



TEACHER GUIDE

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STUDENT HANDOUTS

- Reading Comprehension

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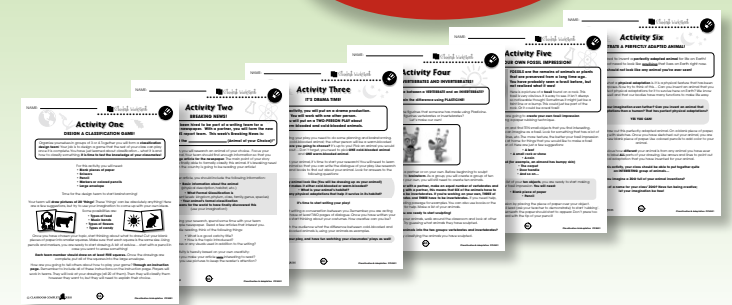
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- Enter pass code CC4501D for Activity Pages..

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Vertebrates

1. Draw a line from the word on the left to its matching definition. Which word is left over? Use the reading passage or a dictionary to help you write out its definition.

- | | | | |
|---|--------------|---|---|
| 1 | vertebrae | an animal that has a backbone | A |
| 2 | vertebrate | an animal that does not have a backbone | B |
| 3 | invertebrate | the stringy bands of tissue that connect the nervous system with other organs | C |
| 4 | nerve | the bones that form a backbone | D |
| 5 | tissue | | E |

2. Look at the matched definitions in the question above. Use each vocabulary word in your own sentence. Make sure your sentence shows that you understand what the word means.

- a) vertebrate _____
- b) invertebrate _____
- c) nerve _____
- d) tissue _____



Vertebrates

All animals can be classified into two groups: **vertebrates** and **invertebrates**. How do we tell them apart? Here is a clue: What do humans have inside them that make them stand up straight and tall? Yes, a backbone! Humans are classified into a category in the animal kingdom called vertebrates. **Vertebrates** are animals that have a backbone (a "vertebrae"). **Invertebrates** do not have a backbone.



Can you think of **THREE** examples of vertebrates besides humans?



Vertebrates are the most advanced organisms on Earth. What makes them so special are their backbones. Think of the human body. We all have **nerves** that run along our back. **Nerves** are the stringy bands of **tissue** that connect the nervous system with other organs. These nerves can't stand up on their own! They need support and protection. That's why vertebrates have backbones.

There are 50 000 vertebrate species on Earth. That seems like a lot, but compared to invertebrates, there are not that many species of vertebrates. Vertebrates are very, very intelligent. This includes you! Most vertebrates have very advanced nervous systems. I bet you don't think a goldfish is very smart. A goldfish is a vertebrate though. Compared to a tiny invertebrate, a goldfish is as smart as Einstein!



Vertebrates

1. Circle the word True if the statement is true. Circle the word False if it is false.

- a) The main difference between vertebrates and invertebrates is that one has a backbone and the other does not.
True False
- b) Vertebrates are the least advanced organisms on Earth.
True False
- c) Nerves cannot stand up on their own. That's why vertebrates have backbones!
True False
- d) There are only ten different kinds of vertebrates.
True False
- e) Vertebrates are very, very smart. Even goldfish are smart!
True False

2. Write each word beside its meaning. There is ONE word that does NOT have a matching definition! Use the reading passage or a dictionary to write a definition for the remaining word.

vertebrate invertebrate nerve tissue

- a) An animal that does not have a backbone.
- b) A group of cells that have a special job to do, or a specific function.
- c) An animal that has a backbone.
- d) _____



Vertebrates

3. a) Circle the animals that can be classified as vertebrates:
snail human grizzly bear snake deer
- b) Circle the words that are associated with a vertebrate:
backbone nerves insect tissue spiders
- c) Circle the words that describe the functions of a backbone:
support intelligence protection food oxygen

Extension and Application

4. **A Backbone Illustration!** Pretend you have just graduated from drawing school and you have been given your first job. You have been hired to illustrate a book on human anatomy. **Anatomy** studies the physical features of an animal, in this case, a human! You will use research tools (the internet and books) to gather information about what a backbone looks like. Can you picture what your own backbone might look like?

On a blank piece of paper, draw a picture of the human backbone. Remember that it is very important that anatomy drawings are labeled properly. There might be many details that you want to include in your drawing, so use a pencil.

5. **One of 50 000 Vertebrates!**

There are 50 000 vertebrate species living on Earth! This means you have A LOT of choice. Pick one vertebrate (use your imagination - pick an animal you have not read about yet. Or even better, one you have never heard of before!).

Design a brochure with information in it about your vertebrate. In your brochure, include:

- the name of your vertebrate
- a drawing of your vertebrate (use a pencil!)
- the vertebrate's formal classification (kingdom, phylum, class, order, etc.)
- why your animal can be classified as a vertebrate
- any other interesting information about your animal

Use the graphic organizer on the next page to help you collect your information.

Make your brochure as visually appealing as possible! Use colored pencils or markers to add color.



A Day in the Life of a Paleontologist!

In this activity, you will pretend you are a paleontologist heading out into the field! Your 'field' for this activity will be the schoolyard. In groups of 3 or 4, you will investigate what life exists in your schoolyard. You might not find fossils from 500 years ago, but you will definitely find something to give you a glimpse of evolution in the schoolyard.

On your trip, you will need to bring the following:

- Pencil
- Paper (for recording what you find, and where you found it)
- A bucket or container to collect rocks
- Digging tool (small shovel or sandbox shovel)

When you are out in the schoolyard, pick an area that is going to be your **dig site**. Don't pick too large an area - you don't want to dig up too much of the playground!

