

The Human Body

Grade Level or Special Area: 5th Grade Science

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Length of Unit: Twelve lessons (45 minutes each), plus a Culminating Activity

I. ABSTRACT

This unit covers all of the content from the *Core Knowledge Sequence* on the Human Body for fifth graders. It is designed to be used alone, or in conjunction with the *Prentice Hall's Science Explorer Human Biology and Heath* textbook. This unit contains some explicit diagrams and information regarding the human body and reproduction. Read all items carefully and preview all information before beginning this unit. It is recommended that if you do not have the textbook that you may wish to copy the various Appendices and place them in a packet for the students to have when you start the unit. Letting the students know what you will be teaching about in advance, seems to reduce anxiety about the subject matter.

II. OVERVIEW

A. Concept Objectives

1. Students understand that many factors and body systems affect their growth and development.
2. Students discover the phases of human development from conception to adulthood.
3. Students understand the reasons for the physical and mental changes they will undergo during adolescence.
4. Students know and understand the characteristics and structures of living things, the processes of life and how living things interact with each other and their environments. (Colorado State Standard Life Science #3)

B. Content from the *Core Knowledge Sequence* (page 128)

1. The Human Body
 - a. Changes in Human Adolescence
 - i. Puberty
 - a) Glands and hormones, growth spurt, hair growth, breasts, voice change
 - b. The Endocrine System
 - i. The human body has two types of glands: duct glands (such as salivary glands), and ductless glands, also known as endocrine glands.
 - ii. Endocrine glands secrete (give off) chemicals called hormones. Different hormones control different body processes.
 - iii. Pituitary gland: located at the bottom of the brain, secretes hormones that control other glands, and hormones that regulate growth
 - iv. Thyroid gland: located below the voice box, secretes a hormone that controls the rate at which the body burns and uses food
 - v. Pancreas: both a duct and ductless gland, secretes a hormone called insulin that regulates how the body uses and stores sugar, when the pancreas does not produce enough insulin, a person has a sickness called diabetes (which can be controlled)
 - vi. Adrenal glands: secrete a hormone called adrenaline, especially when a person is frightened or angry, causing rapid heartbeat and breathing

- c. The Reproductive System
 - i. Males: testes, scrotum, penis, urethra, semen
 - ii. Females: ovaries, fallopian tubes, uterus, vagina, menstruation
 - iii. Sexual reproduction: intercourse, fertilization, zygote, implantation of zygote in the uterus, pregnancy, embryo, fetus, new born
- C. Content not from the *Core Knowledge Sequence*
 - 1. Multiple Births: identical and fraternal twins, triplets, quadruplets
 - 2. Infancy: physical changes, mental growth
 - 3. Childhood: physical changes, mental growth
 - 4. Adolescence: mental and social changes
- D. Skill Objectives
 - 1. Students will be able to explain the function of the endocrine system.
 - 2. Students will be able to define necessary vocabulary terms.
 - 3. Students will be able to correctly identify endocrine glands on a diagram and match each gland to its hormone.
 - 4. Students will be able to explain and give examples of homeostasis.
 - 5. Students will be able to demonstrate their recall of the endocrine system organs and their functions.
 - 6. Students will be able to identify the various parts of the male reproductive system and explain their functions.
 - 7. Students will be able to identify the parts of the female reproductive system and explain their functions.
 - 8. Students will be able to describe the changes that take place during the menstrual cycle. (Colorado State Standard Life Science 3.3c)
 - 9. Students will be able to demonstrate their knowledge of the endocrine systems glands, locations, and functions.
 - 10. Students will be able to know how babies are made.
 - 11. Students will be able to put in sequential order the various stages of pregnancy.
 - 12. Students will be able to chart various aspects of fetal growth.
 - 13. Students will be able to list the three stages in order of childbirth.
 - 14. Students will be able to compare and contrast singular and multiple births.
 - 15. Students will be able to develop a timeline from conception (zygote stage) highlighting the various phases of human development.
 - 16. Students will be able to identify the stages of infancy and childhood and be able to list characteristics of each.
 - 17. Students will be able to identify the endocrine system as the body system responsible for the changes of puberty and adolescence.
 - 18. Students will be able to identify when adolescence begins.
 - 19. Students will be able to identify three physical changes that occur during adolescence.
 - 20. Students will be able to learn that everyone develops at different times and rates.
 - 21. Students will be able to give examples of the changes that take place throughout the human life span. (Colorado State Standard Life Science 3.3c)
 - 22. Students will be able to define peer pressure and give examples of it, both positive and negative.
 - 23. Students will be able to understand the physical changes their bodies are undergoing, or will undergo, during puberty.
 - 24. Students will be able to review the information and concepts learned in this unit and demonstrate that knowledge on the unit test.

III. BACKGROUND KNOWLEDGE

- A. For Teachers
 - 1. *Science Explorer Human Biology and Health*, Prentice Hall
 - 2. *Always Changing* Video (Order in advance at www.pgschoolprograms.com)
 - 3. Walker, Richard. *Encyclopedia of the Human Body*
- B. For Students
 - 1. The Human Body, Body Systems (1st Grade, 2nd Grade, 3rd Grade, 4th Grade)
 - 2. Cycles in Nature (2nd Grade)
 - 3. Cells (5th Grade)
 - 4. Life Cycles and Reproduction (5th Grade)

IV. RESOURCES

- A. Prentice Hall's *Science Explore Human Biology and Health* (all Lessons, if available)
- B. http://www.phschool.com/science/ca_sci_exp_transparencies/index.html (transparencies for various lessons)-this has free, downloadable, color transparencies for this unit.; select Transparency #22-Endocrine System, #23-Male Reproductive System, and #24 Female Reproductive system
- C. Arnold, Tedd. *Parts* (book for Lesson One)
- D. *Nova: The Miracle of Life* (video for Lesson Six)
- E. *The Always Changing 5th Grade School Program and Video* (video for Lesson Twelve)
- F. Various Appendices located at the end of this unit

V. LESSONS

Lesson One: The Endocrine System (45 minutes)

- A. *Daily Objectives*
 - 1. Concept Objective(s)
 - a. Students understand that many factors and body systems affect their growth and development.
 - 2. Lesson Content
 - a. The Endocrine System from *Core Knowledge Sequence* page 128
 - i. The human body has two types of glands: duct glands (such as salivary glands), and ductless glands, also known as endocrine glands.
 - ii. Endocrine glands secrete (give off) chemicals called hormones. Different hormones control different body processes.
 - 3. Skill Objective(s)
 - a. Students will be able to explain the function of the endocrine system.
 - b. Students will be able to define necessary vocabulary terms.
- B. *Materials*
 - 1. *Parts* by Tedd Arnold
 - 2. *Prentice Hall's Science Explorer Human Biology and Health* book, if available
 - 3. Basket or box to put question slips into each day
 - 4. Scrap paper
 - 5. Each student needs to have five index cards for vocabulary
- C. *Key Vocabulary*
 - 1. Puberty- time of development, usually during the teenage years, when a child becomes an adult and is able to reproduce
 - 2. Endocrine System- a body system that controls daily activities and long-term changes such as development
 - 3. Endocrine Glands- organs that produce chemicals and release those chemicals directly into the bloodstream

4. Hormones- the chemical products of endocrine glands; they control the activities of many different organs and glands
5. Target Cells- certain cells that recognize and accept a hormone's chemical structure

D. *Procedures/Activities*

1. Prior to beginning this unit you should consider discussing this unit with your administrator to make sure you are following what your particular school expects to be taught and to make sure you are covering material that may be required by your district. You may also consider sending out a letter to your classroom parents/guardians to let them know what you will be teaching and when. Respect that this is personal subject matter and parents may have concerns. Do your best to listen and assist the parents. Two suggestions: have a copy of the information you will be teaching or any books available to parents in advance to preview, and suggest that students take their books and/or materials home themselves to go over the unit with a parent.
2. Prior to beginning this unit you could also ask parents to send in a baby picture of their child for a bulletin board display. Ask them to label the picture on the back, so that the other students will have to guess who is who.
3. For your convenience, the Appendix R, "Master Vocabulary List" is available. It lists all of the vocabulary words for this unit in the order in which they are taught.
4. To begin the first lesson read *Parts* out loud to the class. Explain that, like the kid in *Parts*, if we do not understand what our bodies are doing we can be confused and scared. Since they already are, or will soon be, entering puberty it is important that they understand what is happening to them physically and why these changes occur.
5. Explain that in this unit we will be discussing several topics that are very personal. Let them know you want to help them understand and answer their questions. They can ask questions out loud, or may write them down anonymously and put them in the basket. Point out where the basket will be located and let them know scrap paper will be by it for their use. Questions will be answered daily as they relate to the various topics.
6. Give ground rules for discussions including:
 - a. No teasing.
 - b. Use the correct terms for items, not nicknames.
 - c. Talk to an adult you trust if you aren't comfortable talking in class.
 - d. Relax!
 - e. Be respectful.
7. Explain that we will be previewing the entire chapter and looking at the section titles and diagrams so that there are no surprises.
8. Preview the chapter in the *Prentice Hall's Science Explorer Human Biology and Health* textbook, or any handouts/booklets you will give the students. These handouts may come from the Appendices at the end of this unit. Answer questions as needed.
9. Mention that as boys and girls their bodies have some things in common and some things that are different. We will be learning about both male and female body parts and their functions.
10. Explain that this unit will be divided into three main sections: The Endocrine System, 2. The Reproductive System and Pregnancy, and 3. Human Development with an emphasis on Adolescence.

11. Ask students if they've ever been on a roller coaster, or been really scared by something unexpected. Ask them to tell briefly what physical reactions their bodies had. (i.e. heart pounding, out of breath, etc.) Explain that that reaction was probably triggered by their adrenal gland giving off a chemical called adrenaline. This is one part of the endocrine system. Define the vocabulary terms out loud, and on the board. Have the students copy down the definitions on their index cards with the term on one side and the definition on the other. Explain that they will be adding to their cards each day and should plan to have them in class everyday as well. These cards will be their tools for studying and completing other unit activities.
 12. If you have the textbook, *Prentice Hall's Science Explorer Human Biology and Health Textbook*, read, as a class, pages 226-227. Otherwise discuss the following information with the students.
 - a. Hormone Production: Explain the cycle used- the nervous system receives an impulse and interprets it. A signal is sent from the nervous system to a specific endocrine gland. The gland then releases its hormones into the bloodstream where it affects specific organs. This can be an instantaneous reaction, like an adrenaline when you are scared, or slowly over time such as puberty.
 - b. Target Cells: How come hormones don't affect all organs? The hormones will only interact with certain types of cells, called target cells, and will travel through the bloodstream until they lock in to the ones they are looking for.
 13. Let students know that tomorrow they will be learning about all the glands in the endocrine system and what jobs they do.
- E. *Assessment/Evaluation*
1. Quickly review the vocabulary terms as a class. Call out the word and have the students recite the proper definitions as a class.
 2. Pass out scrap paper to each student and allow him or her time to write down any questions they may have to put in the basket.

