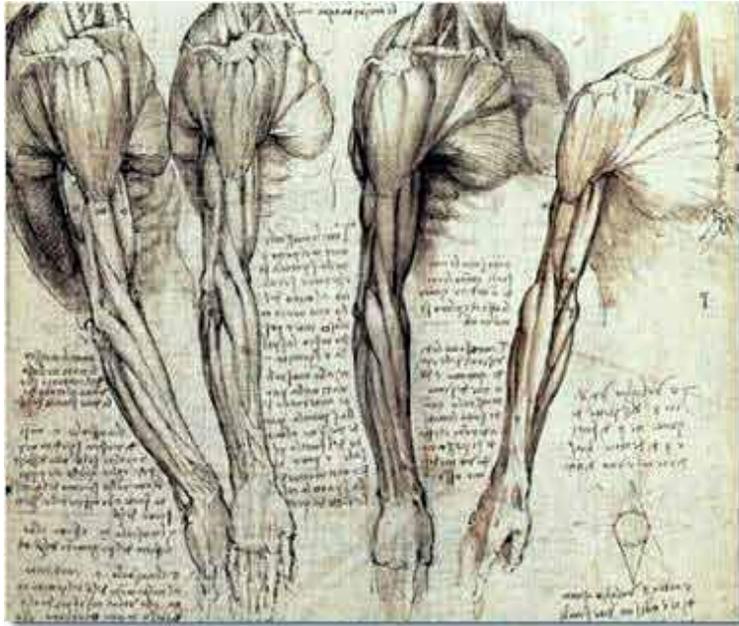
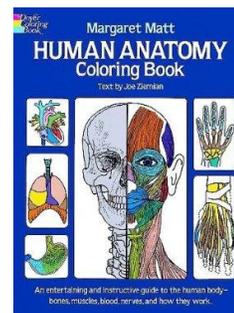


# Human Anatomy and Physiology West Brooke Curriculum



## 1 credit Human Anatomy and Physiology

**Please note:** this guide can be used alone without the purchase of any books as long as the student has access to the internet and the Watchtower library. This guide would best be used from the computer to access the links. You will need to print the worksheets, Kaplan coloring pages you decide to use, tests, and score sheets at the end of this document.



### Book List

*Human Anatomy Coloring Book* by Dover and/or  
Kaplan Anatomy Coloring book PDF

[http://ia700506.us.archive.org/3/items/teb12\\_118/KaplanAnatomyColoringBook.pdf](http://ia700506.us.archive.org/3/items/teb12_118/KaplanAnatomyColoringBook.pdf)

*Prescription for Nutritional Healing* by James F. Balch, M.D. and Phyllis A. Balch, C.N.C.  
Watchtower library  
Internet for assignments

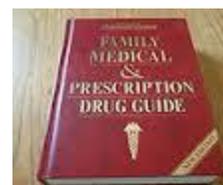
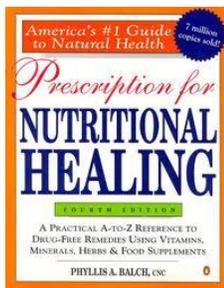
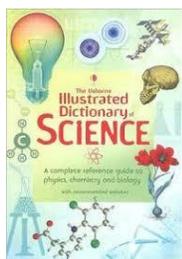
### Supplements:

*The Usborne Science Encyclopedia* (you may already have this from earlier years) OR  
*The Usborne Illustrated Dictionary of Science A complete reference guide to physics, chemistry, and biology*

Various anatomy worksheets: <http://www.smartdraw.com/examples/healthcare/>

*Family Medical and Prescription Drug Guide* by Consumer Guide- This book contains descriptions of the systems of the human body as well as descriptions of diseases. Probably any version of this book would work, mine is 1993, you may find a newer one.

*Prescription for Nutritional Healing* by James F Balch, M.D and Phyllis A Balch, C.N.C. the link for the one above is just for supplements, if you find the full version of this book it is a great reference for the family with descriptions of different ailments and what to do for them naturally. It has been updated many times, mine is older but still very useful!



