Overview
The miraculous story unfolds: conception, two cells uniting to become one, then growing and dividing, differentiating into specific purposes and growing into a fully functioning human being in nine months time. Support systems for this marvelous process, the placenta, umbilical cord and amniotic sac also develop to fully protect and provide nourishment.

Most often this part of the story of development ends with a healthy, completely formed infant with full potential. Unfortunately, miscarriages may interrupt the process, or environmental influences cause harm.

The mother and the father may each be responsible for the damage to their developing child through the use of dangerous substances such as drugs and alcohol, through illness, or through pollution in the workplace. The embryonic period is considered the critical period when the organism is most susceptible to environmental insults.

Fortunately not all the insults are equally harmful. Prolonged rather than minimal exposure is more likely to cause defects. The safest course of action is for the parents, especially the mother, to practice good prenatal care when they are thinking about having a family or when they are of childbearing age. This would be in the best interests of any future children.

Questions To Consider
1. What is meant by gestation?
2. How does the future baby grow during the period of prenatal development?
3. How important is the mother's behavior to the health of the unborn child?
4. What, if any, influence do fathers have on the prenatal development of their children?
5. How important to the developing organisms is the living and working environment of the parents?
6. Are all outside events equally dangerous to the well being of the fetus?

Vocabulary
Read these terms with their definitions before viewing the program.

Amniotic Sac A thin membrane enclosing the embryo/fetus, filled with fluid in which the embryo/fetus is immersed.
Blastocyst A circular mass of cells which develops by the fourth day after fertilization.
Critical Period The period when the developing organs and systems are most vulnerable to environmental influences. The embryonic period is considered the critical period of prenatal development.
Conception (Fertilization) The union of the ovum and the sperm.
Dizygotic Twins Two individual ova fertilized by two separate sperm, develop together in the same uterus.
Ectoderm The outer layer of the embryonic disk, eventually develops into the major body systems.
Embyro The developing organism from the second to the eighth week after fertilization.
Embryonic Disk The three layers of cells which will develop into the embryo's major body systems.
Endoderm The innermost layer of the embryonic disk, eventually develops into digestive and respiratory systems.
Fetus The developing organism from the ninth week to the birth.
Germinal Period The time from conception to implantation; also known as the period of the fertilized ovum or the zygote.
Gestation The time in utero from conception to birth normally 38 weeks or 266 days.
Implantation The point at which the blastocyst attaches to the uterine wall and begins the embryonic period.
Mesoderm The middle layer of the embryonic disk, eventually develops into bones, muscles, circulatory, excretory and reproductive systems.
Monzygotic Twins The separate but identical babies which develop together when the zygote splits in half during division.
Ossification Cartilage begins the development into bone marking the beginning of the fetal period.
Placenta The disk-shaped organ, attached to the wall of the uterus, through which nutrients and waste products are exchanged with the fetus.
Teratogen Substances, agents, or events that interfere with embryonic or fetal development.
Umbilical Cord The structure which contains blood vessels that carry nutrients and waste products between the fetus and the placenta.
Zygote The one to multiple-celled organism formed after fertilization; the fertilized ovum.
**Instructional Objectives**

When you have successfully completed this module, you will be able to:

1. Describe the main characteristics of growth and development in the three stages of prenatal development.
2. Describe the function of the organs that nurture and protect the developing organism.
3. Define the terms: implantation, gestation, critical period, conception, teratogen.
4. Recognize the maternal factors which interfere with prenatal development.
5. Recognize the environmental hazards which interfere with prenatal development.
6. Identify the paternal factors which influence prenatal development.
7. Name and describe the factors which control the effect of teratogens on the developing organism.

**Self-Test**

After studying the objectives and watching the video, take the self-test to check your progress.

1. Describe the main characteristics of development for the
   a. Zygote

   b. Embryo

   c. Fetus

2. Describe the function of the
   a. Placenta

   b. Umbilical Cord

   c. Amniotic Sac

3. Fill in the correct term to complete the definition:
   a. The time in utero from conception to birth is ____________________.

   b. The attachment of the blastocyst to the uterine wall is ____________________.

   c. The time when the embryo is most vulnerable to environmental influences is the ____________.

   d. The union of the sperm and the ovum is ____________________ or ____________________.

   e. Substances that interfere with embryonic development are ____________________.
Select the phrase which best completes the following statements:

4. To protect her unborn child, the mother
   a. should double her intake of food since she is eating for two.
   b. should eat a healthy well balanced diet.
   c. can eat junk food as long as she increases caloric intake.
   d. does not need to worry about nutrition.

5. Malnutrition in the mother
   a. has no effect on the unborn child.
   b. increases the speed of myelinization in the fetal brain.
   c. may result in a smaller brain in her child.
   d. impairs only mental development of the child.

6. In regard to the intake of drugs by the pregnant woman
   a. prescription drugs cause no ill effects on the embryo.
   b. drugs taken by the mother do not cross the placental barrier.
   c. aspirin is safe to use.
   d. antibiotics may cause liver or bone damage to the fetus.

7. According to recent research
   a. mothers age 20 and under have a higher rate of infant retardation and mortality.
   b. mothers age 35 have a lower risk of producing a child with Down Syndrome.
   c. women over age 35 are at higher risk for prematurity and low birth weight.
   d. women who have had four or more pregnancies are likely to have larger babies and fewer stillborns.

8. The influence of the father on prenatal development
   a. ends with his contribution of the sperm.
   b. may be detrimental depending on the condition of his sperm.
   c. is unrelated to his age.
   d. has no bearing on stress in the mother.

9. For each of the following diseases, write one possible teratogenic effect:
   a. Rubella
   b. Diabetes
   c. Toxoplasmosis
   d. Sexually transmitted diseases
10. Next to each statement write T if true or F if false.

   ____ a. Hormones administered to the mother may cause cancer in her children.

   ____ b. Mothers who use crack and heroin may produce children who suffer from prematurity or withdrawal symptoms.

   ____ c. Nicotine has no known effect on the infant after birth.

   ____ d. Fetal alcohol syndrome is the leading cause of mental retardation in the industrialized world.

   ____ e. The Rh factor is a problem only if the mother is Rh- and the fetus is Rh+.

   ____ f. An excessive amount of stress has been linked to prematurity.

   ____ g. There is no evidence that exposure to radiation or chemicals causes birth defects.

   ____ h. Elimination of leaded gasoline has not reduced the number of babies affected by lead in urban areas.

   ____ i. Environmental hazards cause fetal abnormalities after prolonged exposure.

11. Describe the effect of the following teratogenic factors:

   a. Timing

   b. Susceptibility

   c. Threshold effect (exposure)