Lesson Two: The Endocrine System: Glands and Hormones (45 minutes)

- A. *Daily Objectives*
1. Concept Objective(s)
 - a. Students understand that many factors and body systems affect their growth and development.
 2. Lesson Content
 - a. The Endocrine System from *Core Knowledge Sequence* page 128
 - i. Pituitary gland: located at the bottom of the brain, secretes hormones that control other glands, and hormones that regulate grow
 - ii. Thyroid gland: located below the voice box, secretes a hormone that controls the rate at which the body burns and uses food
 - iii. Pancreas: both a duct and ductless gland, secretes a hormone called insulin that regulates how the body uses and stores sugar, when the pancreas does not produce enough insulin, a person has a sickness called diabetes (which can be controlled)
 - iv. Adrenal glands: secrete a hormone called adrenaline, especially when a person is frightened or angry, causing rapid heartbeat and breathing

3. Skill Objective(s)
 - a. Students will be able to correctly identify endocrine glands on a diagram and match each gland to its hormone.
 - b. Students will be able to explain and give examples of homeostasis.
- B. *Materials*
 1. Each student will need yesterday's vocabulary cards as well as eleven more blank cards
 2. Copy of Appendix B "Exploring Our Endocrine Systems for Students" for each student
 3. Copy of Appendix A "Exploring Our Endocrine Systems for Teachers" transparency
 4. *Prentice Hall's Science Explorer Human Biology and Health* book, if available
- C. *Key Vocabulary*
 1. Secrete- to give off, or release
 2. Hypothalamus- a tiny section of the brain in the middle of your head that links the nervous system and the endocrine system; it controls the pituitary gland; it does not produce its own hormone
 3. Pituitary Gland- regulates growth, blood pressure and helps to control other endocrine glands; it is located in the brain; it does not produce its own hormone
 4. Thyroid Glands- are located below the voice box; these glands control the release of energy from food
 5. Parathyroid Glands- are tiny glands near the thyroid that control the levels of calcium in the blood
 6. Adrenal Glands- are located near the kidneys and release several different hormones including adrenaline; adrenaline helps the body respond to emergencies
 7. Pancreas- helps with digestion and produces the hormones of insulin and glucagons with control the amounts of sugars in the blood stream; it is located near the kidneys
 8. Ovaries- release the female sex hormones called estrogen and progesterone; they help trigger the female's body to produce eggs
 9. Testes-release the male sex hormone called testosterone; it is needed for the male to produce sperm
 10. Homeostasis- is how a person's organs stay stable even when things outside the body change
 11. Negative feedback- when a system is shut off because of the situation or condition it creates
- D. *Procedures/Activities*
 1. Before beginning the lesson, copy Appendix A "Exploring Our Endocrine Systems for Teachers" and Appendix B "Exploring Our Endocrine Systems for Students" onto transparencies.
 2. Verbally review yesterday's terms and definitions.
 3. Read the anonymous questions from the basket out loud. Answer any relevant questions. Let students know if their question will be answered later in the week.
 4. Go over Key Vocabulary terms and definitions and have students copy them onto their index cards like yesterday. Answer questions as needed.
 5. Pass out a copy of Appendix B "Exploring Our Endocrine Systems for Students" to each student.
 6. Put the Appendix A "Exploring Our Endocrine Systems for Teachers" transparency onto an overhead projector. Say each gland's name out loud as you

- point out its location. Have students repeat the name out loud. Give the definition out loud for each gland.
7. Have the students fill out the gland locations on their Appendix B “Exploring Our Endocrine Systems for Students” papers.
 8. Read *Prentice Hall’s Science Explorer Human Biology and Health* pages 228-230, if available. If you do not have this book the following information should be helpful.
 - a. Discuss homeostasis and the phrase “negative feedback.” Explain how the body is like a thermostat in the classroom. There is an ideal setting/temperature that we want the room to be. We set the thermostat to that temperature. When the temperature in the room drops below that, then the heater comes on. When the room heats up to the correct temperature, the thermostat sends a signal to the heater to shut off. This is called negative feedback because it is turned off by the condition it creates. In their bodies a signal is sent to release a hormone. Once enough of the hormone is released the endocrine system sends a signal to the right gland to stop secreting the hormone.
 - b. Ask students to imagine what would happen if the thermostat stopped working. Ask them to then imagine what would happen if their internal endocrine system or glands did not turn off (stop releasing hormones). Ask them what could happen with too much adrenaline? Insulin? Growth hormones?
 9. Have students get with a partner and combine their vocabulary cards. Have them put one set of cards with the term facing up and the other set with the definition side up. Tell them to spread the cards around and then try and match up the term with its definition like playing the game Concentration. Play for five to ten minutes as a review.
 10. Let students know that there will be a quiz over the endocrine glands, their locations, and functions during Lesson Five so that they may begin studying.
- E. *Assessment/Evaluation*
1. Place the Appendix B “Exploring Our Endocrine Systems for Students” transparency on the overhead and point to each gland’s location. Call on students to name each gland without looking at their papers.
 2. Ask for volunteers to explain and give examples of homeostasis.

Lesson Three: The Male Reproductive System (45 minutes)

- A. *Daily Objectives*
1. Concept Objective(s)
 - a. Students understand that many factors and body systems affect their growth and development.
 2. Lesson Content
 - a. The Reproductive System from *Core Knowledge Sequence* page 128
 - i. Males: testes, scrotum, penis, urethra, semen
 3. Skill Objective(s)
 - a. Students will be able to demonstrate their recall of the endocrine system organs and their functions.
 - b. Students will be able to identify the various parts of the male reproductive system and explain their functions.
- B. *Materials*
1. Copies of Appendix C “Endocrine Chart”, Appendix D “Endocrine Chart for Students”, and Appendix E “Male Reproductive System” for each student

2. Students will need the vocabulary cards they made from Lessons One and Two as well as twelve more blank cards
 3. Students will also need their Appendix B “Exploring Our Endocrine Systems for Students”
 4. *Prentice Hall’s Science Explorer Human Biology and Health* book, if available
- C. *Key Vocabulary*
1. Egg- the female sex cell; human eggs have no shell
 2. Sperm- the male sex cell; its job is to fertilize the female eggs; it looks kind of like a tadpole with a head and tail
 3. Fertilization- is when the egg and sperm join
 4. Reproduction- the process of creating new individuals of the same species
 5. Zygote- the fertilized egg
 6. Chromosomes- rod-shaped structures in the sex cells that carry the inherited characteristics like eye and hair color
 7. Testes- oval-shaped organs in male where sperm is produced; one is called a *testis*
 8. Testosterone- the male sex hormone that controls things like chest hair and deep voices
 9. Scrotum-the pouch of skin outside the body that holds the testes
 10. Penis- male sex organ
 11. Urethra-the tube sperm and urine use to leave the male’s body
 12. Semen-a mixture of sperm cells and fluid
- D. *Procedures/Activities*
1. Read the anonymous questions out loud. Answer any relevant questions. Let students know if their question will be answered later in the week.
 2. Read *Prentice Hall’s Science Explorer Human Biology and Health* pages 231-233 aloud and answer any questions. If you do not have this book use Appendix E “The Male Reproductive System” for a diagram and explain the function of each part. Using Appendix E, go over Key Vocabulary terms and definitions and have students copy them onto their index cards like yesterday. Answer questions as needed.
 3. Also share that the purpose of the male reproductive system is to produce sperm and testosterone. Testosterone is responsible for males growing facial hair, deeper voices, broad shoulders, and sperm.
 4. Boys begin producing sperm when they are teenagers. The sperm form and are stored in the testes. Their tails help them to move and travel in the fluids called semen. They move through a series of tubes to the penis where they can be released through the urethra.
 5. Urine does also pass out of the body through the urethra, but not at the same time as sperm.
 6. Answer questions as needed.
 7. Pass out Appendix D “Endocrine Chart.” Let students work with a partner or alone for about 10 minutes to fill in the blanks based on their vocabulary cards and Appendix B “Exploring Our Endocrine Systems for Students.” Let them know that they will be responsible to know this information on the unit test.
- E. *Assessment/Evaluation*
1. Collect and grade the Appendix D “Endocrine Chart for Students” to confirm that students understand the glands and their functions. Use Appendix C “Endocrine Chart for Teachers” as an answer key.
 2. Call out various vocabulary definitions and have the class respond as a whole to give you the proper term.

Lesson Four: The Female Reproductive System (45 minutes)

A. Daily Objectives

1. Concept Objective(s)
 - a. Students understand that many factors and body systems affect their growth and development.
2. Lesson Content
 - a. The Reproductive System from *Core Knowledge Sequence* page 128
 - i. Females: ovaries, fallopian tubes, uterus, vagina, menstruation
3. Skill Objective(s)
 - a. Students will be able to identify the parts of the female reproductive system and explain their functions.
 - b. Students will be able to describe the changes that take place during the menstrual cycle. (Colorado State Standard Life Science 3.3c)

B. Materials

1. Students will need all vocabulary cards completed so far, as well as eight more blank cards
2. One copy of Appendix F “Female Reproductive System” copied on a transparency
3. *Prentice Hall’s Science Explorer Human Biology and Health* book, if available

C. Key Vocabulary

1. Ovaries- they are located slightly below a female’s waist with one on each side; their job is to produce egg cells
2. Estrogen- a female hormones that triggers the changes to become an adult woman
3. Fallopian Tubes/Oviducts- the passageways for eggs to go through from the ovaries to the uterus; fertilization usually occurs here
4. Uterus- a hollow pear-shaped organ where the baby grows inside its mother
5. Vagina- is a passageway out of a woman’s body; it is also called the birth canal because it is where the baby comes out
6. Menstrual Cycle- a monthly cycle of changes in the female reproductive system
Ovulation- the time of the month when the egg is released from the ovary to the oviduct
7. Menstruation- the process of the extra blood and uterine lining passing out of the body through the vagina; it is often called a period

D. Procedures/Activities

1. Prior to class copy Appendix F “Female Reproductive System” onto a transparency. You may want to consider copying it onto paper for the students so they each have a copy for reference if you are not using the textbook. It is your choice.
2. Check the basket and read the new anonymous questions out loud. Answer any relevant questions. Let students know if their question will be answered later in the week.
3. Return graded Appendix C “Endocrine Chart” worksheets. Have students make any necessary corrections. Remind them to keep these worksheets and to begin studying them, as well as the Appendix B “Exploring our Endocrine System for Students” worksheets for the final unit test.
4. Read *Prentice Hall’s Science Explorer Human Biology and Health* textbook pages 231-233 aloud and answer any questions. If you do not have this book, use the following information.

5. Put the transparency copy of Appendix F “Female Reproductive System” onto the overhead.
 6. Using the transparency point to each part, say its name, and have the students repeat the name to make sure everyone can pronounce things properly.
 7. Have students copy down the lessons vocabulary terms and definitions onto their index cards.
 8. Information for discussion:
 - a. The purpose of the female reproductive system is to make eggs and to take care of a developing baby until it is born. The eggs are created and stored in the ovaries, which comes from the word *ova*, meaning eggs.
 - b. Estrogen is one of the female sex hormones that helps to produce the eggs. It also is responsible for changing a girl’s body into a woman’s body. It causes a female’s hips to widen and breasts to develop. The breasts develop so that they can produce milk for newborn babies.
 - c. The eggs travel from the ovaries through the oviducts, or fallopian tubes, to the uterus, or womb. If the egg gets fertilized, then the baby will grow in the uterus. It does not grow in the mother’s stomach. They are two separate organs.
 - d. Every month an egg travels from the ovary to the uterus. As it does that the uterus lining begins to thicken. If it is not fertilized, then it and the lining will break down and pass out of the female’s body with extra blood. This is called menstruation, or having a period. Usually having a period lasts four to six days. Females start this process at different ages usually between ten and fourteen years old. It continues monthly, unless you are pregnant, until about age fifty. A period does not hurt, like it would if you cut yourself, even though you see blood. Inform the girls that they will be learning about this during lesson eleven when the boys and girls separate to watch some videos.
 9. Remind students to write down any questions they may have and put them in the basket.
- E. *Assessment/Evaluation*
1. Put the transparency for Appendix F “Female Reproductive System” back on the overhead. Point to various items on the transparency and say their names. Call on students to identify the functions of the items.