Written by: Jennifer Westbrook  
West Brooke Curriculum  
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**This is a sample only**

### Methods of study:

Anatomy requires a lot of memorization in order to retain the information. Using the coloring book will help you learn anatomy. Also using extra worksheets for practice some are included in this manual and additional ones can be found at smartdraw (see link above). A great way to learn vocabulary is to use index cards. You can put the word on one side and the definition on the back. You can then use these like flashcards when you are asked to review. Your parent can use them to quiz you. Outline notetaking of articles read is a great way to retain information; with this method you are outlining key points in a logical order, which makes for easy review. Keeping lists of pertinent information is a good way to review.

This manual contains two tests one for each semester. Study and review all along so that you are not cramming information at the last minute. The idea is to retain as much information for long-term use as possible.

## Anatomy & Physiology Table of Contents:

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## **Week 1: Introduction to Anatomy**

### **Sample**

#### **What is the difference between Anatomy and Physiology?**

“Anatomy and physiology are closely related concepts that are often studied together. In a few words, anatomy is a study of the physical structure of an organism, while physiology involves the study of the functions of individual structures and systems within an organism, as well as the function of an organism as a whole. An understanding of anatomy is critical to the study of physiology, and learning about physiology is important to people who want to understand how anatomical structures work.

Both anatomy and physiology have been studied for centuries. Humans have always maintained a curiosity about how they and other organisms are put together and how they work. Many people throughout history have also been interested in comparing and contrasting different living organisms to find similarities and identify differences. Cats and fish, for example, have very different bodies that are customized for the environments they live in.

The study of anatomy focuses on learning about the size, shape, and location of structures in the body. It usually centers around dissection, in which examples are carefully cut up to reveal the structures within. Physical structures can be identified with the naked eye, or observed under magnification with a microscope for more detail. During the dissection process, anatomists can carefully document everything they encounter, and see how systems in the body are connected. An imperfect understanding of anatomy can lead to considerable confusion for medical practitioners, as knowing about anatomy is a very important part of studying the progress of disease.

Anatomy could be considered a static study, while physiology is more dynamic, involving the chemical, physical, and electrical processes that make an organism function, from the processes that regulate heart rate to the complex systems involved in visual perception. In order to study physiology, it is often necessary to work with living organisms or tissue to fully understand physical processes, such as the release of neurotransmitters in the brain and the storage of energy in cells. Both anatomy and physiology can be studied with the use of dissection, medical imaging techniques, and laboratory analysis of samples from specimens.

Medical students study these fields extensively over the course of their educations, so that they understand how the body works as a whole, and how the different systems within the body relate to each other. This field is also a topic of interest for people in many allied health professions, ranging from X-ray technicians who need a thorough knowledge of anatomy to do their work to medical dosimetrists who need to understand physiology when calculating appropriate dosages and treatments for cancer.”

[-http://www.wisegeek.org/what-is-the-difference-between-anatomy-and-physiology.htm](http://www.wisegeek.org/what-is-the-difference-between-anatomy-and-physiology.htm)

#### **A Short History of Anatomy**

Read this article found at <http://emsu.8m.com/anatomy.htm>

Here below for your convenience:

### **“Anatomy in Ancient Greece**

The systematic study of anatomy may have begun in the fifth century B.C., with the work of two Greek scientists, *Alcmaeon* (ca. 500 B.C.) in Italy and *Empedocles* (ca. 490-430 B.C) in Sicily, where Greek culture and science flourished. Alcmaeon was probably the first person to dissect the human body for research purposes, and he is

also given credit for proposing that the brain is the center of intelligence. Empedocles, who believed that the heart distributed life-giving heat to the body, initiated the idea that an ethereal substance called pneuma, which was both life and soul, flowed through the blood vessels. Although such early anatomists were often incorrect, their work was essential to the development of later scientists.

