Do You See What I See?

An overview on the developmental changes that occur during the three trimesters of pregnancy.

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An original lesson

Focus on Inquiry

The student will be able to describe the process of human development including major changes that occur in each trimester of pregnancy.

Lesson Content Overview

In this activity, students will become scientists and explore the major changes that occur during embryo development. First, students will work in groups and correctly match the fetal development picture cards with the appropriate description. Next, students compare and share their findings with other groups and record this data. Finally, students will act as physicians as they investigate a medical case study of a pregnant woman and determine what trimester she is in by analyzing ultrasound reports detailing certain makers of the stages of development. Students will use a claim, evidence, rationale style activity using the ultrasound pictures and learned content to support their answers. The lesson culminates with students sharing their findings through a gallery walk.

Duration	Setting	Grouping	PTI Inquiry Subskills
100 minutes	Classroom	3-4 students/group	1.3, 3.1, 3.3, 3.5, 3.7, 5.2, 5.3, 6.1, 6.2, 7.2, 7.3

Lesson Components	Estimated Time	Inquiry Subskills Used	Technology Used	Level of Student Engagement	Brief Description
Engage	5 min	1.3, 3.1, 5.3	Internet & Video	2	Students watch a video and make observations on the developmental changes that occur during pregnancy.
Explore	40 min	3.3, 3.5, 3.7, 5.3	None	3	Students will match pictures of a growing fetus with the appropriate descriptions. Next, students match picture and information cards to learn the stages of fetal development.
Explain	10 min	6.1, 6.2	None	3	Students will answer questions about their learning and understanding from the explore activity.
Expand/ Elaborate	40 min	7.2, 7.3	None	2	Students will act as physicians and examine a medical case study of a pregnant woman. In the investigation students will need to find out how far along the patient is in her pregnancy by analyzing post ultrasound reports indicating certain markers of the stages of development. Based on the given evidence, students will diagnose which trimester the patient is in, support their claim with evidence from their previous work, and the rationale for their evidence. Students will share their CER with other students through a gallery walk.
Evaluate	5 min	-	*None*	*1*	There are formal and informal assessments available for this activity.

Level of Student Engagement

1	Low	Listen to lecture, observe the teacher, individual reading, teacher demonstration, teacher-centered instruction
2	Moderate	Raise questions, lecture with discussion, record data, make predictions, technology interaction with assistance
3	High	Hands-on activity or inquiry; critique others, draw conclusions, make connections, problem-solve, student-centered

Next Generation Science Standards – Inquiry

NGSS Practice 2: Developing and Using Models
NGSS Practice 3: Planning and Carrying Out Investigations
NGSS Practice 4: Analyzing and Interpreting Data
NGSS Practice 6: Constructing explanations
NGSS Practice 7: Engaging in arguments from evidence
NGSS Practice 8: Obtaining, Evaluating and Communicating Information

Next Generation Science Standards –Life Science

HS-LS1-2: Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms

Florida Science Standards – Nature of Science

SC.912.N.1.1: Use tools to gather, analyze, and interpret data (this includes the use of measurement in metric and other systems, and also the generation and interpretation of graphical representations of data, including data tables and graphs), (Collect data or evidence in an organized way. Pose answers, explanations, or descriptions of events, Generate explanations that explicate or describe natural phenomena (inferences), Use appropriate evidence and reasoning to justify these explanations to others, Communicate results of scientific investigations, and Evaluate the merits of the explanations produced by others.
SC.912.N.1.6: Describe how scientific inferences are drawn from scientific observations and provide examples from the content being studied.

Florida Science Standards – Life Science

SC.912.L.16.13: Describe the basic anatomy and physiology of the human reproductive system. Describe the process of human development from fertilization to birth and major changes that occur in each trimester of pregnancy *(focusing on the process of human development and major changes that occur in each trimester of pregnancy).*

Materials and Advance Preparation

Materials List

Class set:

- **Blackline Master # 1** Description Cards (1 set per group of 4 students)
- **Blackline Master # 2** Fetal Development Cards (1 set per group of 4 students)
- **Blackline Master # 3** Case Studies (1 different case study for each group; up to 6 groups)
- **Blackline Master # 4** Do You See What I See Student Lab Sheet (1 copy per student)
- **Blackline Master # 5** Case Study Claim, Evidence, Justification Sheet (1 copy per group)

Blackline Masters

1. Blackline Master # 1: Description Cards
2. Blackline Master # 2: Fetal Development Cards
3. Blackline Master # 3: Case Studies - Ultrasound reports
4. Blackline Master # 4: Do You See What I See Student Lab Sheet
5. Blackline Master # 5: Case Study Claim, Evidence, Justification Sheet
6. Blackline Master # 6: Human Development Quiz