Lesson Five: Conception (45 minutes)

- A. *Daily Objectives*
1. Concept Objective(s)
 - a. Students discover the phases of human development from conception to adulthood.
 2. Lesson Content
 - a. The Reproductive System from *Core Knowledge Sequence* page 128
 - i. Sexual reproduction: intercourse, fertilization, zygote, implantation of zygote in the uterus, pregnancy,
 3. Skill Objective(s)
 - a. Students will be able to demonstrate their knowledge of the endocrine systems glands, locations, and functions.
 - b. Students will be able to know how babies are made.
- B. *Materials*
1. Copy of Appendix G “Endocrine System Quiz” for each student
 2. Copy of Appendix H “How a Baby is Conceived” on a transparency

3. Each student will need four index cards for vocabulary
- C. *Key Vocabulary*
1. Intercourse- the act of a man inserting his penis into a woman's vagina; this is often called sex
 2. Conception- the moment a new life begins once an egg is fertilized
 3. Zygote-a single new cell formed when the nucleus of a sperm cell joins the nucleus of an egg cell; it contains the genetic information from both parents
 4. Abstinence- the decision to not have sexual intercourse until older, or married
- D. *Procedures/Activities*
1. Pass out copies of "Endocrine System Quiz." Have students complete the quiz and turn it in according to your standard procedures.
 2. Answers to Quiz:
 1. pituitary gland
 2. link nervous systems and endocrine systems; controls pituitary gland
 3. thymus
 4. adrenalin
 5. pancreas
 6. parathyroid glands
 7. thyroid
 8. ovaries; estrogen and progesterone
 9. testes
 3. After everyone has passed in the quizzes and you are ready begin the instruction portion of this lesson.
 - a. Where do babies come from? Tell the students they may wonder how the sperm from the male reaches the egg from the female. This is called intercourse. Write the definition on the board and have students copy it onto an index card. You can explain how this occurs in your own words, or read the follow excerpt from *The Body and How It Works*, by Steve Parker.
 - i. "As a couple kiss and caress each other, the man's penis becomes larger and stiff, or 'erect', and the woman's vagina becomes firmer. The man slides his penis into the woman's vagina and the muscles around his urethra contract, sending out about 300 million sperm in a milky liquid called semen. Like tadpoles, sperm have long tails to help them swim. They find the entrance to the womb (uterus) and swim up through it into the egg tubes (oviduct/fallopian tubes). The egg cell gives off a chemical that works like a homing device, helping the sperm find the way. Once a surviving sperm reaches the egg, it will penetrate the outer membrane and fertilize it."
 - b. When that happens the egg's outer membrane will no longer allow other sperm to come into it. When the egg is fertilized we say that they have conceived a baby. It is called conception. Write conception and its definition on the board for the students to copy. When the egg is fertilized it is called a zygote. Write the definition of zygote on the board for the students to copy down onto their cards.
 4. Put the Appendix H "How a Baby is Conceived" transparency on the overhead and point out the various parts so that students understand the diagram.
 5. Why do people do this? The basic purpose of intercourse is to reproduce. Students may wonder why people have intercourse when they are not trying to have a baby. Inform them that it is also something that feels good to the people

doing it. Tell them that this is basically the only way to get pregnant and that they need to be aware if they choose to have intercourse, they may produce a baby. They do need to know that a person can become pregnant the first time they have intercourse.

6. Messages about Sex- If you are comfortable, ask students what messages they see or hear about intercourse, or sex. Ask them what movies, television, or songs say. Do they mention babies, or is it all about feeling good?
7. Responsibilities and Consequences- This would probably be an appropriate time to discuss the responsibilities and consequences of having sex. They do need to understand that they can make choices to have sex or wait. Write abstinence on the board and its definition and have the students copy it onto a card. You can ask them if they think they are ready to raise a baby. Would they be ready in middle school? High school? Discuss reasons why it would be a good idea to wait until they are older or married. (Remember that they are only eleven or twelve years old! You know your class and their parents. Only discuss what is appropriate.)

E. *Assessment/Evaluation*

1. Pass out scrap paper to each student and let him or her write down any questions he or she may have. Use the questions to help you assess the class as a whole's understanding of the subject matter. Answer the questions and clarify any misunderstandings. Use the questions to help you know what you still need to teach, or review with the class.
2. It is okay to let students know if a question is inappropriate to the classroom, but do so gently. You can say something like, "Someone in the class has a question about _____. I would prefer to discuss this subject with the person privately. Please see me later if that was your question. If you are not comfortable with that, then I may have to suggest you speak with another adult, preferable your parent. Thank you."
3. It is also okay to let students know if you do not know the answer to a question. You can always refer them to their parents, the school nurse, or their family doctor.

Lesson Six: Pregnancy (45 minutes)

A. *Daily Objectives*

1. Concept Objective(s)
 - a. Students discover the phases of human development from conception to adulthood.
 - b. Students know and understand the characteristics and structures of living things, the processes of life and how living things interact with each other and their environments. (Colorado State Standard Life Science #3)
2. Lesson Content
 - a. The Reproductive System from *Core Knowledge Sequence* page 128
 - i. Sexual reproduction: fertilization, zygote, implantation of zygote in the uterus, pregnancy, embryo, fetus
3. Skill Objective(s)
 - a. Students will be able to put in sequential order the various stages of pregnancy.
 - b. Students will be able to chart various aspects of fetal growth.

B. *Materials*

1. Each student will need five more index cards for vocabulary
2. Each student will need a copy of Appendix J "Stages of Pregnancy for Students"

3. Each student will need a set of colored pencils and a ruler to fill in the worksheet
4. One copy of Appendix I “Stages of Pregnancy for Teachers” on a transparency
5. Gram weights to show the weight of the baby at different stages from one gram to as high as you can up to 3,200 grams, if possible
6. *Prentice Hall’s Science Explorer Human Biology and Health* book, if available
7. Optional Extension/Integration activity: have internet access to see the site www.visembryo.com/baby

C. *Key Vocabulary*

1. Pregnancy- the time from conception to birth, or when the baby is in the mother
1. Embryo- what a developing baby is called for the first eight weeks
2. Amniotic sac- a fluid filled sac that surrounds the baby in the womb (uterus)
3. Placenta- a membrane containing blood vessels that nutrients, waste and oxygen pass through from the mother to the baby during pregnancy
4. Umbilical cord- a ropelike tube from the embryo to the placenta that links the baby and mother
5. Fetus- what a baby is called from the ninth week until birth

D. *Procedures/Activities*

1. Before you begin the lesson, copy Appendix I “Stages of Pregnancy for Teachers” onto a transparency.
2. If you are planning on showing *The Miracle of Life*, or other video, be sure you have previewed it and cued it to the proper starting point. There are some really neat parts in this video, but one hour of it is too much. There is a really neat section that shows the developing baby at about four months that the kids would probably like to see. By the way, it does show all of the birth process at the end in great detail. It’s interesting, but probably not appropriate for class.
3. If you have not made all the Appendices into a packet for the students beforehand, then pass out Appendix J “Stage of Pregnancy for Students” to each student.
4. As you go through this lesson be writing the terms and definitions on the board as you get to them and have the students copy them onto their index cards.
5. Read and discuss *Prentice Hall’s Science Explorer Human Biology and Health* textbook pages 237-239, or just share the following information.
6. As you go through this section have the students label the worksheet.
7. Share with the class:
 - a. Pregnancy begins with the zygote, or fertilized egg. Once it reaches the uterus and attaches, or implants, itself it will begin to grow. At this time and for the next two months it is called an embryo.
 - b. The embryo develops inside a fluid-filled sac called the amniotic sac. Another membrane develops besides the amniotic sac. It is called the placenta. It is the link from the embryo to the mother for the embryo to receive nutrients and oxygen from the mother, as well as allowing the embryo to get rid of wastes and carbon dioxide.
 - c. Eventually the umbilical cord develops between the embryo and the placenta. This was attached to you at what is now called your belly button, or navel.
 - d. Although the embryo is developing its on blood vessels and organs, it is totally affected by what the mother does and takes into her body. Smoking, drinking alcohol, taking drugs and more can really harm the baby.
 - e. Staring at the ninth week and until the baby is born it is called a fetus. At first it is only about the size of a walnut, but it will grow rapidly. Its

head makes up about half its entire body size. Imagine what you would look like if your body were half the size of your total height! Just a month later, or the end of the third month of pregnancy, the baby will be about nine cm long and weigh about twenty-six grams.

- f. Between four and six months the fetus begins to look more like a baby. At the beginning of the fourth month it has developed its internal organs, fingers, toes, and dark eye patches. Over the next two months it begins to move around and kick. Its bones become distinct, and muscles develop. It grows hair over its body. By the end of the sixth month its body is about 20 centimeters long.
 - g. During the last three months the fetus is getting ready to survive outside the mother. Its brain and lungs develop more and it can even open its eyes. It grows eyelashes and eyebrows and doubles in length to about 40 centimeters long.
- 8. Finish filling in any blanks on the worksheet and any definitions the students still need to finish. Using the colored pencils, have the students color in the diagrams.
 - 9. Watch the video.
 - 10. Optional integration/extension: Have students go the website www.visembryo.com/baby and click on the spiral to see the baby at different stages of growth.
- E. *Assessment/Evaluation*
- 1. Collect and grade the worksheets. You may do this the next day if students want more time to finish coloring in the pictures.

Lesson Seven: Birth (45 minutes)

A. *Daily Objectives*

- 1. Concept Objective(s)
 - a. Students discover the phases of human development from conception to adulthood.
- 2. Lesson Content
 - a. The Reproductive System from *Core Knowledge Sequence* page 128
 - i. Sexual reproduction: pregnancy, fetus, new born
 - b. Multiple Births: identical and fraternal twins, triplets, and quadruplets
- 3. Skill Objective(s)
 - a. Students will be able to list the three stages in order of childbirth.
 - b. Students will be able to compare and contrast singular and multiple births.
 - c. Students will be able to develop a timeline from conception (zygote stage) highlighting the various phases of human development.

B. *Materials*

- 1. Copy of Appendix K “Stages of Birth” copied onto a transparency
- 2. Each student will need five more index cards for vocabulary
- 3. Each student will need a copy of Appendix L “Timelines Assignment and Rubric”
- 4. Scissors for each student
- 5. Colored pencils for each student
- 6. *Prentice Hall’s Science Explorer Human Biology and Health* book, if available

C. *Key Vocabulary*

- 1. Contractions- a tightening of the uterus’s muscles
- 2. Labor- the first stage of birth when contractions begin

3. Delivery-when the baby comes out of the uterus, through the vagina, and out of the mother
 4. Afterbirth- contractions after delivery that push the placenta out of the mother
 5. Multiple Births-having more than one baby at a time
- D. *Procedures/Activities*
1. Prior to this lesson be sure to copy Appendix K “Stages of Birth” onto a transparency.
 2. As you go through this lesson be writing the terms and definitions on the board as you get to them and have the students copy them onto their index cards.
 3. Read and discuss *Prentice Hall’s Science Explorer Human Biology and Health* textbook pages 240-241, or just share the following information.
 4. Share with the class:
 - a. After the baby has developed for about nine months in the mother’s womb, it is ready to be born. There are three stages of the birth process. They are labor, delivery, and afterbirth.
 - b. The first stage is labor. The uterus begins to tighten in what are called contractions. These contractions are painful and happen more often and the labor goes on. Contractions cause the amniotic sac to break. The fluid from the sac comes out of the mother through her vagina. People say that the “water broke.” The length of labor is different for every woman. Some women are only in labor for two hours, while others labor may last longer than twenty hours.
 - c. The second stage is delivery. This is when the baby leaves the uterus, goes through the vagina and out of the mother’s body. Usually the baby comes out headfirst.
 - d. The third stage is called afterbirth. This usually occurs within a half hour of delivery. This is when the placenta and the rest of the umbilical cord come out of the mother.
 - e. Sometimes a woman had more than one baby at a time. These are called multiple births. In America, one set of twins is usually born for every ninety births. Triplets occur in one out of 7, 000 births.
 - f. There are two types of twins, identical and fraternal. Identical twins grow from a single egg. Identical twins are always the same sex, meaning both boys, or both girls. Fraternal twins occur when more than one egg is released and different sperm fertilizes both eggs. These twins may be both boys, both girls, or one of each. If you see a boy and a girl that are twins they are fraternal twins, even if they look a lot alike.
 5. Begin working on Appendix L “Timelines Assignment and Rubric.” Go over the directions given on the worksheet. They should complete the stages through birth today. Be sure to fill in when the project is due. One suggestion is to have it due at Lesson Ten.
- E. *Assessment/Evaluation*
1. The “Timelines” final project will be the assessment for this lesson. See Appendix L “Timelines Assignment and Rubric.”

Lesson Eight: Developmental Stages: Infancy and Childhood (45 minutes)

- A. *Daily Objectives*
1. Concept Objective(s)
 - a. Students discover the phases of human development from conception to adulthood.