Anatomical inferences without dissection continued in Greece with **Hippocrates** (ca. 460-377 B.C.), who is known as the Father of Medicine. (Many medical students still take the Hippocratic Oath upon graduation from medical school.) He might also be called the Father of Holistic Medicine, since he advocated the importance of the relationship between patient, physician, and disease in the diagnosis and treatment of illness. This philosophy was rejected at a time when diseases were still thought to be punishments from the gods.

Hippocrates' knowledge of internal anatomy was severely limited by the lack of dissections, and not until **Aristotle** (384-322 B.C.) did physicians begin to dissect animals carefully enough to deduce even the barest essentials of human anatomy. Aristotle corrected many of the anatomical errors of his predecessors, but because he was primarily a philosopher rather than a physician, he depended more on logical deduction than on observation and experimentation. His scanty knowledge of the inner workings of the human body led to many gross inaccuracies; for example, He believed that the brain cooled the heart by secreting "phlegm," and that the arteries contained only air. Nevertheless, he had an enormous influence on scientists for hundreds of years.

## The Beginnings of Modern Anatomy

With the decline of Greek influence on the mainland, Alexandria became the transplanted center of Greek culture. It was there that the Greeks **Herophilus** (ca. 335-280 B.C.) and **Erasistratus** (ca. 310-250 B.C.) conducted the first systematic dissections of the human body. Herophilus established the brain as the center of intelligence, distinguished between veins and arteries, and made many other accurate observations about the structure of the human body, especially the nervous system. He conducted the first public dissection and is supposed to have taught the first female medical student. Erasistratus, an intense rival of Herophilus, was more interested in physiology than anatomy and studied the process of circulation in the body. He believed that pneuma, or vital air, was carried by the arteries. The written works of both Greeks were lost when the library at Alexandria was destroyed in A.D. 272, but their ideas were found in the writings of the Roman Celsus (30 B.C.-A. D. 30) and the physician Claudius Galenus, popularly known as Galen.

**Galen** (ca. A.D. 129-199), considered to be the greatest ancient physician after Hippocrates, was born in Pergamon in Asia Minor (now Pergama in Turkey). His early knowledge of anatomy derived from his studies in Asia Minor, Greece, and Alexandria, and after his return to Pergamon, his job as chief physician to the

gladiators. Galen's dissections of African monkeys (human dissections were still forbidden) provided him with enough related information about humans so that he described correctly many brain structures, the structural differences between veins and arteries, and many other structures of the human body, including heart valves. He also observed that muscles contract in response to a stimulus from nerves, and demonstrated *experimentally* that the arteries carry blood, not air.

Despite Galen's improvements on earlier anatomical studies and his other achievements, he is often remembered for the fact that the Catholic church did not allow his ideas to be criticized; thus many of his erroneous ideas were perpetuated and major progress in the field of anatomy was halted until the sixteenth century.

The twelfth and thirteenth centuries saw a gradual reawakening of valid scientific investigation after the barren years of the Dark Ages. The first true university was founded in Bologna in the twelfth century, and a medical faculty was established there by 1156. By the end of the thirteenth century, the demand for accurate information was so great that the medical dissection of human corpses began in earnest. Anatomists at this time were still conditioned to revere the outdated notions of Aristotle and Galen, and if an autopsy revealed a deviation from prior teachings, the anatomists concluded that the body was abnormal.

The fourteenth century brought a more scientific attitude to the study of the human body. To some extent, artists, rather than scientists, set the pace in revealing new aspects on human anatomy. **Leonardo da Vinci** (1452-1519) was undoubtedly the most industrious artist, producing hundreds of anatomical drawings made from dissections; unfortunately he had little influence on the anatomists of his time.

