

The Human Body

1:1
Answers
IN GENESIS™



GOD'S
DESIGN®

4th Edition
Debbie & Richard Lawrence



God's Design® for Life is a complete life science curriculum for grades 3–8. The books in this series are designed for use in the Christian school and homeschool, and provide easy-to-use lessons that will encourage children to see God's hand in everything around them.

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Welcome to GOD'S DESIGN®

LIFE



You are about to start an exciting series of lessons on life science. *God's Design® for Life* consists of three books: *The World of Plants*, *The World of Animals*, and *The Human Body*. Each of these books will give you insight into how God designed and created our world and the things that live in it.

No matter what grade you are in, third through eighth grade, you can use this book.

3rd–5th grade

Read the lesson.



Do the activity in the light blue box (worksheets will be provided by your teacher).



Test your knowledge by answering the **What did we learn?** questions.



Assess your understanding by answering the **Taking it further** questions.

Be sure to read the special features and do the final project.

There are also unit quizzes and a final test to take.

6th–8th grade

Read the lesson.



Do the activity in the light blue box (worksheets will be provided by your teacher).



Test your knowledge by answering the **What did we learn?** questions.



Assess your understanding by answering the **Taking it further** questions.



Do the Challenge section in the light green box. This part of the lesson will challenge you to do more advanced activities and learn additional interesting information.

Be sure to read the special features and do the final project.

There are also unit quizzes and a final test to take.

When you truly understand how God has designed everything in our universe to work together, then you will enjoy the world around you even more. So let's get started!

UNIT 1

Body Overview

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- 2 Overview of the Human Body • 10
- 3 Cells, Tissues, & Organs • 14

- ◇ Describe the function of the major organ systems in the human body.
- ◇ Explain how cells, tissues, organs, and systems are related.



1

The Creation of Life

God created them male and female.



How is man different from the rest of the creatures God created?

After God created the Earth, plants, sun, moon, stars, and animals, He created man. God spoke the entire universe into existence, but He made man out of the dust of the ground with His own hands and breathed life into his body. God created man to be His companion and friend. The special relationship that man has with God is unique in all of creation.

God also made a woman for man so he would not be alone on the Earth. God made woman from a rib taken from the side of man, and together He charged them with caring for the world He had created.

Fun Fact

There are over 7 billion people alive on the Earth and each one of them is unique and created in God's image.

God gave man and woman wonderful bodies. It has taken scientists thousands of years to even begin to understand the complexity of the human body. Even today, with all of the technology available to us, we have only a small understanding of how everything in the human body really works.

As you study the lessons in this book and learn more about how your body was designed and how it works, remember that God made you special. God wants you to have a relationship with Him. 🌿



What did we learn?

- On which day of creation did God make man?
- In whose image did God create man?
- According to Genesis 1:26, over what were man and woman to rule?



Taking it further

- Since we are created in God's image, how should we treat our bodies?



Self-portrait

Read Genesis 1–2. Discuss how God created humans and why He created them. Then read Psalm 139:13–18. Discuss how God knew each of us even before we were born. Remember that He loves us and has a plan for each of our lives.

Write the words “God Made Me Special” at the top of a sheet of drawing paper. Then using a mirror, try and draw a self portrait.



Body systems

There are eleven recognized systems in the human body. We will be studying eight of those systems in some detail in this book and will briefly look at the other three. On a piece of paper, list as many of the body’s systems as you can. Then write a short

description of what each system does. Which system do you know the most about? Which system do you know the least about? Which system is the most interesting to you?

2

Overview of the Human Body

We are fearfully and wonderfully made!



What systems did God give the body to help it accomplish all of the tasks it must perform?

Challenge words:

endocrine system	kidneys
hormone	reproductive system
excretory system	uterus

Perhaps the most amazing of all of God's creations is the human body. It is a complex set of systems all working together. The human body includes systems to move, breathe, eat, think, and feel. These are all wonders of creation. But most animals also have these systems working in their bodies. So what makes people different from animals?

The Bible says that we are created in God's image. We have souls that can relate to God. As we study the wonder of God's creation, remember that we are His handiwork. God designed humans to be very creative like Him. We have been given the ability to think and reason far beyond anything an animal can do. We resemble our Creator and we are separate from the animals.