2. Lesson Content
 - a. Infancy: physical changes and mental growth
 - b. Childhood: physical changes and mental growth
3. Skill Objective(s)
 - a. Students will be able to identify the stages of infancy and childhood and be able to list characteristics of each.
 - b. Students will be able to develop a timeline from conception (zygote stage) highlighting the various phases of human development.
- B. *Materials*
 1. Each student will need Appendix L “Timelines Assignment and Rubric” from yesterday
 2. Each student will need the paper they are putting their timelines on
 3. Scissors for each student
 4. Colored pencils for each student
 5. Glue stick for each student
 6. Each student will need all of the vocabulary cards they have created so far, along with two more blank cards
 7. *Prentice Hall’s Science Explorer Human Biology and Health* book, if available
- C. *Key Vocabulary*
 1. Infancy-the first two years of a baby’s life after it is born
 2. Childhood- the time from two years old to about thirteen years old
- D. *Procedures/Activities*
 1. Ask students to guess about how much time a newborn baby sleeps. Write their ideas on the amount and vote on the top choices. (Answer: about twenty hours a day, waking every few hours to eat both night and day.)
 2. Answer any new questions from the basket.
 3. Have students fill out vocabulary cards as you define the terms either out of the textbook, or during the discussion time.
 4. Read *Prentice Hall’s Science Explorer Human Biology and Health* textbook pages 242 and 243 if available, or use the following information.
 - a. The first two years after a baby is born is called infancy. During this time a baby grows and changes a lot. When a baby is born it cannot hold its head up, crawl, or even talk. After about three months it can hold up its own head and will begin to grasp objects within the next two months. Babies usually begin crawling when they are about seven months old and most children will begin to speak their first words when they are between one and three years old. They can begin to feed themselves when they are about two, even if it is messy! By the time they reach the end of infancy they can do many things on their own, but they must be constantly supervised.
 - b. Childhood begins at about age two and ends around age thirteen. During childhood, children continue to grow and have many physical and mental changes. They get taller and heavier and much more coordinated as they walk and run. Children will lose their baby teeth and grow their permanent teeth in. They learn how to express ideas using various forms of language like talking and writing. They are able to take on more responsibilities and learn more.
 5. Suggest that students ask family members at home if they recall special events like the student’s first word, or steps. This would be a nice time for students to look at scrapbooks or their baby books if they are available at home.

6. If you made a bulletin board display of the baby pictures have students try and guess who is who, but do not reveal the answers until the next lesson.
 7. Have students continue working on their "Timelines."
- E. *Assessment/Evaluation*
1. The "Timeline" final project will be the assessment for this lesson.

Lesson Nine: Adolescence-Physical Changes (45 minutes)

A. *Daily Objectives*

1. Concept Objective(s)
 - a. Students understand that many factors and body systems affect their growth and development.
 - b. Students discover the phases of human development from conception to adulthood.
2. Lesson Content
 - a. Changes in Human Adolescence from *Core Knowledge Sequence* page 128
 - i. Puberty
 - a) Glands and hormones, growth spurt, hair growth, breasts, voice change
3. Skill Objective(s)
 - a. Students will be able to identify the endocrine system as the body system responsible for the changes of puberty and adolescence.
 - b. Students will be able to identify when adolescence begins.
 - c. Students will be able to identify three physical changes that occur during adolescence.
 - d. Students will be able to learn that everyone develops at different times and rates.
 - e. Students will be able to give examples of the changes that take place throughout the human life span. (Colorado State Standard Life Science 3.3c)
 - f. Students will be able to develop a timeline from conception (zygote stage) highlighting the various phases of human development.

B. *Materials*

1. One index card for vocabulary
2. "Timelines" materials
3. Each student will need a sheet of paper and a pencil for the quiz
4. *Prentice Hall's Science Explorer Human Biology and Health* book, if available

C. *Key Vocabulary*

1. Adolescence- the time when children physically and mentally become adults

D. *Procedures/Activities*

1. If you made the bulletin board with the baby pictures have each person take down their own picture today to compare and contrast how they and their classmates have changed. Give students time to go over this with a partner. Have a few students share what they have discovered with the class.
2. Answer any relevant questions from the basket as needed.
3. Share with the students that they are in, or will soon be in a time of life called adolescence. This is the time of life where they will grow from a child into an adult. They will mature both physically and mentally. Today's class will be on the physical changes that occur in adolescence. Tomorrow will be about the physical and social changes that will happen. Let them know that there will be a quiz at the end of this lesson, so they need to listen carefully.

4. If you have *Prentice Hall's Science Explorer Human Biology and Health* book read pages 244-246. If not, discuss the following information with your class.
5. Share:
 - a. As students begin to go through adolescence and grow up, they will be expected to also take on more responsibilities. Their bodies change to help them with some of these new responsibilities.
 - b. All of these changes occur and are controlled by the different hormones released by the endocrine system we studied previously. The physical changes going on are a part of puberty, the phase of life when a body becomes able to reproduce.
 - c. Puberty usually starts somewhere between the ages of nine and fourteen. Everyone experiences these changes at different times and rates. No one develops exactly the same and that is normal. Usually girls do begin adolescence earlier than boys.
 - d. Girls- Hormones from the pituitary glands and the ovaries control the physical changes in girls. Girls will begin to ovulate and menstruate, or have periods. Their breasts grow and develop. The purpose of this is to help a woman to be able to give her babies milk after giving birth. A girl's hips will begin to widen as well. This is to help her later in childbirth.
 - e. Boys- Hormones from the pituitary glands and the testes control the physical changes in boys. The sex organs grow and they will begin to produce sperm. Boys' voices deepen and they begin to grow hair on their faces and chests.
 - f. Both- Both boys and girls' skin will produce more oils, which can create acne or pimples. Both will notice that body odors increase and they should consider using antiperspirants or deodorants as needed. Both will begin to grow more hair under their armpits and around their sex organs. All of this is normal.
 - g. Most people experience growth spurts, or times when they grow very quickly. Sometimes they find themselves getting hungry more often and eating more. This is fine, but remember that your body needs good, nutritious food to stay healthy and strong. Exercise is also important. Don't worry if you are eating well and being active and you are gaining weight. Just continue to take good care of your body and it will work out. If you have concerns, talk them over with a parent, or family doctor. Dieting can be harmful during this time of development. Try not to compare yourself with others. You are unique and whether you are the first, last, or somewhere in the middle, of where your friends or classmates are, it's okay.
6. Have students add adolescence and adult to their vocabulary cards.
7. Give students time to finish up "Timelines." Students should have these completed by the next lesson.

E. *Assessment/Evaluation*

1. Have students write down the answers to the following questions as you read them out loud. Collect quizzes at the end and grade them. Be prepared to review any; necessary information that may not have been clear before starting the next lesson.
 - a. What body system is responsible for the physical changes of adolescence? (endocrine system)
 - b. Between what ages does puberty begin? (nine to fourteen years old)

- c. Name three physical changes that occur during adolescence. (growth spurts, growing more hair in different places, voices deepen, body odor increases, oil on skin increases, breasts enlarge, menstruation/periods begin, hips widen, sex organs develop, sperm production begins, ovulation occurs)
- d. Will you develop at exactly the same rate as your friends? (no)

Lesson Ten: Adolescence-Mental and Social Changes (45 minutes)

A. Daily Objectives

- 1. Concept Objective(s)
 - a. Students understand that many factors and body systems affect their growth and development.
 - b. Students discover the phases of human development from conception to adulthood.
- 2. Lesson Content
 - a. Adolescence: mental and social changes
- 3. Skill Objective(s)
 - a. Students will be able to define peer pressure and give examples of it, both positive and negative.
 - b. Students will be able to develop a timeline from conception (zygote stage) highlighting the various phases of human development.

B. Materials

- 1. All vocabulary cards, plus two more blank ones for today's vocabulary
- 2. Completed "Timelines"
- 3. Copies of Appendix L "Timelines Assignment and Rubric" for each student
- 4. *Prentice Hall's Science Explorer Human Biology and Health* book, if available

C. Key Vocabulary

- 1. Peer Pressure- pressure to behave like the people around you
- 2. Adult- being grown up, or mature

D. Procedures/Activities

- 1. Check "Timelines" quickly to make sure that all are completed. Pass out a copy of the Appendix L "Grading Rubric" to each student. Go through the categories together as a class and have each student evaluate his or her own project. When you are finished, collect up all the "Timelines" and "Grading Rubrics" so that you can evaluate each project. Consider hanging up the "Timelines" in the classroom and hallway. You may want to include the baby pictures, if you did the bulletin board, on the "timelines" when you display them. Be sure to give students time to look at each other's "Timelines" and ask questions about them once they are displayed.
- 2. Present the vocabulary and have students write the words on their cards.
- 3. Answer any more relevant questions from the basket. Remind students to write down their questions soon, as we are reaching the end of the unit.
- 4. Read *Prentice Hall's Science Explorer Human Biology and Health* book pages 247-249, if available, or use the following information to teach your students.
- 5. Share:
 - a. We have learned that adolescence is a time of tremendous change physically. It is also a time of tremendous mental, emotional, and social change, too.
 - b. Adolescents are growing up and often want to be treated with more respect and responsibility. They look forward to things like getting a drivers license, working a job, making more decisions. They may be

changing friendships and interests. This is a time of tremendous peer pressure.

- c. Peer pressure can be good or bad. We often think of the bad things people feel pressured to do, but we need to realize that peer pressure can be very good. It really depends on what the behavior is. Feeling peer pressure to do drugs, steal, cheat, or bully others would be bad, or negative peer pressure. Practicing extra hard as a team, studying in a group, or rehearsing a play together can be good, or positive peer pressure. It encourages you to be your best. If you feel constant pressure to do things you think are wrong, you may need to make new friends who will encourage you to do what is right.
- d. Mental Changes- Around the ages of thirteen and fifteen you will begin to think and make decisions like an adult. You will be more aware of the consequences of your actions and choices. You will be better at remembering things and solving problems. You will also get more responsibilities and be able to learn harder things. You may have a lot of questions and wonder what you should do with your life. Talking with adults you can trust can help a lot. Many adolescents care a lot about their friends' opinions as well. Remember that adults do have a lot of experiences and have learned many lessons and you can learn from them.
- e. When will you be an adult? You will be considered a legal adult in America at eighteen for most activities and twenty-one for the rest. With these adult privileges come adult responsibilities. Yes, you can vote, drive, drink alcohol, and more. You must, however, be responsible for the choices you make doing these activities. You'll be expected to take care of yourself, keep a job, and maybe take care of a family. Hopefully, by making good choices as an adolescent, you'll be ready to be a successful adult when the time comes.

6. Have students do the Assessment/Evaluation Activity.

7. Let students quiz each other in partners, or small groups with their vocabulary cards.

E. *Assessment/Evaluation*

- 1. Have students discuss in small groups times they have felt positive and/or negative peer pressure. Suggest that they give each other ideas on how to resist negative peer pressure and encourage their friends with positive peer pressure. Have the small groups join back together into one main group. Ask for volunteers to share ideas their group came up with on dealing with peer pressure. You may want to write down their suggestions on a poster paper to keep up in the classroom.

Lesson Eleven: Breakout Groups and Video (45 minutes)

A. *Daily Objectives*

- 1. Concept Objective(s)
 - a. Students understand that many factors and body systems affect their growth and development.
 - b. Students discover the phases of human development from conception to adulthood.
- 2. Lesson Content
 - a. Changes in Human Adolescence from *Core Knowledge Sequence* page 128
 - i. Puberty

- a) Glands and hormones, growth spurt, hair growth, breasts, voice change
3. Skill Objective(s)
 - a. Students will be able to understand the physical changes their bodies are undergoing, or will undergo, during puberty.
- B. *Materials*
 1. *Always Changing* video, or another video you chose on puberty.; it is best to have two copies of the same video if you are trying to show it to the boys and girls separately, but at the same time
 2. Scrap paper, pencils and basket for questions for each group
 3. Copies of the Appendix M and N “*Always Changing* Pretests and Posttests” for each student
- C. *Key Vocabulary*
None
- D. *Procedures/Activities*
 1. Prior to this lesson, contact and schedule another teacher of the opposite sex to take a group of students of the same sex to watch the video. (Have a female teacher for girls, and a male teacher for boys.) Be sure to also plan on a place for both groups to watch the videos.
 2. Divide up into the two groups and go to the designated location.
 3. Set the room up in a way that the students can see the video as it plays. Consider sitting in a circle after the video to ask questions.
 4. Pass out the pretests and have the students take a few minutes to fill them out. Let them know that it is not for a grade, but that they will take a posttest after the video that will be graded so they will want to pay attention. Collect up the pretests when complete.
 5. Play the video.
 6. Pass out scrap paper and pencils and give the students a few minutes to write down questions they may have. After a few minutes you can begin to answer the written questions, as well as any questions the students may just ask verbally.
 7. If you ordered the kits that come with the video, distribute them at the end of class. Suggest they wait to open them until at home.
- E. *Assessment/Evaluation*
 1. Pass out copies of the posttest.
 2. Give students time to complete the test.
 3. Grade the posttest after you collect it. Answers: t=true, f=false

Girls Pretest:	1. t	2. f	3. t	4. t	5. f
	6. f	7. f	8. t	9. b	10. d
Girls Posttest:	1. f	2. f	3. t	4. f	5. f
	6. t	7. t	8. t	9. c	10. a
Boys Pretest:	1. t	2. f,	3. t	4. f	5. t
	6. f	7. f	8. t	9. e	10. b
Boys Posttest:	1. t	2. f	3. f	4. t	5. f
	6. f	7. d	8. t	9. t	10. d
 4. Compare the posttests to the pretests and return both to the students the next day so that they may see what they learned.