Advance Preparation

1. Print out the Blackline Master #'s 1, 2 (1 set for each group) and cut the description cards and fetal development cards apart and place each set in a separate envelope.
2. Print out Blackline Master #3, 1 set.
3. Print out the Blackline Master # 4 and run copies one per student.
4. Print out Blackline Master #5, 1 per group.
5. Print out Blackline Master #6, 1 per student.
6. Make sure you can view the Human Development Video (3:36): https://drive.google.com/file/d/0B3ft7TkiNrXxUVdlRmpybXpHZkE/view?usp=sharing
7. If you have problems viewing the video in Google Docs, try downloading it to your computer.

Lesson Information

Learning Objectives

1. The learner will be able to:
    a. Describe the process of human development from fertilization to birth.
    b. Describe major changes that occur in each trimester of pregnancy.

Prior Knowledge Needed by the Students

- Students should understand the basic anatomy and physiology of the human reproductive system.
- Students should understand the process of fertilization.

Background Information

After fertilization takes place, the **zygote** begins to divide through a process known as *mitosis*. The zygote makes its way to the uterus, implants along the uterine wall, and transforms into a **blastocyst.** The *germ layers (ectoderm, mesoderm, and endoderm)* form and the blastocyst becomes an *embryo*. Human pregnancy is divided into **trimesters** (three periods of roughly three months each.) In as little as nine week, the embryo is called a **fetus**.

The **1st trimester** includes weeks 1-12. During this phase, the following changes occur: heart, brain, intestines, pancreas, kidneys, liver are forming; heartbeat can be detected after week 5; arms and legs begin to develop; lenses of the eye appear; individual fingers and toes begin to form; hair, fingernails, and toenails develop; cerebral hemisphere begin to form; early structure of bronchi (lungs) begin to develop; and external sex organs show sex of the fetus.

The **2nd trimester** includes weeks 13-27. During this phase, the following changes occur: most joints and bones have started to form; skin is protected by fine hair and waxy substance; first movements are felt by mother; wake and sleep cycles are more regular; brain begins a stage of rapid growth; eyes open and blink; eyebrows and eyelashes have formed; fetus breathes in amniotic fluid, which strengthens lungs; fetus swallows amniotic fluid and makes urine.

The **3rd trimester** includes weeks 28-40. During this phase, the following changes occur: the fetus responds more strongly to light and sound outside the uterus; the fetus has periods of dreaming; eyes are open when awake and closed when asleep; fine body hair thins and scalp hair grows in; bones are growing and hardening; synapses between neurons form in huge numbers; lungs complete development; and fetus turns head-down position.

After about 38 weeks, the full grown fetus is ready to be born. Birth occurs in three stages: 1) **Dilation of the cervix**; 2) **Emergence of the baby**; 3) **Expulsion of the placenta**. **In stage 1**, *oxytocin* (hormone) is released from the pituitary gland (located in the brain) to cause contraction which help push the cervix open. The cervix must dilate at least 10 centimeters (4 inches) to allow the baby to pass through the birthing canal. If the cervix dilates too little, a *C-Section* incision may need to be done. **In stage 2**, the baby is pushed through the cervix and out of the vaginal canal. This is the most stressful time for both mother and baby. Oxytocin is further released to stimulate milk production in the mother's breast. **In stage 3**, the contractions continue in order to expel the placenta. In addition, contraction helps to control bleeding.

Lesson Procedure

Engage

1. Watch a short video (3:36) on pregnancy and fetus development:
   https://drive.google.com/file/d/0B3ft7TkiNrXxUVdlRmpybXpHZkE/view?usp=sharing
   If you have problems viewing the video in Google Docs, try downloading it to your computer.
2. After the video, choose from the following follow-up questions and have students use the rally robin structure to discuss with a partner, or round robin to discuss with their whole table. For more information about the rally robin and round robin structures, please visit http://cooperativelearningresources.weebly.com/roundrobin--rallyrobin.html
   - In your own words, describe the process of fertilization? *Student responses will vary but should include that one sperm cell penetrates the egg cell which begins the process of cell division.*

- What were some developmental changes you observed? *Student responses will vary but could include that they saw the heart beating, organs and limbs developing, hair developing, blinking, the fetus beginning to look more like a baby, etc.*
- What organs were formed at the beginning of development? Towards the end of development? *Student responses will vary but should include that the heart, brain and spinal cord were formed near the beginning of development and the other organs were formed later in development.*
- What did you notice about the fetus' movements towards the end of development? *Student responses will vary but should include that the fetus moves more toward the end of pregnancy.*
- Why would it be important to know how far along a woman is in her pregnancy? *Student responses will vary but could include that doctors would know if it was safe to deliver the baby if the mother or baby's health were in jeopardy, doctors would be able to determine if vital organs have already been developed to monitor typical fetal development, etc.*

