Creation Anatomy:

A Study Guide to the Miracles of the Body

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How This Study Works

The *Creation Anatomy unit study* has and continues to be a popular curriculum choice for educators who wish to incorporate the study of anatomy into their science selections for their students. The study's first publication in 1996, written by Felice Gerwitz and the late Jill Whitlock, has been revised to encompass innovative teaching ideas within each grade division, as well as optional lesson plans for teachers, including a quick reference/teaching format ideas in regard to the implementation of the text's content.

The following section provides the reader with comments from both authors pertaining to the importance of studying anatomy from a creation viewpoint, a section describing what constitutes a unit study, how to prepare a unit study and various Q&A's often related to the topic of unit studies.

To allow for easier access, the unit study has been divided into three main sections: Section 1—Teaching Outline and Outline Content; Section 2—Grades K -3; Grades 4-8; Grades 9-12 and Section 3—Additional Resources.

In addition, each grade division contains a study outline, sample lesson plans, reading list, activity/experiment resource list, vocabulary/spelling list, vocabulary/spelling/grammar ideas, math reinforcement ideas, science activities/ experiments, geography/history ideas and art/music ideas.

As a supplement you may wish to purchase the companion book, *Creation Anatomy: Hands on Science and Activity Pack* available on Media Angels, Inc. While not necessary, this activity pack contains printables you will find helpful.

The prayer of the authors is the content of this unit study will not only help educators in their quest of teaching anatomy but also inspire them as well. Learning should be a fun experience for educator and student. When learning is fun, hands-on and messy, the experience is lasting. Try not to get bogged down and become a slave to a schedule—a recipe for disaster! Get ready to have a great time, and better yet, teach in a way that makes great memories that are cherished year after year after year.

I asked the whole frame of the world about my God; and he answered, I am not He, but He made me."—St. Augustine

Let’s Do A Creation Anatomy Unit

The study of anatomy truly shows the awesomeness of our God! It is a study of the wonderful miracle God has created. *Anatomy* is the study of the *body's structure* while *physiology* is the study of *how the body works*. For this unit we will combine the meanings for the purpose of simplicity but will study both. We will study the *body's structure* and *how the body works.* We will also study the *blood; healing; digestive, nervous,* and *reproductive systems; DNA; the senses; the brain; language; races; and human history.* You will need to use discretion when teaching this unit, especially in the area of reproduction. As parents you know your children best and the *time* in which you plan to teach reproduction is up to you.

Science deals with the search for knowledge. In order for a scientific theory to be *valid*, it must be proved or disproved by testing or measuring. This is not possible with many of the theories or assumptions scientists have come up with to support claims about evolution. This book looks at science from a Creation viewpoint. No one was present when Almighty God created man; scientists can at best only theorize as to our origin. Therefore, I consider faith to be an issue whether you believe in Creation or evolution. (See *Creation Science: A Study Guide to Creation!)*

In this study of the human body you will be awed by the Creator's works. To believe that the complicated mechanisms of our bodies were created by an evolving process over millions of years is to miss the foundations that are self-evident in scientific study, especially in the area of DNA.

In researching Anatomy, you will find that various television shows, videos, books, articles, and computer programs almost exclusively deal with evolution. This study is meant to be a balance and to give you Creation Science's answers to evolution's claims so that your children can have a firm basis to dispute evolution.

In this unit we will explore the different contributions by *scientists* and a *history of anatomy.* In order to get the most from this unit study, it is important to have a firm, basic understanding of Creation Science, especially in the older grades, where an understanding of origins is desirable when comparing the two theories.

In this study, I have included the *ideas* I have found to be the most helpful. Many of the *games* and *activities* are original and have been played by children in science workshops I have given and at home with my own children. Some are old favorites revised a little to fit the occasion. In addition to the books listed as resources, I have included other resources, as you know information from Internet tend to be transient—so they are up to date as of this printing. There is a

materials list and field trip guide. The pages containing information on the scientific method, you may copy to assist you with your experiments.

An important point in this science unit study is a correct execution of the *scientific method.* The *scientific method* is a procedure used to do an experiment in an organized fashion. *The point of the scientific method is to solve a problem or further investigate an observation***.** The steps of the scientific method are as follows: *asking a question, researching, forming an educated guess as to what the conclusion will be, doing the experiment, observing the results, and stating a conclusion.* Ideally the conclusion should be the answer to the original question, but alas, things being what they are, this is not always the case! When learning a new scientific concept, make sure you have your children tell you in their own words what they have just learned. For example, let's say you are teaching them about the heart. You may want to do an experiment showing the heartbeat can be measured. To demonstrate your point, you will have your children jog in place for one minute (younger children) to five minutes (for the older ones), then measure their pulse. Be sure to ask questions such as, "How did you feel after you ran?" or "How do you know that your heart increased in speed?" They should be able to tell you, "We know our heart increased in speed because we can feel it beating faster." (Older children should be able to make a comparison between a faster beating heart and more oxygen being supplied to all of the body's systems through the blood.) This is a quick check to make sure they are following the concept and not getting sidetracked by the fun!

Science is always fun, but anatomy can be quite challenging! It is an especially humbling journey, one in which we should daily thank God for the miracle He has given us---our bodies!

Felice Gerwitz

How to Prepare a Unit Study

Understanding the composition and structural format of implementing a unit study into your curriculum is important. Without providing an exhaustive list, we have chosen to list some of the more popular Q&A's regarding unit studies in the hope you will find the information helpful as you prepare to teach Creation anatomy using this study guide. For additional information, we recommend *How to Create Your Own Unit Study* by Valerie Bendt.

What is a unit study?

A unit study is taking one topic, in this case Creation Anatomy, and interrelating all the other subjects into a unified teaching approach. In other words, while studying the topic of anatomy, the children will *read anatomy* science books and research materials, *write* assignments relating to what they've read, *spell* words they may have had difficulty reading or writing, *learn* vocabulary words dealing with anatomy, do *math problems* based on scientific principles, read and research *historical periods* relating to anatomy and time periods in which noteworthy evolutionists or Creation scientists lived, study *geographical locations* of scientific discoveries and Biblical events, create *art works* dealing with anatomy (such as drawing of the body) and for m*usic* play instruments using sounds produced by our vocal cords or other parts of the body (hands to clap rhythms, etc.). In other words, all the subjects will relate to the main topic. (The authors suggest you supplement grammar, phonics and math with other programs, where age appropriate.)