Lesson Twelve: Review of Unit

A. Daily Objectives

1. Concept Objective(s)
 - a. Students understand that many factors and body systems affect their growth and development.
 - b. Students discover the phases of human development from conception to adulthood.
 - c. Students understand the reasons for the physical and mental changes they will undergo during adolescence.
 - d. Students know and understand the characteristics and structures of living things, the processes of life and how living things interact with each other and their environments. (Colorado State Standard Life Science #3)
2. Lesson Content
 - a. The Endocrine System
 - i. The human body has two types of glands: duct glands (such as salivary glands), and ductless glands, also known as endocrine glands.
 - ii. Endocrine glands secrete (give off) chemicals called hormones. Different hormones control different body processes.
 - iii. Pituitary gland: located at the bottom of the brain, secretes hormones that control other glands, and hormones that regulate grow
 - iv. Thyroid gland: located below the voice box, secretes a hormone that controls the rate at which the body burns and uses food
 - v. Pancreas: both a duct and ductless gland, secretes a hormone called insulin that regulates how the body uses and stores sugar, when the pancreas does not produce enough insulin, a person has a sickness called diabetes (which can be controlled)
 - vi. Adrenal glands: secrete a hormone called adrenaline, especially when a person is frightened or angry, causing rapid heartbeat and breathing
 - b. The Reproductive System
 - i. Males: testes, scrotum, penis, urethra, semen
 - ii. Females: ovaries, fallopian tubes, uterus, vagina, menstruation
 - iii. Sexual reproduction: intercourse, fertilization, zygote, implantation of zygote in the uterus, pregnancy, embryo, fetus, new born
 - c. Changes in Human Adolescence
 - i. Puberty
 - a) Glands and hormones, growth spurt, hair growth, breasts, voice change
 - d. Multiple Births: identical and fraternal twins, triplets, and quadruplets
 - e. Infancy: physical changes, mental growth
 - f. Childhood: physical changes, mental growth
 - g. Adolescence: mental and social changes
3. Skill Objective(s)
 - a. Students will be able to review the information and concepts learned in this unit and demonstrate that knowledge on the unit test.

B. Materials

1. Each student will need a copy of Appendix O “Study Guide for Unit Test”
2. All vocabulary cards

3. *Prentice Hall's Science Explorer Human Biology and Health* book, if available
- C. *Key Vocabulary*
None
- D. *Procedures/Activities*
 1. Answer any questions in the basket. Remind students that tomorrow will be the last day to answer questions.
 2. Pass out the Appendix O, "Study Guide for Unit Test."
 3. Have students review the study guide. You may want them to study alone, with a friend, or up to a group of three students.
 4. You may want to play any type of review games you choose.
 5. Remind students to take home all Appendices and vocabulary cards to study.
 6. If possible, have students take the self-test at the following link. It corresponds to the Unit Test.
http://www.phschool.com/atschool/science_explorer/Biology/Student_Area/SE_D_SC8_ST_index.html
- E. *Assessment/Evaluation*
 1. Tomorrow's test is the assessment for this lesson.

VI. CULMINATING ACTIVITY

- A. The culminating activity for this unit will be the Appendix P "Unit Test." Give the test according to your normal procedures. See Appendix Q "Unit Test Answer Key" to grade the test at the end. You may also want to answer remaining questions from the basket as it works within your scheduled time.

VII. HANDOUTS/WORKSHEETS

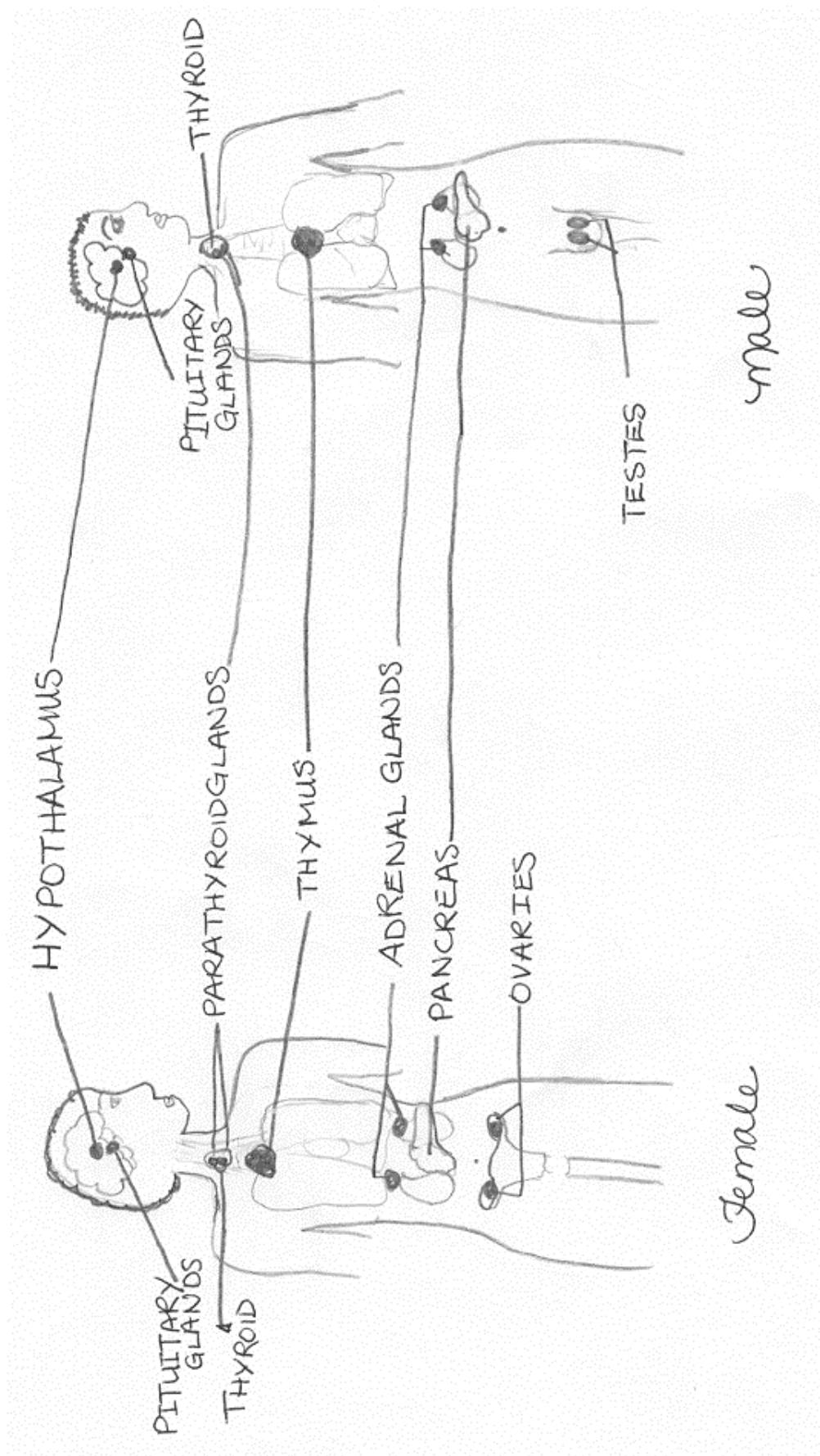
- A. Appendix A: "Exploring Our Endocrine System for Teachers"
- B. Appendix B: "Exploring Our Endocrine System for Students"
- C. Appendix C: "Endocrine System Chart for Teachers"
- D. Appendix D: "Endocrine System Chart for Students"
- E. Appendix E: "Male Reproductive System"
- F. Appendix F: "Female Reproductive System"
- G. Appendix G: "Endocrine System Quiz"
- H. Appendix H: "How a Baby is Conceived"
- I. Appendix I: "Stages of Pregnancy for Teachers"
- J. Appendix J: "Stages of Pregnancy for Students"
- K. Appendix K: "Stages of Birth"
- L. Appendix L: "Timelines Assignment and Rubric"
- M. Appendix M: "Always Pretest"
- N. Appendix N: "Always Posttest"
- O. Appendix O: "Study Guide for Unit Test"
- P. Appendix P: "Unit Test"
- Q. Appendix Q: "Unit Test Answer Key"
- R. Appendix R: "Master Vocabulary List"

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- N. Transparencies for the Unit:
http://www.phschool.com/science/ca_sci_exp_transparencies/index.html
- O. Walker, Richard. *Encyclopedia of the Human Body*. New York: DK Publishing, 2002. 0-7894-8672-5.

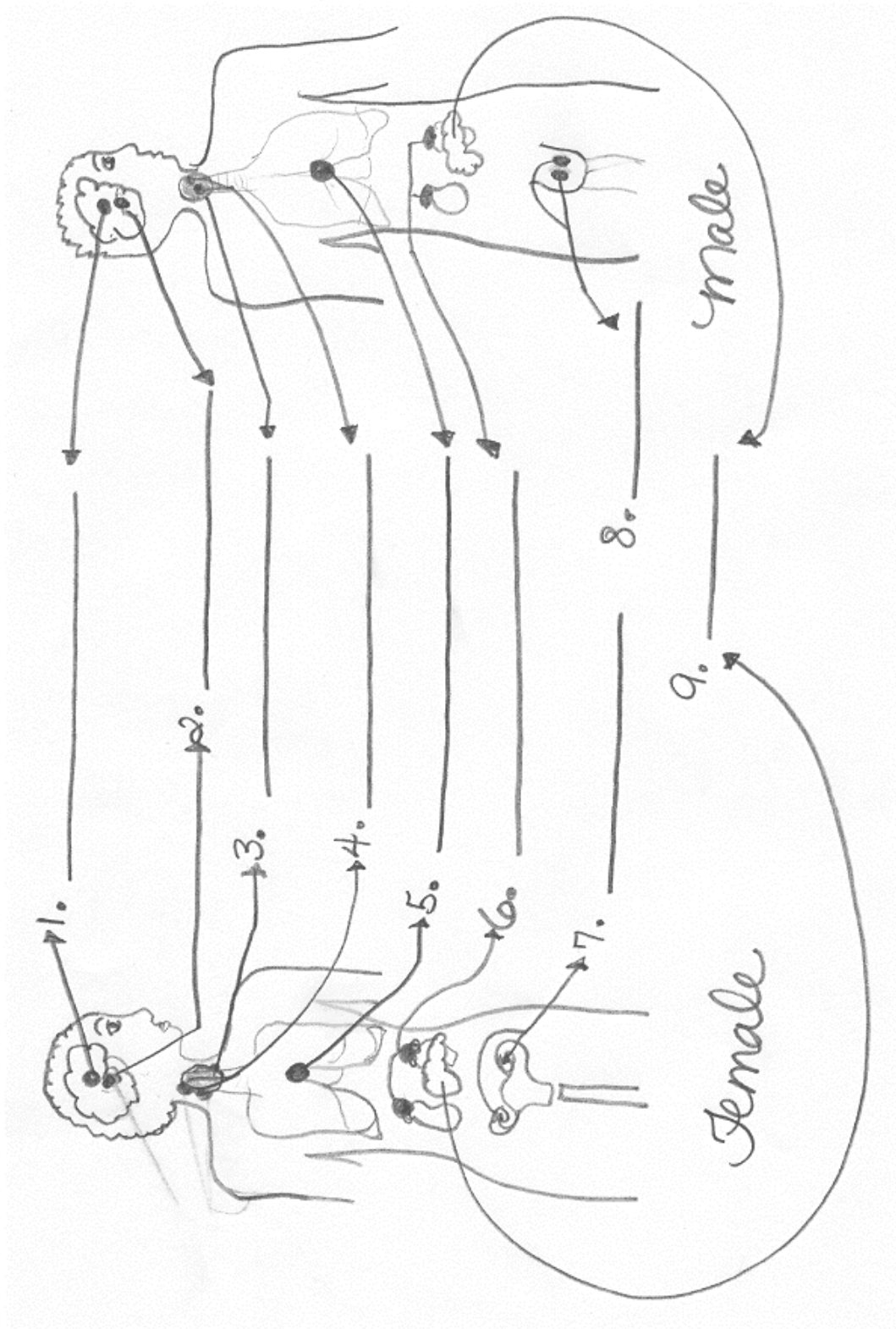
Appendix A
“Exploring Our Endocrine System for Teachers”



Appendix B “Exploring Our Endocrine System for Students”

Directions: Fill in the blanks with the correct endocrine glands. Be sure to spell the names correctly.

