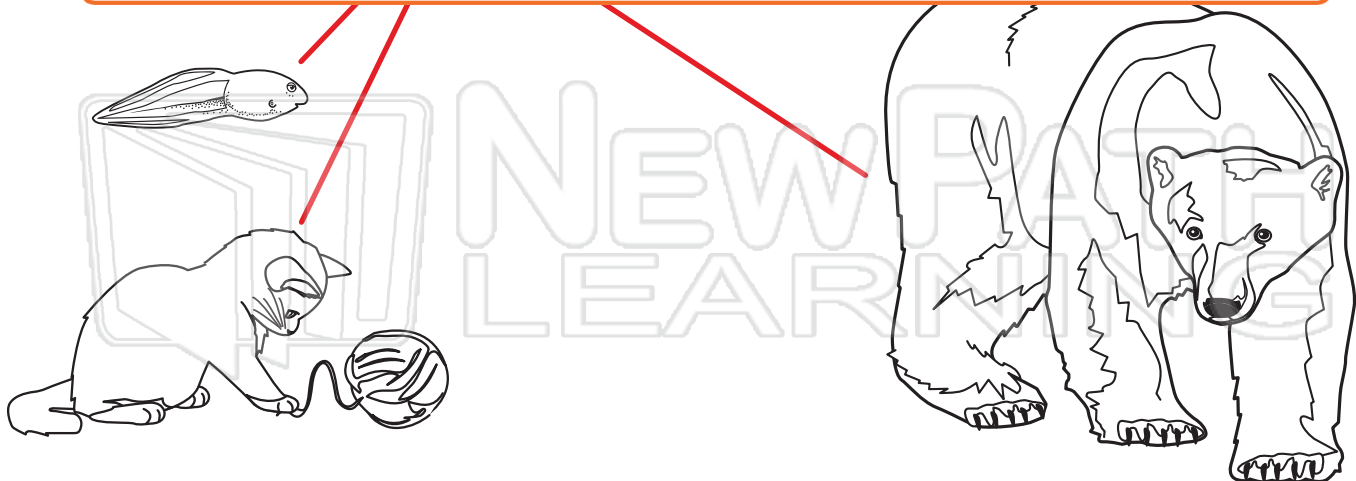
Name _____ Class _____ Date _____

Match each young animal to its parent. Some change a lot as they grow.



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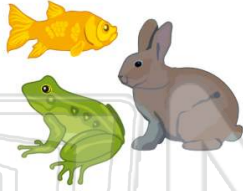




Name _____ Class _____ Date _____

1 Scientists **classify** animals **with backbones** into the _____ category.

- A arthropod
- B invertebrate
- C mollusk
- D vertebrate



2 **Vertebrates** are **divided** by scientists into _____ classes.

- A two
- B five
- C eight
- D ten



3 **Vertebrates** are divided into **five** classes which include: **fish**, **amphibians**, **reptiles**, **birds**, and _____.

- A whales
- B frogs
- C mammals



4 What type of animal **controls its own body temperature** and tries to keep its insides at a **constant** temperature?

- A cold-blooded animals
- B warm-blooded animals



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9 The body temperature of fish is **cold** when the **water** around them is **cold** and is **warm** when the **water** around them is **warm**, which means _____.

- A fish are warm-blooded
- B fish are cold-blooded
- C fish breathe through lungs
- D fish can live on land

10 **Amphibians**, such as _____, are covered with **smooth skin**.

- A worms
- B frogs
- C fish
- D snakes





Name _____ Class _____ Date _____

1 Scientists **classify** animals **with backbones** into the _____ category.

- A arthropod
- B invertebrate
- C mollusk
- D vertebrate



(D)

2 **Vertebrates** are **divided** by scientists into _____ classes.

- A two
- B five
- C eight
- D ten



(B)

3 **Vertebrates** are divided into **five** classes which include: **fish**, **amphibians**, **reptiles**, **birds**, and _____.

- A whales
- B frogs
- C mammals



(C)

4 What type of animal **controls its own body temperature** and tries to keep its insides at a **constant** temperature?

- A cold-blooded animals
- B warm-blooded animals



(B)

5



(A)

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(B)

9 The body temperature of fish is **cold** when the **water** around them is **cold** and is **warm** when the **water** around them is **warm**, which means _____.

- A fish are warm-blooded
- B fish are cold-blooded
- C fish breathe through lungs
- D fish can live on land

(B)

10 **Amphibians**, such as _____, are covered with **smooth skin**.

- A worms
- B frogs
- C fish
- D snakes



(B)



Name _____ Class _____ Date _____

1

Amphibians spend part of their lives in **water** and part of their lives on **land**; therefore amphibians _____.

- A have live births
- B are warm-blooded
- C prefer the water over land
- D breathe with gills and lungs sometime during their lifetime



2

Amphibians are **warm-blooded**.
True or false?

- A true
- B false



3

Amphibians _____ rather than having live births.

- A lay eggs
- B hide from predators
- C live in water only



4

Reptiles are animals that have **bodies** covered in _____.

- A slime
- B feathers
- C scales
- D bumps



5



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9

What is the **most common** feature birds have that other vertebrates **do not**?

- A limbs
- B nose
- C eyes
- D feathers



10

Birds _____.

- A live in water
- B have live births
- C lay eggs
- D have scales





Name _____ Class _____ Date _____

- 1 Amphibians spend part of their lives in **water** and part of their lives on **land**; therefore amphibians _____.
- A have live births
 - B are warm-blooded
 - C prefer the water over land
 - D breathe with gills and lungs sometime during their lifetime



D

- 2 Amphibians are **warm-blooded**.
True or false?

- A true
- B false



B

- 3 **Amphibians** _____ rather than having live births.

- A lay eggs
- B hide from predators
- C live in water only



A

- 4 **Reptiles** are animals that have **bodies** covered in _____.

- A slime
- B feathers
- C scales
- D bumps



C

5



C

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A

9

What is the **most common** feature birds have that other vertebrates **do not**?

- A limbs
- B nose
- C eyes
- D feathers



D

10

Birds _____

- A live in water
- B have live births
- C lay eggs
- D have scales



C



Name _____ Class _____ Date _____

Match each of the following terms to its definition:

- | | | | |
|------------|----------------|-----------------|--------|
| Autotroph | Algae | Archaeobacteria | Animal |
| Angiosperm | Classification | Amphibian | Mammal |

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



2. _____ - a vertebrate that is ectothermic (cold-blooded) that spends part of its life in the water and part of its life on land; it begins its life in water having gills, and spends the later part of its life on land breathing with lungs



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contai



4. aroun

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5. organi

6. classif

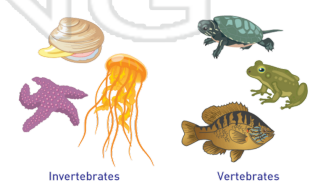
nucleus, some make their own food and some need to obtain food from other sources; often found in harsh environments



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



8. _____ - the process of grouping items together according to their similarities





Name _____ Class _____ Date _____

Match each of the following terms to its definition:

- | | | | |
|------------|----------------|-----------------|--------|
| Autotroph | Algae | Archaeobacteria | Animal |
| Angiosperm | Classification | Amphibian | Mammal |

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



2. amphibian - a vertebrate that is ectothermic (cold-blooded) that spends part of its life in the water and part of its life on land; it begins its life in water having gills, and spends the later part of its life on land breathing with lungs



3. alg
from u
chloro



4. ang
seeds

5. ani
capab

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6. arc
classif

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



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



8. classification - the process of grouping items together according to their similarities