Why teach a unit study?

The unit study approach emphasizes that reading many books interrelated to a topic, rather than isolated textbooks, encourages discussion and research on the part of the children, therefore making learning more natural and retention of information much more successful. This is ideal for parents with children at different grade levels. It makes teaching much easier. The main area of interest can be taught in a group; then children can work on age-appropriate activities individually. It keeps the family together most of the time, rather than separating children to do their own individual work. It also encourages older siblings to assist younger ones and thereby learn by teaching.

How do I begin planning?

The best place to start is with a calendar, paper, pencil and the *Teaching Outline i*n the study guide. The outline will help you become familiar with the topic. A unit study takes planning to be covered well. Write out a rough outline of the points you want to cover. You may use the outline points provided in each of the three grade levels, or you may utilize them as starters in creating your own

outline. As you write your outline or points you want to cover, leave room for additions, i.e. you may run across a book or topic that you want to include. Decide how long you want your unit to take. What months are you considering? Is this time before a major holiday? If so, you may want to do a shorter unit. Is it the beginning of school, summer, or other longer period of time? If so, you may wish to do a more complicated unit or spend more time digging deeper into the topic you choose. Decide what subjects you want to incorporate and what days you will do each. For example you can spend every day reading, writing, doing grammar and math, but perhaps science experimentation and history will only be done three out of five days. You might prefer a Monday, Wednesday, Friday/ Tuesday, Thursday type of routine. Or, if you take Fridays off, your schedule might be Monday—Wednesday / Tuesday—Thursday. Remember, each family is unique and only you can decide which teaching/scheduling format is best suited for you and your students. *Feel free to use our suggested and detailed lesson plans with each grade level division.*

How do I begin using the Creation Study Guides?

It doesn't take much time to plan, especially with our study guides. We have done much of the planning and research for you with our detailed lesson plans. You don't need to use them but they are there for you. In addition, we have provided each grade division with additional subject related lists that will allow you to incorporate other subjects into the unit study as well.

The *Teaching Outline* is specifically to be read by the parent as preparation for teaching the topic. It will give you the necessary information and background necessary to teach the unit. We encourage you to read portions aloud to younger children and have older children read them alone or with you.

Again, planning is important. Have a calendar handy and map out the number of weeks you would like to spend on this unit. Approximately 6-8 weeks is a good time span for Creation science. (We feel this is an excellent preparation to counter secular materials where it is almost impossible to avoid the evolutionary viewpoint.)

How do unit studies differ from traditional teaching methods?

Traditionally subjects are taught in an isolated manner in textbooks or workbooks with fill-in-the-blank format. Very few, if any, of the subjects are interrelated, and all of the learning is done in an individual manner. Unit studies relate all academic subjects under one main idea and can easily work with one child or a group of children.

Does a unit study cover all of the topics I need to teach in every grade?

Yes and no! It depends on the grade level of your child and what your goals are for your home school. Many children know all they need to know for kindergarten by the time they are preschool aged. Thus, the kindergarten year is

left free to implement unit studies on many different topics. Often, as the child progresses, because of all the reading research, projects and experimentation that he does, his learning will surpass what is generally considered normal for his grade level. Still, if you are concerned about standardized testing, the authors recommend you use these study guides as supplements to your core curriculum. However, in many cases, when homeschool students who have been taught with the unit study approach take a standardized test, they score in the 90+ percentile.

How long does it take to complete a unit study?

Unit studies can take several weeks or all year depending on how in-depth your coverage of a topic and the varying abilities of your children. In the younger grades you will most likely do an overview; in the middle grades you will do the unit building upon previous knowledge; and in the older grades you can do an in-depth study, delving deeper. For example we have used Creation Anatomy in our family as a unit study covering three months. We will use it again as a core subject for a high school science credit when the time comes. With units you are not bound to a structured one hour for each subject routine. The relationships between the topics are natural, and you will often find many subjects are covered without much effort. You will also be free to spend more time on a particularly interesting topic as you see your children's interest level rise in that area. These study guides are meant to be supplemental to your core curriculum, and you can tailor them to meet your family's needs.

Once you have an approximate time span, you will want to go through the age-appropriate outlines and lesson plans. If you have older and younger children, try to find a middle ground as a starting place. Look through the activities and suggested assignments. Check off the activities that interest you in each subject area. Decide which supplemental books you will need and plan on obtaining them. Interlibrary loans are able to obtain books from private as well as public libraries. We don't suggest you use every book we recommend. We usually list a greater number of books than necessary so that if you can't obtain one particular book, you may be able to find another.

I've decided what I want to teach; now how do I implement it all?!

Once you have chosen your materials and have your books, you can establish a calendar that reflects your instructional approach, i.e. strict methods or a more lenient approach. This depends on your family's needs and character. We have done both, and I have found that being more organized works for us. If you feel more secure having it all mapped out, please do so. You will know which days you are going to read and research, which days will be for spelling work, math and grammar, and which days you will be doing those experiments that are so important for hands-on learning! If you are an experienced homeschooler with

an idea of what you want to accomplish and like to wing it, then go for it. If this approach doesn't work, you can always change it. The main thing to remember is not to become discouraged or feel overwhelmed.

One way to fit everything in is a day-to-day approach. You may want to do all the reading and research on day one, geography and history on day two, math, language arts (vocabulary, spelling and grammar) on day three, science experiments on day four, art and music on day five. Day five can also be used as the catch-up day, meaning you will finish any work not completed on the previous four days.

Decide which books you want your children to read on their own. Many times older siblings can be a great help in teaching the younger ones and will have lots of great ideas for projects. (One of the nice things about unit studies is it keeps the family together!) Remember, unit studies have the goal of tying in as many subjects as possible, so you don't need to supplement with a spelling workbook or vocabulary workbook unless your child has a definite need that can't be met any other way. Consider that it might be overloading the kids with work and creating frustration when they can't get it all done. (We speak from experience!)

