TEACHER GUIDE

7th–9th Grade

Includes Student Worksheets

Science

- Weekly Lesson Schedule
- Worksheets
- Quizzes & Tests
- Answer Keys

INTRODUCTION TO ANATOMY & PHYSIOLOGY 2

Nervous and Digestive Systems

wonders of the HUMAN BODY

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Introduction to Anatomy & Physiology 2

MASTERBOOKS CURRICULUM

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Table of Contents

Dr. Tommy Mitchell has been a speaker and writer for Answers in Genesis since 2005. He has a degree in cell biology, as well as a medical degree. Once an evolutionist, now a creationist, he feels extremely passionate about sharing the vital creation/gospel message with the world, especially with influential teens.

Using This Teacher Guide

Features: The suggested weekly schedule enclosed has easy-to-manage lessons that guide the reading, worksheets, and all assessments. The pages of this guide are perforated and three-hole punched so materials are easy to tear out, hand out, grade, and store. Teachers are encouraged to adjust the schedule and materials needed in order to best work within their unique educational program.

Lesson Scheduling: Students are instructed to read the pages in their book and then complete the corresponding section provided by the teacher. Assessments that may include worksheets, activities, quizzes, and tests are given at regular intervals with space to record each grade. Space is provided on the weekly schedule for assignment dates, and flexibility in scheduling is encouraged. Teachers may adapt the scheduled days per each unique student situation. As the student completes each assignment, this can be marked with an "X" in the box.

	**Approximately 30 to 45 minutes per lesson, five days a week**
	**Includes answer keys for worksheets, quizzes, and tests**
	**Worksheets for each section**
	**Quizzes and tests are included to help reinforce learning and provide assessment opportunities**
	**Designed for grades 7 to 9 in a one-year course to earn 1 science credit**

Course Objectives: Students completing this course will

- Learn how nerve signals are generated throughout the body
- Identify how nerve signals are transmitted to and from the brain
- Investigate the structure of the brain and how it processes input from the body
- Explore our senses: sight, hearing, taste, and more
- Discover the process of digestion by which the food we take in is converted to the substances our bodies need
- Learn about metabolism, the chemical transformations that happen in our cells

Course Description

The introduction to anatomy and physiology continues as students are given a deeper understanding of God's wonderful design of their bodies. How do just the correct muscles know how to contract in just the right way to allow us to walk? How can we control the movements of our hands in a very precise fashion so that we can brush our teeth? How can we decipher those funny marks on a printed page, understand that they are letters and punctuation marks, and make sense of them? How can we hear others singing and make our voices match theirs? How does the cereal you had for breakfast become energy? Or the popcorn you had at the ballgame? How does the chicken you had for supper provide the amino acids the body needs to build proteins? These questions and more are answered as we look into the wonders of God's awesome creation.

Our minds and bodies process vast amounts of information each second, information that comes from all parts of the body. Then nerve signals are sent out in response to those inputs. If this sounds simple, rest assured, it is not. It is all quite extraordinary! But as with all things in our fallen cursed world, things do go wrong. We will also explore the problems that occur when our bodies are damaged by disease or injury.

When you see the incredible complexity of you, you will realize that our bodies cannot be the result of chemical accidents occurring over millions of years. The human body is the greatest creation of an all-knowing Master Designer!

Note for Grading: All worksheet answers are worth 4 point each (100 points total) and quizzes and tests are 100 points total with all answers valued at 5 points each.

First Semester Suggested Daily Schedule

Date	Day	Assignment	Due Date	✓	Grade
First Semester-First Quarter — ***The Nervous System***					
Week 1	Day 1	Read Pages 4–6 (to Overview of the Nervous System) • *The Nervous System* (NS) • Read Introduction with focus on course objectives • Pages 4–5 • Teacher Guide (TG)			
	Day 2	Read Pages 6–9 (from Overview of Nervous System) • (NS)			
	Day 3	Worksheet 1 • Pages 17–18 • (TG)			
	Day 4	Worksheet 1 • Pages 17–18 • (TG)			
	Day 5	Read Structure of Nervous System • Pages 10–13 • (NS)			
Week 2	Day 6	Read Pages 14–16 • (NS)			
	Day 7	Worksheet 2 • Pages 19–20 • (TG)			
	Day 8	Worksheet 2 • Pages 19–20 • (TG)			
	Day 9	Read Pages 17–19 (to Nerves) • (NS)			
	Day 10	Read Pages 19–21 (from Nerves) • (NS)			
Week 3	Day 11	Worksheet 3 • Pages 21–22 • (TG)			
	Day 12	Worksheet 3 • Pages 21–22 • (TG)			
	Day 13	Read Pages 22–23 • (NS)			
	Day 14	Read Pages 24–25 (to The Action Potential) • (NS)			
	Day 15	Read Pages 25–27 (from The Action Potential) • (NS)			
Week 4	Day 16	Read Pages 28–29 • (NS)			
	Day 17	Read Pages 30–31 • (NS)			
	Day 18	Read Pages 32–34 (to The Role of the Synapse) • (NS)			
	Day 19	Read Pages 34–35 (from The Role of the Synapse) • (NS)			
	Day 20	Worksheet 4 • Pages 23–24 • (TG)			
Week 5	Day 21	Worksheet 4 • Pages 23–24 • (TG)			
	Day 22	Worksheet 4 • Pages 23–24 • (TG)			
	Day 23	Study Day			
	Day 24	**Quiz One** • Pages 97–98 • (TG)			
	Day 25	Read Pages 36–39 (to Cerebrospinal Fluid) • (NS)			
Week 6	Day 26	Read Pages 39–42 (from Cerebrospinal Fluid to Cerebrum - Gross Anatomy) • (NS)			
	Day 27	Worksheet 5 • Pages 25–26 • (TG)			
	Day 28	Worksheet 5 • Pages 25–26 • (TG)			
	Day 29	Read Pages 42–44 (from Cerebrum - Gross Anatomy to end of first paragraph) • (NS)			
	Day 30	Read Pages 44–46 (from first full paragraph to The Cerebrum) • (NS)			

