

Integrated Health and Fitness

Teacher Edition



Oak Meadow

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Teacher Edition Introduction

This teacher edition will help you guide your student through the Oak Meadow Health and Fitness course. The books used in this course are as follows:

- *Health: Making Life Choices* by Glencoe McGraw-Hill
- *Human Anatomy Coloring Book*, by Margaret Matt, 1982
- *Spark: The Revolutionary New Science of Exercise and the Brain*, by John J. Ratey, MD, 2008
- *In Defense of Food: An Eater's Manifesto*, by Michael Pollan, 2009

In this teacher edition, the page references refer to the textbook unless otherwise specified. Sometimes the page references refer to the book mentioned at the top of the question section.

This teacher edition includes the full content of the student coursebook as well as answers and guidelines for assessing student work.



Coursebook Introduction

Welcome to the Oak Meadow Health and Fitness course! Come join us as we explore some topics that may be familiar to you as well as some entirely new ideas and perspectives. It is our goal that you come out of this course with a solid understanding of the meaning of health, a desire to make a healthy lifestyle part of normal life, and a desire to learn more about both health and fitness.

This coursebook, aside from being necessary to receive credit for the course, could be considered a manual for life. Some of the facts and information in it might become outdated as new information becomes available, but much of it is thought-provoking, timeless material. You can refer to this course as relevant questions arise in your life.

As you go through this course, pay attention to the media. Issues related to health are constantly making the news. The more you read and become aware, the more you will seem to notice when related topics come up in the news. Also, the more you learn, the more you will be able to understand what you hear.

You are encouraged to question what you are learning. Nowhere is that more important than with health-related topics. There is more conflicting information available about this subject than just about any course you will take. Learn to listen with a skeptical ear, seek more information, and develop your own conclusions. Keep your mind open to new ideas, yet be sure you know that they are coming from credible sources.

Here is an example of the kind of critical-thinking skills to develop as you listen to the news and learn of new findings and breakthroughs in the field of health (or any field, for that matter). On public radio, there was a report about a study that concluded that students who get a good night's sleep before an exam do better than those who stay up most of the night and study for it. The conclusion was that the mind is more awake and aware when well rested. This seems to make perfect sense, doesn't it? What the report didn't say was that the two groups of students were equally prepared (or not) for the exam. For this study to mean anything at all, we need to know that the experiment was controlled in that way. The difference in how well the students did on the exam could be entirely related to the *type* of students we are dealing with. The ones who slept the night before might have better study habits in general, and the ones who studied all night are likely to be procrastinators who haven't put much effort into their studies.

You are encouraged to question what you are learning. Nowhere is that more important than with health-related topics. There is more conflicting information available about this subject than just about any course you will take.

This is why it's important to read between the lines when you learn of new information. Look for the fine print and all background information. Was it a controlled study? Were there biases? Nowhere is this more important than when hearing about new diet plans, because in these situations, you are asked to be directly involved. Be a smart consumer!

In this course, we will be using the textbook as well as three supplementary books. Two of them are books on diet and exercise. Michael Pollan is a well-known author who has explored diet and agribusiness in detail, and shares his wealth of knowledge in an easy to read style. John J. Ratey, MD, is a brain researcher and professor of psychiatry who reveals some remarkable studies on the connection between exercise and the brain. We hope you will enjoy reading these books and are inspired to want to know more!

The books used in this course are as follows:

- *Health: Making Life Choices* by Glencoe McGraw-Hill
- *Human Anatomy Coloring Book*, by Margaret Matt, 1982
- *Spark: The Revolutionary New Science of Exercise and the Brain*, by John J. Ratey, MD, 2008
- *In Defense of Food: An Eater's Manifesto*, by Michael Pollan, 2009

In addition to the academic portion of the course, you will be actively engaged in a physical fitness routine throughout the year. Starting with lesson 5, you will be using a heart rate monitor (HRM) as a tool to improve your aerobic fitness level. This tool is not included with the course materials, so you will need to purchase it on your own. An important function that it needs to have is the feature where you can set your target heart rate zone. Please discuss with your teacher good sources for finding this piece of equipment.

Writing Guidelines for Oak Meadow Health and Fitness

General Course Information

You will see that there are different categories of assignments: questions, activities, and essays. Notice that sometimes the category heading is “activities and essays.” This is usually the case when you have a choice of either type of assignment.

- All of the required assignments are in this coursebook. There are no additional requirements from the textbook. Read each lesson carefully; the assignments are outlined step by step.
- Notice that the “activities and essays” sections are in outline form. Pay careful attention to the layout and wording. The projects where you are told to “choose one” are listed directly under that particular assignment.

- The “questions” sections are anywhere from a short answer to a paragraph or two. It is up to you to write what it takes to answer each question fully. Very often, you might only need a word or phrase. *Full sentences are not always required.* But if the question states to “explain” or “describe,” then full sentences are the only proper way to answer. The “questions” assignments are not designed to be lengthy essays, and are usually directly related to the reading.
- Some assignments require coloring in the relevant pages of the *Human Anatomy Coloring Book*. Please make a note next to the assignment number that this is “done” when you complete it.
- It is extremely important to get into the habit of using your own words when you write your answers. Do not copy from any text! A good way to practice this is to read the section of the text, try to grasp what it is saying, and then formulate the answer to the question without looking at the book. After you’ve done that, refer to the text for clarification, adding details or corrections to your final answer as needed. If you use portions of the reading directly, you must quote it.
- There are no tests for this course. Throughout the course, you will be practicing using the resources available to you to complete assignments, just as you will in everyday life. This will require regular review of previously covered topics, which will help you integrate the concepts better.

