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Anatomy…from the Greek word anatome,"dissection", is a branch of natural science dealing with the structural organization of living things. As one of the basic life sciences, anatomy is closely related to medicine and to other branches of biology. This site is meant to compliment a high school level anatomy class. It contains worksheets, images, study guides and practice quizzes to support a rich curriculum in anatomy and physiology. Specifically, this class was designed for students at Granite City High School, though other students and teachers may benefit from the resources included here. Image not available forColour: To view this video download Flash Player Figure 1.0 After studying this chapter, you will be able to: Compare and contrast the study of anatomy and physiology Describe the structure of the body, from simplest to most complex Define homeostasis and explain its importance to normal human functioning Use appropriate anatomical terminology to identify key body structures, body regions, and directions in the body Compare and contrast imaging techniques in terms of their function and use in studying the human body Though you may approach a course in anatomy and physiology strictly as a requirement for your field of study, the knowledge you gain in this course will serve you well in many aspects of your life. An understanding of anatomy and physiology is not only fundamental to any career in the health professions, but it can also benefit your own health. Familiarity with the human body can help you make healthful choices and prompt you to take appropriate action when signs of illness arise. Your knowledge in this field will help you understand news about nutrition, medications, medical devices, procedures and help you understand genetic or infectious diseases. At some point, everyone will have a problem with some aspect of his or her body and your knowledge can help you be a better parent, spouse, partner, friend, colleague, or caregiver. This chapter begins with an overview of anatomy and physiology and a preview of the body regions and functions. It then covers the characteristics of life and how the body works to maintain stable conditions. It introduces a set of standard terms for body structures and for planes and positions in the body that will serve as a foundation for more comprehensive information covered later in the text. It ends with examples of medical imaging used to see inside the living human body. This work, Anatomy & Physiology, is adapted from Anatomy & Physiology by OpenStax, licensed under CC BY. This edition, with revised content and artwork, is licensed under CC BY-SA except where otherwise noted. Images, from Anatomy & Physiology by OpenStax, are licensed under CC BY except where otherwise noted. Access the original for free at . By the end of this section, you will be able to: List the components of a homeostatically controlled system Discuss the role of homeostasis in the human body Contrast negative and positive feedback, giving one physiologic example of each mechanism Maintaining a stable system requires the body to continuously monitor its internal conditions. Though certain physiological systems operate within frequently larger ranges, certain body parameters are tightly controlled homeostatically. For example, body temperature and blood pressure are controlled within a very narrow range. A set point is the physiological value around which the normal range fluctuates. For example, the set point for typical human body temperature is approximately 37°C (98.6°F). Physiological parameters, such as body temperature and blood pressure, tend to fluctuate within a range of a few degrees above and below that point. Receptors located in the body's key places detect changes from this set point and relay information to the control centers located in the brain. The control centers monitor and send information to effector organs to control the body's response. If these effectors reverse the original condition, the system is said to be regulated through negative feedback. Figure 1.3.1 Control centers in the brain and other parts of the body monitor and react to deviations from this set point using negative feedback. Negative feedback is a mechanism that reverses a deviation from the set point, and in turn, maintains body parameters within their normal range. The maintenance of homeostasis by negative feedback goes on throughout the body at all times and an understanding of negative feedback is thus fundamental to an understanding of human physiology. Negative Feedback A negative feedback system has three basic components: a sensor, control center and an effector. (Figure 1.3.2a). A sensor, also referred to a receptor, monitors a physiological value, which is then reported to the control center. The control center compares the value to the normal range. If the value deviates too much from the set point, then the control center activates an effector. An effector causes a change to reverse the situation and return the value to the normal range. Figure 1.3.2 – Negative Feedback Loop: In a negative feedback loop, a stimulus—a deviation from a set point—is resisted through a physiological process that returns the body to homeostasis. (a) A negative feedback loop has five basic parts. (b) Body temperature is regulated by negative feedback. In order to set the system in motion, a stimulus must drive a physiological parameter beyond its normal range (that is, beyond homeostasis). This stimulus is "heard" by a specific sensor. For example, in the control of blood glucose, specific endocrine cells in the pancreas detect excess glucose (the stimulus) in the bloodstream. These pancreatic beta cells respond to the increased level of blood glucose by releasing the hormone (insulin) into the bloodstream. The insulin signals skeletal muscle fibers, fat cells (adipocytes), and liver cells to take up the excess glucose, removing it from the bloodstream. As glucose