

An incredible journey into Biology, Chemistry and Physics that powerfully shows the beauty, power, intelligence and the love of the God who created all things.

SCROSSWIRED

Quick Start Info: CrossWired CORE Curriculum

Welcome to Standard CrossWired Science Core 1! We are happy to take you on a thrilling journey to learn about God's handiwork as we study God's Creation together. Our prayer is that you will come to know the power, love intelligence and beauty of the Lord more than you ever thought possible through the things you learn in this course!

PLEASE READ THIS BEFORE BEGINNING.

1. Be sure to be logged in when you are using the downloadable Student Modules. The printable Student Modules will help you schedule and navigate every lesson of the year. (The online calendars on the website are for those using CWS to supplement only). These printable Student Modules are the **ONLY way** to effectively access the online lessons and videos. **All blue print is hyperlinked.**

2. There are 24 Modules CrossWired Science Core Student Modules: They may be printed all at once or module by module.

- Fluid Dynamics/Electricity Global Topics 12 MODULES
- Sound/Acids & Bases Global Topics 12 MODULES
- Mighty Feathers Major Topic EXTRA CREDIT (This is a bonus section on Birds)

3. Integrating BCP with our younger program, CrossWired Science Core.

- CrossWired Science Core: K-8th grades
- The Early Learner/Beginner Guide: 4-8 years old. Gives suggestions for adapting for younger students.
- Biology/Chemistry/Physics (BCP) 101/102: High School: These are our courses for higher level students with 24 Modules each to complete for full High School credit.
- Modules in BCP 101 & 102 correspond to the Module Lessons in the CWS Core 1 Curriculum (see comparison charts below)
- Some lessons each week overlap for all of children, kindergarten through High School, including: Experiments/Video Links/Core Videos/Specific Videos/Gold Digs/Memory Verses/Devotions/Concept Drawings/ and Scientists (K-8th grade). Each age has its own level of work in each of these content areas.
- The graphs below include both Student Notebook Printables 2.0 for Year 1 and BCP Modules.

CWS STANDARD Curriculum (K-8th) Lesson	Bio/Chem/Physics 101 (High School) Module				
Fluid Dynamics/ Electricity 1-5	1				
6-10	2				
11-15	3				
16-20	4				
21-25	5				
26-30	6				
31-35	7				
36-40	8				
41-45	9				
46-50	10				
51-55	11				
56-60	12				

CWS STANDARD Curriculum (K-8th) Lesson	Bio/Chem/Physics 102 (High School) Module				
Sound/Acids & Bases. 1-5	13				
6-10	14				
11-15	15				
16-20	16				
21-25	17				
26-30	18				
31-35	19				
36-40	20				
41-45	21				
46-50	22				
51-55	23				
56-60	24				

SCROSSWIRED Quick Start Info (cont.)

4. You do not need to print the Student Notebooks. You can save money and use them electronically and simply use a regular notebook to record your student's work. You can also use an editing tool to type in these electronically. If you print them, we highly recommend the **EPSON ECOTANK COLOR PRINTER 3760 SE** (Costco/Sam's club). Printing costs to print the first 12 modules for CWS in color is about \$5 TOTAL. This printer is a homeschooler's dream come true. The ink lasts forever and refills are VERY inexpensive.

5. Getting Started:. To access, go to "*My Curriculum*" in the top menu. Click *CORE 1.* Download the Student Module to access the lessons. Open the PDF and click on any blue, hyper-linked text to access the lesson. Print a copy and record student work on printed copy and store in a binder.

6. Hyperlinked General Links and Unit Links. "General Links 1", "General Links 2" and "Unit Links" are not accessible by clicking (hyperlinked), unless you are in the Parent or Admin Account. (If parents are logged on in in their user, you can see General Links and Unit Links when you click on the Parent Tab in the top menu. These General and Unit Links are immediately accessed when an image is clicked. To get to the links in the student user, you must copy and paste the Link in the URL bar at the top of every link. We realize this is inconvenient. We do this to add a tiny amount of internet protection.