Hypothalamus Pituitary Thyroid Parathyroid Thymus Adrenal
Pancreas Ovaries Testes



Appendix C
“Endocrine System Chart for Teachers”

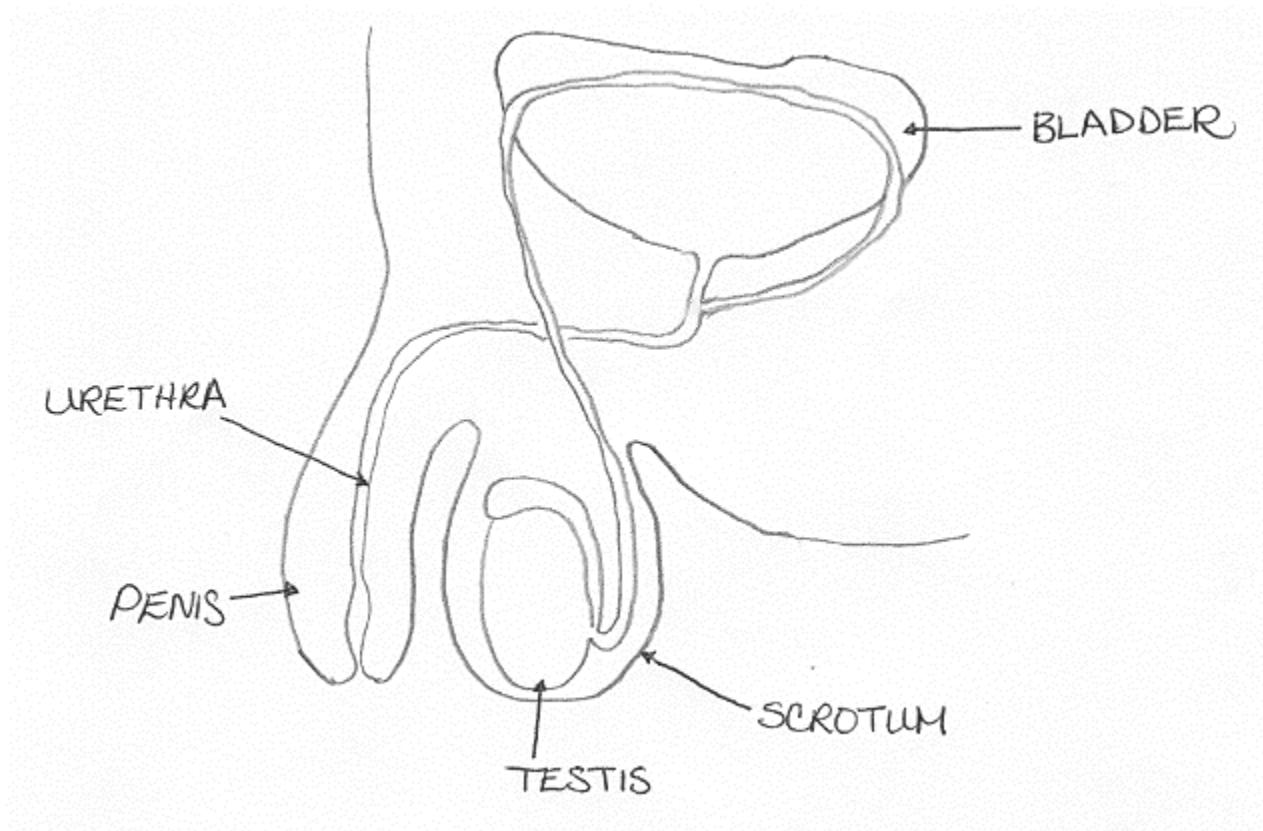
Gland	Function	Location	Hormone
Hypothalamus	links the endocrine system and nervous system; controls pituitary glands	brain	yes
Pituitary	regulates body growth, blood pressure, and water levels; controls other glands	brain	yes, including growth hormones
Thyroid	controls the amount of energy from food your body uses	below the voice box	yes
Parathyroid	tiny glands whose hormones regulate the calcium in your blood	below voice box	yes
Thymus	its hormones help your body fight infection	chest	yes
Adrenal	helps your body react in emergencies; balances salt and water in kidneys, control sugar in the blood	above kidneys	yes; adrenaline
Pancreas	helps with digestion; produces hormones that control the level of sugars in the blood	near kidneys	yes; insulin, glucagon
Ovaries	females only: create and release the female sex cells, the eggs	below the waist on both sides	yes; estrogen, progesterone
Testes	males only: create and release the male sex cells, the sperm	in the scrotum	yes; testosterone

Appendix D
“Endocrine Chart for Students”

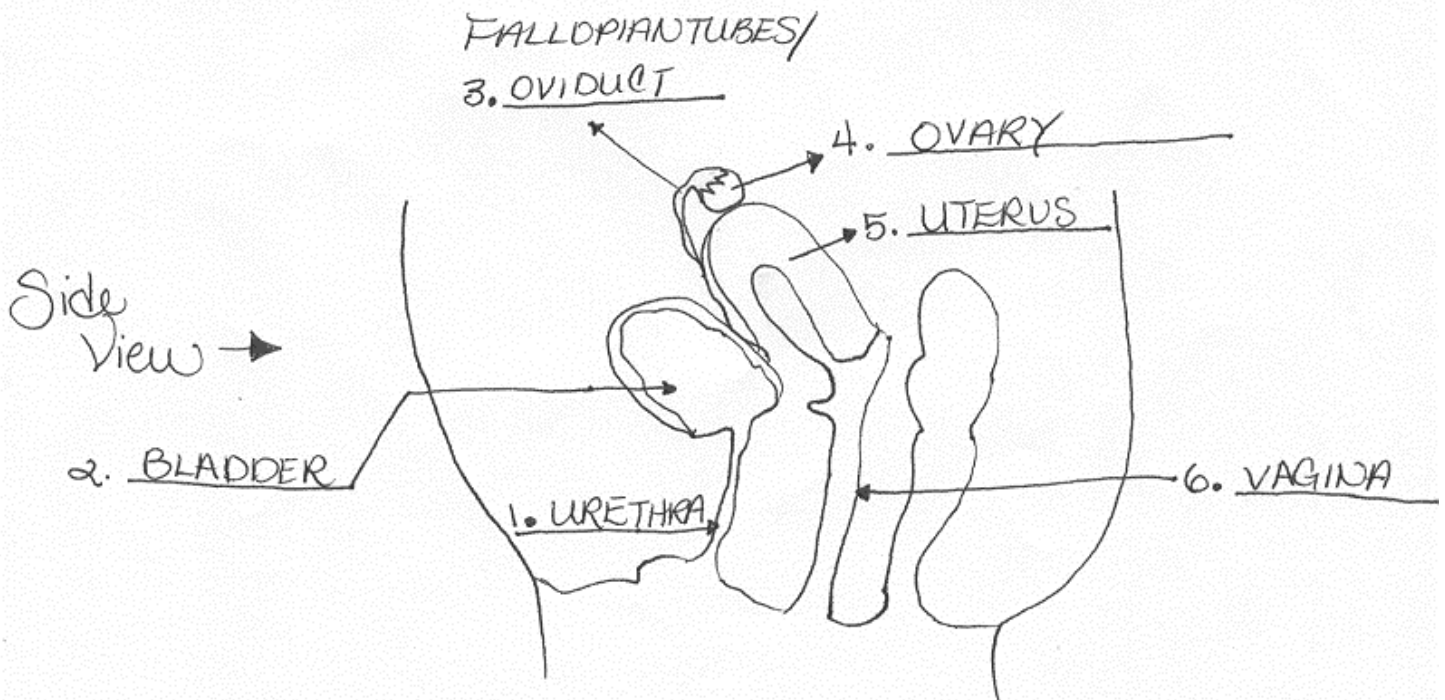
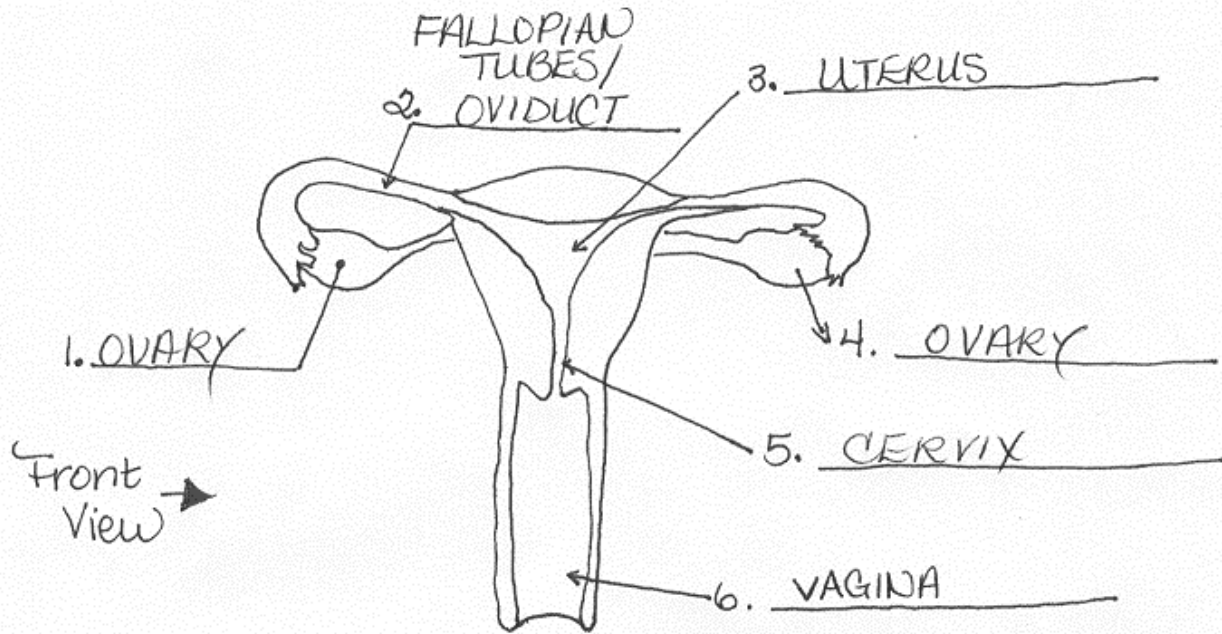
Directions: Fill in the blanks on the chart using your notes and vocabulary cards.

Gland	Function	Location	Hormone
Hypothalamus			
Pituitary			
Thyroid			
Parathyroid			
Thymus			
Adrenal			
Pancreas			
Ovaries			
Testes			

Appendix E
“Male Reproductive System”



Appendix F
"Female Reproductive System"



Appendix G “Endocrine System Quiz”

Directions: Fill in the blanks with the correct answers.