concentration in the bloodstream drops, the decrease in concentration—the actual negative feedback—is detected by pancreatic alpha cells, and insulin release stops. This prevents blood sugar levels from continuing to drop below the normal range. Humans have a similar temperature regulation feedback system that works by promoting either heat loss or heat gain (Figure 1.3.2b). When the brain's temperature regulation center receives data from the sensors indicating that the body's temperature exceeds its normal range, it stimulates a cluster of brain cells referred to as the "heat-loss center." This stimulation has three major effects: Blood vessels in the skin begin to dilate allowing more blood from the body core to flow to the surface of the skin allowing the heat to radiate into the environment. As blood flow to the skin increases, sweat glands are activated to increase their output. As the sweat evaporates from the skin surface into the surrounding air, it takes heat with it. The depth of respiration increases, and a person may breathe through an open mouth instead of through the nasal passageways. This further increases heat loss from the lungs. In contrast, activation of the brain's heat-gain center by exposure to cold reduces blood flow to the skin, and blood returning from the limbs is diverted into a network of deep veins. This arrangement traps heat closer to the body core and restricts heat loss. If heat loss is severe, the brain triggers an increase in random signals to skeletal muscles, causing them to contract, producing shivering. The muscle contractions of shivering release heat while using up ATP. The brain triggers the thyroid gland in the endocrine system to release thyroid hormone, which increases metabolic activity and heat production in cells throughout the body. The brain also signals the adrenal glands to release epinephrine (adrenaline), a hormone that causes the breakdown of glycogen into glucose, which can be used as an energy source. The breakdown of glycogen into glucose also results in increased metabolism and heat production. Positive Feedback Positive feedback intensifies a change in the body's physiological condition rather than reversing it. A deviation from the normal range results in more change, and the system moves farther away from the normal range. Positive feedback in the body is normal only when there is a definite end point. Childbirth and the body's response to blood loss are two examples of positive feedback loops that are normal but are activated only when needed. Childbirth at full term is an example of a situation in which the maintenance of the existing body state is not desired. Enormous changes in the mother's body are required to expel the baby at the end of pregnancy. The events of childbirth, once begun, must progress rapidly to a conclusion or the life of the mother and the baby are at risk. The extreme muscular work of labor and delivery are the result of a positive feedback system (Figure 1.3.3). Figure 1.3.3 – Positive Feedback Loop: Normal childbirth is driven by a positive feedback loop. A positive feedback loop results in a change in the body's status, rather than a return to homeostasis. The first contractions of labor (the stimulus) push the baby toward the cervix (the lowest part of the uterus). The cervix contains stretch-sensitive nerve cells that monitor the degree of stretching (the sensors). These nerve cells send messages to the brain, which in turn causes the pituitary gland at the base of the brain to release the hormone oxytocin into the bloodstream. Oxytocin causes stronger contractions of the smooth muscles in of the uterus (the effectors), pushing the baby further down the birth canal. This causes even greater stretching of the cervix. The cycle of stretching, oxytocin release, and increasingly more forceful contractions stops only when the baby is born. At this point, the stretching of the cervix halts, stopping the release of oxytocin. A second example of positive feedback centers on reversing extreme damage to the body. Following a penetrating wound, the most immediate threat is excessive blood loss. Less blood circulating means reduced blood pressure and reduced perfusion (penetration of blood) to the brain and other vital organs. If perfusion is severely reduced, vital organs will shut down and the person will die. The body responds to this potential catastrophe by releasing substances in the injured blood vessel wall that begin the process of blood clotting. As each step of clotting occurs, it stimulates the release of more clotting substances. This accelerates the processes of clotting and sealing off the damaged area. Clotting is contained in a local area based on the tightly controlled availability of clotting proteins. This is an adaptive, life-saving cascade of events. Homeostasis is the activity of cells throughout the body to maintain the physiological state within a narrow range that is compatible with life. Homeostasis is regulated by negative feedback loops and, much less frequently, by positive feedback loops. Both have the same components of a stimulus, sensor, control center, and effector; however, negative feedback loops work to prevent an excessive response to the stimulus, whereas positive feedback loops intensify the response until an end point is reached. Identify the five components of a negative feedback loop and explain what would happen if secretion of a body chemical controlled by a negative feedback system became too great. The five components of a negative feedback loop are: stimulus, sensor, control center, and effector. If too great a quantity of the chemical were excreted, sensors would activate a control center, which would in turn activate an effector. In this case, the effector (the secreting cells) would be adjusted downward. What regulatory processes would your body use if you were trapped by a blizzard in an unheated, uninsulated cabin in the woods? Any prolonged exposure to extreme cold would activate the brain's heat-gain center. This would reduce blood flow to your skin, and shunt blood returning from your limbs away from the digits and into a network of deep veins. Your brain's heat-gain center would also increase your muscle contraction, causing you to shiver. This increases the energy consumption of skeletal muscle and generates more heat. Your body would also produce thyroid hormone and epinephrine, chemicals that promote increased metabolism and heat production. This work, Anatomy & Physiology, is adapted from Anatomy & Physiology by OpenStax, licensed under CC BY. This edition, with revised content and artwork, is licensed under CC BY-SA except where otherwise noted. 