

# 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 proven or disproven 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 standpoint. 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.

This anatomy study includes a *Teaching Outline*. It is helpful to read the *Teaching Outline* to gain an insight into the material you will be presenting (Jill has done the research for you). To make this study useful to teachers of multi-aged children, it has been divided into three graded levels. The divisions are *K-3, 4-8, and 9-12*. These are only guidelines. Feel free to pull information from any of the grade levels that you wish.

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.

Another feature is *subject area* divisions following the study outlines to give you some ideas on how to incorporate *reading, vocabulary, spelling, grammar, language arts, math reinforcements, geography, history, science projects, science activities, and science experiments, art, and music*. I have noticed that many anatomy books duplicate each other in experiments and ideas. 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. Most *books* listed in the resource section are readily available. And there is also a guide to *videos, cassettes, and computer programs and Internet guide*. I have included a *materials list*

and *field trip guide*. I have also included pages you may copy containing the *scientific method* 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 *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. (It is important to remember to tie in experiments and activities to the topics you are learning.) You may want to do an experiment showing that 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

What is a unit study, and what are the advantages of teaching in such a manner? This is an often-asked question and one we will attempt to answer. For additional information, one excellent book that we recommend is Valerie Bendt's *How to Create Your Own Unit Study* which gives an in-depth explanation of how to plan a unit.

### 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 *music* 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 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 pre-schoolers. 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.

### **How do I begin planning?**

The best place to start is with a calendar, paper, pencil and the *Teaching Outline* in the study guide. 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 ones provided in each of the three grade levels, or you may utilize them as starters in creating your own outline. Use the *Teaching Outline* to familiarize yourself with the topic. 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 may prefer a Mon. - Wed. - Fri. / Tues. - Thurs. type of routine, or if you take Fridays off, your schedule might be Mon. - Wed. / Tues. - Thurs. (See scheduling on page 7.) Remember, it's up to you.

### **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 an outline for each grade level and a Teaching Outline for referencing technical material. The grade level teaching outlines are geared for each of three levels K-3, 4-8 and 9-12. They are not as extensive as the Teaching Outline in the front of the book; therefore, the numerical labels do not correspond exactly. 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.)

Once you have an approximate time span, you will want to go through the age-appropriate outlines. 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 ones 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 set up a strict calendar approach or a laid back "Let's read, discover and experiment!" 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. Don't become discouraged or feel overwhelmed. It takes one or two unit studies to become comfortable and feel like an "old pro".

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 know and don't know. 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 very 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 co-oping?**

Co-oping 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 up to you.

### **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. We have done both literature and history units with our children. (Since we've homeschooled many years, we have had time to do different units! )

We pray that this will help you with unit studies. We believe that learning should be fun for you and your children, while being educational. When it's fun and hands-on and messy, (especially messy!) the learning experience will stay with them. Try not to get bogged down and become a slave to a schedule (recipe for disaster!). While Jill was living in Washington state, a friend of hers was doing a unit on Washington state history. They traveled all over the state visiting historical sites. After a boat ride to see the Orcas migrating, they were so intrigued, they visited the Sea-aquarium and beaches, etc. Soon they realized they were no longer doing a unit on history but one on marine biology. That's they way unit studies should flow. Get ready to have a great time, and better yet, teach in a way that makes great memories that are remembered year after year after year...

## Scheduling and Planning

For those of you who would like help planning a schedule for this study, I have drawn up some thumbnail sketches to use as a basis for planning. Please use these loosely and feel free to add or delete anything you wish. Notice I have not included times. This is intentional, as there is no way I can know what will work for you and your family.

Schedule A:

Monday	Tuesday	Wednesday	Thursday	Friday
Bible/Prayer	Bible/Prayer	Bible/Prayer	Bible/Prayer	Bible/Prayer
Suggested reading	Language Arts activities	Suggested reading	Language Arts activities	Suggested reading
Vocabulary/Spelling and	Math reinforcements	Vocabulary/Spelling and	Math reinforcements	Vocabulary/Spelling and
Science activities	Geography/History	Science activities	Geography/History	Science activities
Art	Music	Art	Music	Art

Schedule B:

Monday	Tuesday	Wednesday	Thursday	Friday
Bible/Prayer	Bible/Prayer	Bible/Prayer	Bible/Prayer	Bible/Prayer
Suggested reading	Math reinforcements	Suggested reading	Math reinforcements	Suggested reading
Language Arts activities	Vocabulary/Spelling and	Language Arts activities	Vocabulary/Spelling and	Language Arts activities
Geography/History	Science activities	Geography/History	Science activities	Geography/History
Finish activities	Music	Finish activities	Art	Finish activities

Schedule C:

Monday	Tuesday	Wednesday	Thursday	Friday
Bible/Prayer	Bible/Prayer	Bible/Prayer	Bible/Prayer	Bible/Prayer
Math textbook	Math textbook	Math textbook	Math textbook	Math textbook
Reading/Phonics program	Reading/Phonics program	Reading/Phonics program	Reading/Phonics program	Reading/Phonics program
Suggested reading	Math reinforcements	Suggested reading	Math reinforcements	Suggested reading
Language Arts activities	Vocabulary/Spelling and	Language Arts activities	Vocabulary/Spelling and	Language Arts activities
Science activities	Geography/History	Science activities	Geography/History	Science activities
Music	Art	Music	Art	Music



# Teaching Outline

I.	BODY ANALOGY — 1 Cor. 12:12-27 . . . . .	10
	Price of the human body — Price paid	
II.	BLOOD - HEART - RESPIRATION . . . . .	12
	Circulatory system and respiration, blood chemistry, heart	
III.	INJURIES and HEALING . . . . .	20
	Plasma, clotting, lymph system	
IV.	SKELETAL SYSTEM and MUSCLES . . . . .	22
	Bones, Muscles, Joints	
V.	DIGESTIVE SYSTEM . . . . .	26
	Mouth, liver, kidneys, processes	
VI.	NERVOUS SYSTEM and BRAIN . . . . .	29
	Central, autonomic	
VII.	REPRODUCTIVE SYSTEM . . . . .	32
	Development, genetics	
VIII.	DNA and the ORIGINS of LIFE . . . . .	37
	Deoxyribonucleic acid, chromosomes, genes	
IX.	SENSES . . . . .	43
	Eye, ear, taste and smell, touch	
X.	LANGUAGE . . . . .	46
	Speech, art, creativity, communication	
XI.	RACES . . . . .	48
	Ham, Shem, Japheth, skin pigment	
XII.	HUMAN HISTORY . . . . .	48
	Population statistics, inventions and achievements	

## Teaching Outline

\*Note: The words in **boldface** are defined in the glossary beginning on page 163.

### 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 through *Jews for Jesus*, 60 Haight St., San Francisco, California 34102-5895.

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

# Creation Anatomy

## Grades K-3

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

**Topics to study:** The blood, parts of the body, breathing, bones, senses, healing, brain, nerves, races, human history.

### Outline

#### 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

# Vocabulary/Spelling and Grammar Ideas

## K-3

Use the vocabulary words as spelling words. Here are some activities to help you incorporate the vocabulary words into your unit study.

- ◇ Pick out some vocabulary words you would like your child to learn. Have him write them on index cards (or you write them) and have him put them in alphabetical order.
  
- ◇ Have children use the words in sentences to show the meaning. Younger children can use the words in sentences or stories. They can dictate the words to an adult or older child who can write the sentences for them. Then have them “read” their sentences.
  
- ◇ Have young children (K) pick out letters of the alphabet that they need to learn. Write the vocabulary words in large bold print on an erasable surface, or on paper. Have them circle the letter they are learning. (All the A’s, B’s, C’s, etc.) Be sure to add your own **basic** words to the list! You can also use several lines from the Scripture (1 Corinthians 12:12-27) for this lesson.
  
- ◇ Choose one or two of the children’s “best” sentences and have them recopy them using their neatest handwriting. (Give them a model to copy if they are just learning to print or write.)

Vocabulary, Spelling, and Grammar Ideas K-3

## Math Reinforcement Ideas

- ◇ Have the children organize the parts of the body (heart, brain, hand, lungs, foot, legs, teeth, mouth, fingers, eyes, ears, etc.) from smallest to largest.
- ◇ Have your child add some equations using his fingers. For example, four plus two. Have him do several different problems. Then give him a sheet of five problems. Have him time how long it takes him to add these problems, again using his fingers. Now have him memorize the answers and re-take the test, timing himself. Which is quicker?
- ◇ Estimate the number of miles of veins we have. How many zeros are in the number? Can anyone walk that far? Why not? Walk one mile. How long did it take? How long does it take by car? Compare the various times.
- ◇ How many miles of blood vessels do we have? Write down this number. How many zeros are there? What is the place value of each of the various digits?
- ◇ Have your child carefully measure his height when he first wakes up. Measure it again later in the day. Are there any changes? Why?