How do I test to find out if my children have learned what I am teaching with the unit approach?

We have found that working closely with our children tells us all we need to know about what they comprehend and what they have not. By reading materials orally and then verbally questioning them, we know what needs review and what doesn't. They do many hands on activities that reinforce previously read materials. For example, in *Creation Science: A Study Guide to Creation!* there is a discussion on evolutionary principles. One of the points made is how evolution violates the second law of thermodynamics. That in itself sounds very dry and scholarly, yet a follow-up activity presented after the discussion is the Entropy Experiment which is a visual way to reinforce what they have learned. If the children can explain it to you, then you know they understand the concept. After reading all this, if you feel the need to create tests to find out what they know, feel free to do so! You could easily generate oral tests for the little ones, and essay questions for the older ones. One of the great things about homeschooling is the freedom to teach as you wish.

What about cooperative learning (co-ops)?

Cooperative learning (co-ops) is teaching a unit study with another family (or several families) and taking time once a week, or more, to work together on projects, experiments or activities for the entire day. Each family focuses on the unit materials at home during the week, and the co-op is a way of reinforcing the subjects taught at home. This unit lends itself well to co-ops. There are many

experiments that would be fun to do as a group. Still, they can be done just as easily with a single family. The choice is yours.

Why teach using a science approach rather than literature or history?

Each of the approaches have their pro's and con's. Without getting into all the reasons for focusing on science let us say it is a personal preference. We like science because it focuses on experimenting, which encourages creative thinking and exploration on a greater scale than either literature or history. Truly, it is a matter of preference.

SECTION 1: TEACHER CONTENT

Teaching Text Outline

Outline Background & Content

Teaching Outline

Teaching Outline

*Note: The words in **boldface** are defined in the glossary at the end of the book.

I. BODY ANALOGY — 1 Cor. 12:12-27

God uses the analogy of the Body of Christ to the human body. The Scripture in 1 Cor. 12:12-27 is beautifully written to show the dependence and inter-relatedness of the body and the unity He wants to see in His Church.

The Price of a Human Body — I have read various breakdowns of the value of the elemental minerals and the various components of the human body. Since the body is mostly water, some scientists have given its components a value of just a few dollars. Others have estimated that since the cost of everything has risen quite high lately, the elements in a body could be worth a million dollars. One biochemical company estimated that the ingredients (elements) needed to make up one human body would be worth $3,563,590.70. (Seuling 1986) However, the body does not operate merely at the elemental or atomic level. The human body functions at the molecular level. That means the body uses molecules, which are combinations of atoms, for proper function. For instance, instead of just using carbon, hydrogen, iron, oxygen, sulfur and nitrogen independently, our bodies use the largest, most complex molecule that occurs in nature — hemoglobin!

There are many other compounds like this that are needed for the body to function. (Red River of Life) Chemical compounds like this are tremendously expensive. In fact, the actual cost of these molecular compounds, if you could buy them, would make the human body priceless. Most compounds cannot be made synthetically. There is no biochemical company in existence that could put together all the molecular compounds necessary to make life function. But, if you could get the best pharmaceutical companies in the world to make the molecular compounds, there would not be enough money in the entire world to buy them. Even if you took into account all the money, all the gold reserves of all the countries, all the coal and oil still in the ground, all the lumber still in the forests and all the gold, diamonds and other precious gems still in the ground, there would not be enough money to buy the necessary ingredients for one human body! (McMurtry 1994) That makes each human PRICELESS. So many people today think human life is worthless. Babies are aborted, old people are euthanized and families are murdered for a few dollars.

The human body is priceless. However, that price has already been paid by The Only One who could ever pay the price: JESUS. He paid the price for the redemption of our sins by sacrificing Himself on the cross. His sacrifice allows us the privilege of living with Him in heaven for eternity.

COMMUNION

All different kinds of churches, synagogues and denominations celebrate the sacrifice of Our Lord in different ways. My church (Jill's) partakes of the emblems

(symbolic ceremony 1 Cor 11:23-33) once a month. Felice's church celebrates Communion every Sunday during Mass. (Her Church teaches, and she believes Communion is the true presence: Body, Blood, Soul and Divinity of Jesus Christ: Luke 22:7-20, Mt. 26:17-29, Mark 14:12-25, 1 Cor 11:23-32) The Messianic Jews remember the Lord's death until He comes again at every Passover celebration. By whatever method your particular faith celebrates the Lord's Sacrifice, it is important to remember that we are all the Body of Christ and to participate with an awesome reverence for what Jesus Christ Our Lord has done.

The next time you are partaking of Communion, Eucharist, or Passover, stop and think. We must consider, each time, exactly what Jesus did for us. We must not eat and drink unworthily. The Last Supper was a Passover meal which Jesus was celebrating with His disciples. This same meal is repeated in Jewish homes every year to remember how God delivered the Hebrews out of the bondage they had suffered under Pharaoh in Egypt. As He passed around the unleavened bread, Jesus told His disciples to take and eat. "This is my body that is broken for you." In my church, we use the Jewish matzoh bread. In the process of preparing this bread (actually more like a cracker), it is pierced many times with a fork, and it is baked so that the bread comes striped. Therefore, the bread we partake of is pierced and striped like the Body of Christ. The next time you receive communion, hold it in your mouth for a moment and notice how the bread begins to taste sweet. This pierced and striped cracker, or bread, or wafer, becomes sweet tasting on the tongue, just as the sacrifice that Jesus made when His Body was broken becomes so very sweet in our lives.

The Last Supper was a Passover celebration, which the Jews call a Seder. Seder means 'set in order' or 'orderly.' Everything is done in a very precise manner according to Jewish tradition. If you have the opportunity to attend a Seder put on by the Jews for Jesus or a Messianic Synagogue, I would highly recommend it. Many of the symbolic elements in this meal point to Jesus as the Messiah. For instance, a piece of matzoh bread is broken into three parts, symbolizing the Father, Son, and Holy Spirit. Then the middle piece, the part that represents The Son, is wrapped in a white linen napkin and hidden in a high place. This represents the burial of Jesus. There is so much more involved in this meal: the bitter herbs, the roasted meat, and so on that all have important meanings.