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Check out the F.A.Q. below for tips on how to save money when using a literature-based curriculum.The printable version of the book list features:The ISBN number and author's nameYou can make sure your copy of the book matches the one in the schedule. Notification of when each book or item is usedYou can plan ahead when to check out books from the library. Books used throughout the year are marked "multiple weeks," so you can decide whether you want to purchase them vs. borrow them. Checklists for planningA handy checklist helps you plan if you are going to buy or borrow a book. It can also help you choose the format of your books (physical copy, e-book, or audio book). Consumables are markedYou'll get advance notice of which items are consumable, so you'll know what you may need to purchase and how many copies you may want to get if you are using the curriculum with multiple students. Keep scrolling to see the full online book list (below the F.A.Q. on this page). We've scheduled in lots of colorful, fact-filled, interesting and engaging books for this year's anatomy study! Before taking a look at the books and resources, we've addressed some common questions:Warning! Preview all materials! I strongly recommend you preview all items to see if they are appropriate for your student. Every family is different in what they find offensive! Additional notes about some of the books are in the descriptions below.Books and ItemsChoose one of the following.I have scheduled BOTH textbook options in the curriculum schedule. I chose option two with my son.You can look at the Amazon previews to see which option is most appropriate for your student.TEXTBOOK OPTION ONE:Anatomy & Physiology Made Incredibly Easy!I chose this book for Guest Hollow's High School Anatomy Curriculum because it's friendly and helps students practice and retain what they are learning. It's just right for high school students and does make learning anatomy fairly easy! It also comes in an e-book format. I like the e-book format because you can touch words for an instant definition while reading. The softcover version is easier to browse through, though.The 5th edition comes with a scratch-off code in the front (inside cover) that gives you access to student resources. The student resources are workbook style pages and games that review the textbook material. Answers are provided. The activities are in PDF format, ready for you to print out for free.*WARNING: This book contains nudity- both male and female. The nudity is depicted via 3-D style illustrations and does show detail, although in a scientific type of style. You will have to decide if this is appropriate for your students or not. The book also states in chapter 16 (The Reproductive System), " When we discuss the male reproductive system, we will be referring to those assigned male at birth." It says the same for females. TEXTBOOK OPTION TWO:Anatomy and Physiology Made Incredibly Visual!Do you have a student who is overwhelmed by textbooks and needs an easier option, or wants to spend more time with the other scheduled reading material? This book covers the same material as textbook option one but in a highly visual and a much more simplified manner. It is perfect (in my opinion) for a visual learner. It's also great for the student who may be overwhelmed by the complex vocabulary in the other book or who wants to focus more on the extra resources (books, videos, etc.) and less on a textbook.There is a scratch off code in the front of this book that gives you one free year of digital access to the entire text online.Note: This book mentions evolution in one place and has a few non-detailed drawings that depict nudity.This book is also scheduled in Guest Hollow's Jr. Anatomy Curriculum.Blood and GutsAn e-book version of this book is available to check out for FREE at OpenLibrary.org.This fun book integrates lots of experiments and activities with lots of information about the human body. Many of this year's labs come from this book, so don't skip it! Some of the activities are very simple and easy to do with a minimum of supplies, while others are more involved like dissections. All 3 of my kids enjoyed this book. In my opinion, the activities are appropriate for elementary school through high school!Choose 1 of the following 2 books:Book 1: Human Anatomy Coloring Book: an Entertaining and Instructive Guide to the Human Body – Bones, Muscles, Blood, Nerves and How They Work This book is free at the Open Library.This book is also scheduled in our Jr. Human Anatomy and Health Curriculum. Note: This book features the internal structures of reproductive parts. Exterior breasts are shown (like a cartoon style drawing).The Human Anatomy Coloring Book is an affordable anatomy class. This easy learning study aid contains careful, scientifically accurate line renderings of the body's organs and major systems: skeletal, muscular, circulatory, respiratory, nervous, digestive, urinary, reproductive, endocrine, lymphatic, and skin. Hundreds of specialized organs, bones, muscles, nerve fibers, blood vessels, and other anatomical features can be absorbed and understood by means of an ingenious format: a coloring book that can help mature children and adult colorists learn anatomy. It is an excellent educational tool for EMT, medical