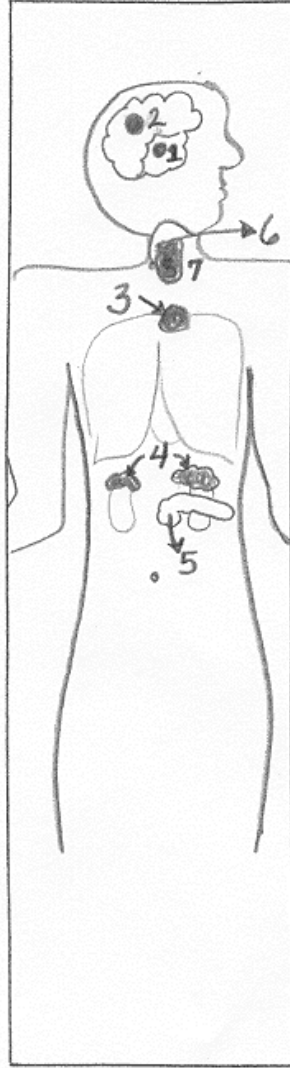
1. _____
job: regulates growth and controls
other endocrine glands

2. Hypothalamus
job: _____

3. _____
job: helps fight infection

4. Adrenal Glands
job: helps the body in emergencies and
controls the levels of sugar in the blood
hormone name: _____

5. _____
job: helps with digestion; helps control sugar
in the blood
hormone names: insulin and glucagon



6. _____
job: these tiny glands
control the amount of
calcium in the blood

7. _____
job: controls energy
from food

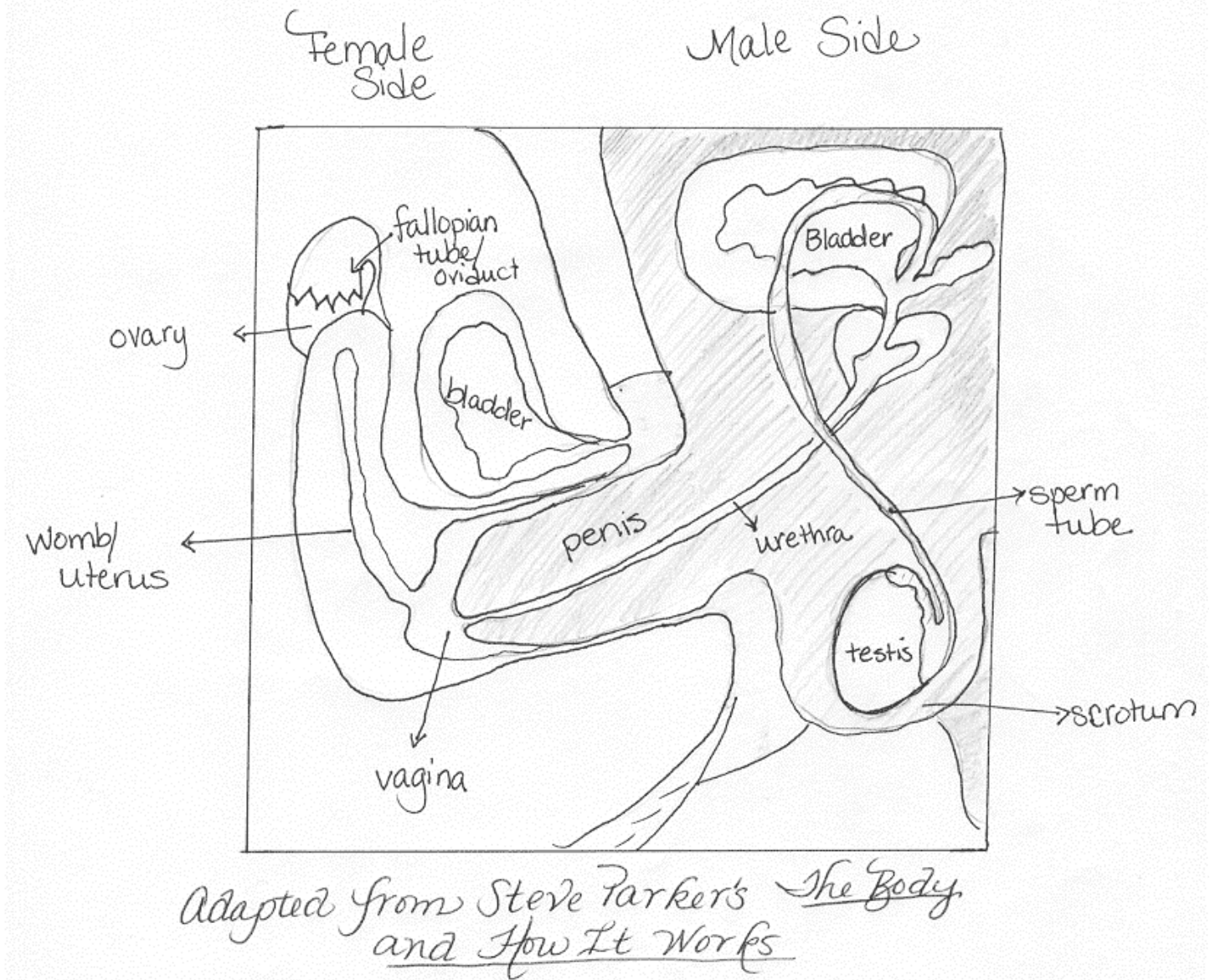
8. Females Only:

job: create and release the female sex
cells, the eggs
9. hormones' name: _____ and
10. _____

11. Males only:

job: create and release the male sex
cells, the sperm
hormone name: testosterone

Appendix H
"How a Baby is Conceived"



Appendix I
“Stages of Pregnancy for Teachers”

①



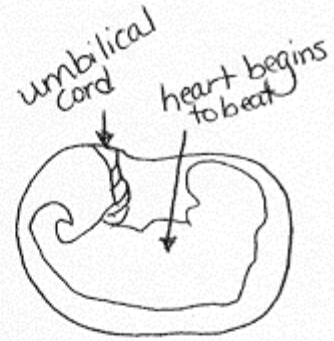
zygote
 single, fertilized
 cell

②



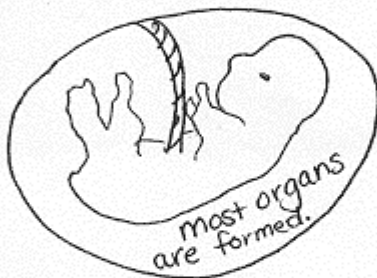
embryo
 Six days later,
 once it implants
 itself into the
 uterus until the
 end of two months

③



four weeks
 It's about the
 size of a pea.

④



after eight weeks
 It's the size of a
 strawberry. It's called
 a fetus until it's
 born.

⑤



Bones are
 forming +
 finger + toe
 nails.
 Head is
 very large

12 weeks old

⑥



24 weeks old
 About 8-9 inches long.

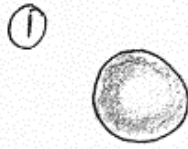
⑦



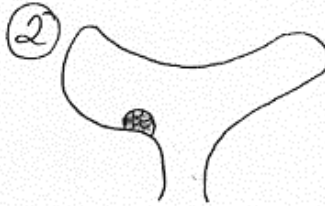
Full-term baby!

Appendix J “Stages of Pregnancy for Students”

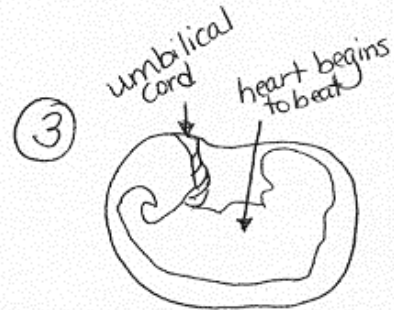
Directions: Fill in the blanks. Color and label as needed.
Use this page to help you with your Timeline.



Single, fertilized
cell



Six days later,
once it implants
itself into the
uterus until the
end of two months



Four weeks
It's about the
size of a pea.



after eight weeks
It's the size of a
strawberry. It's called
a _____ until it's
born.



Bones are
forming +
finger + toe
nails.
Head is
very large

12 weeks old



24 weeks old
About 8-9 inches long.

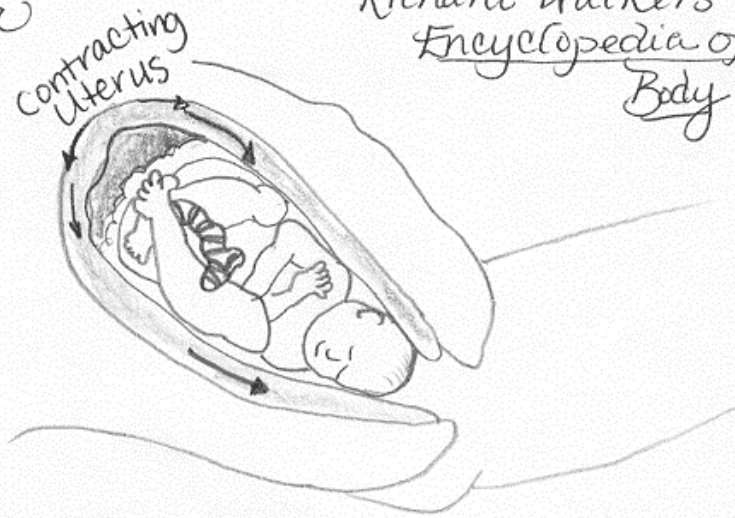


Full-term baby!

Appendix K
"Stages of Birth"

1. Labor

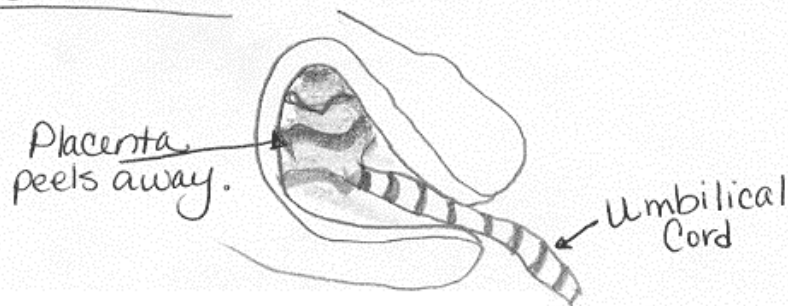
Adapted from
Richard Walker's
Encyclopedia of the Human
Body



2. Delivery



3. Afterbirths



Appendix L, page 1
 “Timelines Assignment and Rubric”
The Human Body Unit
Timelines Assignment and Grading Rubric



Name: _____

Teacher: _____

Date : _____

Title of Work: _____

	Criteria				Points
	1	2	3	4	
Students will place required events and stages in the correct sequence.	Timeline does not contain several of the required events and stages. More than three events are in the wrong sequence.	Timeline contains most of the required events and stages. Some are not in the correct sequence.	Timeline contains most of the required events and stages in the correct sequence.	Timeline contains all of the required events and stages in the correct sequence.	_____
Students will match the correct date or range to the required events or stages.	Dates or range of dates for three items or more than three items is missing or incorrect.	Dates or range of dates for several items are incorrect.	Dates or range of dates for most items is correct.	Dates or range of dates for each item is correct.	_____
Students will use spelling and grammar correctly.	Many spelling and grammar mistakes are made.	Some spelling and grammar mistakes are made.	Most spelling and grammar is correct.	All spelling and grammar is correct.	_____
Students will create a clear and attractive timeline.	The timeline is not legible. No color is used. Few details are given, if any.	The timeline is not legible in places. No color is used. Details are minimal.	The timeline is mostly neat and orderly. Color is used and most details are drawn.	The timeline is neat and orderly. Color is used and details are drawn.	_____
Students will meet the requirements given.	Does not meet the requirements of the timeline.	Only meets some of the requirements of the timeline.	Meets the requirements of the timeline.	Goes beyond the requirements of the timeline.	_____
				Total----->	_____

Teacher Comments:

Appendix L, page 2

“Timeline Assignment and Grading Rubric”

adapted from “The Time of Your Life” assignment, Prentice Hall’s Science Explorer Human Biology and Health Teaching Resources

Assignment Directions: You are to create a timeline to demonstrate that you know about important events and stages in a person’s growth and development and that you can put the events in proper sequence. Feel free to use your notes, worksheets, and any books that may help you.

The timelines will be graded according to the rubric copied onto the back of this page. Be sure to include all of these events and stages in order, and give the approximate time or ages of the events. Draw pictures for each of the events using color and detail. Check your spelling! Neatness and overall appearance will count toward your grade, so plan out your ideas first. Have fun!

You may also include on the timeline personal events that you experienced that are important to you, such as “when I lost my first tooth” or “when I walked the first time”. It’s up to you.

This assignment will be due on : _____.

Events and Stages: *Remember, these are NOT in the correct order on this list. You must put them in order.*

- | | |
|--|------------------|
| *zygote moves down the oviduct to the uterus | *birth |
| *formation of the amniotic sac and placenta | *learns to read |
| *heartbeat can first be heard by stethoscope | *can lift head |
| *development of fingers and toes | *childhood |
| *adulthood | *embryo |
| *begins to walk | *fetus |
| *baby teeth are replaced by permanent teeth | *infancy |
| *adolescence | *learns to speak |

Appendix M, page 1
“Girls Pretest for *Always Changing* Video”
adapted from the Always Changing 5th Grade School Program

Directions: *Circle the best answer from the choices given. This is not for a grade.*

1. Puberty involves both physical and emotional changes.
true/false
2. Sweat has no useful purpose.
true/false
3. Puberty usually begins between the ages of nine and fourteen for most girls.
true/false
4. The menstrual flow usually lasts for three to seven days.
true/false
5. When you have your period you should not take a bath, exercise, or swim.
true/false
6. You will always have your period on a regular schedule.
true/false
7. Everyone call tell if you are having your period.
true/false
8. You should change your pad every three to four hours.
true/false
9. When your body goes through puberty the changes usually happen
 - a. overnight.
 - b. gradually, over a few years.
 - c. on your 11th birthday.
 - d. in two weeks.
10. Girls during puberty
 - a. develop breasts.
 - b. have their periods.
 - c. grow hair under their arms and in their pubic area.
 - d. all of the above.