Explore

1. In this activity students will be scientists by investigating the developmental changes that take place during the three trimesters of human pregnancy.
2. Distribute **Blackline Master #1** Description Cards and **Blackline Master #2** Fetal Developmental Cards (pre-cut and in envelope) to each group.
3. Distribute **Blackline Master #4** (one per student) and divide the class into groups of 3 or 4 students per group.
4. Working in their groups, students will follow the directions on **Blackline Master #4**. Students will match the picture of the embryo/fetus to the appropriate description and complete the lab activity table by filling in the descriptions.

   *Modification of Lab- Teachers can laminate pictures as well as description cards and using poster board and sticky tack/velcro, ask students to match the pictures to the appropriate descriptions.
5. ***During the EXPLORE part of the lesson, the <u>TEACHER MUST</u> walk around to monitor the students' progress and assist in correcting misconceptions & mistakes when the students think they are finished with the match-up. Failure to correct the students' mistakes on the match-up before the EXPLAIN and ELABORATE will result in the learning and teaching of misinformation.***
6. While students are exploring, some questions that the teacher can ask to help guide their learning include:
   - Were there characteristics of the description, name, or shape of the embryo/fetus that helped you match their name and function to the picture?
   - What made you decide to match that picture up with that description?
   - Which pictures were the easiest or most difficult to match up with their description? Why?
   - Which pictures are you still uncertain about?

Explain

1. Once the students are finished completing their table, students can collaborate with other groups to complete any missing information or to verify their responses.
2. Students will explain the various pictures of the trimester of development and their correct descriptions to the other group. The other group will record these findings on their lab sheet and vice versa.
3. Students will complete the reflection questions for the trimesters of development after completing the tables.
4. Some questions you might ask students within their groups or as a whole class include:

- Did anything surprise you about the trimesters of development?
- In what ways are the 1rst and 2nd trimesters similar? In what ways are the 2nd and 3rd trimesters different?
- What would happen to a baby that is born prematurely at the beginning of the third trimester? Why would or wouldn't it be able to survive?
- Why do you think a fetus might be more easily damaged by genetic errors during the first trimester than any other trimester?

5. A quick review of the correct trimesters may still be necessary so that students do not have misconceptions of the trimesters of development.

Elaborate

1. Distribute one of each of the patient case studies (**Blackline Master #3)** to each group.
2. Students will use **Blackline Master # 5** to investigate their patient case study and determine the trimester the pregnant patient is in.
3. Students will then share their analysis with the class. Students will use this time to emphasize their understanding of the trimesters of development.
   - Consider using a technique like 2 stray, 2 stay or a gallery walk to have students share their results with each other. For more information about the stray/say technique, please visit: http://www.theteachertoolkit.com/index.php/tool/two-stray-one-stay. For more information about gallery walks, please visit: http://www.theteachertoolkit.com/index.php/tool/gallery-walk
4. Some questions you might ask students, or students might ask each other, during/after their presentations include:
   - What evidence do you have that supports that this is the CORRECT trimester for your patient?
   - Would you expect a different outcome if the heart beat was not visible?
   - What would happen if the ultrasound picture of the embryo/fetus was not available? Would you have made the same diagnosis? How?
   - What would happen if the description of the embryo/fetus was not available? Would you have made the same diagnosis? Why or why not?

Evaluate

1. Informal/Formative Evaluation

   Observation of students' progress and understanding throughout the activity.

   Responses to probing questions in small groups.
2. Formal/Summative Evaluation
   - Final project and completed worksheet (**Blackline Master #4 and Blackline Master 5)** can be graded and based on three components:
     - Accuracy of pairing the picture cards with the appropriate descriptions (completing the table correctly)
     - Accuracy of the explanation of the trimester for the patient case study (**Blackline Master # 5)**
     - 5 Question Summative Quiz (**Blackline Master #6**)

Further Reading & Resources:

- The Male Reproductive System http://www.webmd.com/sex-relationships/guide/male-reproductive-system
- The Female Reproductive System http://www.webmd.com/sex-relationships/guide/your-guide-female-reproductive-system
- Pregnancy and Conception http://www.webmd.com/baby/guide/understanding-conception?page=1

- Pregnancy and Baby Development http://www.webmd.com/baby/tc/pregnancy-your-first-trimester
- Pregnancy Stages Pictures http://www.medicinenet.com/stages_of_pregnancy_pictures_slideshow/article.htm
- Fetal Development – 1st thru 3rd trimesters http://americanpregnancy.org/while-pregnant/first-trimester/