Date	Day	Assignment	Due Date	✓	Grade
Week 7	Day 31	Worksheet 6 • Pages 27–28 • (TG)			
	Day 32	Worksheet 6 • Pages 27–28 • (TG)			
	Day 33	Read Pages 46–47 (from The Cerebrum to Cerebrum - Association Areas) • (NS)			
	Day 34	Read Pages 47–49 (from Cerebrum - Association Areas to Which Is the Important Side?) • (NS)			
	Day 35	Worksheet 7 • Pages 29–30 • (TG)			
Week 8	Day 36	Worksheet 7 • Pages 29–30 • (TG)			
	Day 37	Read Pages 49–51 (from Which Is the Important Side? to Brain Stem) • (NS)			
	Day 38	Read Pages 51–53 (from Brain Stem to Cerebellum) • (NS)			
	Day 39	Worksheet 8 • Pages 31–32 • (TG)			
	Day 40	Worksheet 8 • Pages 31–32 • (TG)			
Week 9	Day 41	Read Pages 53–55 (from Cerebellum to end of first paragraph) • (NS)			
	Day 42	Read Pages 55–56 (from second paragraph to Blood Brain Barrier) • (NS)			
	Day 43	Worksheet 9 • Pages 33–34 • (TG)			
	Day 44	Worksheet 9 • Pages 33–34 • (TG)			
	Day 45	Read Pages 56–57 (from Blood Brain Barrier) • (NS)			
First Semester-Second Quarter					
Week 1	Day 46	Read Pages 58–59 (to Consciousness and the Mind) • (NS)			
	Day 47	Worksheet 10 • Pages 35–36 • (TG)			
	Day 48	Worksheet 10 • Pages 35–36 • (TG)			
	Day 49	Read Pages 59–61 (from Consciousness and the Mind to Spinal Cord - Gross Anatomy) • (NS)			
	Day 50	Read Pages 61–63 (from Spinal Cord - Gross Anatomy) • (NS)			
Week 2	Day 51	Worksheet 11 • Pages 37–38 • (TG)			
	Day 52	Worksheet 11 • Pages 37–38 • (TG)			
	Day 53	Read Pages 64–65 (to Tracts in the Spinal Cord) • (NS)			
	Day 54	Read Page 65 (from Tracts in the Spinal Cord) • (NS)			
	Day 55	Worksheet 12 • Pages 39–40 • (TG)			
Week 3	Day 56	Worksheet 12 • Pages 39–40 • (TG)			
	Day 57	Read Pages 66–68 • (NS)			
	Day 58	Read Pages 69–71 • (NS)			
	Day 59	Worksheet 13 • Pages 41–42 • (TG)			
	Day 60	Worksheet 13 • Pages 41–42 • (TG)			
Week 4	Day 61	Read Pages 72–73 • (NS)			
	Day 62	Read Pages 74–76 (to Sensory Receptors) • (NS)			
	Day 63	Read Pages 76–77 (from Sensory Receptors) • (NS)			
	Day 64	Read Pages 78–81 • (NS)			
	Day 65	Worksheet 14 • Pages 43–44 • (TG)			

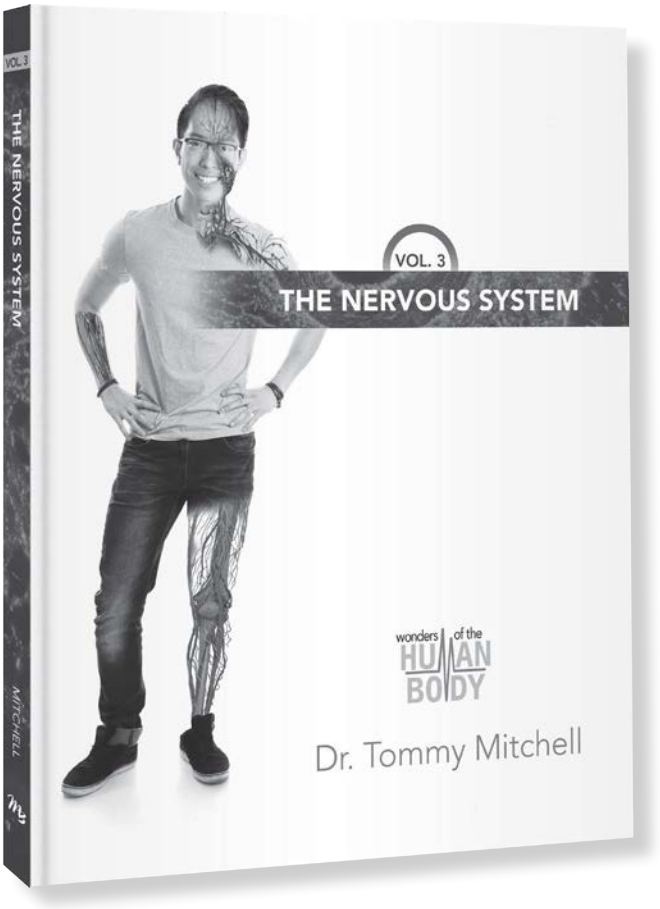
Date	Day	Assignment	Due Date	✓	Grade
Week 5	Day 66	Worksheet 14 • Pages 43–44 • (TG)			
	Day 67	Study Day			
	Day 68	**Quiz Two** • Pages 99–100 • (TG)			
	Day 69	Read Pages 82–83 • (NS)			
	Day 70	Read Pages 84–85 • (NS)			
Week 6	Day 71	Worksheet 15 • Page 45 • (TG)			
	Day 72	Read Page 86 • (NS)			
	Day 73	Read Pages 87–88 (to Hearing) • (NS)			
	Day 74	Worksheet 16 • Pages 47–48 • (TG)			
	Day 75	Worksheet 16 • Pages 47–48 • (TG)			
Week 7	Day 76	Read Pages 88–90 (from Hearing to end of first paragraph) • (NS)			
	Day 77	Read Pages 90–91 (from start of second paragraph to Sound) • (NS)			
	Day 78	Worksheet 17 • Pages 49–50 • (TG)			
	Day 79	Worksheet 17 • Pages 49–50 • (TG)			
	Day 80	Read Pages 91–92 (from Sound) • (NS)			
Week 8	Day 81	Read Pages 93–95 • (NS)			
	Day 82	Worksheet 18 • Pages 51–52 • (TG)			
	Day 83	Worksheet 18 • Pages 51–52 • (TG)			
	Day 84	Read Pages 96–98 (to The Retina) • (NS)			
	Day 85	Read Pages 98–102 (from The Retina) • (NS)			
Week 9	Day 86	Worksheet 19 • Page 53 • (TG)			
	Day 87	Study Day			
	Day 88	**Quiz Three** • Pages 101–102 • (TG)			
	Day 89	Study Day			
	Day 90	**Test One** • Pages 107–108 • (TG)			
		Mid-Term Grade			