Appendix M, page 2
“Boys Pretest for *Always Changing* Video”
adapted from the Always Changing 5th Grade School Program

Directions: *Circle the best answer from the choices given. This is not for a grade.*

1. Boys usually start puberty between ten and seventeen years old.
true/false
2. All boys start to shave during puberty.
true/false
3. Mood swings can be a part of puberty.
true/false
4. There is no useful purpose to sweat.
true/false
5. Your voice may crack during puberty because your vocal cords are growing.
true/false
6. Wet dreams are abnormal.
true/false
7. Everything happens at once in puberty.
true/false
8. Puberty causes both emotional and physical changes.
true/false
9. During puberty most boys
 - a. voice deepens.
 - b. grow taller and more muscular.
 - c. grow hair under their arms, on their faces, and in the pubic area.
 - d. penis and testicles grow larger.
 - e. all of the above.
10. One change that happens during puberty is
 - a. you sweat less.
 - b. you sweat more.
 - c. your body naturally smells better.
 - d. you eat less.
 - e. none of the above.

Appendix N, page 1
“Girls Posttest for *Always Changing* Video”
adapted from the Always Changing 5th Grade School Program

Directions: *Circle the best answer from the choices given.*

1. Don't participate in any activities when you have your period.
true/false
2. Menstruation happens when the lining of the uterus is shed.
true/false
3. Menstruation is the same thing as having your period.
true/false
4. Periods always are on a regular schedule.
true/false
5. You will lose about two cups of blood during your period.
true/false
6. The changes that happen during puberty are because of estrogen.
true/false
7. You should choose your feminine protection (pads) based on how heavy your flow is.
true/false
8. Exercising may help with cramps during your period.
true/false
9. Estrogen is
 - a. a sweat gland.
 - b. an emotional reaction.
 - c. the main female hormone.
 - d. the main male hormone.
10. The average menstrual cycle is
 - a. 28 days.
 - b. 3 days.
 - c. 7 days.
 - d. 50 days.

Appendix N, page 2
“Boys Posttest for *Always Changing* Video”
adapted from the Always Changing 5th Grade School Program

Directions: *Circle the best answer from the choices given.*

1. Some boys may have emotional ups and downs during puberty.
true/false
2. During puberty all boys start to shave.
true/false
3. It's abnormal to have wet dreams.
true/false
4. Your voice may crack during puberty because your vocal cords are growing.
true/false
5. Boys have physical changes because of estrogen.
true/false
6. If you have an erection everyone can tell.
true/false
7. Testosterone is
 - a. a sweat gland.
 - b. an emotional reaction.
 - c. the main female hormone.
 - d. the main male hormone.
8. You may grow several inches at once. It's a normal growth spurt.
true/false
9. Semen is a liquid that contains sperm.
true/false
10. Sperm are developed in the
 - a. pituitary glands.
 - b. penis.
 - c. scrotum.
 - d. testicles or testes.

Appendix O
“Study Guide for Unit Test”

Your test will be on _____.

The test will contain 10 multiple choice questions, 6 fill in the blank questions, 5 true and false questions and two diagrams that you must label correctly.

Students must be able to:

- * Know all vocabulary terms.
- * Label the endocrine system.
- * Know what hormones are and be able to match hormones to their glands.
- * Label the parts of a baby inside its mother.
- * List in order the three-stage birth process.
- * Know at what ages various stages of life begin such as infancy, childhood, and puberty.

Appendix P, page 1

“Unit Test”

Adapted from *Prentice Hall's Science Explorer Human Biology and Health Teaching Resources* Chapter 8 Test.

Name: _____

Directions: Write the letter of the correct answer on the line for each question.

1. _____ An endocrine gland that regulates other endocrine glands is the
a. pancreas. b. pituitary. c. thymus. d. thyroid
2. _____ The oval-shaped organs of the male reproductive system in which sperm are produced are called the
a. ovaries. b. testes. c. pituitary glands. d. kidneys.
3. _____ A child enters puberty sometime between the ages of
a. birth and two years. b. 2 and 7 years.
c. 9 and 14 years. d. 15 and 21 years.
4. _____ The female sex cell is called a(n)
a. egg. b. sperm. c. ovary. d. zygote.
5. _____ The uterus is also called the
a. fertilized egg. b. womb.
c. birth canal. d. umbilical cord.
6. _____ In the female reproductive system, the muscular passageway leading to the outside of the body is the
a. uterus. b. ovary. c. oviduct. d. vagina.
7. _____ The link between the nervous system and the endocrine system is the
a. oviduct. b. hypothalamus. c. pituitary gland. d. placenta.
8. _____ The extra blood and tissue of the thickened lining of the uterus passes from the female body during
a. labor. b. fertilization. c. ovulation. d. menstruation.
9. _____ The chemical product of an endocrine gland is called a(n)
a. chromosome. b. hormone. c. target cell. d. hypothalamus.
10. _____ The membrane that links the developing mother embryo and the mother is the
a. amniotic sac. b. placenta. c. thymus. d. fetus.

Appendix P, page 2
“Unit Test”

Directions: Fill in the blanks with the correct statements.

11. The three stages of the birth process in order are:

12. The two types of twins are _____ and _____.
13. The testes are specialized to produce sperm and the hormone _____.
14. The fluid in the _____ cushions and protects the developing baby.
15. An egg travels through a passageway called the _____ before entering the uterus.
16. The external sac containing the testes is the _____.

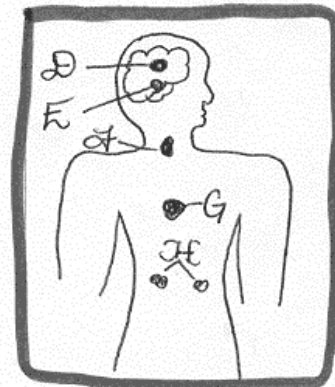
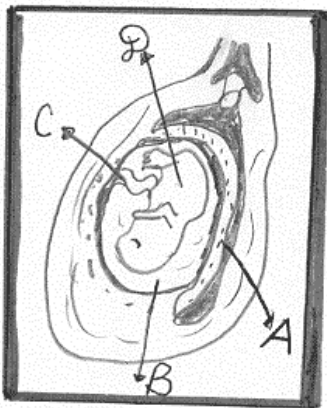
Directions: If the statement is true, write true on the line. If it is false, change the underlined word or words to make the statement true. Do NOT write false on the line.

17. _____ The hormone estrogen is produced by the testes.
18. _____ An embryo develops into a zygote about 9 weeks into the development process.
19. _____ Homeostasis in the body is maintained through negative feedback.
20. _____ Ovulation occurs about halfway through the menstrual cycle.
21. _____ Hormones are the carriers of inherited information.

Directions: Label the necessary items on the following diagrams.

22. a. _____
23. b. _____
24. c. _____
25. d. _____

26. d. _____
27. e. _____
28. f. _____
29. g. _____
30. h. _____



Appendix Q
“Unit Test Answer Key”

- | | |
|---------------------------------|-------|
| 1. b | 2. b |
| 3. c | 4. a |
| 5. b | 6. d |
| 7. b | 8. d |
| 9. b | 10. b |
| 11. labor, delivery, afterbirth | |
| 12. identical and fraternal | |
| 13. testosterone | |
| 14. amniotic sac | |
| 15. oviduct or fallopian tube | |
| 16. scrotum | |
| 17. ovaries | |
| 18. fetus | |
| 19. true | |
| 20. true | |
| 21. chromosomes | |
| 22. placenta | |
| 23. amniotic sac | |
| 24. umbilical cord | |
| 25. fetus | |
| 26. hypothalamus | |
| 27. pituitary gland | |
| 28. thyroid | |
| 29. thymus | |
| 30. adrenal glands | |

Appendix R, page 1
“Master Vocabulary List”

Puberty- time of development, usually during the teenage years, when a child becomes an adult and is able to reproduce

Endocrine System- a body system that controls daily activities and long-term changes such as development

Endocrine Glands- organs that produce chemicals and release those chemicals directly into the bloodstream

Hormones- the chemical products of endocrine glands; they control the activities of many different organs and glands

Target Cells- certain cells that recognize and accept a hormone’s chemical structure

Secrete- to give off, or release

Hypothalamus- a tiny section of the brain in the middle of your head that links the nervous system and the endocrine system; it controls the pituitary gland. It does not produce its own hormone

Pituitary Gland- regulates growth, blood pressure and helps to control other endocrine glands; it is located in the brain; it does not produce its own hormone

Thyroid Glands- are located below the voice box; these glands control the release of energy from food

Parathyroid Glands- are tiny glands near the thyroid that control the levels of calcium in the blood

Adrenal Glands- are located near the kidneys and release several different hormones including adrenaline; adrenaline helps the body respond to emergencies

Pancreas- helps with digestion and produces the hormones of insulin and glucagons with control the amounts of sugars in the blood stream; it is located near the kidneys

Ovaries- release the female sex hormones called estrogen and progesterone; they help trigger the female’s body to produce eggs

Testes- release the male sex hormone called testosterone; it is needed for the male to produce sperm

Homeostasis- is how a person’s organs stay stable even when things outside the body change

Appendix R, page 2
“Master Vocabulary List”

Egg- the female sex cell; human eggs have no shell

Sperm- the male sex cell

Fertilization- is when the egg and sperm join

Reproduction- the process of creating new individuals of the same species

Zygote- the fertilized egg

Chromosomes- rod-shaped structures in the sex cells that carry the inherited characteristics like eye and hair color

Testes- oval-shaped organs in male where sperm is produced; one is called a *testis*

Testosterone- the male sex hormone that controls things like chest hair and deep voices

Scrotum-the pouch of skin outside the body that holds the testes

Penis- male sex organ

Urethra-the tube sperm and urine use to leave the male's body

Semen-a mixture of sperm cells and fluid

Ovaries- they are located slightly below a female's waist with one on each side; their job is to produce egg cells

Estrogen- a female hormone that triggers the changes to become an adult woman

Fallopian Tubes/Oviducts- the passageways for eggs to go through from the ovaries to the uterus; fertilization usually occurs here

Uterus- a hollow pear-shaped organ where the baby grows inside its mother

Vagina- is a passageway out of a woman's body; it is also called the birth canal because it is where the baby comes out

Menstrual Cycle- a monthly cycle of changes in the female reproductive system

Ovulation- the time of the month when the egg is released from the ovary to the oviduct

Appendix R, page 3
“Master Vocabulary List”

Menstruation- the process of the extra blood and uterine lining passing out of the body through the vagina; it is often called a period

Conception- the moment a new life begins once an egg is fertilized

Intercourse- the action of a man inserting his penis into a woman’s vagina; this is often called sex

Zygote- a single new cell formed when the nucleus of a sperm cell joins the nucleus of an egg cell; it contains the genetic information from both parents

Abstinence- the decision to not have sexual intercourse until older, or married

Embryo- what a developing baby is called for the first eight weeks

Amniotic sac- a fluid filled sac that surrounds the baby in the womb (uterus)

Placenta- a membrane containing blood vessels that nutrients, waste and oxygen pass through from the mother to the baby during pregnancy

Umbilical cord- a ropelike tube from the embryo to the placenta that links the baby and mother

Fetus- what a baby is called from the ninth week until birth

Contractions- a tightening of the uterus’s muscles

Labor- the first stage of birth when contractions begin

Delivery-when the baby comes out of the uterus, through the vagina, and out of the mother

Afterbirth- contractions after delivery that push the placenta out of the mother

Multiple Births-having more than one baby at a time

Infancy-the first two years of a baby’s life after it is born

Childhood- the time from two years old to about thirteen years old

Adolescence- the time when children physically and mentally grow to become adults

Adult- being grown up, mature