Some of the remarkable systems that God created for the human body include:

- Skeletal and muscular systems for strength and movement
- Respiratory system for breathing
- Circulatory system for transporting nutrients
- Digestive system for eating
- Nervous system for thinking and feeling
- Skin for protection
- Immune system to fight against disease and other "intruders"

As you learn more about each of these systems, you will marvel at God's creative genius in putting our bodies together. 



What did we learn?

- Name as many of the body's systems as you can and describe what each system does.



Taking it further

- Which body systems are used when you walk across a room?



Body wheel

Color each section of the “Body Wheel.” Then cut out both circles and connect them with a paper fastener in the center. Turn the top wheel and read the description of each system of the body.



Other systems

Look at the list you made from lesson 1. Did you include all eight of the body systems mentioned in this lesson? If not, add any you missed to your list. You are probably somewhat familiar with these body systems, and we will study each system in more detail throughout the remaining lessons in this book. However, there are three other systems that are also important to your body that you might not be as familiar with. We will look at these three systems briefly here. If you want to learn more about these systems, you can study an anatomy book or look in a high school biology book

First is the endocrine system. The **endocrine system** produces chemical messengers called **hormones**. These chemicals are produced in special glands and are then secreted into the blood. Hormones control many functions in your body including growth, heart rate, the rate of digestion, waking, and sleeping. You don't have to think about these things. God designed your body to automatically regulate these functions by producing the necessary chemicals.

The second system is the **excretory system**. This system was designed to remove wastes from the

body. Without this system, poisonous substances would build up in your body and eventually kill you. But God designed our bodies to efficiently remove and eliminate unneeded and harmful substances. The main organs of the excretory system are the **kidneys**, which remove waste substances from the blood, producing urine, which is then eliminated from the body.

Finally, every person has a **reproductive system**. One of the first commands God gave to Adam and Eve was to be fruitful and multiply. God loves children and designed the human body to be able to create new life. A man's body is designed so that he can become a father. A woman's body is designed to carry the developing child in her womb, called the **uterus**, until it is ready to be born and then to nourish the new baby with milk from her body. The creation of a new life is a miraculous process designed by God.

Did you include these systems on your list? These are systems that you might not have thought about. Add these systems to your list and include a brief description of each. Every system of your body is necessary and amazing. Enjoy your study of each system and thank God for His wonderful creation.

Leonardo da Vinci

1452–1519

Artist, inventor, engineer, genius—which was Leonardo? He was all of these. He was born on April 15, 1452, to Ser Piero da Vinci, a young lawyer, and Caterina, a peasant girl. His name meant “Leonardo, from Vinci.” It is believed he was a vegetarian throughout his life. In fact, there are stories that he loved animals so much that he would buy caged animals only to let them go. He studied at home, learning reading, writing, and arithmetic.

When Leonardo was young, his father asked him to paint a round shield. The story goes that Leonardo thought it would be neat to paint a really creepy scene on the shield. He examined all sorts of vermin such as lizards, maggots, and bats to use in the painting. When he showed the shield to his father, his father was so impressed with the realism of the animals, that he knew his son could only be an artist.

Leonardo was successful at nearly everything he did. He was reported to be strikingly handsome with great strength. He also had a fine singing voice. He quickly learned to play the lyre, and he would sing and beautifully improvise with it. But good looks, strength, and musical talent were just the beginning. He was most gifted in art and science.

In 1469, at the age of 17, Leonardo and his father moved to Florence, Italy where he worked under the master artist, Verrocchio. It soon became apparent that his skills surpassed that of his teacher’s. In 1472 Leonardo joined the painter’s guild of Florence where he had contact with many other great Florentine artists. At this time, Leonardo started working for himself. Not only was he doing paintings, he was also sketching water pumps, military weapons, and other machines. One of the more unusual characteristics about Leonardo was that he was not only left-handed, which is not too uncommon, but he wrote many of his papers and works from right to left and backwards. Many of his notes can only be read in a mirror.



In 1482 the Duke of Milan hired Leonardo as a painter and engineer. During his 17 years under the duke, he completed six paintings and worked as an adviser on architecture, fortifications, military matters, hydraulics, and mechanical engineering. In 1489 Leonardo did some of his earliest drawings of human anatomy, and even though most of his drawings were completely wrong, he produced extremely accurate cross-sectional representations of the skull. By 1495 Leonardo felt he had achieved his goal in understanding the human anatomy and he abandoned his work in this area for eight years.

