Contents

TEACHER GUIDE

STUDENT HANDOUTS

- Reading Comprehension

Before You Read NAME: _____

The Nervous System – Spinal Cord and Nerves

1. Complete each sentence with a term from the list. Use a dictionary to help you.

neuron **brain** **tissue** **spinal cord** **vertebra**

a) A single bone in the spine is called a _____.

b) _____ is another word for nerve cell.

c) The _____ carries messages to and from the brain.

d) Our _____ is protected inside our skull.

e) A group of cells that work together to do a specific job are called _____.

2. Which word completes the sentence? Circle your answer. You may need a dictionary to help you.

a) Our spinal cord is _____ by the bones of our spine.

projected **protected**

b) The spinal cord is a thick _____ of nerve cells that run down our back.

bundle **bubble**

c) Our nerve cells carry _____ to and from our brain.

messages **messengers**

NAME: _____ Reading Passage

The Nervous System – Spinal Cord and Nerves

We have read that the nervous system is like a computer network that sends messages to every part of our body. We know the brain controls the whole system. Now we'll learn about the other two important parts of the nervous system – the spinal cord and the nerves.

The Spinal Cord

The spinal cord is a thick bundle of nerve tissue that runs down our back from the base of the brain. Information travels back and forth between the brain and the nerves in the rest of the body along the spinal cord. If our spinal cord was seriously injured, this two-way communication between our body and brain would stop. This is why our spinal cord is protected *inside* the bones of the spine, called **vertebrae**.

STOP

Why is our spinal cord inside our vertebrae?

_____

_____

The Nerves

Nerve cells (also called **neurons**) have the job of carrying messages. They carry messages to and from the brain through the spinal cord to every part of the body. Nerve cells are connected to our spinal cord and to each other. They have tiny ends, like threads, so they can reach everywhere in our body.

There are two main types of nerves. The first are called **motor nerves (**or **motor neurons)**. These nerves work with our muscles to make movement possible. When you think, "I want to pet my dog", you can do it because your motor nerves have "talked" to your muscles. They have **communicated** the message.

The second kind of nerves are called **sensory nerves** (or **sensory neurons**). These nerves bring messages from our **senses** – ears (hearing), eyes (seeing), tongue (tasting), nose (smelling), and skin (touching) – to our brain. Without these nerves you would not be able to feel the soft fur of a kitten or hear your favorite music.

After You Read NAME: _____

The Nervous System – Spinal Cord and Nerves

1. Put a check mark (✓) next to the answer that is most correct.

a) What is the main job of the motor neurons?

- ○ **A** bring messages to our senses
- ○ **B** make movement possible
- ○ **C** protect the spinal cord from damage
- ○ **D** control our emotions

b) Which best describes the spinal cord?

- ○ **A** a long boney ridge
- ○ **B** a thick bundle of nerves
- ○ **C** a computer
- ○ **D** protected by our skull

2. Fill in each blank with a term from the list. Be careful! <u>One</u> term will be used twice. <u>Two</u> terms will be left over.

smell	**brain**	**body**	**sensory**	**neurons**	**hear**
three	**spinal cord**	**two**	**messages**	**motor**	

Nerve cells are also called _____(a). It is their job to carry _____(b) between the _____(c) and the _____(d). The messages travel along our _____(e). Our nervous system is made of _____(f) kinds of neurons. _____(g) neurons make movement possible. _____(h) neurons carry messages from our senses. Without these we would not be able to _____(i) drums or _____(j) pizza.

NAME: _____ After You Read

The Nervous System – Spinal Cord and Nerves

3. Why is it important that our spinal cord is protected?

_____

_____

4. List **three** activities you wouldn't be able to do if you didn't have the use of your motor nerves.

_____

_____

_____

5. Below are some words from the reading. Write each word beside its meaning.

neuron **nerve** **vertebrae** **senses** **protect**

_____ **a)** the bones of the spine

_____ **b)** _____ cells carry messages

_____ **c)** to keep something safe

_____ **d)** seeing and hearing are examples of these

_____ **e)** another word for "nerve cell"

Extension & Application

6. Christopher Reeve was a famous actor who became **paralyzed** when his spine was injured in an accident. Do some research to find out more about Christopher Reeve. Try to find out how his spine was injured and how his life changed when he was paralyzed. Also find out how he helped other people with spinal injuries.

7. Sledge hockey is a popular sport played at the **Paralympics**. Only people with damaged spines can play this sport. Research sledge hockey to find out how it is played at the Paralympics. Then, compare it to the way professional hockey is played. Record your information in a Venn Diagram. What is unique to each game? What is the same in both?

