

Lesson Two – Conception Through Embryonic Development

REVIEW: Stages of Embryonic Development

10 minutes

Purpose:

The purpose of this activity is to review the stages of embryonic development.

Materials:

- Embryonic Development Slides
- *Stages of Embryonic Development* handout (one per participant)
- Embryonic Development Model

Facilitation Steps:

1. Have participants access their *Stages of Embryonic Development* handout with completed drawings.
2. Show the *Human Reproductive Systems- Lesson 2 Embryonic Development* Slide Presentation. Share some of the following information with them:

Slide 13: Introduction Slide

Slide 14: *Sperm and Ovary Development*

Ovary development

Before a female is born, cells in her developing ovaries begin meiosis but stop at the first phase, called prophase I. These cells are called oocytes. The cells remain unchanged until a female begins puberty, usually between the ages of 9-13. During puberty the female begins producing chemicals that cause oocytes to continue meiosis. The meiosis stops again at a second stage called metaphase II. These cells are secondary oocytes also known as the egg cells. An egg cell does not complete meiosis until fertilization occurs.

Sperm Development

The development of sperm, also known as spermatogenesis, is a process of cell division. First the germ cells, spermatogonia, divide and produce spermatocytes. These re-divide twice to form young sperm cells called spermatids. The spermatids mature and transform into spermatozoa, or sperm cells. They lose excess cytoplasm from the head and grow a tail. Each sperm uses the mitochondria it contains to power its tail during the journey to fertilize an egg. Each mature sperm has several parts that help it reach and penetrate an egg: acrosome, mitochondria, tail, and head (including the nucleus).

Slide 15: *Development of the Embryo*

The embryo develops in the following stages:

Fertilization – Conception:

The sperm moves through the vagina, cervix, and uterus to the fallopian tubes, where it fertilizes the egg.

Zygote Stage – 30-55 hours after conception:

The fertilized egg (zygote) divides repeatedly and moves into the uterus, becoming a solid ball of cells.

Morula Stage - 2 ½ - 5 days after conception:

A morula is a 16 cell mass in a spherical shape that turns into a blastocyst.

Blastocyst Stage 5-10 days after conception:

The zygote becomes a hollow ball of cells. The blastocyst implants itself into the wall of the uterus (implantation), where it develops into an embryo.

Embryo Stage - 11 days to 3 months after conception:

The embryo develops within the amniotic sac. Most organs begin to form about 3 weeks after

fertilization. The heart and major blood vessels begin to develop by about day 16, and the heart pumps fluid by day 20. Almost all organs are formed by 10 weeks after fertilization with the exception of the brain and spinal cord. Ask participants to look at their embryonic development sketches. Do they look like this?

Slide 16: *Looking Closer Look at the Blastocyst*

The blastocyst is the pre-implantation embryo of 30-150 cells. It consists of a sphere made up of an outer layer of cells (the trophoblast), a fluid filled cavity the (the blastocoele) and the cluster of cells on the interior (embryoblast)

Slide 17: *Ovulation to Implementation*

Here you can see the path that the egg, zygote, blastocyst, and embryo travel through the stages of development.

Slide 18: *Embryo – First 25 days*

Here is a graphic representation of development through the first 25 days. Using the Embryonic Development Model, pass it around and point out that it covers all stages of development from conception to the first month of development.