Four cups of wine are used during this meal. The first cup is called the Cup of Sanctification; the second cup is the Cup of Judgment; the third cup is the Cup of Salvation. It was this third cup, the Cup of Salvation, that Jesus passed around to the disciples. As He passed this cup, Jesus told them that this emblem was His Blood that was shed for the remission of sins. As you partake of communion, consider how the Blood of Jesus washes away the sins in our lives. Jesus did not drink of the fourth cup, the Cup of Redemption, and He will not drink of it until He comes again. He did not even drink the wine mixed with water while He was on the cross. (This information came from a personal conversation with Steve Birnstien of the Beth Shiloh Messianic Synagogue of Ft. Myers 1996.)

Study the beautiful symbolism of the Seder meal that the Jewish people practice every Passover. This information is available online through Jews for Jesus.

The Bible puts a great deal of importance on the body and the blood, and on the

Body and the Blood of Christ. We must always remember that all believers are part of the Body of Christ, regardless of what doors of what building they may walk through to worship. When we get to Heaven, we won't be known by denomination or religion, but as heirs of the Kingdom.

II. BLOOD — HEART — RESPIRATION

The Circulatory System:
"...the life of every creature is its blood." (Leviticus 17:4)
"...the blood is the life." (Deuteronomy 12:23)

Blood is the most amazing transportation system ever devised. Small, flexible tubes called arteries and veins carry blood cells to and from the cells delivering oxygen and removing waste. Plasma is a fluid that carries those red blood cells as well as platelets that repair injuries, and white cells that fight infections. Blood is a modified connective tissue that acts as an amazing chemical plant that turns food into flesh, blood, bones and teeth.

The average person knows very little about how his own body works. The typical person probably knows more about the different fluids in the family car than about the various fluids in his own body. There are approximately seventy-five trillion cells in the human body, each having the same requirements. These cells must breathe, requiring oxygen; "burn" fuel, which requires a fuel source; get hot, and need cooling; perform work, and give off exhaust gas. Each one of these cells must be continuously supplied with oxygen and nutrients and have waste, gas, and water removed throughout a person's entire life. Unlike the automotive engine, which has separate systems for each function, God has combined these separate functions into one system, the circulatory system. Blood is truly amazing with sugar, fat, other chemicals and minerals that are constantly moving from processing sites to delivery points, taking waste material from cells to disposal plants, surrounding invading foreign material, then destroying them and replacing worn out or damaged parts. All this processing is controlled by electrical impulses from the brain, which is the central computing system.

As a car requires petroleum products on which to run, so the body requires fuel in the form of food. Cars use about 9,000 gallons of air for each gallon of gas. The body uses four gallons of oxygen per hour when at rest and seventy-five gallons of oxygen per hour when active. This oxygen must go from the lungs to every cell of the body very rapidly, and this is accomplished by the blood stream. (*Red River of Life*) We breathe air into our lungs, but we only use one/fifth of this air. Oxygen in the air is absorbed into the bloodstream by a physical process called **diffusion**. Gas bubbles in the blood would be fatal. Oxygen bonds to the hemoglobin molecule and is carried to the cells needing oxygen. The blood carries oxygen chiefly as an unstable compound which is formed in the lungs and which decomposes into oxygen and hemoglobin in the tissues. Hemoglobin is the largest, most complex molecule that occurs in nature:

$$C_{3032}H_{4812}N_{780}Fe_4O_{872}S_{12}$$

Our life depends on the four iron atoms that are protected by this giant molecule. When the oxygen reaches a cell in the big toe, it diffuses into the cell. At that same

SECTION 2: GRADES K-12

TEACHING FORMAT INSTRUCTIONS

TEXT OUTLINE

SAMPLE LESSON PLANS

READING LIST

ACTIVITY/EXPERIMENT RESOURCE LIST

VOCABULARY/SPELLING LIST

VOCABULARY/SPELLING/LANGUAGE ARTS SUGGESTIONS

MATH REINFORCEMENT

SCIENCE ACTIVITIES/EXPERIMENTS

GEOGRAPHY/HISTORY REINFORCEMENT

ART/MUSIC REINFORCEMENT

Creation Anatomy Outline
Grades K-3

I. The Price of the Human Body

A. Scripture: 1 Corinthians 12:12-27

B. Value of Materials

C. Price Paid

II. Blood, Heart and Lungs

A. Scripture: Leviticus 17:4

B. Definition and Function

C. Facts

D. Heart as a Muscle

E. Parts of the Blood

F. Lungs and Breathing

III. Injuries and Healing

A. Blood Cells

1. Red Cells
2. White Cells
3. Platelets (Blood clotting)

B. Immunization (Shots)

1. Lymph System
2. Germs
3. "New" Science

IV. Bones & Muscles

A. Framework

B. Muscles

1. How they work
2. Types

C. Joints

D. Hands

V. Digestive System

A. Mouth

B. Teeth

C. Saliva

D. Esophagus

E. Stomach

F. Liver

G. Small Intestines

H. Large Intestines

I. Kidneys

VI. Nervous System and Brain

VII. Senses

A. Eyes (Sight)

B. Ears (Hearing)

C. Mouth (Taste)

D. Nose (Smell)

E. Skin (Touch)

VIII. Language

IX. Races

X. Human History

A. Achievement

B. Invention

C. Population

Lesson Plans

Subject Date:	Monday	Tuesday	Wednesday	Thursday	Friday
Bible/Religion Studies					
Teaching Outline					
Reading Section					
Language Arts/Spelling/ Vocabulary					
Math Reinforcement					
Science Activities and Experiments					
Geography/History					
Art/Music					

CR= Creation Resource TS= Teacher Selection

Lesson Plans: Grades K-3 Week 1

Bible/ Religion Studies

Monday –Thursday: 1 Cor. 12:12-27 (dictation / memory work) ; **Friday:** Lev. 17:14; Gen 2: 7; teacher's selection of additional verses/lessons