7. Interestables and Clipped Sentences. We will often ask students to find "Interestables". These are interesting–even fascinating– facts and concepts. We want Note Taking about them to be as easy and pleasant as possible. To make this so, we say it is fine to do 3 rather than our suggested 5 notes. You decide as a parent or a teacher what you want your students to do. Younger children may even draw a picture, instead of doing interestables. We encourage using "Clipped Sentences" for note taking, which are shortened notes like those taken in a college class. An example of a clipped sentence for, "The iris is the colored part of the eye. It grows and shrinks to let different amounts of light into your eye." Clipped: "Iris colored. Grows shrinks. Adjusts light."

8. Review is an essential component to a CrossWired approach. Review is VERY important for detailed long-term memory! *You will see materials brought back to your children at regular intervals.*

9. Every Friday is Reading Day. There are suggested reading plans in the reading section. If you want our recommended *Christian Heroes Then & Now* books (which are excellent for family read-alouds and student reading of all ages), we offer them from YWAM with Free shipping and for \$10 under Amazon. Find them under the menu selection <u>"SHOP"</u>.

10. We recommend 1-2 weekly "Power-hours" with your children. This is a special time when you spend 15, 30, 45 or 60 minutes with your children and go over the CWS material and learn alongside your children. This is fun for everyone and is especially effective for your younger children.

11. Go at your OWN pace! We encourage you to choose what sections fit your child's needs and spread out the lessons over as much time as needed. The goal is to create a LOVE for learning about God's handiwork, NOT to create head-smart but heart-ignorant young people. !

12. Stay Connected - Join our <u>CrossWired Science Community Facebook Group</u> and join our email list at <u>contact@crosswiredscience.com</u>. Log in and Registration questions? Use the same email.

CrossWired Science Core Mod 1: Lesson 1

1. FD: Core Video 1 (20 minutes)

Watch this Core Video twice. Write down 5 interesting concepts about the video. Use back if necessary. (Younger students may write down 3 or draw a picture of something fascinating.) Don't take the quiz.



Fluid Dynamics and Bernoulli

2. Verse Explanation (5 minutes)

Explain what the verse below means and apply it to your life in some way.

Romans 1:20



3. Specific Videos (15-30 minutes)

Watch the video links below. Choose older or younger. Write 3 interestables (interesting concepts) or draw two pictures or make a mind map of each one. Google "Science mind maps" for examples or see MIND MAPS. You do not need pictures unless you want. Younger: Check Out the Great Barrier Reef! SSK 7m WILD Stingray Catch! BW 13m Older: SED 7m Squirrel Maze 1.0- Ninja Warrior MR 21 m Cat Flip (Learn how astonishing God has made the abilities of the marble-sized brain squirrel.) Younger: The Sweet Secret of Frogsicles! SSK 5m Leopard vs. Warthog! BW 11m Older: Chameleons Change Color Ver 6m "Great is our Lord ... His understanding is infinite. **Psalms 147:5** God effortlessly made all His insects perfectly. He created the DNA sequences to build dragonfly wings with just the right materials in just the right places. Trust the beauty and love of God to use His infinite wisdom and intelligence to put all the right pieces

together in all the just-right ways to make your life a masterpiece of His working. He knows how to create praise in you. (Isaiah 57:19) He is able to amazingly do this through the daily situations of your life. Remember Joseph.





Gold Dig1: Bones

First Timers-Older students:

- Read First Timers Gold Digs for 4 sections.
- Write 3 exciting facts or draw & label 2 pictures of the most interesting concepts found in the 4 letters for this Gold Dig in the boxes below.

DO NOT DO THE TEST YET.

An alternative to doing Gold Dig lessons is to watch "Absolute Genius" Videos found in Fluid Dynamics <u>General Links</u>. These are only accessed by copy/ pasting the given URL

For clickable access Be logged into Parent User and use this link:<u>General Links 1 Hyperlinks</u>.

Younger Students: Write 2 interestables &/or draw 2 pictures of this reading.

Title:

1.	FD:	Core	Video	2	(15 minutes)
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Watch this Fluid Dynamics Core Video twice. Draw a picture about a fun fact, or write down a few interesting facts about the video. (Be sure to be logged in to watch the video!) Don't take the quiz.