CITATION OF SOURCES

Open Folder Picture : http://www.texample.net/tikz/examples/file-folder/

Sample Ultrasound Reports: http://www.mtsamples.com/site/pages/sample.asp?Type=45-Obstetrics%20/%20Gynecology&Sample=247-Ultrasound%20OB%20-%201

Sample Ultrasound Reports & Pictures: http://www.baby2see.com/development/ultrasound_sonogram/first_trimester_scans.html

Sample Ultrasound Pictures: http://pregnancy.about.com/od/fetus/a/uswbw.htm

Video clipped from Human Growth and Development video on YouTube:
https://www.youtube.com/watch?v=UgT5rUQ9EmQ
https://www.youtube.com/watch?v=Q9nRKPv1upM

__✓__ Yes, I cited all materials and resources used in this lesson.

Heather Miller
& Leila Greene
Lesson authors' signatures

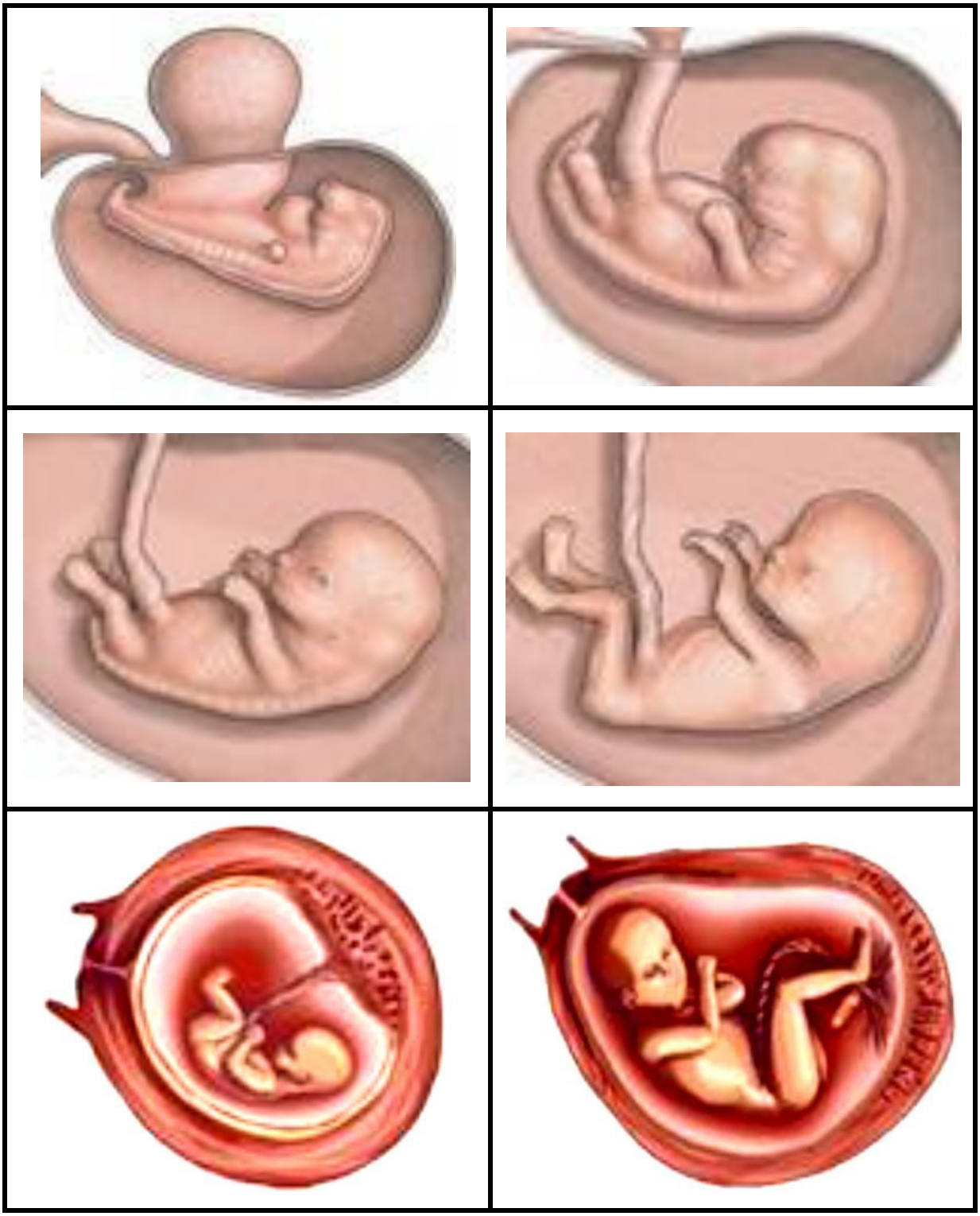
Blackline Master #1

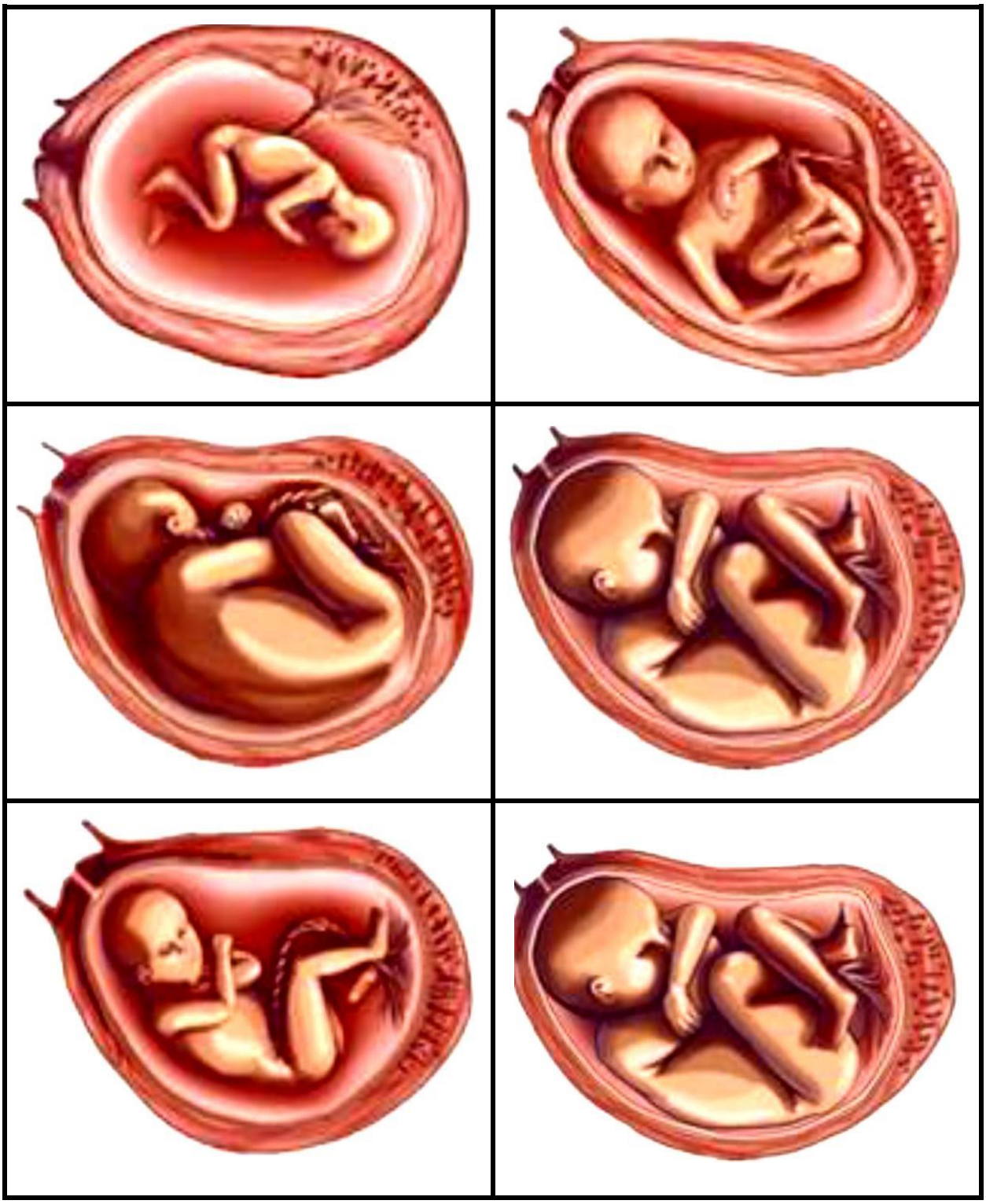
Human Development Description Cards

• The embryo is 2 mm in length and has a mass of 100 mg. • The brain, spinal cord, and heart begin to develop. • The gastrointestinal tract begins to develop.	• The fetus is 7cm to 9 cm in length and has a mass of 28 g. • Fingers and toes are distinct. • Placenta is complete. • Fetal circulation is complete. • Organ systems are complete.
• The embryo is 4 mm in length and has a mass of 300 mg. • Arm and leg buds become visible. • The brain develops into five areas and some cranial nerves are visible. • The eyes and ear structures begin to form. • Tissue forms that develops into the vertebra and some other bones. • The heart continues to develop and now pumps in a regular rhythm. • Rudimentary blood moves through the main vessels.	• The fetus is 10 cm to 17 cm in length and has a mass of 55 g to 120 g. • The external genitalia are visible. • The newly formed kidneys begin to excrete urine. • The heartbeat is present. • Nasal septum and palate (in nose/mouth region) close.