Teaching Outline

Monday: I a,b,c II-a,b; **Tuesday: r**eview II-,c,d ; **Wednesday**: II e,f ; **Thursday:** II e,f continued; **Friday: review;** II a,b,c,d,e,f

Language Arts/Math/History/Music/Art

Monday: assign vocabulary words, write definitions on index cards; write each word five times; read sections in Teaching Outline on price of human body (Lev. 17:14); use resource books for information on circulatory system; discuss the heart/parts/function of heart; draw/label parts of heart; discuss process of the scientific method and importance in using process when studying science; locate pulse points in wrist/neck; using pulse rate hand-out, record heart/pulse rate;

Tuesday: use vocabulary words in sentence/write words five times each; squeeze tennis ball (activity); make pulse meter; continue to record pulse/heart rate;

Wednesday: write vocabulary words five times each; make stethoscope; listen to heart/beat; sing song about heart; discuss how many miles of blood vessels are in human body; practice mapping/reading skills; make drawing of blood cells; make diagram of lung; record how many breaths taken in a minute/five minutes; discuss chest colds/flem; name parts of the lung; write your words 5 times.

Thursday: write vocabulary words five times each; take a practice spelling test; review definitions; measure chest expansion when inhaling/exhaling; record how long student can hold their breath; place hand mirror in refrigerator for an hour, remove wipe surface and have student breath on it. Discuss what happens to mirror; review parts of heart/lungs and functions of each.

Friday: orally ask definitions of vocabulary; take spelling test if necessary; play the Stepping Hearts game; read about Dr. Christian Barnard and first heart transplant; locate where Dr. Barnard was from; pretend you are in Miss Frizzle's class and add dialogue to the story/act out the scene; sing "There is Power in the Blood" and other songs pertaining to blood.

Lesson Plans Grades K-3 Week 2

Bible/ Religion Studies

Monday—Friday: teacher's choice of verses and lessons

Teaching Outline

Monday-Review **Tuesday**-III-a-1,2,3 **Wednesday**-III-b1,2,3 **Thursday**– Review, **Friday**– reports and presentations

Language Arts/Math/History/Music/Art

Monday: assign vocabulary words/write definitions on index cards, write each five times each; read in Teaching Outline/resource books about blood cells; make life-size drawing of student's body; label organs studied thus far; review by playing the Jumping Bee Game; review respiration using Scientific method; continue recording heart rates after exercise.

Tuesday: use vocabulary words in a sentence, write words five times each; choose a sentence from a resource book for dictation; make drawing of blood cells/review job of each cell; discuss what cells are made of; exercise and record pulse rate; read book about scientist Galen/ask comprehension questions; locate where Galen lived on map; sing "Be Careful Little Eyes What You See" or other body part songs.

Wednesday: write words five times each/alphabetize the words; select the best sentence to copy using the best handwriting/printing; add lymph system to body drawing/read about this system and how it keeps you healthy; study healing process of a scrape/cut; exercise/record pulse rates; discuss germs and how they intrude human body/importance of keeping hands clean; discuss some of the greatest epidemics in history;

Thursday: spell vocabulary words orally; take practice test; make up a chapter for the *Magic School Bus* about what happens in the body when someone scrapes their elbow; review week's content; discuss who discovered penicillin; make a commercial/public service announcement about pros/cons of immunizations/flu shots.

Friday: add the new vocabulary to play the Stepping Heart Game; review definitions and take the spelling test; review week's content; review body drawing/ name all parts; perform commercial/PSA; present experiments/reports done during week.

Creation Anatomy Outline
Grades 4-8

I. Body Analogy

A. Scripture: 1 Corinthians 12:12-27

B. Value of Materials

C. Price paid

II. Circulatory System

A. Scriptures

B. Definitions

C. Heart

D. Blood Parts

F. Lungs and Breathing

III. Injuries and Healing

A. Blood Cells

1. Red Blood Cells
2. White Blood Cells
3. Platelets

B. Immunity

1. Lymph system
2. Bacteria and Viruses
3. How Science catches up with the Bible

IV. Skeletal System and Muscles

A. Framework

1. Construction
2. Function

B. Muscles

1. How they work

2. Type

C. Joints

D. Hands

V. Digestive System

A. Mouth

B. Teeth

C. Salvia

D. Esophagus

F. Liver

B. Small Intestines

C. Large Intestines

D. Kidneys

VI. Nervous System and the Brain

VII. Reproductive System

VIII. DNA

IX. Senses

A. Eye
B. Ear
C. Taste
Language

XI. Races

XII. Human History

Lesson Plans

Subject Date:	Monday	Tuesday	Wednesday	Thursday	Friday
Bible/Religion Studies					
Teaching Outline					
Reading Section					
Language Arts/Spelling/ Vocabulary					
Math Reinforcement					
Science Activities and Experiments					
Geography/History					
Art/Music					

CR= Creation Resource TS= Teacher Selection

Lesson Plans Grades 4-8 Week 1

Bible/ Religion Studies

Monday –Wednesday Cor. 12:12-27 (dictation / memory work)**Thursday-Friday** Lev 17:4 Gen 2:7 and verses of your choice dealing with blood/heart / breathe. Show how to use a Bible Concordance to find other related verses.

Morning warm up: 5 minute write up. Do this everyday and you will be surprise how quickly you kids will love it! This is a great way to get past writer's block. Anything they write in 5 minutes is shared at the end. Here's how it works: Give your student 5 minutes to write something about a topics that you choose—what ever comes into your head. Here's what is popping into my head right now, for example: how or if a foot can get along without the rest of the body or how is your body unique, or what is your favorite body part and why or what do you want to learn about the body, or how do you think food effects the body, or how can you make a body stronger or grow taller or faster or can you? This is just a quick exercise and the children will get better and better at it every day. They don't ponder the topic they just pick up their pen/pencil and write. My kids balked at first, but by the end of the first week, they were begging for more time to finish! They wrote short stories, poems, songs and many silly sentences! It doesn't matter the point is to get the creative juices flowing and to get it on paper! (Additional 5 minute write-up ideas: heart, love, sacrifice, obedience, medicine, feet, exercise, doctor, emergency, experiment, determination, breathe)

Teaching Outline– **Monday**: I- a, b,c, II-a,b,c **Tuesday** –Review II-d **Wednesday**- II d,e **Thursday**-II-Review **Friday** –Review knowledge II a,b,c,d,e

Reading/Research—Everyday. Reading 30 minutes –1 hour (perhaps even longer depending on the research you are asking them to do) everyday both silently and aloud. Choose books with your children that will explore Circulation and Respiration Systems. See reading list. Consider looking for biographies of men and women who contributed to the science/medical fields like: Christian Barnard, William Harvey, Carlos Finlay, Walter Reed, Hippocrates so you can include some historical/ geographical perspectives and subject integration into this unit study.