Wrights and Foils

2. Devotion: (10+ minutes)

Teen Devotion: <u>A Backpacking Trip</u> Science Devotion: <u>Hearing Plants</u> Bible Devotion: <u>A Hike To What We Never Want To Have</u>

Read the devotion in Teen Devotions link above. Write the main take home point and 2 personal applications below. Next Pick either the Science or the Bible Bible and do the same . Use the back for more room. For younger children, we suggest using the book "Indescribable" or "How Great Thou Art" by Louie Giglio.

3. Dragonfly, Cicada Wing Concept Drawing (15+ minutes)

Training the eyes to see!



The transparent wings of a dragonfly and a cicada are both made of chitin, a modified form of sugar!

Sugar-hi-tech wings, an astonishing wonder constructed by God's masterminded DNA! The wing veins are designed for great stresses and exceedingly complex aerodynamics.



God adds beauty even to insect wings!

Draw a Dragonfly and Cicada Wing! <u>The Secret Of Backward Flight</u> and <u>Dragonfly Design</u> The dragonfly is considered to be the lion of the insect world, one of the most agile flyers on earth. Zipping along at 40 miles-per hour, these aerodynamic wonders can fly forward or backward or up and down like a helicopter. They can even fly backwards! Notice that the wing isn't shaped with a foil (wing bump) like planes and birds have. Lift is achieved by changing wing angles. Look at the changing sizes and the amazing spacing of the "cells" created by the ribbing in the wings. Look at the curves in the secondary ribbing.</u> God created a masterpiece with light-weight strength in all the right places.

For the insect buff: There are two basic aerodynamic models of insect flight. Most insects use a method that creates a spiralling leading edge vortex.^{[20][21]} Some very small insects use the fling and clap or Weis-Fogh mechanism in which the wings clap together above the insect's body and then fling apart. As they fling open, the air gets sucked in and creates a vortex over each wing. This bound vortex then moves across the wing and, in the clap, acts as the starting vortex for the other wing. Circulation and lift are increased, at the price of wear and tear on the wings. Many insects can hover by beating their wings rapidly, requiring sideways stabilization as well as lift.^[22]A few insects use gliding flight, without the use of thrust. It is found in some species of arboreal ants, known as gliding ants. ^{Wiki}



5b. Craft and Fun Supplements



Lesson 2 Page 4

Never underestimate the immense value of giving motivation though fun and fellowship. The academic value can be beyond belief. A LIFE-LONG love for learning can arise.



Coloring Pages Dragonfly Color pages Chameleon Color Pages Sea Turtles Color Pages Butterfly Color Pages Dragonfly Color-by-Number

Sea Turtle Craft

Possible Subject Areas:

Fluid Dynamics Definition Daniel Bernoulli Dragonfly Wright Brothers Foils Carburetors Venturis Feathers & Birds Bones Sea Turtles Sharks Birds landing Cat Squirrel Chameleon Planes Hydrofoil Boats Cicadas Birds and Insects Flying Patterns Butterfly

Cicada - Sugar Wings Cupcakes



Shark Sun Catcher



SIMPLE KIDS CRAFT SHARK PORTHOLE SUN CATCHER CRAFT

Watch this Fluid Dynamics Core Video twice. Draw a picture about a fun fact, or write down a few interesting facts about the video. (Be sure to be logged in to watch the video!) Don't take the quiz.	
Feathers & Carb Venturis	
2. Verse Memory (10 minutes) Write or illustrate the verse & memorize.	
Romans 1:20	

1. FD: Core Video 3 (15+ minutes)

Lesson 3 Page1

3. Aerodynamics & Bernoulli Experiment Block (3+ Hours in 3

NOTE: This is the official Connected Experiment Block of CWS. All levels of CrossWired Science do this experiment block this week. You may do any experiment in our <u>FD Experiment/Activity List</u> instead.