Questions

short answers

Activities

projects and exercises

Essays

research papers

SHARE YOUR WORK

If you send incomplete assignments, you will not receive a grade for the lesson until it is complete. If for some reason you cannot complete the assignment, include a detailed explanation of why it is impossible for you to complete it. The more you communicate with your teacher, the better. Be sure to begin each lesson assignment with your name, the course subject (Health), the lesson number, and the date.

Research

- There are numerous research projects in this course. It is assumed that students have internet access, which will help with research. If you are an enrolled student and do not have internet access, please discuss these assignments with your teacher.
- Be careful with your choice of websites that you use for research. There are many biased websites, websites with a specific agenda, or websites that don’t back up their information with credible scientific research. How do you know what to choose? If the site belongs to an organization that is selling products, it is likely to be biased and not research-based.
- Examples of excellent websites for this course are the Centers for Disease Control (cdc.gov), WebMD (webmd.com), the Mayo Clinic (mayoclinic.com), and the National Institutes of Health

(nih.gov). There are many more, and with practice, you'll be able to discern between them.

- Use caution with Wikipedia. While it usually has a wealth of information, anyone can write a Wikipedia entry. You need to make sure the information you read there is cited and based on sound science. Wikipedia has improved, and often now notes clearly on the entries if there is a section that is questionable or is not cited properly. It is recommended that you use Wikipedia as a jump-off point to access the links and citations that are referenced there.
- While it is not a requirement, you are highly encouraged to use at least three sources when you do research. This will allow cross-checking and a more accurate relay of information.
- Whenever you do research, please include a works cited page stating the resources you used.
- *See the appendix for complete information on citing sources and avoiding plagiarism.*

Credible Web Sources

- Centers for Disease Control (cdc.gov)
- WebMD (webmd.com)
- Mayo Clinic (mayoclinic.com)
- National Institutes of Health (nih.gov)

Lesson

1

What Is Health?

The dictionary describes **health** as “the state of being free from illness or injury.” Does that mean if you have a broken leg, you are not healthy? Another definition is “a person’s mental or physical condition.” This implies that there is such a thing as “bad” health. Is health an either/or situation? Are you either healthy or not healthy; are you in a state of good or bad health? Or is it a continuum? Are there different facets of health, and might you consider yourself healthy in some regards, and less healthy in others?

Anthropologists have found that different cultures define health in vastly different terms. Likewise, healers, doctors, or shamans utilize techniques and approaches to healing that are as diverse as the cultures in which they operate. Much of modern medicine approaches health from the perspective that the body is a machine, made up of parts that function together to keep one healthy. This perspective is useful in looking at health in terms of prevention of accident or disease.

The things we do, the environment in which we live, and the food that we eat all interact in so many ways that virtually everything affects our ability to maintain good health. Today, one common reason for neglecting the maintenance of the body is lack of awareness and reliable information.

In this course, we will explore all the above questions from many different perspectives. By the end of the course, you will be able to define health more clearly, and possibly in a different way than you might expect. We will get started in this lesson with a general overview of health, acknowledging your role in maintaining your own health.

Essay

Before you do any further reading, take a few moments to analyze your own health. Think about what health means to you, and how you fit into those criteria. Write an essay of at least one page in length where you discuss this. Write your own definition of health, and give specific examples that support the statements you make about your health. For example, give specific information about physical qualities, things that you do, or where you live that affect the quality of your health. *Please refer to the writing guidelines in the introduction for information about how to complete writing assignments.*

Students should assess their own health. These essays will vary, but encourage students to understand that there are many aspects of health, including physical, emotional, mental, and spiritual health. Students might discuss diet, sleep, family life, social life, stress, etc. Encourage all exploration.

Reading

- *Health: Making Life Choices* (hereafter referred to as your “textbook”), Chapter 1, “Health Choices and Behavior,” pages 2–21.

Questions

“Questions” require anywhere from a short answer to a paragraph or two. It is up to you to write what it takes to answer each question fully. Very often, you might only need a word or phrase. *Full sentences are not always required.* But if the question states to “explain” or “describe,” then full sentences are necessary.

1. What are the four components of wellness?

Physical wellness, social wellness, mental/emotional wellness, and spiritual wellness. (p. 10)

2. What factors should you consider when reading articles on health news?

When reading articles on health news, one should be skeptical of sudden “breakthrough” information or studies, along with headlines that are sensationalized. Information that is only based on one study is likely to be insufficient. One should look for credibility and reliable sources of information. (p. 12)

3. When trying to make a change in your life, why is it a good idea to set small, short-term goals rather than making a lot of changes at once?

Small, short-term goals will help one to not feel overwhelmed, as can happen with a large goal. It allows the feeling of success that comes with each small step gained. (p. 18)

4. Choose a goal you would like to attain in your own life. It doesn’t have to be related to health. Break it up into smaller components, and following the guidelines on page 18 of the text, write an action plan for yourself. Remember to write actions that are *doable*.

Answers will vary, but look for the goal-setting steps listed on page 18, as well as the example on page 19.