Math Reinforcement Ideas: K-3

# Science Activities and Experiments

## K-3

Doing science activities and experiments is lots of fun! Using the scientific method makes it easier to understand. 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. (See page 2) Once you ask the question make sure the children give you their *hypothesis* (or “guess” for the younger children). This is what they think will happen. If they have no idea, read or observe to further research the question. The children can write (or draw) their experiment using the scientific method (found on page 153). *Parental supervision necessary! Always use caution when doing any science projects or experiments. After using raw meats always wash your hands and surrounding areas with anti-bacterial soap!*

- ◇ Squeeze a tennis ball. The force needed to squeeze a tennis ball is like the force needed to squeeze blood out of the heart. Measure your child’s pulse rate (for example, sixty-six times per minute). Squeeze the tennis ball that amount of times. Can you imagine how hard your heart works in one hour? One day?
  
- ◇ Have your child make a stethoscope (many science books have directions— see *Blood and Guts* or *How the Body Works*). Have him listen to the sounds of his heart. Why does your heart make different sounds? Where does the blood go? Have him draw a picture of his

# Geography/History

## Ideas

### K-3

- ◇ Make a world map using large sheets of paper (computer paper taped together works well). Many newspaper companies sell newspaper remnant rolls for a minimal charge (\$1.00). Use pieces of yarn to outline the continents. Place a star on countries where your ancestors lived. How many generations removed are you from those ancestors? Make a family tree.
  
- ◇ Using the above map, locate and mark places where early scientists such as Andreas Vesalius (born in Belgium, worked in Italy), Robert Hooke (England), Marcello Malpighi and Camillo Golgi (Italy) Wilhelm Röntgen (Germany), René Descartes (France), William Beaumont and Ernest Starling (United States), Karl Landsteirner (Austria) , Herman von Helmholtz (Germany), and Antony van Leeuwenhoek (Netherlands) lived. (Scientists found in *How the Body Works*)
  
- ◇ Study and read about the different scientists and doctors that made major discoveries. Talk about their contributions. You can do a mini-play; pretend you are the scientist telling another person about a great discovery. Perhaps you are the first person the scientist told about his discovery. Tell how he acted, and whether he was excited. Do this with several people.
  
- ◇ How did early discoveries and books, such as *The Fabric of the Human*

# Art/Music

## K-3

### Art

- ◇ Draw a life-size picture of yourself. Put in all of your facial features, hair and skin coloring and favorite outfit. Don't forget your ears or eyebrows! (You may also want to draw another outline with your inside parts labeled.)
  
- ◇ Make different molds of your hands, fingers, feet, (or anything else you wish!). **Recipe for clay dough:** four cups of flour, one cup of salt, one and one half cups of water. Add more flour if it's too sticky. Knead six minutes. Shape, then bake at 325°-350° until slightly brown.
  
- ◇ Make a 3-D model of your teeth. Dry your teeth with a paper towel. Use plasticine clay. Shape a thick piece of clay to fit your mouth. Bite into the clay and press it up against your teeth to make a good impression. Carefully pull it away. (If the clay breaks apart, do it again with another piece that is thicker.) Do both the upper and lower jaws. Tape a strip of paper (poster) around the edge of the mold. Now mix 3/4 of a cup of Plaster of Paris and enough water to make a creamy liquid. Pour into the mold and tap it lightly to make sure the plaster went down into the grooves. When the plaster is dry, (at least two to three hours more time if it is a humid day in Florida!) carefully remove the clay. Write your name and date on this.

# Creation Anatomy

## Grades 4-8

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

**Topics to Study:** The circulatory system, skeletal system, digestive system, nervous system, reproductive system, DNA, senses, brain, language, races, human history.

### Outline

#### 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

Creation Anatomy Outline: 4-8

- 2. White Blood Cells

# Spelling/ Vocabulary and Grammar Ideas

## 4-8

Use vocabulary and spelling words interchangeably in the following activities. Choose the words you want your child to learn to spell.