Five years before the death of Leonardo, the true "Father of Anatomy" was born. This was **Andreas Vesalius** (1514-1564), who at the age of 29 published his seven-volume *De humani corporis fabrica* (*On the Structure of the Human Body*), in which he carefully integrated text and drawings made from dissections, setting anatomy on a new course toward the scientific method. (The drawings were made by Jan Calcar, a student of Titian.) Another significant scientific event occurred in the same year, 1543, when the Polish astronomer Nicolaus Copernicus (1473-1543) published his view that the earth revolved around a stationary sun.

The publication of the *Fabrica* was a major scientific event because it was instrumental in overcoming the authority of the Catholic church. For the first time, anatomy was placed on an objective level, and Galen's inaccuracies were exposed. Unfortunately, Vesalius's ideas were originally rebuked by anatomists because they challenged Galen and others.

## The Contributions of William Harvey

The English physician and anatomist **William Harvey** (1578-1657) studied at the University of Padua (the newly established center of medical research) several years after Vesalius taught there. In 1628, Harvey published *An Anatomical Treatise on the Motion of the Heart and Blood in Animals*, in which he described for the first time how blood is pumped by the contractions of the heart, circulates throughout the body, and returns to the heart. Both the accurate plan of the circulation and the idea that the heart is a pump were enormous breakthroughs that helped overcome the primitive ideas of Aristotle and Galen once and for all. Although Harvey's discovery was attacked by Galen's steadfast followers, it was difficult to argue against Harvey's methods of first-hand observation and experimentation. Harvey had not only made a most important anatomical discovery, he had also demonstrated a logical and scientific approach that set the standard for future anatomical research. From then on, physicians and anatomists considered structure *and* function when investigating the human body. Such research was aided by microscopes, beginning with those produced by the Dutch microscopist, Antonie Van Leeuwenhoek (1632-1723), which enabled scientists to examine the cells, tissues, and fluids of the body.

## Modern Anatomy

To many, gross human anatomy is associated with Gray's Anatomy, originally published by the English surgeon Sir Henry Gray in 1858. Since then the book has had several authors and has evolved into the current thirty-seventh edition in Great Britain and the thirtieth edition in the United States, each with its own character.

Radiological advances in the twentieth century have allowed scientists to make remarkable connections between anatomy and physiology, and researchers are integrating the study of anatomy with other disciplines, including biochemistry, genetics, and biophysics. Physicians now have access to advanced technology such as CAT and PET scanners, and magnetic resonance imaging (MRI), all of which go far beyond microscopy and x-rays. These techniques permit physicians to look inside the body without performing surgery, yet another major breakthrough in the history of anatomy.”

Taken from "Human Anatomy" by Robert Carola *et al* copyright © 1992 by McGRAW-Hill Press

## Sample

Write an outline of the information in your notebook.

Example:

### A Short History of Anatomy

#### I. Anatomy in Ancient Greece

##### A. Alcmaeon

1. First dissection of human body
2. Proposed brain is center of Intelligence

##### B. Empedocles

1. Heart distributed life giving heat
2. Life flowed through blood vessels

##### C. Hippocrates

1. Father of medicine
2. Holistic medicine

##### D. Aristotle

1. Dissection of animals
2. Vessels contained air
3. Influenced science for hundreds of years

#### II. Beginnings of Modern Anatomy

.....

## Sample

### Answer these questions:

What is Holistic Medicine?

The “Father of Anatomy,” Andreas Vesalius (1514-1564) wrote what book?

What did Antoine Van Leeuwenhoek contribute to Anatomy?

What book published by the English surgeon Sir Henry Gray is still in use today, although revised many times?

**Supplements:** during this week read from the following supplements if you have them. If not use your encyclopedia or research online.