Hands-On Activity # 2

How Much Air?

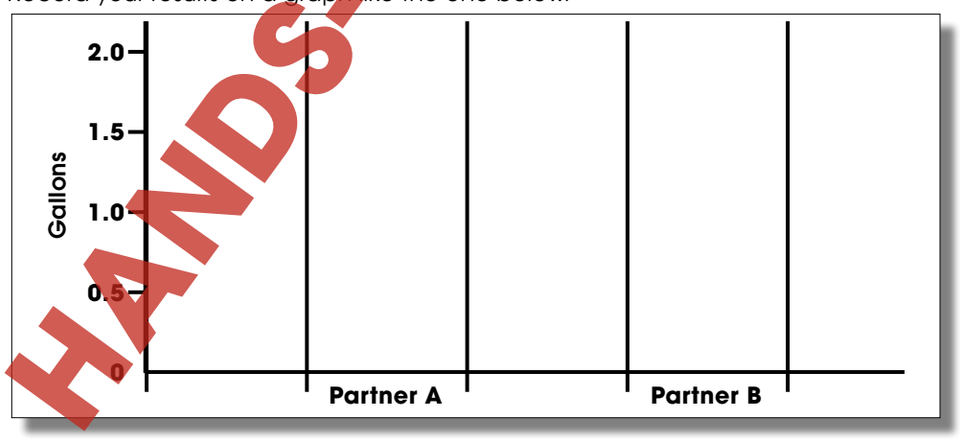
We have learned that when you INHALE, your lungs fill with air, and that when you EXHALE, air is pushed out of your lungs. This activity will show you how much air your lungs can hold.

Work with a partner.

FOR THIS ACTIVITY, you will need: • a shallow tub • a 2-gallon pop bottle, filled with water • a flexible tube • a marker

STEPS:

1. Set up your materials as follows. (Your teacher may do this for you.)
   - **a.** Make sure the bottle is filled up with water so there is no air in it.
   - **b.** Put one end of the tube in the bottle of water.
   - **c.** Partner A holds the bottle right-side up over the tub. (No water should fall out if you hold it up straight.)
   - **d.** Partner B holds onto the other end of the tube.
2. Partner B takes a deep breath in, and then blows into the tube. Keep blowing into the tube until you have run out of air. (As you do this, you will see water coming out of the bottle. The air pushes the water out.)
3. The air that you will see inside the bottle is the air that was in your lungs. We call this your **lung capacity.** With your marker, put a small line on the bottle where the water begins.
4. Switch roles and repeat Steps 1 to 3.
5. Record your results on a graph like the one below.



HANDS-ON ACTIVITIES

NAME: _____ After You Read

Word Search

Find all of the words in the Word Search. Words are written horizontally, vertically, or diagonally, and some are even written backwards.

nervous system	lens	motor nerves	vibration
retina	cerebellum	brain	ear canal
electrical signal	windpipe	cochlea	blink
respiratory system	optic nerve	iris	auricle
pupil	vertebrae	spinal cord	pressure
cerebrum	neuron	sensory receptor	pain
sight	eardrum	focus	sensation

S	P	A	S	D	C	E	R	E	B	R	U	M	Q	N	W	E	R
T	I	U	E	R	U	S	S	E	R	P	V	B	J	E	I	H	F
U	Y	G	P	I	O	Z	X	C	A	U	R	I	C	L	E	A	D
B	V	C	H	I	X	U	Y	T	I	R	E	W	Q	E	A	S	P
M	C	K	K	T	L	L	Z	X	N	C	V	B	N	C	M	A	S
R	E	S	P	I	R	A	T	O	R	Y	S	Y	S	T	E	M	Q
W	R	E	V	E	R	T	E	B	R	A	E	R	T	R	Y	U	I
Z	E	A	R	C	A	N	A	L	X	C	V	B	N	I	M	P	N
X	B	C	V	B	N	M	Q	W	E	R	T	Y	E	C	U	I	O
Z	E	X	D	C	C	O	C	H	L	E	A	V	A	A	V	N	I
Q	L	W	R	E	R	T	Y	U	I	O	R	M	R	L	P	O	T
A	L	S	O	N	E	U	R	O	N	E	E	D	D	S	F	I	A
Z	U	X	C	C	V	B	N	M	N	T	B	C	R	I	V	T	R
Q	M	W	L	E	R	T	Y	C	S	Y	L	A	U	G	Z	A	B
Z	W	E	A	X	C	V	I	Y	B	S	I	Q	M	N	W	S	I
X	C	V	N	B	D	T	S	F	G	H	N	Z	X	A	C	N	V
C	Q	W	I	E	P	S	D	Z	X	C	K	V	Z	L	X	E	S
L	Q	W	P	O	U	E	X	C	D	F	C	V	B	N	M	S	R
S	E	N	S	O	R	Y	R	E	C	E	P	T	O	R	Q	E	F
A	I	N	V	S	D	F	S	E	V	R	E	N	R	O	T	O	M
X	C	R	S	V	B	N	M	Q	W	E	G	H	J	I	C	A	S
J	E	H	I	W	I	N	D	P	I	P	E	G	N	U	F	D	S
N	X	C	C	S	V	F	G	H	J	K	L	A	S	Q	W	E	C