Activity

Interview three people who are over 50 years old, including at least one who is over 70. Try to choose people with different lifestyles (physically active vs. sedentary, different types of work, use of tobacco or alcohol, diet, etc.). Write their names, or make up fictitious names if you like. Ask each person the following questions. Try to word the questions carefully so the person doesn’t feel intimidated or pressured.

- How old are you? (chronological age)
- How old do you *feel*? (this is related to your physiological age)
- How much exercise do you get (per day or week)? What kind?

- What are your favorite foods that you eat often?
- What do you like to do in your spare time?
- Have you made any lifestyle choices that you think affect how old you feel?

Write a conclusion based on your interviews and observations. Do you see any correlation between diet, exercise, interests, attitude, and the age that they feel or act? Feel free to include your own insights about how you perceive their health.

Students may or may not send the actual interview answers, but should share the summary and conclusions that they reach. Look to see that the student addresses all of the questions in the interviews. This is a good exercise in staying organized. Encourage students to notice correlations, comparing how old people seem to their actual age.

SHARE YOUR WORK

You will submit your work from this lesson at the end of lesson 2. In the meantime, if you have any questions, please contact your teacher.

Lesson

2

Introduction to Anatomy; Skeletal and Muscular Systems

In order to better understand your body and health, it is necessary to learn some anatomy and physiology. Anatomy is the study of the body parts and how they are put together. The word **anatomy** is derived from the Greek words *tomy*, to cut, and *ana*, apart. In the early days of anatomy study, deceased criminals were used as dissection specimens. In the eighteenth and nineteenth centuries, medical schools were becoming more popular, and people were eager for knowledge of the human body. There weren't enough criminals to supply the need. This is when the practice of "body snatching" became common. Some medical schools actually employed people to dig up graves for medical study! There was a constant need, as the bodies had to be fresh. People lived in fear that their deceased loved ones would be dug up, and went to great lengths to guard their graves. By the twentieth century, as preservation methods improved and medical science was becoming more respected, the practice of body snatching vanished. Bodies are still used, but they come from donations. In addition, the use of plastic models, photographs, computer simulations, and other visual aids has reduced the need for fresh bodies when learning about anatomy.

Anatomy is the study of the body parts and how they are put together.

Physiology is the study of how the body and its parts function. *Physis* means "nature," and *-ology* means "the study of." In order to learn about health, we need to learn how our body functions, and it's hard to understand how it functions without understanding how it's put together! For this reason, physiology and anatomy will be integrated into much of this course.

Physiology is the study of how the body and its parts function.

First, let's get a general picture of the body and its systems. Whenever you learn a new discipline, there is always a certain language that is used, and to communicate clearly some common vocabulary is necessary. In this lesson, we will introduce the language of anatomy, learn the layout of the body systems, and cover the details of the skeletal and muscular systems.

A note to enrolled students: Throughout much of this semester, you will color the diagrams in the Human Anatomy Coloring Book that came with your course materials. You will need to send these to your teacher. We don't recommend that you tear the pages out of the book, as it is a good reference book if you keep it intact. You may scan the appropriate pages with each lesson, copy them, or wait and send the entire book to your teacher after lesson 11, when we complete the book.

In the *Human Anatomy Coloring Book*, look at the pictures of the human body and skeletal system on pages 1 and 2. Notice the body is in one position. This is called the **anatomical position**. This is the standard position used when body parts are mentioned in reference to each other, regardless of the position the body happens to be in at the time. Notice particularly the position of the hands, with the palms forward.

The following are the directional terms to become familiar with:

Superior (or cephalic)	Above, or toward the head end
Inferior (or caudal)	Below, or toward the lower end
Anterior (or ventral)	In front of, or toward the front of the body
Posterior (or dorsal)	Behind, or toward the back of the body
Medial	Toward the midline of the body
Lateral	Away from the midline of the body
Proximal	Closer to the point of attachment to the trunk
Distal	Farther from the trunk
Superficial	Closer to the body surface
Deep	Farther from the body surface; more internal

Using these directional terms and the anatomical position, you can see that the head, for example, is superior to the heart even if the person is doing a handstand or lying on a bed.

The **anatomical position** is the standard position used when body parts are mentioned in reference to each other.

Reading

- Textbook, pages 130–139
- *Human Anatomy Coloring Book* (from now on, this will be referred to as *HACB*), pages 1–12

Questions

1. What is homeostasis?

Homeostasis is “the maintenance of a stable body environment, achieved as body systems adapt to changing conditions.” (p. 132)

2. Describe the four levels of organization in the body.

Cells: the basic unit of life in the body.

Tissues: cells working together to perform specific tasks. All the cells of one tissue type work the same way.

Organs: collections of tissues that work together to perform specific jobs.

Organ systems, or whole body systems: organs working together to perform various functions, such as the digestive system or skeletal system. (pp. 132–133)

3. Considering the anatomical position, use the directional terms to fill in the blanks:

- The elbow is **proximal** to the hand.
- The sternum is **anterior** to the vertebral column.
- The thumb is **lateral** to the fingers.
- The tibia is **distal** to the femur.
- The lungs are **deep** to the skin.
- The triceps is **posterior** to the biceps.