*Family Medical & Prescription drug Guide by Consumer Guide*

Read “Staying Healthy” section

[\*Prescription for Nutritional Healing\*](#) by Balch

Read “Vitamins & Minerals” section



### Relative Position

Do the Activity and write the definitions of the positions in your notebook:

<http://www.wisc-online.com/objects/ViewObject.aspx?ID=AP15305>

[Kaplan Coloring book PDF](#): Anatomical Position pg 1, Anatomical Planes pg 3, and Body Regions pg 15

### Sample

#### Vocabulary:

Inferior- \_\_\_\_\_

Superior- \_\_\_\_\_

Anterior- \_\_\_\_\_

Posterior- \_\_\_\_\_

Medial- \_\_\_\_\_

Lateral- \_\_\_\_\_

Axial- \_\_\_\_\_

Appendicular- \_\_\_\_\_

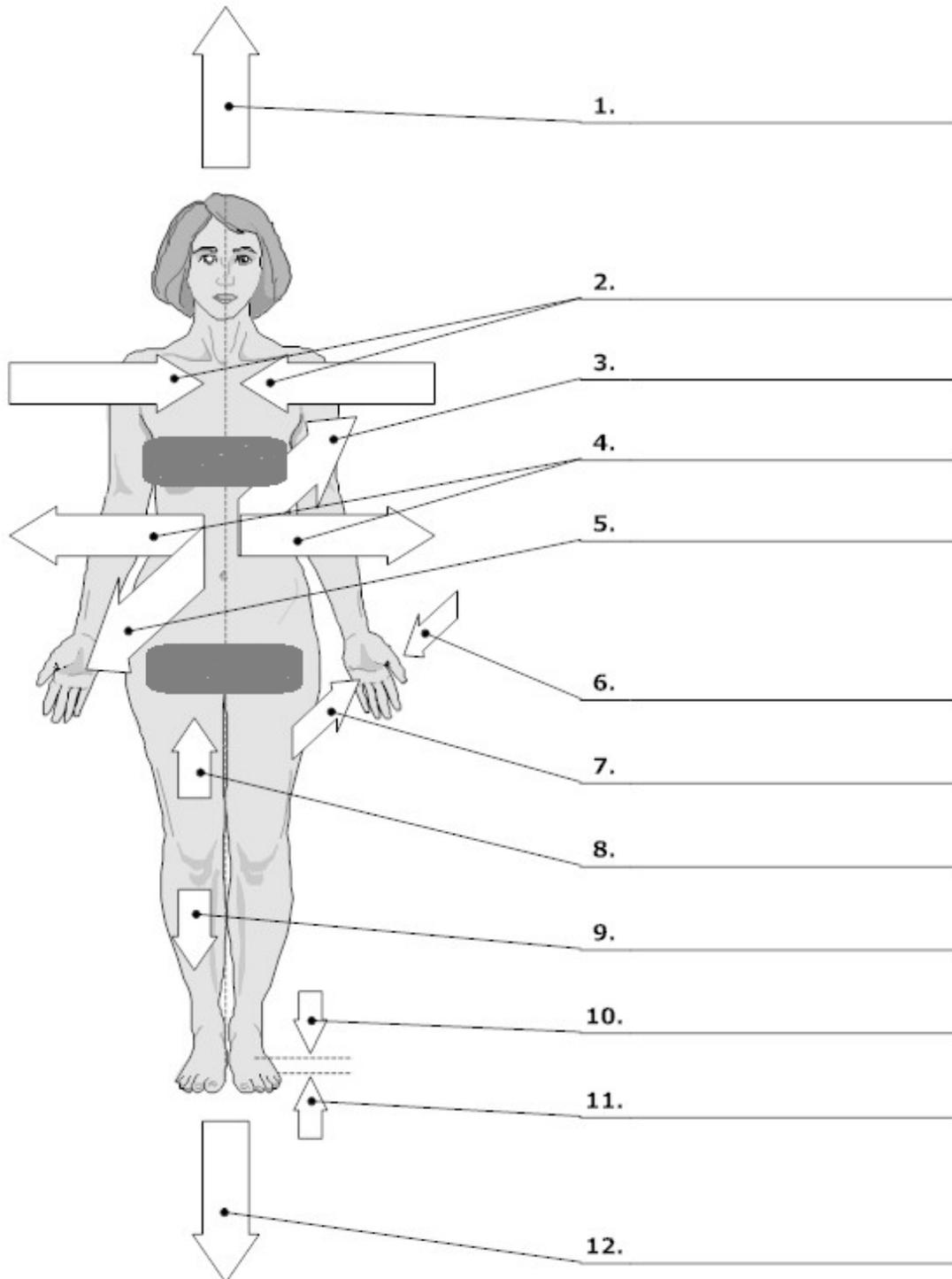
Proximal- \_\_\_\_\_

Distal- \_\_\_\_\_

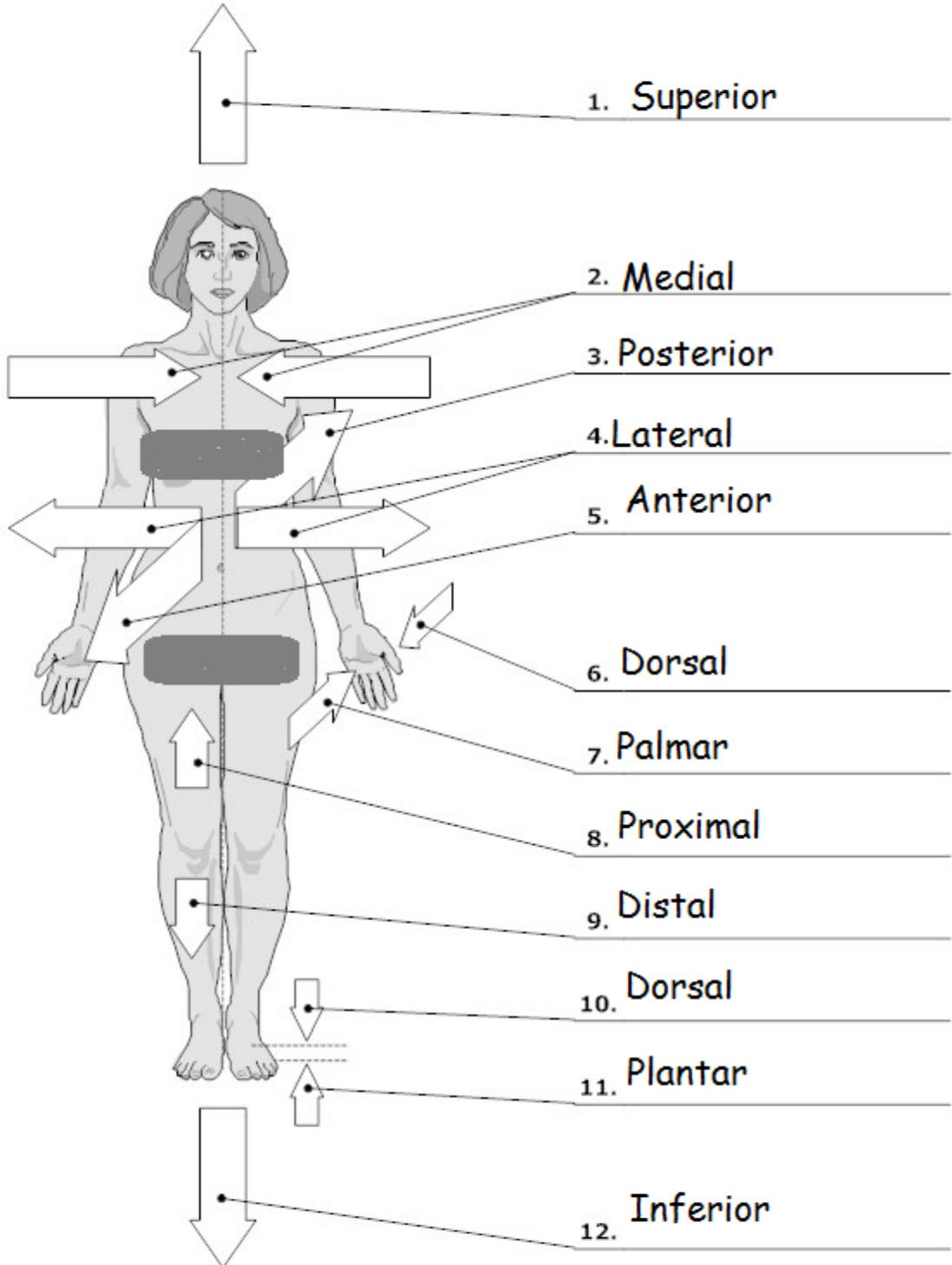
\*Watch the video: [Anatomical Terms of Direction and Planes](#) of Section  
By the PenguinProf