- ◇ Use the words in sentences showing their meaning. Use the sentences the child has written to study the parts of speech. Continue the list below with any of the parts of speech you are currently studying. For example:

Underline a noun once

Underline a verb twice

Put a squiggly line under an adjective

Put two squiggly lines under an adverb

Put a box around a preposition

Circle a pronoun with a "P" above it

Highlight direct and indirect objects

Put parenthesis around prepositional phrases and arrows to what they modify.

- ◇ Use colored pencils or markers for the grammar activity, assigning a color to each of the parts of speech.

Spelling, Vocabulary, and Grammar Ideas: 4-8

# Language Arts Ideas

## 4-8

- ◇ Use the Scripture 1 Cor. 12:12-27 as a basis for an oral presentation on the human body and the way its systems are interdependent.
- ◇ Begin an open-ended story and take turns adding to the story orally in a group. (This is especially fun with a group of different-aged children). For example: “It had always been my dream to be on a space mission, but never did I imagine the “space” in which I would travel. As I checked the instrument panel which contained a computer display, I still couldn’t believe I had actually been chosen from thousands of students. There were two students and six adults on board; my job was to monitor the computer screen which, for the moment, was showing a myriad of signals I had never before seen. It worked automatically, taking pictures as our space ship hurtled through the blood stream of a human body!” (This can also be used as a written assignment.) Variation: Concentrate on parts of the body you are studying: lungs, heart, etc. Change mission of the trip or characterization.
- ◇ Use a paragraph from one of the books you are reading on anatomy to give dictation. Check for proper spelling and punctuation.
- ◇ Research the difference between M.D. (Medical Doctor) and D.O. (Doctor Osteopath). In what ways are they similar? In what major

## Math Reinforcement Ideas

### 4-8

- ◇ What are some mathematical facts relating the “price” of the contents of our body? What do scientists say the mineral content is worth? What about the molecular content? Write word problems based on your findings. (See Teaching Outline.)
  
- ◇ What is your reaction time? (The time it takes for your brain to process instructions relating to an action your body must perform.) Do this activity with a friend. How quickly can you catch a ruler (or any object) another person drops in front of you? The faster you react, the less time the ruler has to fall. Where will your hand be on the ruler? At the top, in the middle, or at the lower end? Record your findings in centimeters: the top of the ruler (30 cm.), the middle (15 cm.), or the end (1 cm.). Can this reaction time improve with practice? Do this ten times and chart and graph your results. Convert your findings to mm.
  
- ◇ How many times do you breathe in and out in one day? An average adult inhales then exhales about .5L (about 1 pint) of air per breath and has a respiration rate of about 12-20 breaths per minute. Figure out how much air is breathed in one day. (Answer: 500 ft<sup>3</sup> and 14,000,000 ft<sup>3</sup> of air in a lifetime! *You and Your Body* ) Count the number of times you breathe in and out in thirty seconds, multiply the amount by two. How many breaths do you take in one day? Why don't all the people and animals in the world use up the oxygen? (Research

# Science Activities and Experiments

## 4-8

A good understanding of the scientific method is a must at this grade level. (Felice's personal bias!) For an overview of the scientific method see page 2. Remember to formulate your question and hypothesis before you begin the experiment. At this age give the children flexibility to experiment. If they have an idea of something they want to try, give them the time to do it. It is helpful if they write out their procedures using the scientific method sheets (page 157). In the event that they discover something amazing, they will be able to duplicate the experiment. *Always use caution when doing any science projects and experiments. Parental supervision necessary! Remember: Whenever using raw meat wash hands and the surrounding areas with anti-bacterial soap!*

- ◇ What process does oxygen go through after it is inhaled and passes through the cells, organs, and is carried to the lungs and exhaled? (See Teaching Outline.)
  
- ◇ Compare the blood, as it is necessary for our life, and how Christ saved us by His Blood. Use the *Bible* to back up your claim.
  
- ◇ Make up body "trivia cards". Use the teaching outline for information and other resources. Ask questions such as, "How many round trips does a blood cell make through the circulatory system?"

