

# From Conception to Birth

## Teacher's Guide



**Grade Level:** 9–12

**Curriculum Focus:** Health

**Lesson Duration:** 5 class periods

### Program Description

*Introduction to Human Reproduction* (3 min.) – Introduces viewers to the process of human reproduction from conception to birth. *Conception* (4 min.) – Reveals where conception occurs and the cell development that follows. *The Human Embryo* (6 min.) – Investigates developmental stages during the first eight weeks of pregnancy. *Fetal Development* (7 min.) – Examines fetal development during the second and third trimesters. *Labor and Childbirth* (5 min.) – Explores the physiological changes that mother and baby undergo during labor and childbirth.

---

### Discussion Questions

Before watching the video

- What do you know about the stages of fetal development?
- At what point in a pregnancy can the fetus survive outside the womb?
- What role does nutrition play in the development of an unborn child?

After watching the video

- At what point in a pregnancy are the fetus' limbs fully developed?
  - What are some of the physiological changes experienced by a mother during pregnancy?
  - What is the role that medical technology plays in prenatal care?
- 

### Lesson Plan

#### *Student Objectives*

- Explore embryonic development between the moment of conception and the confirmation of pregnancy.
- Examine prenatal development through all three trimesters of human gestation.
- Investigate the process of labor and delivery.
- Evaluate the importance of prenatal care during each stage of pregnancy.

#### *Materials*

- *From Conception to Birth* video
- Computer with Internet access

- Print and Web resources about pregnancy, fetal development, and childbirth

## Procedures

1. Before viewing the video, ask the class what they know about the stages of fetal development. Ask them if they know the difference between an embryo and a fetus. (The unborn baby is considered an embryo for the first eight weeks after conception and defined as a fetus after eight weeks). At what point in the pregnancy can a fetus survive outside the womb? (After 26 weeks, with medical assistance.) What types of activities should expectant mothers avoid during pregnancy? What role does nutrition play in the development of an unborn child?
2. After viewing the video, the in-class discussions will include an overview of conception and prenatal development, with an additional investigation into the physiological changes experienced by the mother and the role that medical technology plays in prenatal care. Where does conception occur inside the woman's reproductive system? (Typically in the fallopian tube, and then the fertilized egg is implanted in the lining off the uterus.) At what point in the pregnancy are the fetus' limbs fully developed? (By the end of the third month.)
3. Discuss the impact that pregnancy has on the mother. What are some of the physiological changes experienced by the mother during pregnancy? Write down the students' responses. (Possible answers include morning sickness, food aversions or cravings, weight gain, swelling of the feet, fatigue, frequent urination, and difficulty sleeping during the later stages of pregnancy.)
4. Do women experience symptoms of pregnancy even before they have a positive pregnancy test? What would be some of the indications that a woman is pregnant? (Possible answers include a missed period, nausea, vomiting, or changes in appetite.)
5. Explain that human gestation is divided into three trimesters, with key developmental milestones taking place throughout the pregnancy. When is the fetus considered full term? (Thirty-seven weeks after conception.) During the class discussion each student will be assigned a number from one to four, and the teacher will direct questions to the different groups of students regarding the development of the fetus' organs, limbs, central nervous system, and reproductive organs. Ask the students to discuss possible answers to these questions with the classmate sitting next to them, and have them respond together.
6. Briefly discuss the role that ultrasounds and other tests play in prenatal care. What sort of medical attention might be necessary if a baby was born prematurely? What medical conditions or delivery complications can be detected during the pregnancy? Ask the students to discuss possible answers to these questions with the classmate sitting next to them, and have them respond together.
7. Later on in the week, divide the class into four groups based on their number assignment and ask them to work together on an in-class presentation. Each group will research part of a larger question: Why is prenatal care so important at every step of the pregnancy? By studying the milestones of fetal development and the physiological changes in the mother, students will gain a greater understanding of the role that medical technology plays in monitoring and maintaining the health of the mother and infant. Each of the first three groups will research one of the trimesters of pregnancy, while the fourth group will investigate what happens to the mother and child during labor and delivery.

