

# Integrated Health & Fitness

## Oak Meadow Teacher Manual

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# Lesson



## INTRODUCTION TO *Anatomy; Skeletal* AND *Muscular Systems*

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### Questions

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

2. **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. a. proximal

b. anterior

c. lateral

d. distal

e. deep

f. posterior

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

5. a. **Tendon:** a cord of strong fibrous tissue (connective tissue) that attaches a muscle to a bone

b. **Ligament:** a band of fibrous connective tissue that connects two bones or cartilages at a joint

- c. **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. Students should color the appropriate diagrams in *HACB*.
7. 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. Students will color the appropriate diagrams of the muscular system.
9. **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. 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

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

# Lesson



## Fats

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### Questions

*From Pollan:*

1. When the imitation food labeling rule was repealed, it opened the door for a new wave of food engineering. As long as the engineered food was “nutritionally equivalent,” it could be marketed as real food, not fake food. What was “adulteration” has now become “food science.” In the food industry, food science took over, and nutrients were sold, not foods. (p. 35)
2. The lipid hypothesis stated that the consumption of fat and dietary cholesterol was responsible for rising rates of heart disease. (p. 23—this is the reading for lesson 13; hopefully students won’t have forgotten it yet)
3. Trans fat raises bad cholesterol and lowers good cholesterol, increases triglycerides, promotes inflammation and possibly blood clotting, and may produce insulin resistance. Current thinking is that trans fat is far worse than saturated fat in the diet. (p. 44)
4. A good example of this is the Frito-Lay chips example on p. 52. It’s a game of wording and politics. Nutritionism favors new and more processed foods, and if the individual nutrients are promoted, the food can sound like a healthy food. (pp. 50–52)
5. Students’ discussions will vary. According to Pollan, the increase in obesity and diabetes is partly a result of politics: no longer can we be told to eat “less” of something. The wording now states to reduce the percentage of total calories that are fat. People did that by eating more carbohydrates, and by eating *more* low-fat foods. (pp. 50–52) As Pollan argues, fat has not been proven to be the culprit in the first place, but as a result of the fat scare, the huge increase in carbohydrate consumption has led to the obesity and diabetes epidemics. There is a theory that eating refined carbohydrates interferes with insulin metabolism in ways that promote overeating and fat storage in the body. (pp. 58–60)

6. There are numerous examples throughout the reading, such as on pp. 46–47, 50–51, 60–61, 68, 70, 73–74. This is a skills-based question, and students should be encouraged to notice the flaws Pollan brings out in the studies cited. Pollan is excellent at keeping the big picture in mind. Studies involving diet and lifestyle are all but guaranteed to result in inconclusive or disputable results.
7. Foods are composed of many nutrients that work together to make the whole food. Isolating them takes them away from the other substances that work synergistically with them in the food. An excellent example is the antioxidant discussed on pp. 63–64. Also, it must be considered that there are variations in individuals, based on genetics, ethnic origin, physiology, and intestinal ecology. (pp. 62–66)
8. Omega-3s play an important role in neurological development and processing (brain function), visual acuity, the permeability of cell membranes, glucose metabolism, and reducing inflammation. Omega-6s are involved in fat storage, clotting, and the inflammation response. It is the ratio of these fatty acids that is more important than the quantity of each. (pp. 125–126) Omega 3s also regulate heart rhythm. (p. 128)
9. The ratio is important because these fatty acids compete with each other for space in cell membranes and the “attention of various enzymes.” The ratio has shifted to more omega-6 fatty acids because of the shift to a grain-based diet for humans as well as the animals we eat. Omega-3s also spoil more readily, so the tendency in the food industry has been to reduce the amount of them in processed foods. The current ratio of omega-6 to omega-3 is about 10:1, whereas it used to be more like 3:1. (pp. 125–127)
10. Answers will vary.

### Activity

Students will start the food label project, using the table included with the lesson. The table will be completed in lesson 15.

### Fitness Plan

Students should be continuing with regular exercise. If the second progress test wasn't done last week, it should be done this week. The relaxation method introduced in lesson 13 should be practiced again this week.

## Lesson

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# Healing and Health Care

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### Questions

1. Medicare is hospitalization insurance for people who are receiving Social Security benefits. These are mostly senior citizens. Medicaid is insurance for low-income people who qualify financially. They are both federal programs. (p. 733)
2. It is always advisable to get a second opinion before any test or surgery. Very often, tests and surgery are performed unnecessarily. Health-care professionals often have nothing to lose and much to gain from this strategy. The opinions of different practitioners can vary widely. (p. 735)
3. The FDA oversees the manufacturers of food and drugs. All new drugs need to be approved by the FDA, and the FDA controls food labeling as well. (p. 734)
4. Allopathic medicine takes the responsibility for health away from the individual, and puts it on the doctor or health-care provider. The germ theory, drugs, the mastery of surgical techniques, as well as the notion that health care is something that is done from the outside by a trained specialist, have all taken the idea of personal responsibility away from the patient. In this process, the sense of individual empowerment has also been removed. People are no longer considered active in their own healing and health, but are bystanders that are acted upon. (coursebook reading)

### Research and Activities

- A. Students will choose one of the research topics to report on.
- B. Students will explore the media for issues related to health care, describing the various interests involved.

## **Fitness Plan**

Students will continue getting regular exercise. In addition, they should familiarize themselves with resistance bands and the exercise ball, two simple tools for additional strength building.