and nursing students, homeschoolers, biology teachers for classroom learning, and anyone interested in studies of the human body and its anatomy.Book 2: Netter's Anatomy Coloring BookAn older version of this book is free at the Open Library.Note: This book features realistic illustrated nudity and the structures of reproductive parts. This is a college level book. It's total overkill for students who just want an understanding of the basics. If that is the case, we recommend the book to the left. However, if you have a motivated student who REALLY wants to go in depth and work on memorizing/learning anatomy, this is a better choice.Reinforce your knowledge of structures, pathways, and relationships with this active and engaging review tool! This comprehensive book is a fun and easy way to trace arteries, veins, and nerves through their courses and bifurcations, reinforce your understanding of muscle origins and insertions, and develop a better understanding of the integration of individual organs in the workings of each body system throughout the human form. Whether you are taking an anatomy course or just curious about how the body works, you'll learn and master anatomy with ease. Note: This book contains multiple, detailed pen and ink drawings of anatomy (breasts, vaginal area, penis, etc.). These drawings are in a line drawing style and in a medical context. Chapter 5 has a curse word that is used for "going to the bathroom."Chapter 20 discusses family planning and gives information about condoms, "pulling out", etc. On p. 293 (in chapter 20) the book talks about oral and anal sex in the context that neither causes pregnancy.The book also discusses STD's, AIDS, and drug use.Pages 416-417 discuss abortion in a pro-abortion manner. There is also the comment: "…there are almost no deaths or problems from abortion." which doesn't discuss the death of the unborn child.If you have a younger student, you may want to cherry pick the chapters to read depending on their maturity and what your family feels comfortable viewing/discussing.Where There Is No DoctorThere are so many practical things you can learn from this book! It's highly visual with many drawings and very easy to understand text. This is a great book for any student interested in the medical or mission field, or just for basic first aid, health, and medicine type information.You can download this amazing book for FREE as a PDF. I kept this book even after we were done homeschooling!Note: There are some adult humor/references as well as evolution mentioned. This book also takes about the Bible story of Jacob and Laban and interprets the story as Jacob using "fertility magic" when he stripped the bark from willow rods and set them near the watering hole.This book is also scheduled in Guest Hollow's Biology Curriculum.The Cartoon Guide to GeneticsThis book is FREE at the OpenLibrary.This book takes a complex subject and makes it much more understandable in a cartoon / comic-book styleNote: There is some adult content in this book.Inheritance: How Our Genes Change Our Lives–and Our Lives Change Our Genes"Award-winning physician and New York Times bestselling author Sharon Moalem, MD, PhD, reveals how genetic breakthroughs are completely transforming our understanding of both the world and our lives.Conventional wisdom dictates that our genetic destiny is fixed at conception. But Dr. Moalem's ground-breaking book shows us that the human genome is far more fluid and fascinating than your ninth-grade biology teacher ever imagined. By bringing us to the bedside of his unique and complex patients, he masterfully demonstrates what rare genetic conditions can teach us all about our own health and well-beingCompound microscopeIf you want to view the microscope slide sets, you'll need a microscope. You can choose any compound microscope from the link above (or any other source). It should be a microscope capable of at least 40x-1000x magnification. The microscopes in the $90+ range are probably adequate. This one has decent reviews and looks like it would do the job: ��ve not used it personally, though. ☹ This is the microscope our family owns: Sonlight Ultra Microscope. However, it's quite pricey.Anatomy microscope slide set"Study human anatomy with this set of 16 high-quality, hand-prepared microscope slides. Survey the major tissues and organs of the body and study the details of cells. The set comes in a plastic storage box."Human pathology microscope slide set "This set contains 12 research-quality prepared tissue microscope slides of human diseases."Note: There are a lot of factual descriptions of different ways of dying, suicides, etc. Pages 82-84 (chapter 6) talks about death from autoerotic asphyxiation. Preview! This may not be an appropriate book for sensitive or younger students. Some families may not feel comfortable with some of the material.Dead Men Do Tell Tales: The Strange and Fascinating Cases of a Forensic Anthropologist"From a skeleton, a skull, a mere fragment of burnt thighbone, Dr. William Maples can deduce the age, gender, and ethnicity of a murder victim, the manner in which the person was dispatched, and, ultimately, the identity of the killer. In Dead Men Do Tell Tales, Dr. Maples revisits his strangest, most interesting, and most horrific investigations, from the baffling cases of conquistador Francisco Pizarro and Vietnam MIAs to the mysterious deaths of President Zachary Taylor and the family of Czar Nicholas II."This book is also scheduled in Guest Hollow's Jr. Anatomy Curriculum.Guinea Pig Scientists: Bold Self-Experimenters in Science and Medicine"It was August 27, 1885. In a hospital in Lima, Peru, a student named Daniel Carrión was preparing to infect himself with a dreaded disease . . . He had a small, sharp lancet ready . . . Carrión's friends and teacher from the medical school thought it was a bad idea. They knew Carrión was eager to learn more about this mysterious disease.But were the risks worth it?Science and medicine from the inside