4. What are the functions of the skeletal system?

The skeletal system determines the body’s shape, allows movement, supports and protects internal organs, stores calcium, and manufactures blood cells. (p. 137)

5. When you learn about the skeletal system, it is important to learn the functions of certain connective tissues, which are common sites of injuries. Using a dictionary, define the following terms:

- tendon **a cord of strong fibrous tissue (connective tissue) that attaches a muscle to a bone.**
- ligament **a band of fibrous connective tissue that connects two bones or cartilages at a joint.**
- cartilage **a firm and flexible connective tissue that is found in various places in the body, including at surfaces of some joints. It is found in an infant’s skeleton, being replaced by bone during growth.**

6. Using colored pencils, color the diagrams on pp. 3, 5, 6, and 7 of *HACB*.

Students should color the appropriate diagrams in *HACB*.

7. What are the three types of muscles? Describe their functions and where they are found.

The three types of muscle are skeletal muscle, smooth muscle, and cardiac muscle. Skeletal muscle is found throughout the body and allows voluntary movement of the bones. Smooth muscle is found in the blood vessels, digestive system, and lungs, and allows involuntary movements. Cardiac muscle, also involuntary, is only found in the heart. (p. 139; *HACB*, p. 8)

8. The term **muscular system** refers to the skeletal muscles, which is what we will be exploring. Using colored pencils, color the major muscular system diagrams on pages 8–12 of *HACB*. Notice that all muscles are connected to the bone with tendons, some of which can be quite long.

Students will color the appropriate diagrams of the muscular system.

9. Define *origin* and *insertion*. Give an example of the location of each for one muscle.

Origin: where the muscle meets the bone that doesn't move.

Insertion: where the muscle meets the bone that does move.

Example: Since the biceps muscle bends the elbow and moves the forearm, the origin of it is at the shoulder, and the insertion is in the forearm (in the radius, to be specific). (*HACB*, p. 8)

10. Why do muscles need to work in pairs? What are these pairs called? Give an example of each.

Muscles work in pairs because they can only pull on a bone, not push. Flexors cause joints to bend (examples: biceps, hamstrings), and extensors cause joints to straighten (examples: triceps, quadriceps). (p. 139; HACB, p. 8)

Activities

Do the following surface anatomy explorations:

- A. There is much that you can learn about your own skeletal system by examining the parts of your body. By carefully touching and feeling the parts of the body beneath the skin, you can develop a pretty clear picture of how you are put together. Using the diagrams in *HACB* and the text, do a surface anatomy exploration of your bones. Start with your skull and work down. Write a paragraph describing your results, noting any bones you had particular ease or difficulty locating.
- B. Using the diagrams in the text and *HACB*, do a surface anatomy muscular examination of yourself. Use your hands to feel the major muscles listed. Sometimes it helps to flex the muscles to feel them more easily. Write a paragraph describing your experience, listing any muscles you had particular ease or difficulty locating.

A and B: Look for descriptions of the student's experience with the surface anatomy explorations, as outlined in the assignment.

SHARE YOUR WORK

Please share lessons 1 and 2 with your teacher.

Lesson

6

Emotional Health and Personality

This lesson is about emotional health, how you feel about yourself, and how you relate to others. While reading these chapters, keep the mind-body connection in mind. Your emotional health very much affects your physical health, and vice versa. Any steps you take to improve one will improve the other!

Reading

- Textbook, Chapter 2, “Emotional Health,” pages 24–47
- Textbook, Chapter 3, “Your Changing Personality,” pages 50–75

Questions

1. What does it mean to have good emotional health?

Emotional health is defined as “the state of being free of mental disturbances that limit functioning.” An emotionally healthy person can develop good relationships with others, receive support from others, and contribute to society. (p. 25)

2. We all have negative thoughts that come up. They might be about ourselves, somebody else, something we have to do, etc. Think of a negative thought you’ve had recently, and describe it. Give an example of how you can turn that negative thought into a positive thought, using specific wording. One possibility you might choose is to create what is known as an **affirmation**, which is a positive message that you can repeat to yourself to help change the negative thought.

An **affirmation** is a positive message that can redirect negative thoughts.

Answers will vary. Guidelines are on p. 27.

3. After reading Section 2 of Chapter 2 in your textbook on conflict resolution, read the conflict on page 29. Answer questions 2 and 3, where you practice conflict resolution skills using “I” statements. Using “I” statements allows you to express how you feel in a nonoffensive way.

Answers will vary, but look for the use of “I” messages, as well as assertive, respectful, and open-minded dialogue as explained in Section 2.

4. What are the healthy steps to managing emotions?

These are listed on p. 33. Recognize the emotion, own it (accept that you feel it), verbalize it, and express it physically. Students may expand on these.

5. Choose **one** of the following questions to answer, writing as much as you need for a thorough answer. *Enrolled students may complete both for extra credit.*

Students will choose either (a) or (b), or both for extra credit.

- a. Consider the meaning of behaving assertively. Think about your own life, and describe an example where you expressed, or wish you had expressed, assertive behavior.

Answers will vary, but assertive behavior is described on pp. 37–38.

- b. List the six steps for making decisions, and describe the importance of each one. Which of the steps do you feel you would be best at, and which are more challenging for you?

Answers will vary. The six steps are described on pp. 41–43: name the problem, describe the problem’s parts, brainstorm solutions, think about each solution, choose a solution and act on it, and evaluate the outcome.

6. What is the difference between personality and self-image?

Personality is “the characteristics of a person that are apparent to others.” Self-image is “the characteristics that a person sees in him/herself.” (p. 51) Students should expand on these definitions.