Your Experiment Block for the next 3 weeks is Aerodynamics and Bernoulli's Principle Experiments. This is a challenging experiment block because there is so much to choose from! Don't forget to take a stab at the paper airplane innovations. You may also chose to do some of the activities list on the Fluid Dynamics Experiment Plan Page.

PROCEDURE:

•Do one to ten of the following experiments. They vary greatly in difficulty. Pick what intrigues you!

•Use the links below to access them.

•Take 1-3 Pictures of your experiments & tape them in the boxes below or tape them on the back of this sheet.

•Be sure to build the **\$**paper rocket from the video below . If you get the aerodynamics right, you will be astonished. It flies the length of a football field!

NOTES:

The wind bag can be purchased from the web location listed in the experiment. You may substitute other experiments if you desire.

BERNOULLI'S PRINCIPLE EXPERIMENTS

Ball, TP & Blowers Wind Bag and Paper Bernoulli's Exps

MORE SOPHISTICATED EXPERIMENTS <u>Plane Wing</u> <u>Helicopter</u>

Home-made Helicopter Multi-stage Rocket

PAPER AIRPLANE EXPERIMENTS

Paper airplanes can teach many powerful lessons about flight. Watch first this simple video on Crosswired <u>Science</u> Paper Airplane Basics & begin to work with the aerodynamics of paper airplane flight.

The first one on the paper rocket is like the CrossWired Science Paper Airplane Basics (very simple) BUT once you get its aerodynamic design done right - it works incredibly!

CWS:World's Best Paper Plane & Rocket Paper Airplane Trick Shots Amazing! World Record Paper Airplane Fold Five Incredible Paper Airplanes

The Concord's Delta Wings



Lesson 3 Mods 1-3

3. Aerodynamics & Bernoulli's Principle Experiments

List your findings below for your Aerodynamics and Pressure experiments.. List your favorite experiments that you did from the dozens listed on the Journal pages including <u>Bernoulli's Bonus Experiments</u>. Describe them and write your results and tape on pictures. Use the back of this page if you need to. You may also us the next colored page to list your findings. The next page is a template you can use for any experiment. So is the template for experiments seen in Day 18 -the Bird Bone Experiment.

3. Flight Patterns Hunt 3 Months

Lesson 3 Mods 1-12

The purpose of this experiment block is to get you thinking more deeply about aerodynamics and to apply your knowledge to living things. You have the next 3 months to find 20 flying creatures with different flying patterns and analyze the aerodynamics involved in each. You may include flying mammals, and insects and birds. The analysis of their flights may be researched or hypothesized. You must see each one personally. We've listed 6. Write in your analysis of these two and do likewise for your remaining flight patterns. (Put the remaining 5 on the back)



Daniel Bernoulli Info

EXTRA CREDIT

Research the life of Daniel Bernoulli. Record your findings here. Here are a couple of great places to help start your search. Famous Scientists: Daniel Bernoulli Famous People: Daniel Bernoulli



Bernoulli's Principle Research





Bernoulli's principle has a surprising amount of application in our lives. We'll look some of these applications here.

Facts About Bernoulli's Principle

List 10 interesting facts about the Bernoulli's Principle and its applications from these Experiment Journal pages – **Bernoulli's Bonus Experiments** – or from other sources such as the videos mentioned in the Journal pages.

Visit this webpage from NASA for ideas! NASA and Bernoulli's Principle

1	•
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2.

3.

4.

5.

6.

7.

8.

9.

10.

Experiment Findings For:

List your experiments and what you discovered. Include pictures on the back.



1. FD:General Links 1-Lesson #1 (45-60 minutes)

Today is a"General Links 1" Lesson where YOU pick what Links to watch.

PARENTS: Watch this **VERY IMPORTANT** video which explains <u>How To Do Links</u>. Click the button "Quick Looks" in the upper right hand corner of the page. **Record your Link Views.** Every link has a number. Record the date viewed in small print in the appropriate box in the Viewing Record sheets below. This is explained in <u>How To Do Links</u>.

IMPORTANT: The General Links 1 link above is not to activated links. In the student user, Links can only be accessed by copying the URL. For clickable links you must be logged into the Parent User and access the links from the Parent/Teacher tab. Watch 45-60 minutes of Links you chose from this group.

