The Science of Life Before Birth – Lesson Plan Options

This curriculum centers on documentary film content. Included are lecture notes with visual aids for further research, class discussion options, and assessment options.

Objectives:
- The students will begin to understand the complexity of the prenatal developmental process.
- The students will be able to define key terms related to human development.
- The students will be able to identify 15 major milestones of prenatal development.

Lesson One: Video

Watch science documentary video. Different versions of the film are available for various levels of comprehension and maturity. The 49-minute *The Science of Life Before Birth* version is suggested for college/advanced high school use. The 28-minute *See Baby Grow* version is suggested for junior high and high school. The 30-minute *Before You Were Born* version is the children's edition and is intended for elementary, kindergarten, and pre-k use.

To avoid diverting student attention away from the extraordinary visual content of these documentary films, it is recommended that they not take notes while watching the film.

Suggested plan:

Prior to watching the age-appropriate film, ask the students to be ready to discuss what they've watched. They can ask questions about content or share interesting facts gleaned from the film. Remind them not to take notes, just to watch the film and see what they find most interesting. After the film ends, but before discussion begins, it may be useful to give students a few minutes to jot down questions while content is still fresh in their minds.

Suggested post-view discussion starters:

Do you have questions about what you've seen?
Were there any terms that were unfamiliar to you?
What did you find most interesting?
Did any information in the video surprise you?

Lesson Two: Lecture/Discussion

Included are lecture notes with which to review the content of the video. Tailor the lecture notes to the appropriate age level of the students. Incorporate the exploration of the 3D organ models as time allows.

Lesson Three: Discussion/Review Option

Break the students into pairs and assign vocabulary terms. Have the students present their findings to the group.

Lesson Four: Discussion/Review Option

Put the students in small groups and assign topics: 1) early stage information; 2) heart; 3) brain; 4) movement; 5) musculoskeletal system and skin; 6) liver, kidneys, digestive system, and lungs; 7) eyes, reproductive organs, and ears. Have each group become "experts" on their topics, using the lecture notes to extract information on their assigned subjects, creating a review of the material learned from the videos.

Lesson Five: Discussion/Review Option

Milestones Worksheet. This could be an individual assignment for homework or a group/pairs project in class. Vocabulary to review/word bank: 11 weeks, cochlea, embryonic period, fetus, 6 weeks and 2 days, fertilization, almost half, fingerprints, 3 weeks and 1 day, DNA, one billion, light, four thousand, quickening, estrogen, viability, circadian rhythms

Lesson Six: Discussion/Review Option

Test prep day. Give the students a copy of the lecture notes and have them work in pairs on the final multiple-choice test. Correct the tests in class.

Lesson Seven: Discussion/Review Option

Jeopardy-style game review day.

<u>Questions</u>

1) How long does a full-term pregnancy last?
2) What is the developing human called from eight weeks of pregnancy until birth?
3) What does fetus mean?
4) When does human development begin?
5) What is another word for egg (a woman's reproductive cell)?
6) What is another word for sperm (a man's reproductive cell)?
7) A single-celled embryo is called a zygote, which means _____.

<u>Answers</u>

1) 38 weeks from fertilization/conception
2) a fetus
3) unborn offspring
4) at fertilization/conception
5) oocyte
6) spermatozoon
7) yolked or joined together
8) double helix
9) above
10) hair
11) endoderm
12) 3 weeks and 1 day after fertilization

8) DNA molecules resemble a twisted ladder called a _____.
9) The placenta produces hormones and maintains embryonic and fetal body temperature slightly _____ that of the mother.
10) Ectoderm gives rise to numerous structures including the brain, spinal cord, nerves, skin, nails, and _____.
11) _____ produces the lining of the respiratory system and digestive tract and generates portions of major organs such as the liver and pancreas.
12) The heart begins to beat at _____.
13) Which body system is the first to achieve a functional state?
14) Which permanent organ appears by five weeks?
15) This is the primary muscle used in breathing and largely develops by six weeks.
16) Brainwaves have been recorded as early as _____.
17) Bone formation begins by six weeks in the clavicle and upper and lower jaw. This process is called _____.
18) Hiccups have been observed by _____ weeks.
19) Eight weeks marks the end of the _____ period.
20) By nine weeks the fetus can grasp an object and is also able to _____ and _____.
21) External genitalia are identifiable as either male or female at _____ weeks.
22) What is the name of the material first expelled from the fetal and newborn colon?
23) From 19 weeks, fetal movement, breathing activity, and heart rate begin to follow daily cycles called _____.
24) The fetus has a firm hand grasp at _____ weeks.
25) The _____ initiates labor by releasing large amounts of estrogen.

13) the circulatory system
14) the kidneys
15) the diaphragm
16) 6 weeks and 2 days after fertilization
17) ossification
18) seven
19) embryonic
20) sigh, stretch
21) eleven
22) meconium
23) circadian rhythms
24) 35
25) fetus