During his time with the duke, Leonardo spent many hours studying geometry. This took time away from his painting. But he wrote a book on the elementary theory of mechanics. It was also during his time under the duke that he started exploring the possibility of constructing a telescope, looked into flying machines, designed advanced weapons, including tanks and other vehicles for war, and designed submarines. During this period, Leonardo achieved new heights of scientific thought.

When the Duke of Milan died, his son wanted Leonardo to make a bronze sculpture of his father on horseback. The sculpture was to be four times bigger than life size and weigh about 80 tons. But this task proved too challenging even for Leonardo. Leonardo studied for years, developing new casting methods, but when the French invaded, he had only been successful in building a 22-foot clay model. He left Florence in 1499 when the French soldiers used the model for target practice.

Leonardo spent the next few years traveling through southern Europe. From 1502 to 1503 he worked as a military engineer for Cesare Borgia. After this, he returned to Florence for three years. It was during this time he painted what is perhaps his most famous work, the “Mona Lisa.” In 1504, Leonardo received word of his father’s death. His father’s estate went to his half brothers and sisters, so he left Florence for Milan only to return the following year to fight for his uncle’s estate, which he eventually inherited.

In the winter of 1507–1508 his interest in the human anatomy was revived when he witnessed an old man die. The man claimed to be one hundred years old. The old man told Leonardo before dying that he felt fine, only weaker. Leonardo wanted to know how this man could have such a peaceful death, so he studied this man’s anatomy and found an absence of fat. This study allowed Leonardo to complete the most detailed records of a single subject. During his lifetime, Leonardo made hundreds of sketches of the human body.

In 1509 Leonardo returned to Milan and spent time on other scientific studies including a project to change the course of the Abba River. From 1510 to 1513 he concentrated on the study of human



anatomy and developed a new way to do science. The old way was to interpret everything with what you already knew; the new method was to first observe and then see if it fit with what you understood. During this time, Leonardo did some of his most famous anatomical drawings—one of them being the “Embryo in the Womb,” which is still found in some medical textbooks today.

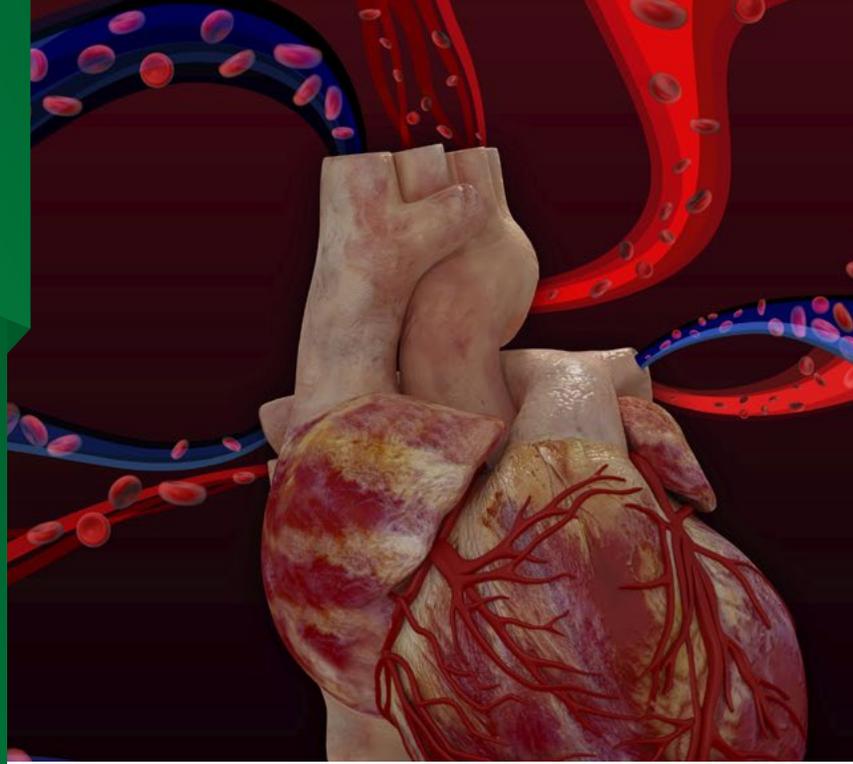
In 1513 Leonardo went to Rome under the protection of Giuliano de Medici, the brother of Pope Leo X. He had a workshop and undertook a variety of projects for the Pope. He was also able to continue his studies in human anatomy. However, the Pope would not allow him to dissect any cadavers.