Second Semester Suggested Daily Schedule

Date	Day	Assignment	Due Date	✓	Grade
Second Semester-Third Quarter — ***The Digestion System & Metabolism***					
Week 1	Day 91	Read Foundations • Pages 4–7 • *Digestive System & Metabolism* (DSM)			
	Day 92	Read Pages 8–10 • (DSM)			
	Day 93	Read Pages 11–13 • (DSM)			
	Day 94	Worksheet 20 • Pages 57–58 • (TG)			
	Day 95	Worksheet 20 • Pages 57–58 • (TG)			
Week 2	Day 96	Read Pages 13–16 (to The Tongue) • (DSM)			
	Day 97	Read Pages 16–18 (from The Tongue) • (DSM)			
	Day 98	Worksheet 21 • Pages 59–60 • (TG)			
	Day 99	Worksheet 21 • Pages 59–60 • (TG)			
	Day 100	Read Pages 19–20 (to final full paragraph) • (DSM)			
Week 3	Day 101	Read Pages 20–23 (from final full paragraph) • (DSM)			
	Day 102	Worksheet 22 • Pages 61–62 • (TG)			
	Day 103	Worksheet 22 • Pages 61–62 • (TG)			
	Day 104	Read Pages 24–25 (to Saliva) • (DSM)			
	Day 105	Read Pages 25–27 (from Saliva) • (DSM)			
Week 4	Day 106	Worksheet 23 • Pages 63–64 • (TG)			
	Day 107	Worksheet 23 • Pages 63–64 • (TG)			
	Day 108	Read Pages 28–31 • (DSM)			
	Day 109	Read Pages 32–34 (to The Stomach) • (DSM)			
	Day 110	Worksheet 24 • Pages 65–66 • (TG)			
Week 5	Day 111	Worksheet 24 • Pages 65–66 • (TG)			
	Day 112	Read Pages 34–37 (from The Stomach) • (DSM)			
	Day 113	Read Pages 38–39 • (DSM)			
	Day 114	Worksheet 25 • Pages 67–68 • (TG)			
	Day 115	Worksheet 25 • Pages 67–68 • (TG)			
Week 6	Day 116	Read Pages 40–43 (to And Now...) • (DSM)			
	Day 117	Read Pages 43–44 (from And Now...) • (DSM)			
	Day 118	Worksheet 26 • Pages 69–70 • (TG)			
	Day 119	Worksheet 26 • Pages 69–70 • (TG)			
	Day 120	Read Pages 45–46 • (DSM)			
Week 7	Day 121	Read Pages 47–48 • (DSM)			
	Day 122	Worksheet 27 • Pages 71–72 • (TG)			
	Day 123	Worksheet 27 • Pages 71–72 • (TG)			
	Day 124	Read Pages 49–51 (to Blood Supply of the Liver) • (DSM)			
	Day 125	Read Pages 51–54 (from Blood Supply of the Liver to Functions of the Liver) • (DSM)			

Date	Day	Assignment	Due Date	✓	Grade
Week 8	Day 126	Worksheet 28 • Pages 73–74 • (TG)			
	Day 127	Worksheet 28 • Pages 73–74 • (TG)			
	Day 128	Read Pages 54–55 (from Functions of the Liver) • (DSM)			
	Day 129	Read Pages 56–57 • (DSM)			
	Day 130	Read Pages 58–59 • (DSM)			
Week 9	Day 131	Read Pages 60–61 (to Blood Supply of the Small Intestine) • (DSM)			
	Day 132	Worksheet 29 • Pages 75–76 • (TG)			
	Day 133	Worksheet 29 • Pages 75–76 • (TG)			
	Day 134	Study Day			
	Day 135	**Quiz One** • Pages 103–104 • (TG)			
Second Semester-Fourth Quarter					
Week 1	Day 136	Read Pages 61–63 (from Blood Supply of the Small Intestine) • (DSM)			
	Day 137	Read Pages 64–65 • (DSM)			
	Day 138	Worksheet 30 • Pages 77–78 • (TG)			
	Day 139	Worksheet 30 • Pages 77–78 • (TG)			
	Day 140	Read Pages 66–67 • (DSM)			
Week 2	Day 141	Read Pages 68–69 • (DSM)			
	Day 142	Worksheet 31 • Pages 79–80 • (TG)			
	Day 143	Worksheet 31 • Pages 79–80 • (TG)			
	Day 144	Read Pages 70–73 • (DSM)			
	Day 145	Read Page 74 • (DSM)			
Week 3	Day 146	Worksheet 32 • Pages 81–82 • (TG)			
	Day 147	Worksheet 32 • Pages 81–82 • (TG)			
	Day 148	Read Pages 75–76 • (DSM)			
	Day 149	Read Pages 77–79 (to Digestion of Proteins) • (DSM)			
	Day 150	Worksheet 33 • Pages 83–84 • (TG)			
Week 4	Day 151	Worksheet 33 • Pages 83–84 • (TG)			
	Day 152	Read Pages 79–81 (from Digestion of Proteins to Lipids) • (DSM)			
	Day 153	Read Pages 81–83 (from Lipids) • (DSM)			
	Day 154	Worksheet 34 • Pages 85–86 • (TG)			
	Day 155	Worksheet 34 • Pages 85–86 • (TG)			
Week 5	Day 156	Read Pages 84–85 • (DSM)			
	Day 157	Read Pages 86–87 • (DSM)			
	Day 158	Worksheet 35 • Pages 87–88 • (TG)			
	Day 159	Worksheet 35 • Pages 87–88 • (TG)			
	Day 160	Read Pages 88–89 (to Water) • (DSM)			