8. Each member of the group will be responsible for one aspect of their assigned topic. In the first three groups, up to three students per group will become “experts” on the developmental milestones of the embryo or fetus during a particular month of the pregnancy, one person will research the physiological changes experienced by the mother during that trimester, another student will investigate various prenatal tests taken at that stage of the pregnancy, while yet another researches the medical conditions that can be detected by an ultrasound or blood test. For example, a six-person group studying the third trimester of pregnancy might divide their research as follows:

- Student A: Fetal development during the seventh month
- Student B: Fetal development during the eighth month
- Student C: Fetal development during the ninth month
- Student D: Physiological changes in the mother during the third trimester
- Student E: Diagnostic tests available during the third trimester (e.g., group B streptococcus)
- Student F: Medical conditions that might develop during the third trimester (e.g., gestational diabetes or preeclampsia)

In the case of the group investigating labor and delivery, a six-person group might divide their research as follows:

- Student A: Physiological changes in the baby during labor
- Student B: Physiological changes in the mother during labor
- Student C: Birth options: natural (drug-free) childbirth
- Student D: Birth options: childbirth with pain medication
- Student E: Vaginal childbirth
- Student F: Cesarean section

9. Students should be able to find information in print resources and at the following Web sites:

- BabyCenter.com (Fetal Development)  
[www.babycenter.com/fetaldevelopment](http://www.babycenter.com/fetaldevelopment)
- AmericanBaby.com (Fetal Development)  
[http://americanbaby.com/ab/category.jhtml?categoryid=/templatedata/ab/category/data/fetaldev\\_0.xml](http://americanbaby.com/ab/category.jhtml?categoryid=/templatedata/ab/category/data/fetaldev_0.xml)
- Pregnancy-info.net (Stages of Pregnancy)  
[www.pregnancy-info.net/topic\\_timing\\_and\\_planning.html](http://www.pregnancy-info.net/topic_timing_and_planning.html)
- Fetal Development (Sutter Health Network)  
<http://babies.sutterhealth.org/babygrowth/fetaldev>

- Healthsquare.com (Labor and Delivery)  
[www.healthsquare.com/fgwh/wh1ch26.htm](http://www.healthsquare.com/fgwh/wh1ch26.htm)
- Discovery Health (Labor and Delivery Index)  
<http://health.discovery.com/centers/pregnancy/labordelivery/labordelivery.html>

10. After the members of the original groups have researched their assigned topics, the teacher will utilize the jigsaw method of cooperative learning by assigning new groups using at least one member from each original team. The new teams will use their collective knowledge to answer the initial question "Why is prenatal care so important at every step of the pregnancy?" by presenting their evidence to the rest of the class. Students will answer questions about their "area of expertise" within the group project. Everyone should be encouraged to use as many visual aids as possible, including illustrations or reprinted pictures of the unborn baby at various stages of development.

### Assessment

Use the following three-point rubric to evaluate students' work during this lesson.

- **3 points:** Students worked cooperatively and efficiently in groups, following all directions to create a presentation that reflects thorough research and a clear understanding of the larger question "Why is prenatal care so important at every step of the pregnancy?"
- **2 points:** Students usually worked cooperatively and efficiently in groups, following most of the directions to create a presentation that reflects research and a clear understanding of the larger question "Why is prenatal care so important at every step of the pregnancy?"
- **1 point:** Students worked somewhat cooperatively and efficiently in their groups, following some of the directions to create a presentation that reflects research and a clear understanding of the larger question "Why is prenatal care so important at every step of the pregnancy?"

### Vocabulary

#### cesarean section

*Definition:* Surgical incision of the walls of the abdomen and uterus for delivery of offspring

*Context:* Cesarean sections, commonly referred to as C-sections, have saved the lives of mothers and their babies during difficult deliveries.

#### chromosome

*Definition:* Threadlike structure consisting of DNA and proteins; found in the nucleus of any given cell and containing the cell's genetic information

*Context:* Every human being has the combined chromosomes of their mother and father.

#### egg

*Definition:* An animal reproductive body consisting of an ovum together with its nutritive and protective envelopes and having the capacity to develop into a new individual

*Context:* A female is born with all the eggs she will ever produce.



### **ejaculation**

*Definition:* A sudden discharging of a fluid from a duct

*Context:* Millions of sperm are released during a single ejaculation.

### **embryo**

*Definition:* The developing human from the time of implantation to the end of the eighth week after conception

*Context:* A mother's alcohol or drug use can cause permanent damage to a developing embryo.

### **fetus**

*Definition:* A developing human from usually two months after conception to birth

*Context:* After eight weeks in the womb, the unborn baby is known as a fetus.

### **placenta**

*Definition:* The vascular organ in mammals that unites the fetus to the maternal uterus and mediates its metabolic exchanges

*Context:* The uterus contracts to expel the placenta within minutes after childbirth.