out-ten engrossing stories of self-experimentationWho are these "guinea pig scientists"? Searching for clues to some of science's and medicine's bigger (and sometimes stranger) questions, they are all the men and women who devoted their lives to help find the answers. Spanning from the 1770s to the present–and uncovering the science behind digestion, the spread of yellow fever, the development of the first heart catheter, and more–their ten stories are at once scientifically detailed and fascinatingly personal."Note: Stephen Hawking had ALS, a condition that first brings muscle weakness, then wasting and then paralysis. This is a movie about him and his first wife. Christian families may wish to discuss Stephen's atheism.Click here for the Common Sense Media rating.The Theory of Everything"Starring Eddie Redmayne and Felicity Jones, this is the extraordinary story of love between the renowned astrophysicist Stephen Hawking, and his tireless first wife Jane. "Note: This book mentions evolution.Brain RulesMy son couldn't put this book down! It's a very accessible and interesting read."Most of us have no idea what's really going on inside our heads. Yet brain scientists have uncovered details every business leader, parent, and teacher should know—like the need for physical activity to get your brain working its best.How do we learn? What exactly do sleep and stress do to our brains? Why is multi-tasking a myth? Why is it so easy to forget—and so important to repeat new knowledge? Is it true that men and women have different brains?In Brain Rules, Dr. John Medina, a molecular biologist, shares his lifelong interest in how the brain sciences might influence the way we teach our children and the way we work. In each chapter, he describes a brain rule—what scientists know for sure about how our brains work—and then offers transformative ideas for our daily lives.Medina's fascinating stories and infectious sense of humor breathe life into brain science. You'll learn why Michael Jordan was no good at baseball. You'll peer over a surgeon's shoulder as he proves that most of us have a Jennifer Aniston neuron. You'll meet a boy who has an amazing memory for music but can't tie his own shoes.This kit is also scheduled in Guest Hollow's Jr. Anatomy Curriculum.Sheep brain (Kit)"Study mammal anatomy with this preserved sheep brain specimen (cranial nerves attached)! Through dissection, students will observe external & internal brain structures, such as the corpus callosum, pituitary gland & more."This series is also scheduled in Guest Hollow's Jr. Anatomy Curriculum.The Secret Life of the Brain"A startling new map of the human brain has emerged during the past decade of neuroscience research, contradicting much of what was previously believed. Narrated by Blair Brown and directed by David Grubin, this series tells stories through a mix of personal histories, expert commentary, and cutting-edge animation. Viewers learn startling new truths about the brain as they journey inside about this complicated organ."This book is also scheduled in Guest Hollow's Jr. Anatomy Curriculum.Phineas Gage: A Gruesome but True Story About Brain ScienceAn e-book version of this book is available to check out for FREE at OpenLibrary.org."Phineas Gage was truly a man with a hole in his head. Phineas, a railroad construction foreman, was blasting rock near Cavendish, Vermont, in 1848 when a thirteen-pound iron rod was shot through his brain. Miraculously, he survived to live another eleven years and become a textbook case in brain science."Note: This is a Christian book.Blind Courage"The story of a blind man, Bill Irwin, who, with his dog, Orient, hiked the 2100 miles of the treacherous Appalachian Trail. The journey was made as a testimony to the God whom Irwin believed had turned his shattered life around. It is an account of Irwin's faith, perseverance and will to survive."This kit is also scheduled in Guest Hollow's Jr. Anatomy Curriculum.Cow Eye Kit"This Cow Eye Dissection Kit gives an inside view of how the eye works. It comes with all the tools you need for this activity."This book is also scheduled in Guest Hollow's Jr. Anatomy Curriculum.How to Really Fool Yourself: Illusions for All Your SensesThis book contains over 70 activities and is a fun read. Even a high schooler should enjoy it. We had fun playing with this book!"Fans of Vicki Cobb's unique blend of humor, science, and hands-on activities will have tons of fun with How to Really Fool Yourself. Kids won't be able to believe their eyes–not to mention their ears, noses, hands, and tongues! Packed with all-new illustrations and a delightful new design, this book features over 70 activities to fool all five senses. Each illusion is followed by a fascinating "Why You're Fooled" section that explains the science and history behind the "magic.""This book is also scheduled in Guest Hollow's Jr. Anatomy Curriculum.She Touched the World: Laura Bridgman, Deaf-Blind Pioneer"When she was just two years old, Laura Bridgman lost her sight, her hearing, and most of her senses of smell and taste. At the time, no one believed a child with such severe disabilities could be taught to communicate, much less lead a full and productive life. But then a progressive doctor, who had just opened the country's first school for the blind in Boston, took her in. Laura learned to communicate, read, and write—and eventually even to teach. By the age of 12, she was world famous."Deaf Like MeAn e-book version of this book is available to check out for FREE at OpenLibrary.org."Deaf Like Me is the moving account of parents coming to terms with their baby girl's profound deafness. The love, hope, and anxieties of all hearing parents of deaf children are expressed here with power and simplicity. In the epilogue, Lynn Spradley as a teenager reflects upon being deaf, her education, her struggle to communicate, and the discovery that she was the focus of her father's and uncle's book. At once moving and inspiring, Deaf Like Me is must reading for