Date	Day	Assignment	Due Date	✓	Grade
	Day 161	Read Pages 89–91 (from Water to Fiber) • (DSM)			
	Day 162	Worksheet 36 • Pages 89–90 • (TG)			
Week 6	Day 163	Worksheet 36 • Pages 89–90 • (TG)			
	Day 164	Worksheet 36 • Pages 89–90 • (TG)			
	Day 165	Read Pages 91–94 (from Fiber) • (DSM)			
	Day 166	Read Pages 95–96 • (DSM)			
	Day 167	Read Pages 97–98 • (DSM)			
Week 7	Day 168	Worksheet 37 • Pages 91–92 • (TG)			
	Day 169	Worksheet 37 • Pages 91–92 • (TG)			
	Day 170	Worksheet 37 • Pages 91–92 • (TG)			
	Day 171	Read Pages 99–102 (to Lipid Metabolism) • (DSM)			
	Day 172	Read Pages 102–105 (from Lipid Metabolism) • (DSM)			
Week 8	Day 173	Worksheet 38 • Pages 93–94 • (TG)			
	Day 174	Worksheet 38 • Pages 93–94 • (TG)			
	Day 175	Worksheet 38 • Pages 93–94 • (TG)			
	Day 176	Study Day			
	Day 177	**Quiz Two** • Pages 105–106 • (TG)			
Week 9	Day 178	Study Day Volume One			
	Day 179	Study Day Volume Two			
	Day 180	**Test Two** • Pages 109–110 • (TG)			
		Final Grade			



Nervous System Worksheets

for Use with

The Nervous System

Words to Know — Define the Following:

1. Sensory function:
2. Motor output:
3. Central nervous system:
4. The brain:
5. Peripheral nervous system:
6. Sensory division:
7. Afferent division:
8. Motor division:
9. Somatic nervous system:
10. Autonomic nervous system:

Fill in the Blank

1. The basic pattern of the nervous system consists of information coming into the nervous system. This information is then recognized and _____, and finally a signal is sent out instructing an organ (or organs) to respond in some manner.
2. The nervous system often compares what is sensed in the present to what has been _____ in the past.
3. _____ implies movement or some sort of action.
4. The two major divisions of the nervous system are the central nervous system (CNS) and the _____ nervous system (PNS).
5. The _____ cord extends from the base of the brain down to the lower levels of the spinal column.
6. The peripheral nervous system consists of the _____ nerves that extend from the brain, and the spinal nerves that extend from the spinal cord.
7. The PNS has two basic functions: carrying sensory information to the CNS and transmitting _____ out to the various part of the body.

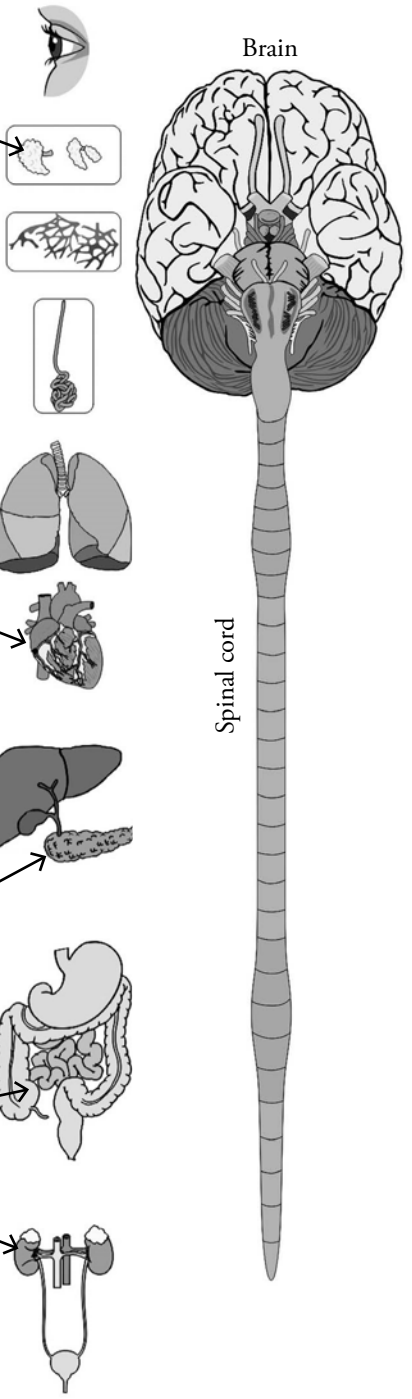
8. We can divide the PNS into two divisions, which are the _____ division and the motor division.

9. The motor division is sometimes called the _____ (meaning "carrying away") division because it carries instructions "away from" the CNS.

10. _____ means "body," so this part of the nervous system allows us to control our body's movements.

Complete the Chart — Automatic Nervous System

Parasympathetic



Salivary & Parotid Glands

1. _____
   _____

Heart

2. _____

Pancreas

3. _____

Intestines

4. _____
   _____

Kidneys

5. _____
   _____
   _____

Words to Know — Define the Following:

1. Neurons:
2. Stimulus:
3. Neuroglia:
4. Neurotransmitters:
5. Dendrites:
6. Axon terminals:
7. Multipolar neurons:
8. Bipolar neurons:
9. Unipolar neurons:
10. Interneurons:

Fill in the Blank

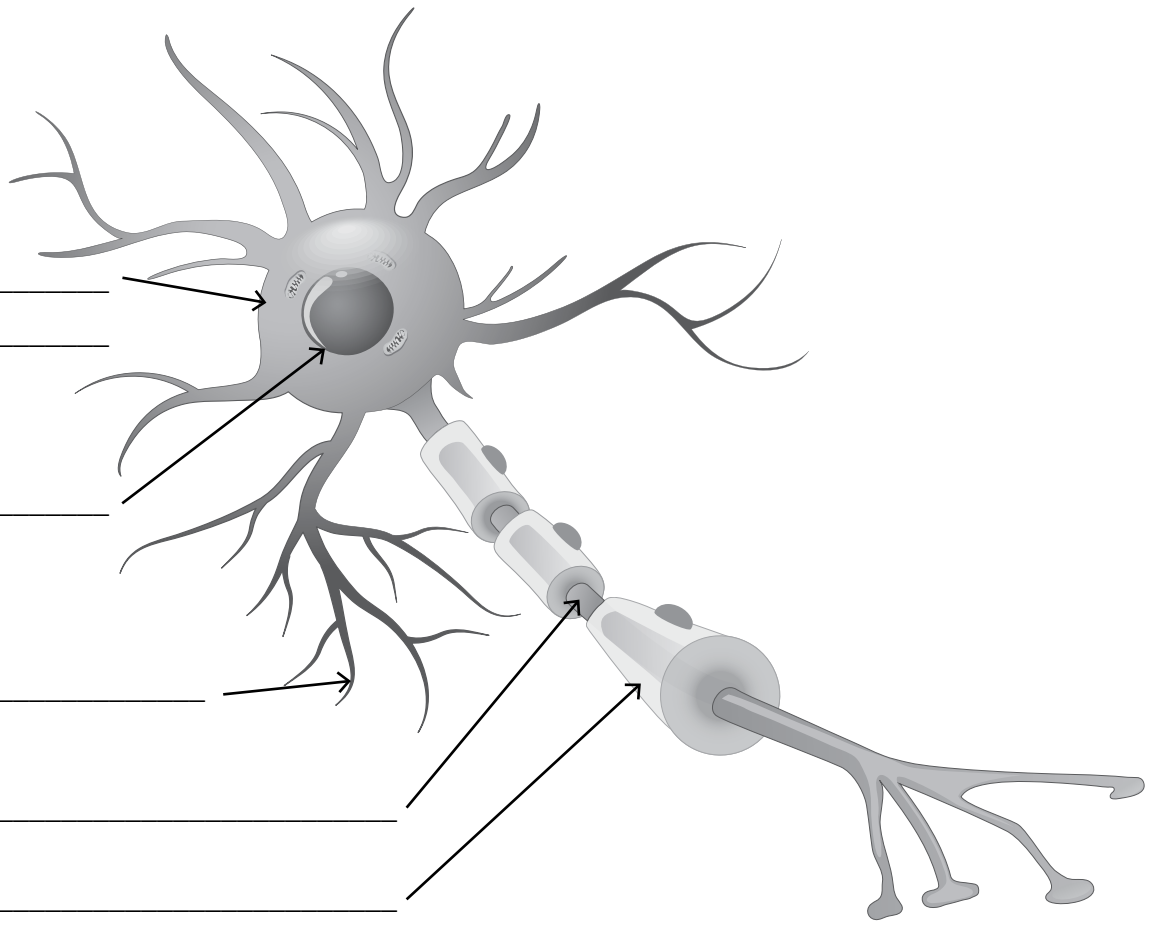
1. _____ tissue lines body cavities or covers surfaces.
2. _____ tissue helps provide a framework for the body and helps connect and support other organs in the body.
3. _____ tissue is the primary component of the nervous system.
4. _____ tissue is responsible for movement and includes skeletal, smooth, and cardiac.
5. The _____ is composed of three parts: the cell body, dendrites, and the axon.
6. The _____ is the portion of the neuron that carries a nerve impulse away from the cell body.
7. Unlike most cell types in your body, neurons cannot be routinely _____.

8. Neurons that transmit impulses away from the central nervous system are called motor or _____ neurons.

9. Sensory or _____ neurons carry impulses triggered by sensory receptors toward the central nervous system.

10. The four types of _____ cells in the central nervous system are the astrocytes, microglial cells, ependymal cells, and oligodendrocytes.

Complete the Chart — Neuron



1. _____
_____
2. _____
3. _____
4. _____
5. _____

Words to Know — Define the Following:

1. Myelination:
2. Schwann cells:
3. Multiple Sclerosis (MS):
4. Neuron:
5. Motor neurons:
6. Sensory neurons:
7. Mixed nerves:
8. Nerve damage in the PNS:
9. Nerve damage in the CNS:
10. Wallerian degeneration:

Fill in the Blank

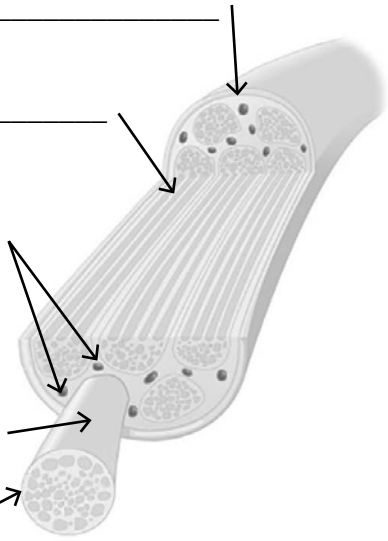
1. The _____ sheath provides electrical insulation for the axon.
2. There are small gaps between adjacent Schwann cells called _____ of Ranvier.
3. In the CNS, it is the oligodendrocyte that is responsible for _____.
4. The number of myelinated axons _____ from birth throughout childhood until adulthood.
5. Symptoms of MS include double vision, weakness, loss of _____, and paralysis.
6. A newborn baby has very little _____ of its body in the beginning.
7. A _____ is made of bundles of axons located in the peripheral nervous system.
8. With rare exceptions, mature neurons do not divide to _____ themselves.

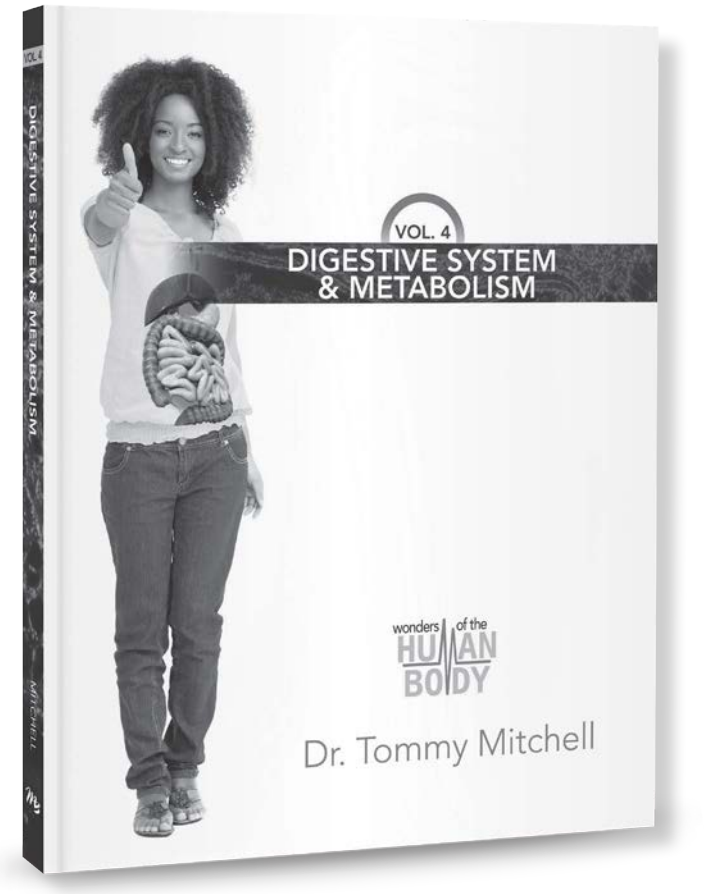
9. We are not the products of chance, but special _____.