7. According to Maslow, what are some of the most basic human needs?

The most basic needs in Maslow’s hierarchy are physiological needs, such as the need for food, clothing, and shelter—the things necessary to survival. Safety needs are the next in importance; a person needs to feel safe and secure. (pp. 55–56)

8. Why is a negative body image so common in our society?

Society has promoted a certain body image, which leads people, especially teens, to compare their bodies to those of models, actors, or athletes. Advertisers repeatedly use thin, strong, and “sexy” images in their ads. Teens are the most susceptible to this media input, and as a result, often develop a negative body image of themselves. (p. 65)

9. Describe two benefits of peer groups and two potential drawbacks.

Peer groups can help teens not feel alone and recognize that others have the same feelings and fears. Peer groups allow each person to try out a newly emerging identity within the safety of the group. They give teens a feeling of belonging. Some drawbacks are that teens might ignore their own values in order to fit in with the crowd. Some peer groups will judge others harshly, or pressure an individual to be involved in unhelpful or negative behavior.

Activities and Essays

- A. Keep an emotion diary for two days. List the emotions you felt, the situations that prompted them, and the outlets you used to deal with them. Then write a concluding paragraph, where you summarize your experience, noting if there were any patterns (in the emotional triggers or the way you handled your emotions), whether you were happy with the way you handled them, ways you could improve on that, etc. Don't forget positive emotions! *Enrolled students only need to send the concluding paragraph to their teacher.*

Students will share their concluding paragraph for their emotion diary. Look for candid discussion of their experiences. Students' responses will likely vary widely, depending on the degree of comfort with sharing. The goal is to see that the student has given some thought to patterns with the way emotions are managed.

- B. Choose **one** of the following activities, writing as much as you need to be thorough:
1. Choose two of the gender stereotypes listed on page 62, and describe whether you have seen examples of them in your own life or the people around you.
 2. Analyze several ads in magazines or on TV, and determine if gender stereotypes are used to sell the product. Cut out or copy the magazine ad, or summarize the TV ad, describing the gender stereotype you see.

Answers will vary.

If using a written ad, students should submit a copy or describe it thoroughly, along with their responses.

- C. Choose **one** of the following activities:

Students will choose one of the suggested activities. Responses will vary.

1. People with high self-esteem appear "comfortable in their own skin." Describe someone you know who is like this, listing the qualities about the person that made you choose them.
2. Write a letter to yourself convincing you of your worth as a person. Tell why you are special, including your good points, talents, and skills.

Fitness Plan

This week you will start with your organized fitness plan. As mentioned in lesson 5, if you are not used to being active, ease into it!

- Toward the beginning of each week, record your resting heart rate. You can use the method outlined in the textbook chapter, or just use your heart rate monitor. Your resting rate should be measured when you are at complete rest. Early morning, when you are just waking up, is the best time.
- Try to do an aerobic activity most days of the week. Use the pyramid on page 246 of your textbook for general guidelines for your exercise plan.

- Don't forget to plan warm-up and cool-down time. Start and end your workout with some walking, light jogging, or a slow version of the activity you are doing.
- Incorporate some light stretching each time you do a workout. *It's important to warm up your muscles before stretching or doing strength exercises!* The order should be as follows: 10-minute warm-up, a minute of easy stretches (can be done standing), workout, 10-minute cool-down.
- Try to get at least 20 minutes in your target heart rate zone (120–140 bpm for most people). *Remember, you are not competing with anyone! The pace does not matter!* All that matters is your heart rate.
- Record your heart rate data in your fitness journal, along with other notes about how you feel, other exercise you get, etc.
- When you are using the HRM, it is best not to have other electronic devices, such as MP3 players, cell phones, bike computers, etc., in close proximity, as these could affect the function of the HRM. If you see readings that seem out of line with your activity, this could be a factor. Other things, such as strong electric fields from high-tension power lines, could also briefly change the reading.

Students should start getting regular exercise, and recording their results in their fitness journal. Fitness journals will not be submitted until the end of the semester, but check in with students to make sure things are going well, and to see if there are any questions.

SHARE YOUR WORK

Please share lessons 5 and 6 with your teacher.

Lesson

17

Food Additives and Processed Food

Our food is full of chemicals. Some of them come with the foods. They are in plants to help the plants ward off insects or fungal attacks. Humans have adapted to these chemicals over thousands of years, and as you have read in Michael Pollan's book and will read in *Spark*, some, such as antioxidants, have become essential to our health.

The modern diet has bombarded our bodies with a plethora of new, very foreign chemicals. They are words we can't pronounce, and that our bodies don't recognize. They are added to food (or "foodlike substances," as Pollan coins processed foods) to trick the brain, which relies on our system, highly defined through evolution, of recognizing what is good to eat and what is not. Consider who benefits from food additives. The food industry? The health-care industry? The consumers? One perspective is that consumers pay dearly for this extra flavor and convenience. But the "food" looks good (and colorful!), has a long shelf life and just the right texture, and tastes so good!

A visit to the local supermarket speaks volumes on the state of food and diet. Aisles are lined with shelves of packaged, processed, canned, dehydrated, and frozen foods. These make up the bulk of foods sold, as can be seen by the small area devoted to fresh foods.