Language Arts/Vocabulary:

Monday: assign vocabulary using list (look for words dealing with this section of the Teaching Outline) adding words from your own resources as needed for spelling and definition work. Have students keep a vocabulary words and definitions on index in a card file. It makes daily quick reviews easy; Re-write the

Scripture verses using their own words. Do some sentence diagraming of these sentences. Do this activity throughout unit– Make Trivia Cards

Tuesday: Review vocabulary words learning the spelling and reviewing the definitions; Find sentences in your books using 5 words and do some sentence diagraming. Dictate 2-3 sentences from one of your books using your vocabulary.

Wednesday: Practice spelling words by writing lists with some words misspelled; Make a hopscotch and learn vocabulary definitions (Spelling, Vocabulary and Grammar Ideas 4-8).

Thursday: Write an open ended story using your vocabulary words—did you spell them correctly and use them correctly in context?

Friday: Take a spelling test; orally ask the definitions; Ask comprehension questions about the books the student is reading and have the student read several pages aloud.

Math Reinforcement/Science Activities and Experiments/Geography/History/Art/Music/Drama– Using your resources both in this guide and those you have found in the library, bookstores, and internet put together your students integrated curriculum plan of attack! Remember: Read it; watch it (or follow the processes by a diagram); review it; have the student tell it back to you orally and in writing, drawing or modeling projects. Ask yourself and your student what they want to learn and what interests them most. If you are writing papers of any length assign them early in the week to allow time to read, take notes and put the paper together. Choose different types of writing too- poetry, reviews, consider more dramatic options like a informational advertisements about heart disease, or asthma using sound effects like heart beat and breathing.

Monday: Using the Teaching Outline Read/Teach from the outline about the value both spiritually and materially of the Human Body. Watch the Red River of Life DVD as an introduction. Discuss the movie and write a review; Make word problems from the mathematical data given about the material worth of the body provided in the Teaching Outline (Math Reinforcements 4-8). Spend extra time beginning to read your resource books and the books chosen to be read individually. Take pulse after different exercises (PE/ Math) Use the chart and redo the exercises daily to monitor changes in pulse rate during the unit.

Tuesday: Read/Teach from the outline about the blood and heart. If you want, watch the Red River of Life DVD again. What did you see/learn this time that you missed yesterday? Make and label drawings of the heart and have the student explain how the blood passes through the heart (Science/Art) Have your students ex-

plain the path blood takes through the heart, lung, heart. Take pulse after different exercises (PE/ Math). Using the Scientific Method sheet, do the osmosis experiment. (Janice VanCleave's Biology for Every Kid also has some experiments dealing with osmosis and diffusion) Use the Teaching Outline to make Trivia Cards. Make up a game using the cards.

Wednesday: Check and complete your observations on the osmosis experiment and record the information on your Scientific Method sheet. What process does oxygen go through after it is inhaled? Explain the process. Play your Trivia Card Game to review. Learn about blood pressure and have your blood pressure taken. Have your teacher donate blood and go watch the process and interview the phlebotomist. Write a news article about the importance of blood donation. (Language Arts) How many times do you breathe in and out? Record sound effect of heart and breathing using them in an informational advertisement about heart and lung diseases. Try to get different animal hearts from the Butcher to compare, cut in half and identify the chambers.

Thursday: Teaching Outline -Respiration process. Check your resources for building model lungs and demonstrating respiration. How many breathes do you take in one day? (Math), Graph the proportion of gases in the Air. If your student is reading a biography of a scientist/doctor create a timeline of what is happening during that time history. How does history impact his research, thoughts. (History) Find his country, where he traveled on a globe. (Geography). Add cards to the Trivia Game.

Friday: Play the Trivia Game to review what you have learned. Consider watching the Red River of Life once again to reinforce the information and learning that has taken place. Did you learn anything new? How is hearing and seeing this information different than the first time you watched it? Give oral presentations using the charts, graph, diagrams and drawing to explain the circulation and respiration system. Find poems about the body. Act out the advertisement. How best can your student recap what learning has taken place?

Creation Anatomy
Grades 9-12

Objective: To study anatomy from a Biblical perspective through observation, comparison, research, and experiments.

Topics of Study:

Outline

I. Body Analogy
A. Scripture
B. Value Human Body
C. Price Paid

II. Circulatory System and Respiration
A. Scriptures
B. Terminology
C. Function
D. Heart — Arteries and Veins
E. Blood Components
    1. Cells
    2. Shape
    3. Function
    F. Respiration

III. Injuries and Healing
A. Components of Blood
    1. Plasma
    2. Nutrients and Minerals
    3. Leukocytes (white cells)
    4. Granulocytes
    5. Thrombocytes
    6. Platelets
    7. Fibrinogen, Antigen, Lymphocytes, Antibodies
B. Immunity
    1. Response to infections
    2. Creating antibodies
    3. Lymph System
    4. Science catches up with the Bible

IV. Skeletal System and Muscles

A. Composition of framework
B. Function of framework
C. Muscles
    1. Function
    2. Types
D. Joints, Ligaments, Tendons
E. The hand

V. Digestive System

A. Organs
B. Fluids
C. Functions

VI. Nervous System and Brain

VII. Reproductive System

VIII. DNA

IX. Senses

A. Auditory
B. Vision
C. Olfactory and Taste
D. Tactile and Skin

X. Language

XI. Races

XII. Human History

Anatomy: A Two Months Study At A Glance
Grades 9-12

Week 1	Body Analogy-Scripture-body's value, price paid; Circulation-terminology-function, heart, blood components-cells , shape-function; Respiration
Week 2	Injuries and Healing-Components of Blood-plasma, nutrients and minerals, leukocytes, granulocytes, thrombocytes, platelets, fibrinogen, antigen, lymphocytes, antibodies; Immunity-response to infection, creating antibodies, lymph system , science catches up with the Bible
Week 3	Skeletal System-composition and function of the skeleton; Muscles– function-types; Joints, ligaments, tendons; The Hand
Week 4	Digestive System– Organs, Fluids and Functions
Week 5	Nervous System– Brain
Week 6	Reproductive System DNA/ Life's Origins
Week 7	Five Senses-auditory, vision, olfactory and taste, tactile and skin; Language
Week 8	Races; Human History Round-up— Oral presentations of students "big" project Celebrate God's gift of the body.