Science Activities and Experiments: 4-8

## Geography and History Ideas 4-8

- ◇ Study early scientists. Choose one scientist and learn as much as possible about him. What drove him to find a cure (make a discovery etc.)? Pretend you are his apprentice. What did you find or discover? What was it like living in the \_\_\_\_ century? What was the favorite food, activity, or musician of the day?
- ◇ Study some early remedies in medicine. What were some that actually worked? Which remedies were dangerous to the health of the person? What were the practices of quarantine? How did the practices change through the centuries?
- ◇ Map out the places where scientists who made discoveries in the field of anatomy lived (see teaching outline). Where was the most concentrated number of scientists found? Why?
- ◇ What obstacles did early scientists encounter? Were people willing to believe all of their claims? Why or why not? How were some of these scientists paid to continue their research?
- ◇ How were the bodies of ancient Egyptian mummies prepared for burial? Why did this treatment preserve the skin? Would the body have lasted as long if it had not been treated? Why? Did other cultures practice this way of body preservation? Why did the Egyptians do this?

# 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

## Language Arts Ideas 9-12

- ◇ Use 1 Cor. 12:12-27 as a basis for an oral presentation of the human body and the way it works and its relation to believers as the Body of Christ.
- ◇ Research different scientists. Pick a scientist of interest. Write a biographical sketch of this person's life. What type of education was necessary for his degree? How many years of school, etc.? What was sacrificed (family, time, religion) in the quest for knowledge? Were the sacrifices worth it in your estimation? In God's? (Do the same activity as an autobiography. Another variation is to add fictionalized accounts or write as if you lived in the future.)
- ◇ Use a first aid book and learn the basics of first aid. Write a small pamphlet and illustrate it showing different treatments you can use in case of emergency.
- ◇ Research hypothermia. What are ways to prevent it in case of emergency? Focus on survival skills for cold climates, and on water temperatures. Should you ever stay in one place until help comes?
- ◇ Using a paragraph from a book you are reading for dictation, check for proper spelling, punctuation, and form.

## Math Reinforcement Ideas

### 9-12

- ◇ Learn about the metric system. Why is this used in scientific experimentation?
- ◇ Make a chart of metric equivalents, using linear measurements such as inches, feet, yards, and miles converted to centimeters, meters, and kilometers. Also convert liquid measurements: ounces to grams and quarts to liters and milliliters.
- ◇ What is the difference between a word equation and a symbol equation? How are these used in scientific experimentation?
- ◇ How long does it take food to travel through the digestive system? Include the time it takes to chew, swallow, time in the stomach, small intestines and large intestines. Why is this knowledge important for medical tests and surgeries?
- ◇ What is the value of the human body in relation to its elements? What is the value of its molecular compounds? What is the value of human life in relation to the *Bible*? How do these compare? Draw an analogy.
- ◇ Make a chart of your pulse taken several times a day for a week. Make sure you measure your pulse before getting out of bed, after a

# Science Activities and Experiments

## 9-12

*Remember to wash your hands and surrounding area thoroughly with anti-bacterial soap after dissecting or handling raw meat! See page 2 for scientific method information and page 157 for scientific method copy sheets.*

- ◇ Take a glass of water and add several teaspoons of salt to it. What happens? (This is an example of a decomposition reaction. The water molecules break the bonding of the salt crystals into sodium and chlorine ions.) Continue to add salt, a teaspoon at a time, until no more salt will dissolve. Keep track of how many teaspoons you have added. Now heat the solution. Can you add more salt? Record how much salt you added in all. Let the water evaporate and observe. Why did this happen?
  
- ◇ Study atomic bonding which forms molecules. For example, ionic bonding in salt: salt is made up of sodium and chlorine (NaCl). A sodium (Na) atom will readily give up an electron, forming a sodium ion with a positive charge. A chlorine atom (Cl) will readily receive an extra electron and form a negatively charged ion. When these two ions combine they form a molecule with an ionic bond. (Find more information in the *Usborne Dictionary of Science*.)
  
- ◇ Study covalent bonding. For example, two ions share an electron(s) which orbit both nuclei. (Find more information in the *Usborne Dictionary of Science*.)
  