10. The enormous _____ of the body should remind us constantly of God's wisdom and creativity.

Complete the Chart — Anatomy of a Nerve

1. _____
2. _____
3. _____
4. _____
5. _____





Digestive System & Metabolism Worksheets

for Use with

The Digestive System & Metabolism

Words to Know — Define the Following:

1. Digestion:

2. Alimentary canal:

3. The accessory digestive organs:

4. Mechanical digestion:

5. Chemical digestion:

6. Absorption:

7. Elimination:

8. Serosa:

9. Peritoneum:

10. Bolus:

Fill in the Blank

1. The first function of the digestive system is called _____.

2. _____ is when food is moved along the length of the GI tract.

3. The indigestible material eliminated from the body is called _____ and leaves the body through the anus.

4. The food you chew up and swallow enters the _____, where it is processed and moved along from section to section.

5. The innermost tissue layer in the GI tract wall is called the _____.

6. The dense connective tissue of the _____ supports the overlying mucosa as it expands to accommodate food to be digested and shrinks back when digestion is completed.

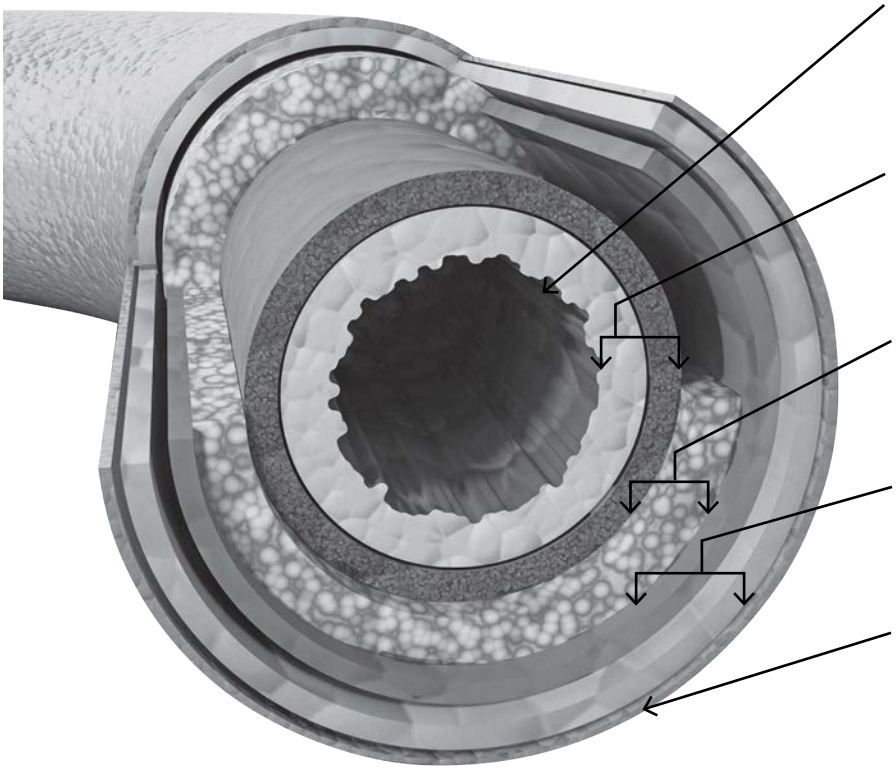
7. _____ help secure organs to the body wall and hold them in the proper position so that they won't twist while also suspending them to allow them room to expand and to slide along other organs.

8. _____ is a condition resulting from an acute inflammation of the peritoneum.

9. Symptoms of peritonitis include _____ pain and fever.

10. The GI tract has its own nervous system, called the _____ nervous system.

Complete the Chart — Tissue Layers of the GI Tract



1. _____
2. _____
3. _____
4. _____
   _____
5. _____

Words to Know — Define the Following:

1. Hard palate:

2. Soft palate:

3. Papillae:

4. Tooth's neck:

5. Gingiva:

Fill in the Blank

1. The _____ are covered by skin on the outside but by mucous membrane on the inside of the mouth.

2. The lips, containing _____ muscle, are under voluntary control.

3. The superior (upper) boundary of the mouth is formed by the hard and soft palates, which is called the "_____" of the mouth.

4. The _____ is composed of two sets of skeletal muscles.

5. The tongue's extrinsic muscles are attached to the _____ bone.

6. _____ buds are found in fungiform, foliate, and circumvallate papillae.

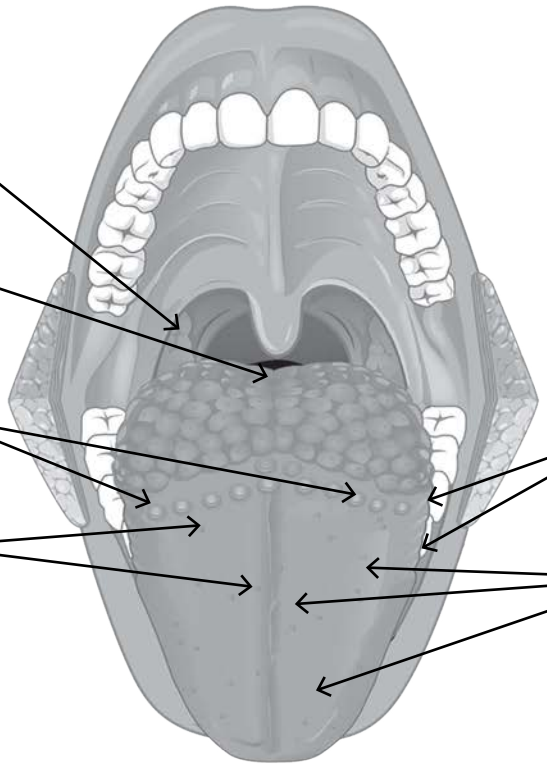
7. The more thoroughly food is chewed, the better for your _____.

8. Each tooth has three major regions: the crown, the neck, and the _____.

9. _____ is the hardest substance in the body, and it is very durable.

10. _____ makes up the majority of the volume of a tooth.