every parent, relative, and friend of deaf children everywhere."Sound and FuryThis is a great documentary. I learned a lot from it!This kit is also scheduled in Guest Hollow's Jr. Anatomy Curriculum.Sheep Heart Dissection Kit"Learn how the heart works as you locate the internal parts with this complete dissection set."Ryan White: My Own StoryAn e-book version of this book is available to check out for FREE at OpenLibrary.org.This is the courageous story of Ryan White, a boy who was born with hemophilia and contracted AIDS from a contaminated blood transfusion.This kit is also scheduled in Guest Hollow's Jr. Anatomy Curriculum.Eldoncard Blood Type Test Kit We enjoyed this kit!Please note: You do have to prick your skin to get a drop of blood. The lancet is so sharp that we hardly felt it. If you have a squeamish kid, you'll probably want to skip this activity."This single-use blood type test kit contains everything needed to perform a complete blood test at home for ABO and Rh. It's a quick way to identify your blood type."Alternate book: Breath from Salt: A Deadly Genetic Disease, a New Era in Science, and the Patients and Families Who Changed Medicine ForeverAlex: The Life of a ChildThis book is available to check out for FREE at OpenLibrary.org."In 1971 a girl named Alex was born with cystic fibrosis, a degenerative genetic lung disease. Although health-care innovations have improved the life span of CF patients tremendously over the last four decades, the illness remains fatal.Award-winning author Frank Deford, celebrated primarily as a sportswriter, was also a budding novelist and biographer at the time of his daughter's birth. Deford kept a journal of Alex's courageous stand against the disease, documenting his family's struggle to cope with and celebrate the daily fight she faced. This book is the result of that journal.Alex relives the events of those eight years: moments as heartwarming as when Alex recorded herself saying "I love you" so her brother could listen to her whenever he wanted, and as heartrending as the young girl's tragic, dawning realization of her own very tenuous mortality, and her parents' difficulty in trying to explain why.Though Alex is a sad story, it is also one of hope; her greatest wish was that someday a cure would be found. Deford has written a phenomenal memoir about an extraordinary little girl."Note: In chapter 11 there is a mention of drug trafficking, putting drug packets into cavities, and some homosexual behavior is mentioned. Everything is presented in a scientific manner, but you may want to do that chapter as a read-aloud and skip over those parts.Gulp: Adventures on the Alimentary Canal""America's funniest science writer" (Washington Post) takes us down the hatch on an unforgettable tour. The alimentary canal is classic Mary Roach terrain: the questions explored in Gulp are as taboo, in their way, as the cadavers in Stiff and every bit as surreal as the universe of zero gravity explored in Packing for Mars. Why is crunchy food so appealing? Why is it so hard to find words for flavors and smells? Why doesn't the stomach digest itself? How much can you eat before your stomach bursts? Can constipation kill you? Did it kill Elvis? In Gulp we meet scientists who tackle the questions no one else thinks of—or has the courage to ask."Everybody Poops 410 Pounds a YearONCE UPON A TIME . . . when you were little, you learned that everyone poops. But did you ever discover how much? Well, sit down on that cold porcelain throne and get ready to laugh your butt off at the most amazing, hilarious, need-to-go facts on the one thing everyone does–but nobody talks about. Filled to the rim with piles of fascinating dirty fun, this illustrated kids' book for grown-ups answers all the questions you never thought to ask:• How do astronauts poop in space?• Where does poop go after you flush?• Why can I see the corn but not the chicken?• Can I light my poop on fire?• Who invented the first flushing toilet?This book is also scheduled in Guest Hollow's Jr. Anatomy Curriculum.Chew On This: Everything You Don't Want to Know About Fast Food"When Eric Schlosser's best-selling book, Fast Food Nation, was published for adults in 2001, many called for his groundbreaking insight to be shared with young people. Now Schlosser, along with co-writer Charles Wilson, has investigated the subject further, uncovering new facts children need to know.In Chew On This, they share with kids the fascinating and sometimes frightening truth about what lurks between those sesame seed buns, what a chicken 'nugget' really is, and how the fast food industry has been feeding off children for generations."Salt, Sugar, Fat: How the Food Giants Hooked Us"Every year, the average American eats thirty-three pounds of cheese and seventy pounds of sugar. Every day, we ingest 8,500 milligrams of salt, double the recommended amount, almost none of which comes from the shakers on our table. It comes from processed food, an industry that hauls in $1 trillion in annual sales. In Salt Sugar Fat, Pulitzer Prize–winning investigative reporter Michael Moss shows how we ended up here. Featuring examples from Kraft, Coca-Cola, Lunchables, Frito-Lay, Nestlé, Oreos, Capri Sun, and many more, Moss's explosive, empowering narrative is grounded in meticulous, eye-opening research. He takes us into labs where scientists calculate the "bliss point" of sugary beverages, unearths marketing techniques taken straight from tobacco company playbooks, and talks to concerned insiders who make startling confessions. Just as millions of "heavy users" are addicted to salt, sugar, and fat, so too are the companies that peddle them. You will never look at a nutrition label the same way again."This kit is also scheduled in Guest Hollow's Jr. Anatomy Curriculum.Sheep Kidney Dissection Kit"With a Sheep Kidney Dissection, learn how kidneys work as you locate the internal parts. Get all you need for a dissection lab: preserved sheep kidney, illustrated dissection guide, #22 scalpel, and