• The embryo is 1.6 cm to 2.3 cm in length and has a mass of 1 g to 2 g. • The arms and legs have grown longer, and foot and hand areas can be distinguished. • The hands and feet have fingers and toes (digits), but may still be webbed. • The brain continues to form. • The lungs begin to form.	• The fetus is 25 cm in length and has a mass of 223 g. • A very soft, fine hair (lanugo) covers the entire body. • Fetal movements can be felt by the mother. The heartbeat can be heard with a stethoscope.

• The embryo is 3.1 cm to 4.1 cm in length and has a mass of 4 g to 7 g. • Nipples and hair follicles form. • Elbows and toes are visible. All essential organs have begun to form. • The eyelids are more developed. • External features of the ear begin to take their final shape. • Facial features continue to develop. • The intestines rotate.	• The fetus is 28 cm to 36 cm in length and has a mass of 680 g. • The skin appears wrinkled. • A waxy or cheese-like white substance that coats the skin (vernix caseosa) begins to develop. • Eyebrows and fingernails develop.
• The fetus is 35 cm to 38 cm in length and has a mass of 1200 g. • The skin has a distinct pink/red color. The membrane on the eyes begins to disappear. • The fetus has an excellent chance of survival on its own. • The eyes can open and close.	• The fetus is 38 cm to 43 cm in length and has a mass of 1500 to 2500 g. • The fetus is viable and could now survive on its own. • The fingerprints are formed. • Vigorous fetal movements occur.