Lesson Plans

Subject Date:	Monday	Tuesday	Wednesday	Thursday	Friday
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Lesson Plan Grades 9-12 Week 1

Bible/ Religion Studies—**Monday-Wednesday**: Cor. 12:12-27 (dictation / memory work) **Thursday– Friday** Lev 17 Gen 2: 7 and verses of your choice dealing with blood/ heart and breathe. Show how to use a Concordance to find other related verses.

Morning warm up: 5 minute write up! (optional) Do this everyday and you will be surprise how quickly you kids will love it and their writing will improve! This is a great way to get past writer's block. Anything they write in 5 minutes is shared at the end. Here's how it works: Give your student a topic or word you choose and 5 minutes to write —what ever comes into their head. Here's a few topics that are popping into my head, for example: how or if a foot can get along without the rest of the body or how is your body unique, or what is your favorite body part and why or what do you want to learn about the body, or how do you think food effects the body, or how can you make a body stronger or grow taller or faster or can you? Words like: heartache, the blood of Christ, pumping, and breath. This is just a quick exercise and the children will get better and better at it each day. They don't ponder the topic they just pick up their pen/pencil and write. My kids balked at first, but by the end of the first week, they were begging for more time to finish! They wrote short stories, poems, songs and many silly sentences! It doesn't matter the point is to get the creative juices flowing and to get it on paper! (Additional 5 minute write-up ideas: love, sacrifice, obedience, medicine, feet, exercise, doctor, emergency, experiment, determination)

Teaching Outline– **Monday**: I a,b,c, II-a,b,c,d **Tuesday** –Review II-d, continued **Wednesday**- II-e **Thursday-**Review II a-e Friday –Review knowledge

Reading / Research- Every day: For upper grades reading and research is the primary way students make their learning their own. Teachers are more the facilitator, guide and enabler. Work with student closely to select the exceptional books that will go deeper into this unit. For more hands-on learners, model building, experiments and diagram drawing will be beneficial.

Language Arts Spelling Vocabulary and Grammar-

Monday- As you read the Teaching Outline and your resource books select the vocabulary words pertaining to this week's study. Assign unknown words to look up and write definitions. Look at the origins of the vocabulary words (Spelling/ Vocabulary and Grammar Ideas 9-12). Have the student make an oral presentation about the human body as related to the Body of Christ (Language Arts Ideas 9-12).

Tuesday-To make sure the older students have knowledge of easier vocabulary ask them to make word puzzles for the younger students (Spelling/Vocabulary Pull sentences from the books they are reading for dictation, sentence structure and sentence diagramming.

Wednesday– Have student write a biographical sketch of a scientist of interest in this study. Check spelling and sentence structure/grammar.

Thursday-Review vocabulary to make sure they have learned the definitions; Write a comparison between body, soul and spirit (Language Arts 9-12)

Friday-Review vocabulary, spelling.

Math Reinforcement/ Science Activities and Experiments/ Geography/ History / Art/ Music/ Drama- Using your resources both in this guide and those you have found in the library, bookstores, and internet put together your students integrated curriculum plan of attack.

How are you going to approach this study with the older student? Depending on the depth and length of the study you are planning you can approach this for students in the upper grades differently. You might choose a more in depth study or a more generalized approach depending on the interest level of the student. A more in depth study could result in a larger, more sophisticated (science fair quality) project on a specific area of interest. If you choose this route, be sure to include daily oral updates on what they are reading (should be several types of sources) and reviewing the notes they are taking. This project should includes experiments using the scientific method, and possibly interviews with people. Demand excellence in the finish writing product, with rewrites as necessary. Choosing the in depth study should also have the benefit of attaining a general knowledge of the interactive workings of the entire body. If you select a more generalize study of anatomy, it should demonstrate some depth of knowledge as to how our bodies work. It might include a more historical approach by studying the history of medicine, the scientists who toiled to advance our knowledge of the body, and the part medicine has played in improving the lives of people, and societies. A study of medical ethics is a possibility.

**Remember: Read it; watch it (or follow the processes by a diagram); review it; have the student tell it back to you orally and in writing, drawing or modeling projects and experiments. Choose different types of writing too, like poetry, dramatic portrayals, consider options like an informational speech, public service announcements that are video taped or power point demonstrations.

Monday: Using the Teaching Outline Read/Teach from the outline about the value both spiritually and materially of the Human Body. Watch the Red River of Life DVD as an introduction to the circulatory system . Discuss the movie in light of 1 Cor. 12-12-27 and being members of the body of Christ. What is the value of the human body in relation to its elements? (Math Reinforcement Ideas 9-12). Write out the chemical name for Hemoglobin, and explain each of the chemical symbols (Science Activities and Experiments 9-12). What is the difference between an atom, an element and a molecule (Science Activities and Experiments 9-12). Describe the unique transportation system of the blood. Begin charting your pulse at different times of the day (Math Reinforcement Ideas 9-12) Start an exercise program and see how it effects your heart rate over the course of the unit (Science Activities and Experiments 9-12). Spend extra time reading the books you have selected to read individually for the study. How will you share what you have learned about the blood, heart, arteries and veins? (Report, term paper, informational speech, power point, can you add demonstrations/ experiments?);

Tuesday-Read and teach from the outline. Can you explain how the blood travels through the heart and is circulated through the body. What is the function and structure of the system. Review the parts of the heart and blood vessels. Demonstrate osmosis (Science Activities and Experiments 4-8). Continue to spend extra time reading and taking notes for your project. Look into the life and times of scientists who contributed to our understanding of the heart and blood. Learn and explain how understanding has changed and look at what was happening historically at the time to see if that influenced their research. Try to get different animal hearts from the butcher to compare, cut in half and identify the chambers.