dissecting tray."Choose one of the following.I bought The Magic School Bus: The World of Germs Kit for my homeschool. It was less expensive, and the experiments were appropriate for any age (in my opinion).These kits are also featured in Guest Hollow's Biology Curriculum and are scheduled in Guest Hollow's Jr. Anatomy Curriculum.Bacteria Growing KitThe Magic School Bus: The World of Germs KitNote: This is a Christian book. This book doesn't shrug from graphic medical details like a toddler who can't feel pain painting her crib with her own blood after chewing her own fingers. A very squeamish student may not feel comfortable with some of the descriptions.The Gift of Pain"A WORLD WITHOUT PAIN? Can such a place exist? It not only can—it does. But it's no utopia. It's a colony for leprosy patients: a world where people literally feel no pain, and reap horrifying consequences. His work with leprosy patients in India and the United States convinced Dr. Paul Brand that pain truly is one of God's great gifts to us. In this inspiring story of his fifty-year career as a healer, Dr. Brand probes the mystery of pain and reveals its importance. As an indicator that lets us know something is wrong, pain has a value that becomes clearest in its absence. The Gift of Pain looks at what pain is and why we need it. Together, the renowned surgeon and award-winning writer Philip Yancey shed fresh light on a gift that none of us want and none of us can do without."Good Germs, Bad Germs: Health and Survival in a Bacterial World"Public sanitation and antibiotic drugs have brought about historic increases in the human life span; they have also unintentionally produced new health crises by disrupting the intimate, age-old balance between humans and the microorganisms that inhabit our bodies and our environment. As a result, antibiotic resistance now ranks among the gravest medical problems of modern times. Good Germs, Bad Germs tells the story of what went terribly wrong in our war on germs. It also offers a hopeful look into a future in which antibiotics will be designed and used more wisely, and beyond that to a day when we may replace antibacterial drugs and cleansers with bacterial ones."A Paralyzing Fear"First appearing in the United States in 1916, the disease crippled tens of thousands of children every summer until it was finally eradicated by the Salk vaccine beginning in 1954. Every baby boomer remembers the terror of the polio epidemic and the thrill when the vaccine was discovered."American Experience Influenza 1918"As the nation mobilized for war in the spring of 1918, ailing Private Albert Gitchell reported to an army hospital in Kansas. He was diagnosed with the flu, a disease about which doctors knew little. Before the year was out, America would be ravaged by a flu epidemic that killed 675,000 people–more than died in all the wars of this century combined–before disappearing as mysteriously as it began. "Note: This book mentions evolution.Parasites: Tales of Humanity's Most Unwelcome Guests"Hidden away within living tissues, parasites are all around us–and inside us. Yet, despite their unsavory characteristics, as we find in this compulsively readable book, parasites have played an enormous role in civilizations through time and around the globe. Parasites: Tales of Humanity's Most Unwelcome Guests puts amoebae, roundworms, tapeworms, mites, and others at the center of the action as human cultures have evolved and declined. It shows their role in exploration, war, and even terrorist plots, often through an unpredictable ripple effect. It reveals them as invisible threats in our food, water, and luggage; as invaders that have shaped behaviors and taboos; and as unexpected partners in such venues as crime scene investigations. Parasites also describes their evolution and life histories and considers their significant benefits. Deftly blending the sociological with the scientific, this natural and social history of parasites looks closely at a fascinating, often disgusting group of organisms and discovers that they are in fact an integral thread in the web of life."ParasiteThis novel is a Michael Crichton-style thriller that is firmly anchored in real-life science and technology!"A decade in the future, humanity thrives in the absence of sickness and disease. We owe our good health to a humble parasite — a genetically engineered tapeworm developed by the pioneering SymboGen Corporation. When implanted, the Intestinal Bodyguard worm protects us from illness, boosts our immune system — even secretes designer drugs. It's been successful beyond the scientists' wildest dreams. Now, years on, almost every human being has a SymboGen tapeworm living within them. But these parasites are getting restless. They want their own lives . . . and will do anything to get them." Note: This book tries really hard to be cool (in my opinion) and just seems kind of overdone to me. My family isn't into being "cool". However, it's the only anti-drug book for teens I could find that is specifically Christian. The graphic, magazine style may appeal to your kids, and the message is sound.Buzz: A Graphic Reality Check for Teens Dealing With Drugs and Alcohol"Life is tough. You've got questions. You've got choices…and the results are yours to live with. So go ahead—do a little investigating and discover the answers for yourself. The graphically captivating books in the FlipSwitch series are the real deal. They unashamedly tackle pressing issues that you face every day. After pinpointing God's solution, they offer practical steps that will help you take your life in the right direction…without a doubt."The Deadly Dinner Party: and Other Medical Detective Stories" Award-winning author Jonathan Edlow, M.D., shows the doctor as detective and the epidemiologist as elite sleuth in stories that are as gripping as the best thrillers.In these stories a notorious stomach bug turns a suburban dinner party into a disaster that almost claims its host; a diminutive woman routinely