Watch 45-60 minutes of Links you chose from this group. Write 2 great facts from 3 of your favorite Links.

Link 1:		
	Link 2:	
Link 3:		



General Links 1 View Record Sheet



Choose 30-45 min of links. Log in to parent/Teacher account for **<u>HYPERLINKS</u>**. Record the date watched.

D:

1a.	1b.	7a.	7b.	13a	13b.
2a.	2b.	8a.	8b.	14a	14b.
3a.	3b.	9a.	9b.	15a	15b.
4a.	4b.	10a	10b.	16a	16b.
5a.	5b.	11a	11b.	17a	17b.
6a.	6b.	12a	12b.	18a	18b.

Level 2

1a.	1b.	7a.	7b.	13a	13b.
2a.	2b.	8a.	8b.	14a	14b.
3a.	3b.	9a.	9b.	15a	15b.
4a.	4b.	10a	10b.	16a	16b.
5a.	5b.	11a	11b.	17a	17b.
6a.	6b.	12a	12b.	18a	18b.

Level 3

1a.	1b.	7a.	7b.	13a	13b.	
2a.	2b.	8a.	8b.	14a	14b.	
3a.	3b.	9a.	9b.	15a	15b.	
4a.	4b.	10a	10b.	16a	16b.	
5a.	5b.	11a	11b.	17a	17b	
6a.	6b.	12a	12b.	18a	18b	

1. Read a Book (30-60 minutes)

Lesson 5 Page 1



Read a book or a magazine for one hour. Choose a way to record something about your reading. Reading aloud as a family is great!

- Short essay
- Key words
- Mind map or drawing, etc.

CWS SUGGESTION: Heroes of History: **GEORGE WASHINGTON CARVER. By J. Benge p.1-35.** NOTE: We offer these five great books at \$10 under Amazon with free shipping from YWAM. See <u>PURCHASE BOOKS</u>. Buy "Science Bundle"

Title:

Pages read

"Walk in love" –Ephesians 5:2

God shows His love through the beauty of birds like the toucan.

He also shows the beauty of His love through the beauty of His love moving in your heart to bring specific thoughtful blessings to others. Part of "walking in love" each day involves kind encouragements and blessings God wants you to give others.

To "walk in love" also means if someone is being selfish or crabby, to do your best to forgive and love. When you do this, God understands your efforts to be a peacemaker.. He will help you.

Quotes: (10 minutes) Write this quote and one other quote from this scientist on the back.



"Ninety-nine percent of the failures come from people who have the habit of making excuses."

George Washington Carver

2a. CWS Devotionals: Read the devotional. Follow directions at the end.

The Most Astonishing Feet on Earth! pg.1



God hides wonders in the craziest places. One of them is tucked on the bottom of Gecko feet.

Geckos were a mystery for many years. They can cling to almost any surface in the wildest way. You can put one on a piece of glass then turn the glass upside down. The gecko can walk around on it easily. While still upside down, you can pry three of his feet off the glass and he can still hold on with one foot. What's really strange is it isn't using any way that anyone could think of to do it.

Geckos can be quite cute little guys!

The more scientists explored the gecko's abilities the more they were astonished. No one on earth knew how a tiny gecko could hold on to things the way it does. When

they discovered what was happening, everyone was shocked.

Gecko feet are probably the most sophisticated feet on earth. They have tiny hairs on the bottom of their feet called setae. They are so small that you cannot see them without a powerful microscope. The hairs look like little Christmas trees with long trunks. The ends of the "branches" look like little spatulas. There are between 400 and 1000 "branches" of the setae hairs which all end in these incredibly tiny spatulas. There are about 250 *million* spatulas per foot. That's one billion "spatulas per gecko!

When a gecko foot sticks to something, it isn't from anything sticky on the bottom surface of their feet. Some thought that they held on by suction like how a rubber-tipped children's arrow sticks to a door. But

There are 1 billion "spatulas" on the gecko's four feet!

they tested the gecko foot in a vacuum and it still worked. To their astonishment, they learned that the gecko is using molecular forces to stick to things. These tiny spatulas, a billion for a for example, the atoms of a mirror



There are over 1500 different kinds of geckos. Some have the setae feet and some don't.