### **sperm**

*Definition:* A male gamete or germ cell

*Context:* The average male will produce about 12 trillion sperm in his lifetime.

## ***Academic Standards***

### **National Academy of Sciences**

The National Academy of Sciences provides guidelines for teaching science in grades K–12 to promote scientific literacy. To view the standards, visit this Web site:

<http://books.nap.edu/html/nses/html/overview.html#content>.

This lesson plan addresses the following national standards:

- Life Science – Reproduction and heredity

### **Mid-continent Research for Education and Learning (McREL)**

McREL's Content Knowledge: A Compendium of Standards and Benchmarks for K–12 Education addresses 14 content areas. To view the standards and benchmarks, visit

<http://www.mcrel.org/compendium/browse.asp>.

This program addresses the following national standards:

- Health – Understands the fundamental concepts of growth and development
- Science – Life Sciences: Understands the principles of heredity and related concepts

## **DVD Content**



This program is available in an interactive DVD format. The following information and activities are specific to the DVD version.

## ***How to Use the DVD***

The DVD starting screen has the following options:

***Play Video*** – This plays the video from start to finish. There are no programmed stops, except by using a remote control. With a computer, depending on the particular software player, a pause button is included with the other video controls.

***Video Index*** – Here the video is divided into sections indicated by video thumbnail icons; brief descriptions are noted for each one. Watching all parts in sequence is similar to watching the video from start to finish. To play a particular segment, press Enter on the remote for TV playback; on a computer, click once to highlight a thumbnail and read the accompanying text description and click again to start the video.

***Standards Link*** – Selecting this option displays a single screen that lists the national academic standards the video addresses.

***Teacher Resources*** – This screen gives the technical support number and Web site address.

## ***Video Index***

### **I. Introduction to Human Reproduction (3 min.)**

Within nine months a single cell becomes an entire human being. Learn more about this amazing process from beginning to end.

#### ***Pre-viewing question***

**Q:** How has medical technology enabled us to learn more about human reproduction during the past 50 years?

**A:** Answers may include ultrasounds, diagnostic tests, and the ability to anticipate possible complications with delivery.

#### ***Post-viewing question***

**Q:** At what point in the pregnancy is it possible for a fetus to survive outside the womb?

**A:** With medical attention, a fetus might be able to survive outside the womb at 26 weeks.

### **II. Conception (4 min.)**

By the time a woman discovers she is pregnant, almost a month has passed since conception. Discover what happens during these first crucial weeks of development.

#### ***Pre-viewing question***

**Q:** What is a gamete?

**A:** The male or female reproductive cell – the sperm or the egg.

#### ***Post-viewing question***

**Q:** Approximately how many eggs does a woman have stored in her ovaries?



**A:** The average woman has approximately 40,000 eggs stored in her ovaries.

### III. The Human Embryo (6 min.)

For the first eight weeks, the unborn baby is called an embryo. Learn more about how the organs, limbs, and brain develop during the first trimester.

#### *Pre-viewing question*

**Q:** How soon after conception does a woman know she is pregnant?

**A:** Answers may include the following: after the onset of pregnancy symptoms, after the first missed menstrual period, or after a positive pregnancy test.

#### *Post-viewing question*

**Q:** Where does the fertilized egg implant itself?

**A:** The fertilized egg implants itself in the lining of the uterus, which supplies nutrition for the growing embryo.

### IV. Fetal Development (7 min.)

After 26 weeks a human fetus might be able to survive outside the womb. Witness the rapid development of the bones, muscles, and nervous system during the final months of pregnancy.

#### *Pre-viewing question*

**Q:** What is a fetal position?

**A:** The fetal position is the position that the unborn baby assumes for most of the pregnancy, where the back is curved, the head is bowed, and the limbs are folded up against the torso.

#### *Post-viewing question*

**Q:** At what point in the pregnancy does a woman begin to feel fetal movement?

**A:** Pregnant women usually detect fetal movement around the fourth month of pregnancy.

### V. Labor and Childbirth (5 min.)

After nine months the fully developed baby is ready to come into the world. Learn more about the physical changes a woman undergoes during labor and delivery.

#### *Pre-viewing question*

**Q:** What do you know about childbirth?

**A:** Answers will vary.

#### *Post-viewing question*

**Q:** What causes labor pains?

**A:** Labor pains are caused by the powerful muscle contractions needed to push the baby out of the mother's body.