• The fetus is 42 cm to 49 cm in length and has a mass of 1900 g to 2700 g. • Face and body have a loose wrinkled appearance, because of subcutaneous fat deposits. • The very soft, fine hair covering the body (lanugo) disappears. • The amniotic fluid begins to decrease.	• The fetus is 48 cm to 53 cm in length and has a mass of 3000 g. • The skin is smooth. • The eyes are uniformly slate (bluish) colored. • Bones of skull are ossified and nearly together at the sutures.

Blackline Master #2





Blackline Master #3

Case Study # 1

Exam: OB Ultrasound
History: A 29 year old female requests for size and date of pregnancy
Findings:

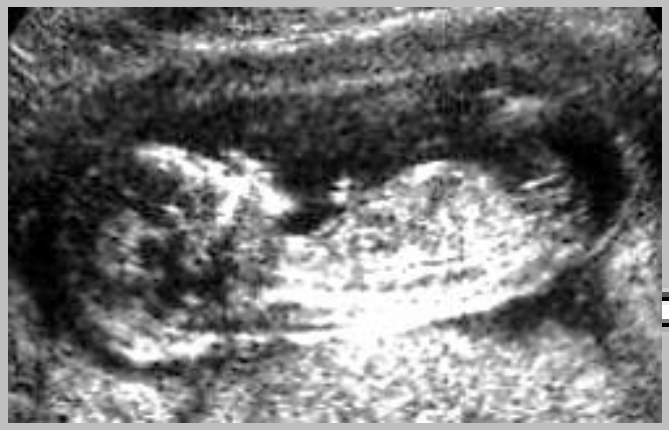
- Crown- to-Rump Measurement: 20mm to 30mm
- Length = 0.9 to 1.2 inch
- Weight = 2 g(0.07oz)
- Webbed hands and feet
- Cartilage and bones begin to form
- Upper lip and nose tip is being formed
- Tongue begins to develop and the larynx is developing
- Optic vessels visible but remain closed for several months
- Heartbeat detected

Case Study # 2

Exam: OB Ultrasound
History: A 28 year old female requests for size and date of pregnancy
Findings:

- Crown –to-heel measurement: 46 cm
- Weight: 2400 grams
- Length: 18 inches
- Skull bones are pretty flexible and not completely joined
- Fat accumulations plumps up the arms and legs
- Eyes open when awake and close when sleeping
- Fingernails are completely formed
- Immune System is strengthening

Case Study # 3



Exam: OB Ultrasound
History: A 33 year old female requests for size and date of pregnancy
Findings:

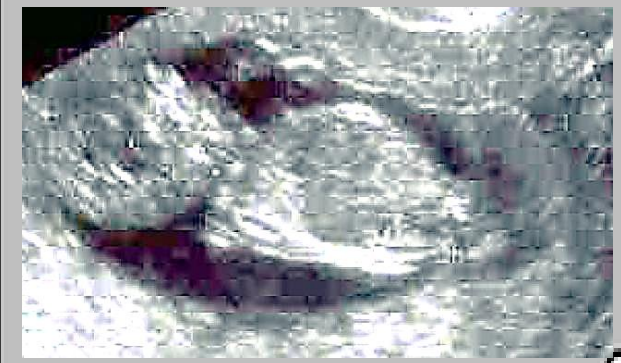
- CRL Measurement: 74mm to 87 mm
- Length = 8cm
- Weight = 23g (0.8oz)
- Webbed hands and feet
- Bone replaces cartilage and ribs appear
- Nose and chin are well-defined
- Movements can be measured
- Child will begin to learn to suck its thumb
- Mouth can open/close
- External genitalia are almost defined

Case Study # 4

Exam: OB Ultrasound
History: A 25 year old female requests for size and date of pregnancy
Findings:

- Crown to heel measurement: 28cm
- Length = 11 inches
- Weight = 450 grams
- Fetus reacts to loud sounds
- Regular sleeping and waking rhythm
- Taste buds are forming on the tongue
- Eyebrows and eyelids are fully developed
- Fingernails cover the fingertips

Case Study # 5



Exam: OB Ultrasound
History: A 31 year old female requests for size and date of pregnancy
Findings:

- Crown-to-rump: 1.5 inches (35mm)
- Weight = 0.18 ounce (5g)
- Taste buds are starting to develop
- Tooth buds are formed
- Baby can swallow and stick out tongue
- Sensitive to touch
- Cartilage now calcifying to become bone
- If a boy, testicles are starting to produce the testosterone hormone

Case Study #6

Exam: OB Ultrasound
History: A 34 year old female requests for size and date of pregnancy
Findings:

- Length: 37.5cm
- Weight = 1000 grams
- Brain waves show rapid eye movement (REM) sleep, which means the baby may be dreaming
- Feet are just over 2 inches (5.5cm) long
- Hair on the head is visible
- Milk teeth have developed under the gums
- Eyes are starting to move in their sockets
- Branches of lungs are quite developed
- Baby recognizes voices

Blackline Master #4

Name_____Period_____Date_____

Do You See What I See?
Student Lab Sheet

Instructions: You are a doctor who has been assigned a special case study. You are trying to determine how far along a woman is in her pregnancy based on the ultrasound findings. For this activity your task is to learn all there is to know about the different stages of fetal development.

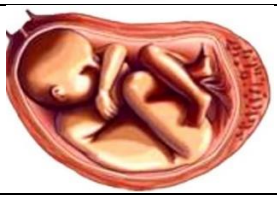
1.) Matching - Working with your group, match the picture of the embryo/fetus with the correct description card.

2.) Reflecting - Complete the table below to demonstrate your understanding of the different stages of pregnancy that you investigated.

3.) Collaboration - Next, compare your findings to another groups' responses until you have completed all tables below. Finally, answer the questions about the trimesters of development that you investigated with your group.

<u>Trimesters of Development:</u>

Trimester : _____	Descriptions
	
	
	
	

Trimester : _____	Descriptions
	
	
	
	
Trimester : _____	**Descriptions**
	
	
	
	

Trimesters of Development Continued

a) Human pregnancies are divided into trimesters. Approximately how many weeks are in each trimester? _____

b) During what trimester, or what week will the embryo become a fetus?
_____

c) During what trimester, or what week, will the embryo's heart begin to beat?
_____

d) During what trimester, or what week will the fetus' fingers and toes be fully formed?
_____

e) During what trimester, or what week will the fetus' lungs be completely developed?
_____

f) Explain why the picture of the trimesters of development are considered a model. Explain some of the limitations of the model of the Trimesters of development.
_____
_____
_____

Blackline Master #5

Case Study Claim, Evidence, Justification

- Working in your groups, you will become doctors to analyze a medical case study to determine which trimester your patient is in. Each case study will have a brief description of the patient and an ultrasound finding.
- You will state a claim as to which trimester you think your patient is in, provide evidence for your claim, and then provide justification for why your evidence supports your claim.
- Your group will present the case study and findings to the rest of the class.