Complete the Chart — The Tongue



1. _____
2. _____
3. _____
4. _____
5. _____
6. _____

7. _____
8. _____
9. _____
10. _____

Words to Know — Define the Following:

1. Periodontal ligament:

2. Cavities:

3. Saliva:

4. Tooth decay:

5. Plaque:

6. Gingivitis:

Fill in the Blank

1. In the _____ cavity is found nerves and blood vessels.

2. Both enamel and cementum contain _____, which is incorporated into their calcium-containing structures.

3. Fluoride is present in varying amounts in ordinary _____, in tea leaves, and in some foods, such as raisins and potatoes.

4. Unprotected by _____, tooth decay can become severe.

5. God designed your tooth enamel to _____ itself by incorporating minerals dissolved in your saliva.

6. The _____ produced by bacteria not only dissolve the minerals in your tooth enamel but also make it hard for teeth to recapture the lost minerals.

7. Ancient Egyptians and Babylonians — like the ones talked about in the Bible — cleaned their teeth by chewing on the frayed ends of _____.

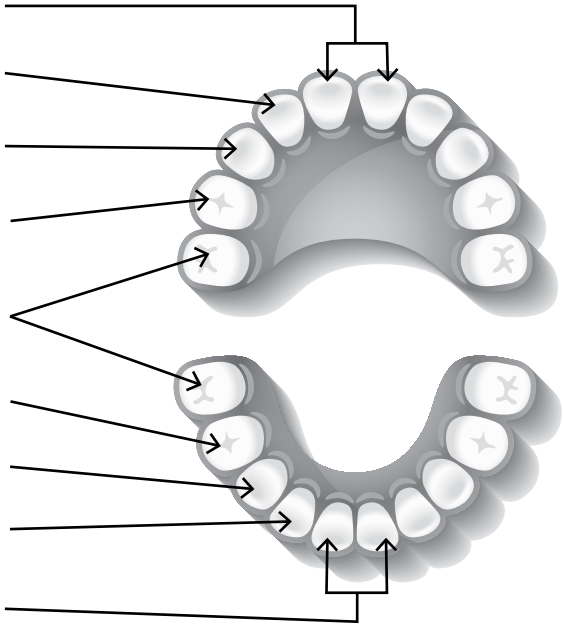
8. The ancient Egyptians developed the oldest known recipe for toothpaste, containing dried iris flower, mint, salt, and _____.

9. There is some evidence that poor oral hygiene can lead to _____ disease.

10. Baby teeth or milk teeth are already present in a baby's _____ at birth, hidden deep beneath the gums.

Complete the Chart — Dentition: The Arrangement of the Primary Teeth

1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____



Quizzes and Tests

for Use with

Introduction to Anatomy & Physiology 2

Match the words/phrases and their definitions. (5 points each)

Autonomic nervous system	Neuroglia	Synapse
Central nervous system	Neurons	The brain
Depolarization	Sensory neurons	
Motor neurons	Stimulus	

1. _____ composed of the brain and the spinal cord
2. _____ excites a neuron, triggering an electrical signal called an action potential
3. _____ carry impulses away from the central nervous system
4. _____ the part of the motor division that controls the involuntary functions
5. _____ carry impulses toward the central nervous system
6. _____ the place where a neuron communicates with another neuron or with a muscle cell
7. _____ the master control center of the nervous system
8. _____ cells in nervous tissue that help protect and support the neurons
9. _____ the excitable nerve cells that transmit electrical signals
10. _____ the membrane potential becomes less and less negative, and then positive

Fill in the blank with the correct answer. (5 points each)

experienced	nerve	neuron	replaced	signals
increases	nervous	peripheral	resting	Somatic

1. The _____ is composed of three parts: the cell body, dendrites, and the axon.

2. The nervous system often compares what is sensed in the present to what has been _____ in the past.

3. Neurotransmitters are the molecules that carry the _____ across the synaptic cleft.

4. _____ means "body," so this part of the nervous system allows us to control our body's movements.

5. A _____ is made of bundles of axons located in the peripheral nervous system.

6. There exists a small electrical difference across the cell membrane, which is called the _____ membrane potential.

7. The two major divisions of the nervous system are the central nervous system (CNS) and the _____ nervous system (PNS).

8. The number of myelinated axons _____ from birth throughout childhood until adulthood.

9. Unlike most cell types in your body, neurons cannot be routinely _____.

10. The _____ tissue is the primary component of the nervous system.

Match the words/phrases and their definitions. (5 points each)

Autonomic nervous system	Müller cells	Spinal cord
Central nervous system	Neurons	Tracts
Cochlea	Peripheral nervous system	
Homeostasis	Sound	

1. _____ Act like fiberoptic cables, efficiently transmitting the light that strikes the surface of the retina to the photoreceptor cells
2. _____ The part of the motor division that controls the involuntary functions
3. _____ Provides a pathway for sensory information to reach the brain
4. _____ Anterior to the vestibule; a spiral chamber made of bone
5. _____ The body's tendency to maintain internal balance
6. _____ The excitable nerve cells that transmit electrical signals
7. _____ A series of vibrations; cannot travel through a vacuum, such as in space
8. _____ The portion of the nervous system outside the brain and spinal cord
9. _____ Bundles of axons in the central nervous system
10. _____ Composed of the brain and the spinal cord

Fill in the blank with the correct answer. (5 points each)

autonomic	chemicals	nerve	opposite	permanent
barrier	increases	neuron	optic	waves

1. When we hear something, we are sensing sound _____ from the environment.
2. To prevent potentially harmful things from coming into contact with brain tissue, there is a blood brain _____.
3. The _____ nerve carries nerve impulses for vision.
4. Our ability to taste depends on our ability to detect, and then react to, certain _____ in our environment.
5. The cerebral hemispheres control the _____ sides of the body.
6. A _____ is made of bundles of axons located in the peripheral nervous system.
7. With an _____ reflex, you remain unaware of what happened.
8. The number of myelinated axons _____ from birth throughout childhood until adulthood.
9. Strokes can result in _____ neurologic damage or even death.
10. The _____ is composed of three parts: the cell body, dendrites, and the axon.