WORD SEARCH

NAME: _____ After You Read

Part C

Comprehension Quiz

Answer each question in complete sentences.

1. Name the **three** main parts of the **nervous system**. Describe what each part does. (6)

2. Name **one** part of the **brain**. Describe where it is in the brain, and one main job it has. (3)

3. Name **one** of the two kinds of **nerves** in the human body. Describe what they do in the body. (2)

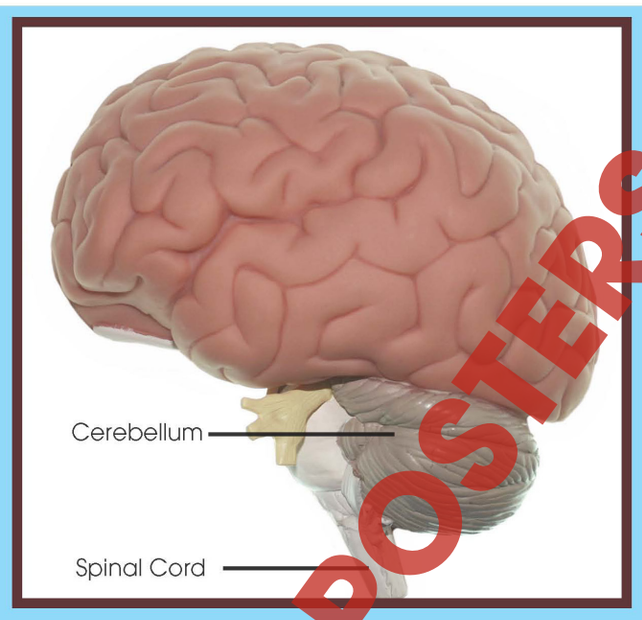
4. Describe what happens with **oxygen** and **carbon dioxide** in the respiratory system. Use the terms **inhale, exhale, lungs** and **bloodstream** in your answer. (4)

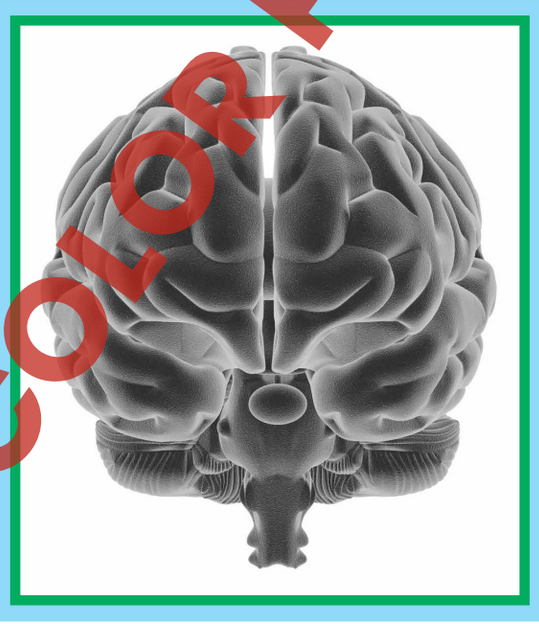
5. Describe how our body feels **pain**. Use the terms **skin, sensory receptors, message** and **brain** in your answer. Why is it important that we can feel pain? (3)

SUBTOTAL: /18

ASSESSMENT

Parts of the Brain





COLOR POSTER

NAME: _____

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EZ

3.
Because it allows for communication between our brain and our body

Answers will vary

11

4.
Answers will vary – activities must involve muscles

5.
a) vertebrae

b) nerve

protect

d) senses

e) neuron

Answers will vary

12

6.
Answers will vary depending on resources used

Answers will vary

13

7.
Answers will vary depending on resources used

Answers will vary

10

14

EASY MARKING ANSWER KEY