Processed foods have many benefits that are, unfortunately, mostly nonnutritive. Although the FDA does require labeling of ingredients, the listed nutritive value of processed foods is routinely computed by adding the nutritive value of the ingredients *before processing*. Boiling, parboiling, baking, frying, or puffing reduces the nutritive value of most everything that was once alive and vibrant. Whenever dealing with processed foods, even minimally processed foods such as canned or frozen foods, you are usually getting less than you think you are.

Processed foods are exemplary of the hidden costs common to consumer products. These are costs that are not reflected in the price paid for the product. They are paid by the consumer in the form of ill health. Also, enormous waste is usually generated by convenience foods, as food packaging requires large amounts of metal, glass, paper, cardboard, and plastic. Increased energy needs for refining, processing, packaging, advertising, transportation, and storage also can lead to environmental degradation.

You are being asked to look at the big picture here. Consider the correlation between profit for the food industry and nutrition. Also, do you think the health-care industry profits from poor nutrition? What are the effects on the environment? Food has suddenly become a vast topic, and the food choices you make every day have ramifications far beyond your own physical body.

As you are reading in Pollan, consumers are gradually becoming aware of what is real food and what isn't. You can see it in the supermarket—the produce section has grown, and the organic section is not hard to find. But those center aisles are still full of processed foods of ever more creative colors, shapes, and textures, with ingredient labels that are not shrinking!

To clarify, any time food is cooked, it is processed to a certain extent. Although cooking is generally destructive to nutrients, it has an important place in the diet. It breaks down indigestible cellulose in plants, making the nutrients more available for absorption. Cooking can also destroy some relatively toxic substances in foods. Soybeans, for example, would not be digestible if they weren't cooked. So, while cooking can destroy some vitamins, it can also increase the digestibility of a food, making more vitamins available.

For the rest of this lesson, we will discuss the processing that greatly changes the nature of the food, such as what you get when you buy those colorful packages. The ingredients that you see on a food label are what were added during processing. Not included are the “behind the scenes” chemicals, such as the pesticides, antibiotics, and hormones that snuck into the ingredients during agricultural production. We will cover those in a later lesson.

Here is a list of some of the categories of food additives:

- Food colorings
- Preservatives
- Artificial flavorings
- Artificial sweeteners
- Flavor enhancers
- Thickeners, stabilizers, and emulsifiers

The health consequences of consuming food additives are complex and little understood, but it is generally agreed that the cumulative effects can be detrimental. Some of the suspected consequences are increased hyperactivity in children, higher risk of cancer, depressed immune system, allergic reactions, and increased risk of cardiovascular disease and other degenerative conditions.

By law, most food additives need to be included on the ingredients label, but not all. “Artificial flavors,” which are defined as anything added to food for flavor that is not taken directly from whole foods, do not need to be specifically identified. Some artificial colors are required to be specified, but only ones that are known to have caused allergic reactions in some people. On the flip side, we must consider that foods labeled with “natural flavors” aren't necessarily much better. Just because their contents come from foods doesn't mean the substances weren't isolated, extracted, distilled, or otherwise separated from their food source, such that they can be remarkably similar to something created from scratch in a lab!

There are several food additives that are relatively benign. These include fumaric acid, lactic acid, xanthan gum, guar gum, lecithin, monocalcium phosphate, calcium chloride, and others. Some of these

are preservatives, and others added for texture. It should be noted that some of these are extracted from corn, which has made its way into almost every food we eat. More on that in lesson 18!

Note: For lesson 18, there will be a video documentary to watch. Now might be the time to try to procure it, so you won't delay the lesson. You can get it from a library or Netflix.

Reading

- Pollan, pages 139–181

Questions

1. Why is the processed food industry reluctant to encourage people to eat whole, unprocessed foods?

The food industry doesn't make money on whole, unprocessed foods. The focus on nutrition, and new "breakthrough" studies, is helpful to the food industry, as it allows a continual new line of food products to be developed. Simply put, the processed food industry is just that—a processed food industry. (p. 141)

2. Write down Michael Pollan's rules of eating that he outlines in Chapter 2 of this section, "Eat Food: Food Defined." For each one, answer the question, "Why?"

1) Don't eat anything your great-grandmother wouldn't recognize as food. Two or three generations ago, none of the new processed foods had been developed, and food was generally fresh, whole, and perishable.

2) Avoid products containing ingredients that are unfamiliar, unpronounceable, more than five in number, or that include high-fructose corn syrup. All of these are red flags that the food could be highly processed. (Students may note that even most homemade foods have more than five ingredients, so this one would have to go in conjunction with the "unpronounceable" element of the ingredients.)

3) Avoid food products that make health claims. Any food that needs to make a health claim comes in a package and is likely to be a more processed food—a product of food science.

4) Shop the peripheries of the supermarket and stay out of the middle. Generally, the fresh and whole foods are on the edges of the food store.