\*She is a good teacher, she is teaching an Introductory Anatomy college class. She sometimes uses slang terms like OMG, etc. These videos will show anatomically correct figures. Also, some of her videos may contain some adult things in them. (worksheets below from <http://www.smartdraw.com/examples/healthcare/> )

# View Orientation and Anatomical Planes



# View Orientation and Anatomical Planes



## Week 2: Introduction to Anatomy

### Sample

#### Homeostasis

Homeostasis is the body's ability to stabilize itself despite outside influences like temperature extremes, stress, and traumatic injury. Homeostasis is derived from the Latin words *homeo* meaning constant and *stasis* meaning remaining stable.

This internal balance is controlled both physically and psychologically through the kidneys, the liver, and the brain. The nervous system plays a part in the "fight or flight" response to adrenaline when something extreme happens such as being frightened or a serious injury. Also, the endocrine system helps control homeostasis by producing the correct amounts of hormones as needed.

The inability to maintain homeostasis can lead to death or disease and is called homeostatic imbalance. For example, you have heard the term "frightened to death" this would be where someone is so frightened that they have a heart attack. The body is unable to stabilize and the person may die. Other diseases that can result from a homeostatic imbalance are diabetes, hyperglycemia, hypoglycemia, gout, or dehydration.

For example, let's look at extreme external temperatures and how your body responds to these. If it is extremely hot you will sweat and this will help cool your body off. If it is extremely cold you will shiver thus producing body heat by the rapid contraction and relaxing of your muscles. Homeostatic imbalance would occur in these instances if you were to suffer heat stroke (hyperthermia) or experience hypothermia. With a heat stroke your body just can not overcome the extreme temperatures, if not cooled quickly enough it could result in brain damage or death. Hypothermia, the body's temperature has dropped too low and you are unable to bring your body temperature back to normal, uncontrollable shivering occurs, then mental confusion; if not treated quickly enough death would occur.

Define any words from this article that you are not familiar with.

Read two *Watching the World* articles:

Temperatures parked cars: *Awake!* 3/06 pg 29

Winter Warning: *Awake!* 1/8/98 pg 29



**Lab:** Take your temperature when the air is cold and again in an overheated room or outside on a very hot day.

What is your temperature when the air is cold?

What is your temperature when the air is overheated?

## Sample

### **For Students with the references:**

*The Usborne Illustrated Dictionary of Science a complete reference guide to physics, chemistry, and biology* read Energy for Life and Homeostasis pages 334-335