Following the death of Giuliano de Medici, Francis I of France offered Leonardo the position of Premier Painter, Engineer, and Architect of the King. Leonardo accepted the position and went to work for the king of France where he lived in a house near the royal chateau at Amboise. He worked for King Francis until his death, and legend has it that when he died in 1519, King Francis was at his side, cradling Leonardo’s head in his arms. Leonardo da Vinci was buried in the cloister of San Fiorentino in Amboise, France. The world will remember him as a painter, architect, engineer, and scientist with one of the brightest minds of the Middle Ages.

3

Cells, Tissues, & Organs

The building blocks of our bodies



How are organs related to cells?

Words to know:

cell	nucleus
tissue	cytoplasm
organ	mitochondria
cell membrane	vacuole

Challenge words:

muscle tissue	epithelial tissue
nerve tissue	connective tissue

The systems of the human body begin with cells. **Cells** are the smallest part of the human body that can function on their own. Cells are essentially the building blocks of your body. Many cells working together form a **tissue**, and many tissues working together form an **organ**. Each system is comprised of cells, tissues, and organs all working together to perform a certain function.

Although various kinds of cells may look different, they all have some similar features. All cells have a **cell membrane**, which surrounds and protects the rest of the cell, somewhat like your

skin. Also, every cell has a **nucleus**, which functions as the brain of the cell. Cells are filled with a liquid called **cytoplasm**, which allows the other parts of the cell to move around inside the cell. All cells have **mitochondria**, which break down food into energy for the cell. And finally, cells have **vacuoles**, which store food or any variety of nutrients a cell might need to survive. They even store waste products until the waste can be eliminated from the cell so the rest of the cell is protected from contamination.

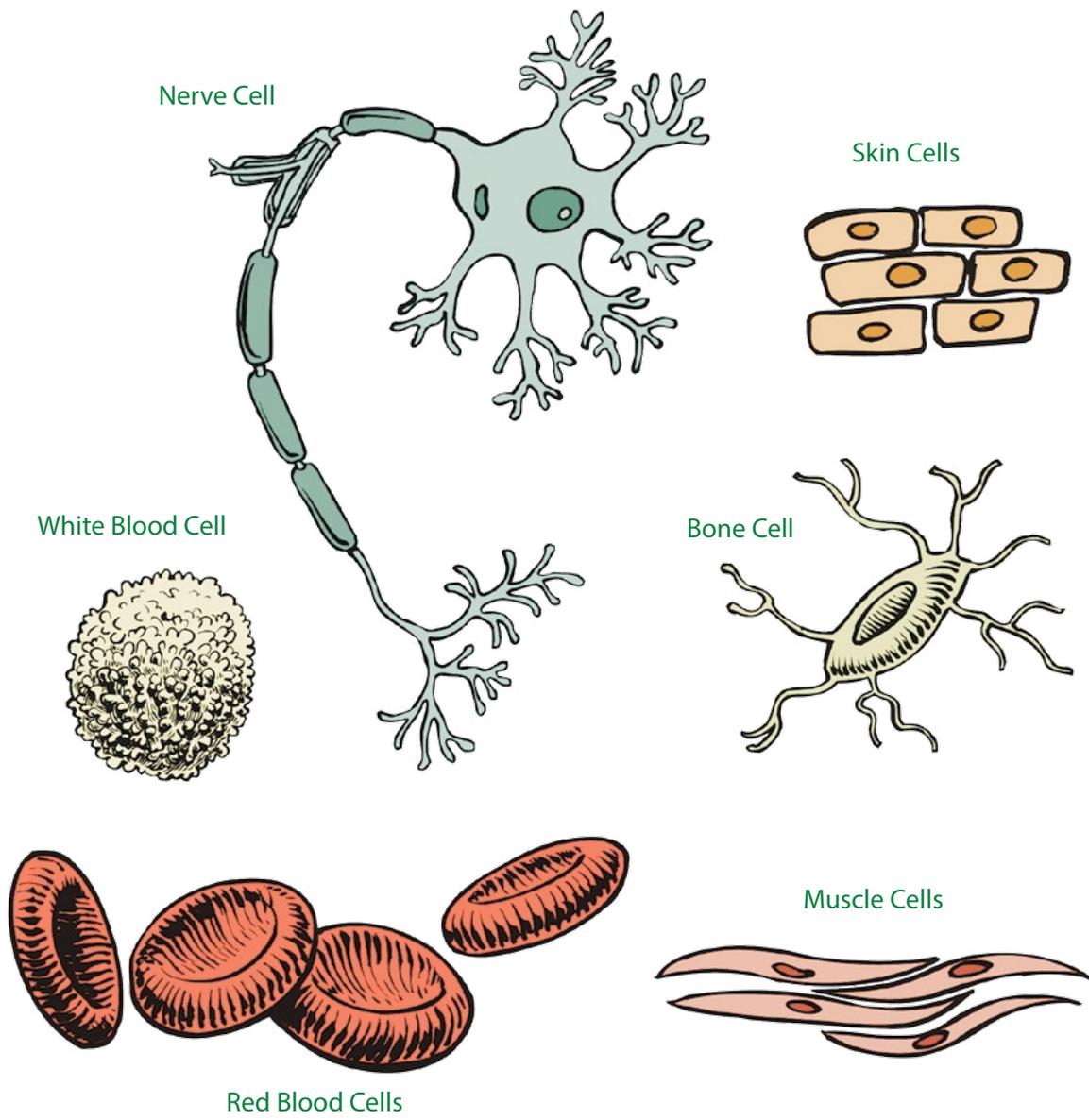
Even though all cells have these common characteristics, the cells in each system are specially designed for their jobs. Red blood cells, which move throughout the body inside the blood vessels, are round and smooth. They are shaped like disks, or little lifesavers, so they easily flow over each other and move easily through the blood vessels. Also, their cell membrane is designed to easily allow gases to pass through so oxygen can be released to other parts of the body and carbon dioxide can be absorbed and transported to the lungs where it is removed from the body. White blood cells look like white balls but can change their shape to surround germs that get inside the body. Skin cells are rectangular and fit tightly together to keep germs on the outside and moisture on the inside of the body.