5) Get out of the supermarket whenever possible. Try shopping at a farmer's market for fresh, local food. (pp. 148–161)

3. Give three reasons why we should "eat mostly plants, especially leaves."

Plant foods are loaded with different kinds of antioxidants that are so necessary for good health. They not only have the benefits listed in lesson 16, but they help the liver produce enzymes that break down toxins. It is likely that if you eat more vegetables, you will

consume fewer calories. Basing your diet on plants, and eating meat in smaller quantities, allows for excellent total nutrition. Most meat consumed comes from highly industrialized animal agriculture. (pp. 162–167)

4. What does Pollan mean when he says, “Be the kind of person who takes supplements”?

Many supplements are taken unnecessarily, and the supplement industry is big business. The point of the statement is that those people who think to take vitamins and food supplements are people who are somewhat conscious of their health. Be that kind of person: be conscious of your health, and put that energy into the food you eat. (p. 172)

Activities

This week’s activities start in the supermarket. Take a trip there, and plan to spend a little time. Read both activities before you start, so you can make a plan.

- A. As you walk around the store, pay close attention to the packaging of certain foods.

Students will visit a supermarket for this assignment.

1. What types of foods have the greatest amount of packaging? What types have the least? Give a few examples of each.

Generally, the processed foods have the most packaging: cereals, cookies, other highly processed snack foods, desserts, etc. Some cookies are in a plastic container inside a bag, which is inside a box. The least amount of packaging is found with the whole foods: produce, meats, cheeses, bags of beans and rice, etc.

2. What types of foods have the brightest and most eye-catching packaging? What foods have the plainest packaging? Give a few examples of each.

Cereals, cookies, chips, and snack foods, especially those targeted for children, have the brightest packaging. Even the processed foods in the natural food section can fall into this category. The plainest packaging is, once again, on the produce, meats, canned food, dry beans and rice, etc.

- B. Choose **one** of the following two activities:

- In the supermarket, your kitchen, and your refrigerator, examine at least ten processed or preserved foods that contain additives. Create a table, listing the foods, the chemical additives in them, and the purpose they serve in the food. Sometimes, the function of the food additive is included on the label. There are also extensive lists available on the internet that describe the functions of food additives. If you wish to make your presentation artistic or colorful, please do!
- Plan a healthy meal and cook it for your family or friends. In your planning, consider the source, packaging, price, and nutrition (including additives) of the foods you choose. Visit a supermarket or farmer’s market for any ingredients you need. Consider how far the food traveled to get to you, how it was grown, and how many processing steps were involved. Try to find locally grown and less-processed ingredients. Describe your food ingredients, your

menu, and your results. Was the meal a hit? Are there any changes you would make if you were to do this again?

Students will choose one of the activities, and create either a food-additive chart or a family meal. For the family meal option, the goal is to consciously choose the menu and the ingredients, thinking about the factors mentioned in the question. The manner in which the food was grown, the amount of processing, the number of ingredients, the amount of vegetables the meal contains (not just potatoes), and how far the ingredients have traveled should all be considered. Encourage local and organically grown foods, whole foods, etc.

Fitness Plan

Continue with your exercise activities and fitness journal. Again this week, practice visualization as a relaxation technique. Explore some more of the strength-building exercises that you started last week. The idea at this time is just to get to know some of the options that exist. We will explore strength building in much more depth in the second semester.

Students will continue with their fitness routine, and practice with visualization and the strength-building exercises for another week.

Lesson

30

Sexuality

Now we will continue the topic of the previous lesson, but among other things, we will talk about how to *prevent* pregnancy. Most teen pregnancies are unintended. It's likely that you haven't come this far in life without being introduced to the subject of birth control. Hopefully, this lesson will help answer any questions you might still have. Along with the topics of sexuality and birth control, we will explore how to reduce the risk of acquiring a sexually transmitted disease (STD).

Before you read the chapters, test your knowledge of the subject by reviewing (for yourself) the “Fact or Fiction” questions on pages 575 and 593, and checking your answers. Also, write down some questions you might have about sexuality. Now is the time to get answers; whether you find the answer in the textbook, do some research yourself, ask your teacher (Share Your Work), or talk to parents or other trusted adults, it's time to get informed! There are some good websites for information, such as the Planned Parenthood and CDC websites.

Reading

- Textbook, Chapter 21, pages 574–589, “Understanding Sexuality”
- Textbook, Chapter 22, pages 592–619, “Preventing Pregnancy and STDs”

Questions

1. Explain the statement, “People are sexual beings.”

Answers will vary. The statement is generally saying that sexuality is a major part of the human experience and of a person's personality. It affects all facets of life. (pp. 575–577)

2. Describe some important parts of an intimate relationship. How are these parts integrated when it comes to family planning?

An intimate relationship is one where two people are very close and familiar, and share feelings and emotions. It is a relationship based on trust, knowledge, and acceptance of each other. (p. 495, lesson 28) When it comes to sexuality, physical intimacy, and family planning, these attributes are very important. Trust, sharing, communication, and understanding are all crucial parts of decision making. (critical-thinking question; also p. 579)

3. What are some ways that sexual tension can be released without engaging in sexual intercourse?

Sexual tension can be released through masturbation and nocturnal emissions. (pp. 579–580)

4. Describe two sexual myths. Do you know of any others that aren't in the reading?

Sexual myths: Females prefer a male with a large penis; males prefer females with large breasts; sexual intercourse is a healthy path to commitment; male ejaculation must occur for a female to become pregnant. (pp. 583–585) Students might come up with their own myths as well.

5. What are some possible reasons for a lack of interest in sexual behavior?

A lack of interest in sexual behavior could be a result of poor communication between partners; an illness; or use of alcohol, drugs, or tobacco. (p. 584)

6. Why should you take the effectiveness rating of a contraceptive cautiously? What factors must be considered to get the maximum effectiveness?