[Prescription for Nutritional Healing](#) by Balch

Read “Nutrition, Diet, and Wellness” section

**Review:** Relative Positions from last week

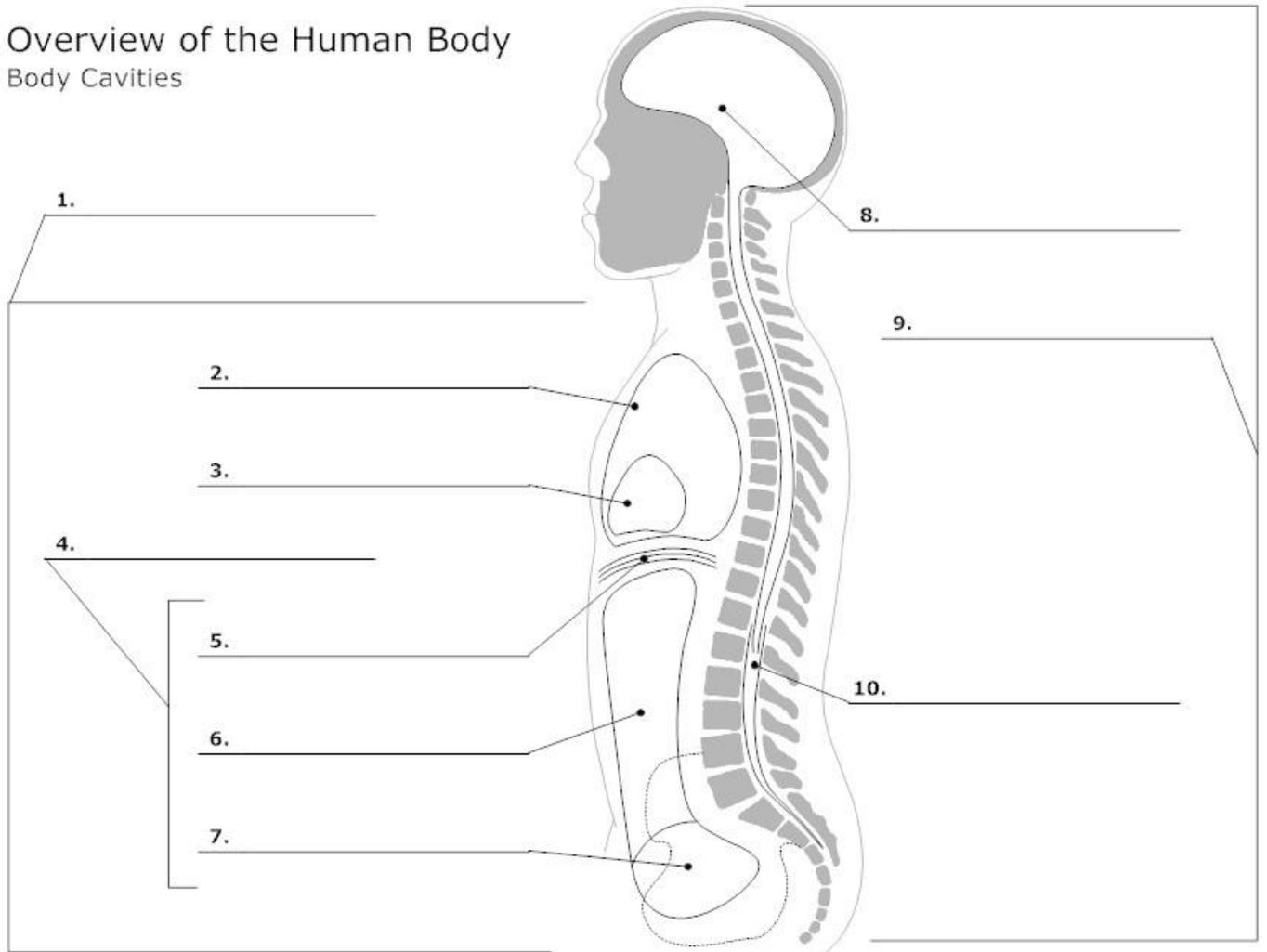
Review all of [Introduction to Anatomy](#)

[The Study of Human Anatomy](#)

[Kaplan Coloring book PDF](#): Hierarchy of the body pg 5, Regions of the abdomen pg 7, and Body Cavities pg 19

**Body Cavities-** a body cavity is a space within the human body that contains certain organs. Knowing these general regions of the body helps doctors to describe a general area of the body without being specific. (the following is from [www.smartdraw.com](http://www.smartdraw.com) )

## Overview of the Human Body Body Cavities



# Overview of the Human Body

## Body Cavities