Wednesday– Review from the teaching outline vocabulary, and the circulation process. Can the students tell the process to you? Continue your study of the blood and its make up and respiration. How many breaths do you take in one day? (Math Reinforcement Ideas 4-8) What comprises the air we breathe (Math Reinforcement Ideas 4-8). Review the process oxygen goes through after it is inhaled and passes through the cells, organs, and is carried to the lungs and exhaled (Science Activities and Experiments 4-8). On a white board or chalk board map out the process of respiration and how the fuel (oxygen) travels through the body and how the waste is removed and expelled through the lungs. Explain diffusion (Blood and Guts). How are the lungs of scuba divers effected during dives. What happens when divers come too quickly to the surface? What are the effects of smoking on the lungs? Write and perform a public service announcement that would or might help convince people to quick smoking. Use the Teaching Outline to make Trivia Cards (Science Activities and Experiments 4-8). Make up a game using the cards. What has your historical research on the scientists uncovered? Who was Walter Reed and what contributions did he make?

Thursday-: Continue to add cards to the Trivia Game you have created to review the material. Continue your research and reading. Work on your projects-both written and hands-on. What are the parts of the Circulatory System you find most interesting? What are questions you still have? Where can you look to find the answers? Have you been taking a historical perspective studying the life and times of the scientists who shaped the knowledge we have of the Circulatory and Respiratory Systems? Tell what you have learned.

Friday: Review all material covered this week. How best can your student recap what learning has taken place? Have the students make presentation of materials, experiments, models, and drawings so they can demonstrate their knowledge. Consider inviting friends in to listen to the presentations. Have there been any changes on their pulse rates and exercise charts since they began at the beginning of the week? Continue this charting for the entire unit. Play your Trivia Game. Thank God always for the gift of our bodies and pray that we always be mindful that our bodies are a temple of the Holy Spirit.

◊ Using a blank world map, chart the locations of the different languages. Instead of writing the name of the country, for example, for France, write French. Use the most prevalent language excluding dialects.

◊ How have inventions changed history? Take one invention and research it. Answer the following questions: Where was the inventor born? How well received was the invention? How much trouble did the inventor have in making his invention? Was it something that radically changed the way we live, or did it take years and many improvements before change was noticeable?

◊ Research the origins of languages and use a map to label the spread of humanity. Where was the biggest concentration of inhabitants for years?

◊ Research the largest populations and, using a world map, label countries by their populations. How is population explosion a myth? What information can you find to answer the following questions: What state in the U.S. could hold the *entire population* of the world? How much room would this give each person? How much room would these people have for recreation, food, travel, etc.? (Human Life International)

Exercise Chart

Directions: Keep track of the following information daily. Measure your body dimensions once a week. Do this for several weeks and compare the information. What did you find? Evaluate your overall physical condition.

Type of Exercise	Duration or Repetition					Pulse Rate				
	M	T	W	TH	F	M	T	W	TH	F
Stretches										
Jumping Jacks										
Sit-Ups or Variations of Sit-Ups										
Toe Touches										
Push-Ups										
Leg Lifts										
Jump Rope										
Jogging										
Weight:										

Body Measurements:

Waist
Upper Arms
Upper Thighs
Hips
Calves
Shoulders
Chest

GLOSSARY OF TERMS

alveoli - tiny air sacs at the end of the bronchioles where oxygen passes into the red blood cells
amylase - a digestive enzyme contained in saliva that begins to break down complex starch molecules into simple sugars such as glucose and maltose
antibodies - made by the lymphocytes that recognize and remember certain pathogens that have previously invaded the body
antigens - chemical patterns on germs that stimulates the human body to produce antibodies; these antibodies are produced by the lymphocytes
axon - transmitter that carries nerve impulses to the end of other nerves
basophils - a type of granulocyte that fights infection by releasing chemicals that cause fever and inflammation
brain stem - connects brain and spinal cord; includes thalamus and hypothalamus which control sleep, hunger, thirst, etc., and the medulla which controls heart rate, breathing, blood pressure and other vital functions
bronchi - tubes that branch from the windpipe (trachea), one for each lung
bronchioles - branches from the bronchi that become smaller and smaller
cecum - a pouch at the beginning of the large intestine that receives matter from the small intestines
cerebral cortex - surface of the cerebrum where most of the brain's information is stored
cerebellum - means 'little cerebrum' and is 1/8 the size of the cerebrum; controls equilibrium and muscle movement
cerebrum - the two major halves or hemispheres of the brain, divided into lobes, said to be the location of intelligence and learning
circadian rhythms - A daily rhythmic cycle, based on 24-hour intervals
cochlea - the spiral-shaped portion of the inner ear that contains the perilymph fluid that conducts vibrations
colon - consists of the ascending, transverse, and descending portions; the first half of the colon absorbs water and the second half stores the feces
condyle - the oval shaped head (the rounded process at the end of a bone) of bone that articulates in the cavity (hollow part) of another bone
corpus callosum - that part of the brain that links both hemispheres so that they work in unison
cytoplasm - the gel substance on the inside of the cell which contains all other cell structures
deoxyribonucleic acid - known as DNA, is a molecule that contains two chains, of thousands of nucleotides, made from the sugar deoxyribose (deoxyribose sugar has one less oxygen atom that the ribose sugar), that wind around each other to form a helix; DNA is found in the nucleus of the cell and contains all of the body's hereditary information
dermis - layer of skin beneath the outer layer, that gives the skin its nutrition; contains hair follicles, nerves, sweat glands, and sensory receptors
diffusion - The spontaneous mixing of the particles of two or more substances as a result of random motion.
duodenum - the first part of the small intestine that receives the processed food from