Claim: *(Write one or two sentences stating your claim)*	
Evidence: *(Use this column to record any evidence or analyzed data to support your claim.)*	**Justification:** *(Use this column to defend your evidence using relevant scientific concepts.)*

Blackline Master #6

Human Development Quiz

1. All of the following will take place during the first trimester EXCEPT? *(SC.912.L.16.13)*

A. lenses of the eye appear
B. heartbeat can be detected
C. wake and sleep cycles become regular
D. external sex organs show the sex of the fetus

2. All of the following will take place during the second trimester EXCEPT? *(SC.912.L.16.13)*

A. fetus makes urine
B. joints and bones begin to form
C. first movements are felt by mother
D. cerebral hemispheres begin to form

Use the picture of the fetus below to answer questions 3 & 4.

3. During which trimester does the fetus grow to its largest size? *(SC.912.L.16.13)*

A. first
B. second
C. third
D. fourth

4. Why is it important for a fetus to reach at least 32 weeks before being born? *(SC.912.L.16.13)*

A. To allow their kidneys to completely develop
B. To allow for their lungs to completely develop
C. To allow their bones and joints to completely develop
D. To allow their ovaries and testes to completely develop

5. Models of the trimesters of development were used in this activity. Why are models important in science? *(SC.912.N.3.5)*

A. Models can simplify, substitute, or stand-in for what you are actually studying.
B. Models can eliminate the danger when you have to work in dangerous conditions.
C. Models can show you an exact replica of what is happening or what you're studying.
D. Models are the only tool that can help you communicate your ideas to other scientists.

Trimesters of Development:

Trimester : _____1st_____	Descriptions
	The embryo is 2 mm in length and has a mass of 100 mg. The brain, spinal cord, and heart begin to develop. The gastrointestinal tract begins to develop.
	The embryo is 4 mm in length and has a mass of 300 mg. Arm and leg buds become visible. The brain develops into five areas and some cranial nerves are visible. The eyes and ear structures begin to form. Tissue forms that develops into the vertebra and some other bones. The heart continues to develop and now pumps in a regular rhythm. Rudimentary blood moves through the main vessels.
	The embryo is 1.6 cm to 2.3 cm in length and has a mass of 1 g to 2 g. The arms and legs have grown longer, and foot and hand areas can be distinguished. The hands and feet have fingers and toes (digits), but may still be webbed. The brain continues to form. The lungs begin to form.
	The embryo is 3.1 cm to 4.1 cm in length and has a mass of 4 g to 7 g. Nipples and hair follicles form. Elbows and toes are visible. All essential organs have begun to form. The eyelids are more developed. External features of the ear begin to take their final shape. Facial features continue to develop. The intestines rotate.

Trimester : ___2nd____	Descriptions
	The fetus is 7cm to 9 cm in length and has a mass of 28 g. Fingers and toes are distinct. Placenta is complete. Fetal circulation is complete. Organ systems are complete.
	The fetus is 10 cm to 17 cm in length and has a mass of 55 g to 120 g. The external genitalia are visible. The newly formed kidneys begin to excrete urine. The heartbeat is present. Nasal septum and palate (in nose/mouth region) close.
	The fetus is 25 cm in length and has a mass of 223 g. A very soft, fine hair (lanugo) covers the entire body. Fetal movements can be felt by the mother. The heartbeat can be heard with a stethoscope.
	The fetus is 28 cm to 36 cm in length and has a mass of 680 g. The skin appears wrinkled. A waxy or cheese-like white substance that coats the skin (vernix caseosa) begins to develop. Eyebrows and fingernails develop.
Trimester : ____3rd ____	**Descriptions**
	The fetus is 35 cm to 38 cm in length and has a mass of 1200 g. The skin has a distinct pink/red color. The membrane on the eyes begins to disappear. The fetus has an excellent chance of survival on its own. The eyes can open and close.
	The fetus is 38 cm to 43 cm in length and has a mass of 1500 to 2500 g. The fetus is viable and could now survive on its own. The fingerprints are formed. Vigorous fetal movements occur.
	The fetus is 42 cm to 49 cm in length and has a mass of 1900 g to 2700 g. Face and body have a loose wrinkled appearance, because of subcutaneous fat deposits. The very soft, fine hair covering the body (lanugo) disappears. The amniotic fluid begins to decrease.
	The fetus is 48 cm to 53 cm in length and has a mass of 3000 g. The skin is smooth. The eyes are uniformly slate (bluish) colored. Bones of skull are ossified and nearly together at the sutures.

Case Study Answers:

Case Study # 1: First Trimester- Week 9

Case Study # 2: Third Trimester- Week 34

Case Study # 3: Second Trimester- Week 13

Case Study #4: Second Trimester- Week 22

Case Study #5: First Trimester- Week 11

Case Study #6: Third Trimester – Week 28

Quiz Answers:

1. C 2. D 3. C 4. B 5. A