Answer Keys

for Use with

Introduction to Anatomy & Physiology 2

The Nervous System Worksheet Answer Keys

Worksheet 1

Words to Know: Define the Following:

1. **Sensory function:** a vast number of sensory receptors throughout the body provide input to the nervous system
2. **Motor output:** simply what the body is told to do as the result of all this information input and processing
3. **Central nervous system:** composed of the brain and the spinal cord
4. **The brain:** the master control center of the nervous system
5. **Peripheral nervous system:** portion of the nervous system outside of the central nervous system
6. **Sensory division:** carries information from the skin and muscles as well as from the major organs in the body to the central nervous system
7. **Afferent division:** another name for sensory division, and meaning "bringing toward" because it carries nerve impulses "to" or "toward" the CNS
8. **Motor division:** carries instructions from the CNS out to the body
9. **Somatic nervous system:** instructions that are carried by the motor division and taken to muscles that we can consciously control
10. **Autonomic nervous system:** the part of the motor division that controls the involuntary functions

Fill in the Blank

1. processed
2. experienced
3. Motor
4. peripheral
5. spinal
6. cranial
7. instructions
8. sensory
9. efferent
10. somatic

Complete the Chart — Automatic Nervous System

1. Stimulates saliva production
2. Slows heart beat
3. Stimulates pancreas
4. Stimulates intestinal motility
5. Decreases renin secretion (lowers blood pressure)

Worksheet 2

Words to Know: Define the Following:

1. **Neurons:** the excitable nerve cells that transmit electrical signals
2. **Stimulus:** excites a neuron, triggering an electrical signal called an action potential
3. **Neuroglia:** cells in nervous tissue that help protect and support the neurons
4. **Neurotransmitters:** the chemicals that transmit an electrical impulse from one neuron to the next
5. **Dendrites:** parts of neurons that receive inputs, and when received, an electrical signal is generated and transmitted toward the cell body
6. **Axon terminals:** where neurotransmitters are released to carry the neuron's signal on to the next cell in line
7. **Multipolar neurons:** most common type; have one axon and multiple dendrites
8. **Bipolar neurons:** have only two processes: one axon and one dendrite
9. **Unipolar neurons:** have a more unusual configuration with only one process extending from the cell body
10. **Interneurons:** means "between neurons"; carries impulses from one neuron to another within the central nervous system

Fill in the Blank

1. Epithelial
2. Connective

3. Nervous
4. Muscle
5. neuron
6. axon
7. replaced
8. efferent
9. afferent
10. glial

Complete the Chart — Neuron

1. Cell body
2. Nucleus
3. Dendrite
4. Node of Ranvier
5. Schwann cell

Worksheet 3

Words to Know: Define the Following:

1. **Myelination:** a process in which long axons are covered by a myelin sheath
2. **Schwann cells:** cells that initially indent to receive the axon, and then wrap themselves repeatedly around the axon
3. **Multiple Sclerosis (MS):** an autoimmune disease that results in the destruction of myelin sheaths in the central nervous system
4. **Neuron:** a nerve cell with dendrites and axons
5. **Motor neurons:** carry impulses away from the central nervous system
6. **Sensory neurons:** carry impulses toward the central nervous system
7. **Mixed nerves:** possess both motor and sensory fibers
8. **Nerve damage in the PNS:** does not always result in permanent loss of function
9. **Nerve damage in the CNS:** damage to the brain or spinal cord is more serious and more likely to be permanent than peripheral nerve injury
10. **Wallerian degeneration:** when distal portions of the axons begin to break down without nutrients

Fill in the Blank

1. myelin
2. nodes
3. myelination
4. increases
5. coordination
6. control
7. nerve
8. reproduce
9. creations
10. complexity

Complete the Chart — Anatomy of a Nerve

1. Epineurium
2. Axon
3. Blood vessels
4. Fascicle
5. Perineurium

Worksheet 4

Words to Know: Define the Following:

1. **Action potential:** a change in the membrane potential from negative to positive and then back again
2. **Depolarization:** the membrane potential becomes less and less negative, and then positive
3. **Threshold:** when the membrane potential reaches a certain level of depolarization to initiate the action potential
4. **All-or-none event:** when a stimulus is received, there is either a full action potential or there is no action potential at all
5. **Repolarization:** when the neuron's negative resting membrane potential is reset before another action potential can travel along that portion of the axon
6. **Continuous conduction:** when one region directly triggers the next, and the next, and the next, and so on in unmyelinated axons
7. **Saltatory conduction:** by generating local currents around the myelin sheath, the action

potential seems to "leap" from one gap to the next

8. **Graded potentials:** vary with the strength of the stimulus; the greater the stimulus, the greater number of ion channels open
9. **Synapse:** the place where a neuron communicates with another neuron or with a muscle cell
10. **Chemical synapse:** designed to transfer nerve signals by releasing special chemicals called neurotransmitters

Fill in the Blank

1. neutral
2. concentration
3. resting
4. impulse
5. depolarization
6. frequent
7. polarization
8. synapses
9. signals
10. homeostasis

Complete the Chart — Synapses Can Occur in Many Locations

1. To a dendrite
2. To the cell body
3. To another axon
4. To extracellular fluid
5. To the bloodstream

Worksheet 5

Words to Know: Define the Following:

1. **Cranial vault:** also called the cranium; the large open space in the skull
2. **Meninges:** three layers of connective tissue that cover the brain and spinal cord
3. **Periosteal:** the outermost layer of the dura attached to the inside of the cranium
4. **Meningeal:** the inner layer of the dura
5. **Pia mater:** dips down into the folds and grooves in the brain
6. **Cerebrospinal fluid (CSF):** this fluid flows around the brain and spinal cord, cushioning both
7. **Meningitis:** an inflammation of the meninges; most commonly caused by an infection
8. **Cerebrum:** the human brain is made of four major parts; this is the largest part
9. **Sulci:** the folds of the cerebrum
10. **Cerebral hemispheres:** the two halves to the cerebrum

Fill in the Blank

1. 3
2. 20
3. synapses
4. dura
5. arachnoid
6. float
7. circulate
8. ventricle
9. folds
10. lobes

Complete the Chart — Ventricles of the Brain

1. Lateral ventricles
2. Third ventricle
3. Cerebral aqueduct
4. Fourth ventricle
5. Central canal

Worksheet 6

Words to Know: Define the Following:

1. **Gray matter:** made up of the cell bodies of neurons and neuroglia; cerebral cortex
2. **White matter:** made up of both myelinated and nonmyelinated axons
3. **Corpus callosum:** a large band of white matter that connects the two cerebral hemispheres
4. **Voluntary movement:** movement you can consciously control