- ◇ Compare carbon atoms in coal and diamonds. Diamonds are much

## Geography and History Ideas 9-12

- ◇ Study the history of anatomy. Note the different beliefs through the ages. When did scientists' beliefs begin to change? What was happening in the world? How did the scientific beliefs change the thinking at the time? Compare the Seventeenth through Twentieth centuries.
- ◇ Compare the early findings about the origins of the universe through the centuries. Use a chart and list the changes in belief as they began to be stated publicly. What was happening in history during this time?
- ◇ What is a "one world government"? Is this a good thing? When is it a problem? Study what is happening in the European countries in relation to currency. Discuss your opinion.
- ◇ Research the population explosion myth. Why does this seem to be taken as a fact in the media? What do the World Conferences, such as the (1995) Beijing Conference, have as their agenda? What other World Conferences have taken place recently? What U.S. state could hold all of the population in the world, and how much space would each person have? (The entire population of the world would fit into the state of Texas allowing 1000-1200 square feet for each individual.)

Geography/History Ideas: 9-12

# Pulse Rates and exercise

**Name:** \_\_\_\_\_

Take your pulse rates at rest and after doing exercises of your choice. Measure your pulse for 30 seconds and multiply by two to get your pulse rate for one minute. Record the amounts for one week. Do this with other people in the family. Try to do this for several weeks. Does your pulse go down as you get used to exercising?

<b>Type of Exercise and Number Done:</b>	<b>Pulse Rate at Rest and After doing:</b> Exercise:	<b>Pulse Rate at Rest and After doing:</b> Exercise:	<b>Pulse Rate at Rest and After doing:</b> Exercise:	<b>Pulse Rate at Rest and After doing:</b> Exercise:	<b>Pulse Rate at Rest and After doing:</b> Exercise:
<b>Monday</b>					
<b>Tuesday</b>					
<b>Wednesday</b>					
<b>Thursday</b>					
<b>Friday</b>					
<b>Saturday</b>					

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This book is dedicated to  
our children, the miracles in our lives:  
Neal, Christina, and Nicholas Gerwitz  
Jacob, Jonathan and Jesse Whitlock

“The body is a unit, though it is made up of many parts; and though all its parts are many, they form one body. So it is with Christ. For we are all baptized by one Spirit into one body...”

1 Corinthians 12:12

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## Introduction To Creation Anatomy

The human body is the most amazing handiwork in all of God's creation. The amazing flexibility of the structure that is totally self-contained and self-propelled is remarkable. To think that anything as complicated as the human body could have evolved by random chance processes requires more faith than our belief in Creation. Even Darwin said on his death bed, "To think that something as complicated as the human eye could have evolved is absurd in the highest degree." As you study each fascinating system in the body, with its precisely designed functions, you will be amazed and will truly appreciate how you were created. Not only is each system special, but they are all interrelated and interdependent. Just as God stated, when He compared the Body of Christ to the human body, every function is unique but each is dependent on all the others.

"The body is a unit, though it is made up of many parts; and though all its parts are many, they form one body. So it is with Christ. For we were all baptized by one Spirit into one body - whether Jews or Greeks, slave or free - and we were all given the one Spirit to drink.

"Now the body is not made up of one part but of many. If the foot should say, 'Because I am not a hand, I do not belong to the body.' And if the ear should say, 'Because I am not an eye, I do not belong to the body,' it would not for that reason cease to be part of the body. If the whole body were an eye, where would the sense of hearing be? If the whole body were an ear, where would the sense of smell be? *But in fact God has arranged the parts in the body, every one of them, just as He wanted them to be.* If they were all one part, where would the body be? As it is, there are many parts, but one body.

"The eye cannot say to the hand, 'I don't need you!' And the head cannot say to the feet, 'I don't need you!' On the contrary, those parts of the body that seem to be weaker are indispensable, and the parts that we think are less honorable we treat with special honor. And the parts that are unpresentable are treated with special modesty, while our presentable parts need no special treatment. But God has combined the members of the body and has given greater honor to the parts that lacked it, so that there should be no division in the body, but that its parts should have equal concern for each other. If one part suffers, every part suffers with it; if one part is honored, every part rejoices with it.

*"Now you are the body of Christ, and each one of you is a part of it."* (1 Corinthians 12:12-27) [author's emphasis]

God gives considerable importance to the body and to the Body of Christ. Christ gave His Body and His Blood for us. In this unit we will learn the importance of each body part and its significance. I hope you enjoy doing this unit as much as I enjoyed researching it!

Jill Whitlock