Muscle cells are long and stretchy, allowing them to expand and contract so our bodies can move.

Bone cells crisscross to make strong structures. Nerve cells have an irregular shape that includes a cell body and a long part with finger-like tendrils that allows signals to move efficiently throughout the body. This lets the brain “talk” to all parts of the body very quickly. A nerve cell can be over one yard (1 m) long. God designed each cell to look and act differently based on its function in the body.

The cells, or building blocks, work together to make tissues and the tissues work together to make organs such as muscles, lungs, the brain, and your

skin. We group these organs together into systems by what they do for us. For example, the heart and blood work together to take oxygen and nutrients to every part of the body, so we group them together and call them the circulatory system. The brain, spinal cord, and all of our nerves work together to communicate messages to the body, so we group them together and call them the nervous system. We will study each system of the human body separately to better understand its function.





Body cells

Complete the “Body Cells” worksheet. Use the pictures on the previous page as a guide.



What did we learn?

- What is the function of each of the following kinds of cells: skin cells, red blood cells, white blood cells, bone cells, nerve cells, and muscle cells?



Taking it further

- How has God uniquely designed red blood cells to transport oxygen?
- How are nerve cells specially designed to carry signals?
- How did God design skin cells to perform their special functions?
- With all these cells working together, what do you think is the largest organ in the body?



Tissue types

The human body contains many organs and tissues. These tissues are classified into four different categories.

- **Muscle tissue** is designed to contract. Its main function is movement. Muscle tissue moves your bones when you decide to move an arm, leg, or other body part. It also moves parts inside your body without you even thinking about it such as making your heart beat or your stomach move to digest your food.
- **Nerve tissue** controls body activities and coordinates functions. Nerves are directly connected to most muscles and send them the necessary signals to make the muscle tissue contract. Your brain is made of nerve tissue, which coordinates all of the input from your body and also allows you to think.
- **Epithelial tissue** lines all of your body parts, both inside and out. Epithelial tissue secretes

liquid that lubricates all the parts of your body to reduce friction as your body parts move. It also covers and protects each part of your body.

- **Connective tissue** holds your body together. Many connective tissues are solid; however, blood and lymph are considered connective tissues even though they are liquids because they connect all of the parts of the body together as they circulate throughout the body.

Based on what you just learned about the different kinds of tissues, identify which type of tissue each of the following body parts belongs to. Some of these are tricky so don't be surprised if you get some wrong.

- | | |
|-----------------------|-------------------|
| • Skin | • Brain |
| • Muscles | • Inside of lungs |
| • Tendons | • Fat |
| • Lining of the mouth | • Bones |