Look for rocks and stones that appear different from typical, round and smooth rocks. Look for patterns, lines, different textures, etc.

Once you have collected enough evidence on your dig, return to the classroom and record your observations. In your notebook, **write up a report** answering the following questions:

- Where in the schoolyard did you carry out your 'dig'?
- What kind of vegetation was there at your dig site? (grass, gravel, etc.)
- Did you find any rocks that looked interesting? Describe them.
- Did you find any rocks that had a pattern on them?
- What did the patterns look like?
- Do you think you found a fossil?

Once you have answered these questions, **draw a picture** showing you working at your dig site. Next to this picture, draw a picture of all the items (for example, rocks) that you found at your dig site.



Word Search

Find all of the words in the Word Search. Words may be horizontal, vertical, or diagonal. A few may even be backwards! Look carefully!

adaptation	environment	kingdom	phylum
arachnid	evolution	marsupial	sense
biologist	family	mollusk	species
class	fossil	nerve	symmetrical
classification	habitat	opposable	tissue
category	insect	organism	vertebrate
coldblooded	invertebrate	paleontologist	warmblooded

p	c	v	r	f	g	s	e	i	c	e	p	s	w	q	k	o	b
h	w	a	r	m	b	l	o	o	d	e	a	y	s	a	c	p	i
y	e	v	o	l	u	t	i	o	n	n	y	m	d	z	a	p	o
l	w	f	s	w	e	t	l	l	h	v	h	m	n	r	t	o	l
u	d	r	a	u	r	v	x	a	h	n	e	e	t	e	s	o	
m	v	a	z	m	w	y	u	j	a	r	t	t	r	y	g	a	g
s	e	c	e	g	i	f	h	k	r	o	g	r	v	h	o	b	i
r	r	v	d	f	g	l	m	v	r	n	b	i	e	d	r	l	s
t	t	b	n	m	j	g	y	e	m	r	c	w	f	y	e	t	
y	e	d	i	n	h	c	a	r	a	e	f	a	d	h	h	f	d
u	b	m	q	s	v	b	m	u	y	n	v	l	x	b	y	r	w
l	r	m	a	z	x	e	v	b	g	t	m	o	d	g	n	i	k
c	a	a	o	i	n	v	e	r	t	e	b	r	a	t	e	d	
l	t	s	l	s	a	s	d	f	g	f	s	h	f	s	n	e	
a	e	d	k	e	l	u	w	e	r	t	o	m	a	y	r	f	d
s	h	f	y	d	f	u	p	r	t	y	s	s	b	k	t	m	o
s	e	n	s	e	g	j	s	i	o	u	s	i	i	y	t	e	o
d	f	g	h	j	h	j	k	k	a	l	i	n	t	w	i	y	l
a	d	a	p	t	a	t	i	o	n	l	l	a	a	h	s	q	b
t	c	e	s	n	i	a	s	d	f	g	m	g	t	f	s	e	d
q	w	e	r	t	y	u	l	o	p	l	n	r	f	d	u	w	l
c	l	a	s	s	i	f	i	c	a	t	i	o	n	z	e	b	o
p	a	l	e	o	n	t	o	l	o	g	i	s	t	w	y	p	c



Comprehension Quiz



Part A

Circle the word True if the statement is true. Circle the word False if it is false.



- To classify something means to divide things into groups based on similarities.
True False
- Biologists are scientists who study evolution and fossils.
True False
- The difference between warm-blooded and cold-blooded animals is their ability to control their own body temperature.
True False
- There are more invertebrates living on Earth than vertebrates.
True False
- Invertebrates are organized the same way as vertebrates. They also have a backbone.
True False
- Animals adapt their physical features over long periods of time so that they survive in their habitat.
True False
- The koala has two opposable thumbs on each hand which gives it excellent grip for swinging in trees.
True False
- Scientists study evolution by reading newspaper reports from hundreds of years ago. These reports show how life on Earth has changed over time.
True False

Part B



Label each picture below as either a **vertebrate** or an **invertebrate**.



a) _____

b) _____

c) _____

SUBTOTAL: /14

Vertebrates



Bird



Monkey



Dolphin



Shark



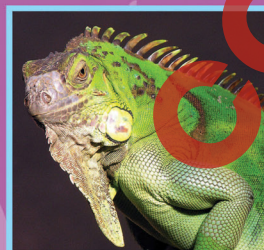
Toad



Kangaroo



Squirrel



Lizard



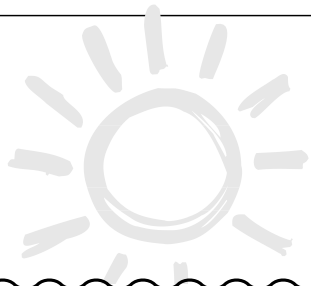
Panda



Seal



Vertebrates



3. a) Circle the animals that can be classified as **vertebrates**:
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- b) Circle the words that are associated with a **vertebrate**:
 backbone nerves insect tissue spiders
- c) Circle the words that describe the functions of a **backbone**:
 support intelligence protection food oxygen

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- 3.
- a) human, grizzly bear, deer
- b) backbone, nerves, tissue
- c) support, protection

4. Answers will vary

5. Answers will vary

1. 37° F (same temperature as its surroundings)
2. 100° F (temperature of most mammals when active)
3. 107° F (temperature of most birds when active)
4. No – can only swim to the surface where there is more sunlight on a sunny day
5. Fairly well – it has fur and layers of fat to insulate it
6. Not well – it has scales rather than fur and very little body fat
7. Body temperature drops as the temperature of its surroundings (water or air) drops



EASY MARKING ANSWER KEY