The effectiveness rating of a contraceptive sometimes depends on the couple to use it perfectly, exactly as intended. If it is not done this way, the effectiveness will be much lower. Some contraceptive methods require a good fit, and most require that the instructions be followed exactly. Some require a high degree of awareness of cycles and timing. (pp. 596, 608)

7. Describe the possible relationship between use of the birth control pill and depression.

The use of the birth control pill over time may cause depression. Females who are feeling especially sad or moody and are on the pill might consider this. (pp. 600–601)

8. Match the terms below with the correct statement.

- | | | |
|-------------------------------|---------------|--------------|
| a. spermicide | d. diaphragm | h. condoms |
| b. fertility awareness method | e. abstinence | i. the patch |
| c. withdrawal method | f. vasectomy | j. the pill |
| | g. IUD | |

 e 1. Contraceptive method that is 100% effective in preventing pregnancy and STDs.

 b 2. A birth control method that requires diligent and careful tracking of a woman's menstrual cycle.

 a 3. Chemicals that kill sperm.

 d 4. A barrier contraceptive method that must be custom fitted for each user.

 h 5. The only contraceptive device that offers good protection against some STDs.

 i 6. A hormonal method of birth control which releases hormones through the skin.

 c 7. A notoriously unreliable birth control method.

- f** 8. A reliable and permanent contraceptive method that is commonly done when no more children are desired, and is not generally offered to young adults.
9. Describe some reasons couples don't use contraception, even if they don't want to become pregnant.

Some reasons include fear, embarrassment about purchasing contraceptives, lack of knowledge, and other risky behaviors such as drug or alcohol use. (pp. 618–619) Students will elaborate on these.

Activities

- A. Explore your feelings about homosexuality. If at all possible, discuss the topic with some friends or family members. Are you comfortable with homosexuality? Consider what it would be like if you realized that you were gay or lesbian. (If you are, then you know firsthand.) Consider what it would be like if your best friend confided in you that he or she was homosexual. When you put yourself in these situations, are you comfortable? Do you feel like you want to be comfortable, but aren't really? What do you think is blocking you? Are your feelings toward homosexual men different than those toward homosexual women? Many times, people choose to avoid the issue or make jokes about it. If you were able to vote for or against gay marriage in your state, how would you vote? Write a paragraph or two, discussing some of these questions.

Students will explore their feelings about homosexuality, and discuss the questions that are asked.

- B. Watch some TV sitcoms and make a tally of the sexual behavior that you see. Write what show you are watching, and keep count of the number of times sexual behavior is expressed both verbally and physically. Do you feel the numbers are realistic and in line with real life?

Students will watch TV sitcoms and keep track of sexual behavior, commenting on what they see.

- C. Choose **one** of the following activities, and write your findings:
1. Contact a family planning office near you and ask them to describe the services offered.
 2. Visit the Planned Parenthood or other family planning website. Find out what services and information they offer, and if there is a clinic near you.
 3. Contact a crisis pregnancy center near you and ask about the services they offer.
 4. Your friend Lisa has just found out she is pregnant. She is scared, and doesn't know what to do. She is also afraid to tell her boyfriend, who she feels will be caring but clueless about options. Describe what you might say and do to help Lisa.

Students will choose one of the activities to learn more about local resources for family planning and support. Even if students choose #4, a reference to the help available is encouraged.

Fitness Plan

You have probably noticed that we have given very little attention to stretching in this course. As mentioned in lesson 5, there is some debate about the value of stretching. While many advocates for stretching tout its benefits for preventing injury and soreness after exercising, it turns out that there is no evidence that it does either of these things.

Stretching is commonly done in a hurried manner, which can cause it to be more harmful than helpful. On the flip side, some people do excessive stretching, which also provides no benefit. We recommend you listen to your body! When you stretch a muscle, hold the stretch for 30 seconds. You do not need to hold it longer. Stretching should feel good, not be painful. In fact, all research aside, one of the most important benefits of stretching is that it feels good and is relaxing. That in itself goes a long way!

Listed below are some types of stretching:

- Dynamic stretching: This involves slow movement of a limb to the limits of its range of motion.
- Active stretching: This is when you hold a position with no other force than your own muscles. Yoga involves active stretching.
- Ballistic stretching: This is bouncing during a stretch. It is not recommended, as it is not beneficial and can lead to injury.
- Passive stretching: This is where you stretch a limb and hold it in position with some other part of your body (or object such as the floor or a chair).
- Isometric stretching: This is also known as resistance stretching, and is currently thought to be extremely beneficial. In this type, you add resistance to the stretch, such that you are contracting the muscle as you stretch it. The muscle is strengthened as it is stretched, and when the muscle relaxes, it has increased range of motion. This type of stretching is *not recommended* for people whose bones are still growing (this could be you!). It places a lot of demand on the tendons.

As a teenager you are most likely more flexible than you will be later in life. This is why we don't place a high focus on stretching. Light stretching is recommended after you warm up your muscles, as was mentioned back in lesson 6. If you do any yoga or whole-body flexibility work, keep doing it!

Continue with your usual routine, and spend another week focusing on the bridge and side plank exercises introduced last week. How do you feel?

Students will continue with their fitness routine. In this lesson, different types of stretching are introduced for students to become familiar with.

SHARE YOUR WORK

Please share lessons 29 and 30 with your teacher.



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