eats more than her football-playing boyfriend but continually loses weight; a young executive is diagnosed with lung cancer, yet the tumors seem to wax and wane inexplicably. Written for the lay person who wishes to better grasp how doctors decipher the myriad clues and puzzling symptoms they often encounter, each story presents a very different case where doctors must work to find the accurate diagnosis before it is too late."Choose one of the following.Ten Stupid Things Women Do to Mess Up Their Lives (for GIRLS)Dr. Laura has a lot of very practical and blunt advice that could be helpful to your teens as they approach adulthood. Lots of stuff to think about and discuss in this book! Highly recommended!Ten Stupid Things Men Do to Mess Up Their Lives (for BOYS)I had my son read this book! Great advice and plenty to think about / discuss! Highly recommended!Note: Recommended for all older teen girls. This book could be life-changing. Preview for appropriateness (sexual content, etc.).How to Spot a Dangerous Man Before You Get Involved (for GIRLS) "This savvy, straightforward book pairs real women's stories with research and the expertise of a domestic violence counselor to help women of all ages identify Dangerous Men — before they become too involved.Brown describes eight types of Dangerous Men, their specific traits and characteristics. In separate chapters, she explores victim's stories that tell how they came in contact with this type of Dangerous Man and their outcome. Brown then shows readers how to develop a Defense Strategy — how to spot, avoid, or rid themselves of this type of Dangerous Man.Brown explains women's innate "red flag" systems — how they work to signal impending danger, and why many women learn to ignore them. With red flags in hand, Brown then guides readers through their own personal experiences to develop a personalized "Do Not Date" list. With these tools, Brown shows women how they can spot and avoid patterns of engagement with Dangerous Men." Note: This book has sexual content. The content isn't graphic, but it is very frank. Preview.Abuse OF men BY women: It happens, it hurts, and it's time to get real about it (for BOYS)""It Happens, It Hurts" describes what abuse OF men BY women looks like, why women do it, how we are supporting and encouraging women to abuse men, how men get pulled into these dysfunctional relationships, why they stay, the impact of abusive or manipulative women have on men, and what can be done about it.This book arms men with the information they need to avoid getting hooked into relationships with abusive or manipulative women."PBS: Twice Born"Step inside the newest medical frontier of fetal surgery with an intimate look at the Special Delivery Unit at the Children's Hospital of Philadelphia, where a courageous group of doctors and patients take on the challenges of operations done on babies still inside their mother's wombs. Witness real-time footage of fetal operations, and meet expecting parents as they face gut-wrenching decisions."Note: I recommend you preview this book to see if it's appropriate for your student.The Gift of Fear and Other Survival Signals that Protect Us From Violence"True fear is a gift. Unwarranted fear is a curse. Learn how to tell the difference.A date won't take "no" for an answer. The new nanny gives a mother an uneasy feeling. A stranger in a deserted parking lot offers unsolicited help. The threat of violence surrounds us every day. But we can protect ourselves, by learning to trust—and act on—our gut instincts.In this empowering book, Gavin de Becker, the man Oprah Winfrey calls the nation's leading expert on violent behavior, shows you how to spot even subtle signs of danger—before it's too late. Shattering the myth that most violent acts are unpredictable, de Becker, whose clients include top Hollywood stars and government agencies, offers specific ways to protect yourself and those you love, including…how to act when approached by a stranger…when you should fear someone close to you…what to do if you are being stalked…how to uncover the source of anonymous threats or phone calls…the biggest mistake you can make with a threatening person…and more. Learn to spot the danger signals others miss. It might just save your life."Sex Has a Price Tag: Discussions about Sexuality, Spirituality, and Self RespectThis book is optional. You can use it or another purity book (if that is what your family believes in). We have read through a variety of purity books. This one is easy to read but very frank and covers some pretty sensitive topics. Please preview it first to make sure it's appropriate for your child.This is a Christian resource. If you are a secular parent, you may want to find a book that discusses teen sexuality and agrees with your family's principles.Glo Germ Mini Handwashing KitMy family had fun using this product to learn about germs! In link to a PDF of Glo-Germ experiments in the schedule.The Miracle Worker"Helen Keller comes under the tutelage of an amazing teacher.""Helen Keller comes under the tutelage of an amazing teacher."Thames & Kosmos Genetics and DNA KitLearn the basics of genetics and DNA with this optional kit. The kit comes with several experiments, a 48-page full color experiment manual, and a DNA model you can build. The recommended age is 10-15, so older students may want to skip it, unless they love hands-on activities.View the manual here.Nutrient Agar, Prepared Media PlatesandSterile swabs (2 packages)These prepared agar plates are for a microbiome experiment.The Art of Drawing Optical Illusions: How to draw mind-bending illusions and three-dimensional trick art in graphite and colored pencilThis book is perfect for a beginning artist to work with while learning about optical illusions!"Optical illusions are like magic tricks of the art world. They may look difficult to create, but with just a little bit of guidance, they can be easily achieved. Jonathan Stephen Harris guides you step-by-step in creating mind-blowing pencil dr