These tiny spatulas, a billion for all four feet, get close enough to, for example, the atoms of a mirror it wants to climb. When the spatulas get close enough to the surface, the van-der-Walls molecular forces of the spatulas attract the van-der-Walls forces of the mirror's glass. The spatulas are just the right size to get close enough to irregular surfaces like those of glass and can stick by using atomic forces. What a shocker this was to scientists.

When you learn about things like this, it's important to remember how they came about. A code that God designed built the gecko from atoms in the food that its mother ate and atoms that it ate.

The code built the gecko and everything in its tiny amazing body atom-by-atom! This means a whole lot to us as Christians.



The setae hairs are in these folds on the bottom of their toes.

The Most Astonishing Feet on Earth! pg.2

God shows us through the living things He created that He is intelligent beyond anything that we can comprehend. By creating larger things like the earth, the moon, the sun and the 100 billion galaxies of the universe He shows us that He has power beyond anything we can imagine.

God will never forget anything that concerns us. He is also completely aware of our desires and the sighings of our hearts when something we have hoped for hasn't happened. But through

the marvels of living things and the majesty of larger things God is whispering and shouting to us that we can trust Him. He WILL act in excellent ways when the time is exactly right.



Do you have some desires and sighings you need to trust the Lord with? Do it now in a quiet place. Write down your prayers and leave them with Him. He will not disappoint you; *you will not be put to shame!*

"Lord, all my desire is before You, and my sighing is not hidden from You." Psalms 38:9

God is aware of our desires and He knows our sighings when we are waiting. He will give what is good at the best possible time. No good thing does He withhold from those who walk uprightly (Psalms 84:11, I Timothy 6:17)

"You have taken account of my wanderings; You have put my tears in Your bottle. Are they not in Your book?" Psalms 56:8

God knows our hurts and does not forget them.

"No one who hopes in You will ever be put to shame..." Psalms 25:3

"There is nothing good the human heart has yearned for that will not be granted or a great deal more."–Oswald Chambers

Hope in God alone; He will not disappoint you. People may; God won't.



Write what this devotional means in your own words and add a couple personal applications on the back–either needs you have or answers God gave you.

2b. CWS Devotionals: Read the article and follow the directions at the bottom.

The Subway and God

There is a slot canyon in Zion National Park called "The Subway." Physical wonders like the Subway are all remnants of the flood and other natural processes. But, the Bible tells us that God somehow orchestrated the wonders in the earth we have today. We see this through the verse in Psalms 104:8, *"The mountains rose and the valleys sank to the levels You decreed."*

Creation geologists believe this verse is speaking of God overseeing the making of the world's topography. The earth's surface of Noah's time was destroyed by the Flood but God was involved in re-shaping the earth. The placements, shapes and heights and depths of the mountains and the



The Subway is part of a 5 hour hike that requires some repelling.

valleys of the world were all moved into place according to His plan. The amazingly beautiful Subway Canyon is here because God wanted it to be here.



I've been awed beyond belief at what I've learned In Biology. This has caused me to not argue a whole lot with God; If God says He somehow decreed the exact height of mountains and depth of valleys, I know that He's also claiming that He is responsible for the wonders we see now in the physical Earth. I don't dispute it; I say, "Thank you!" for the beauty I see.

Because of the beauty of the earth, we can greatly look forward to heaven because God will be there and it will be a place that is astonishingly wonderful in every way!

Write what this devotional means in your own words and add a couple personal applications here and on the back–either needs you have or answers God gave you.

U-Choose & Field Trips (30-60+ minutes)



This is a Science-Free-For-All Lesson!

The <u>U-Choose</u> lesson contains truckloads of great ideas. Summarize the projects or <u>Field Trips</u> you choose here. Be sure to add a picture or two (or a dozen).

Go For Whatever U-Want! Field Trips included!



EXTRA CREDIT

Page 5

Lesson 5

Title