

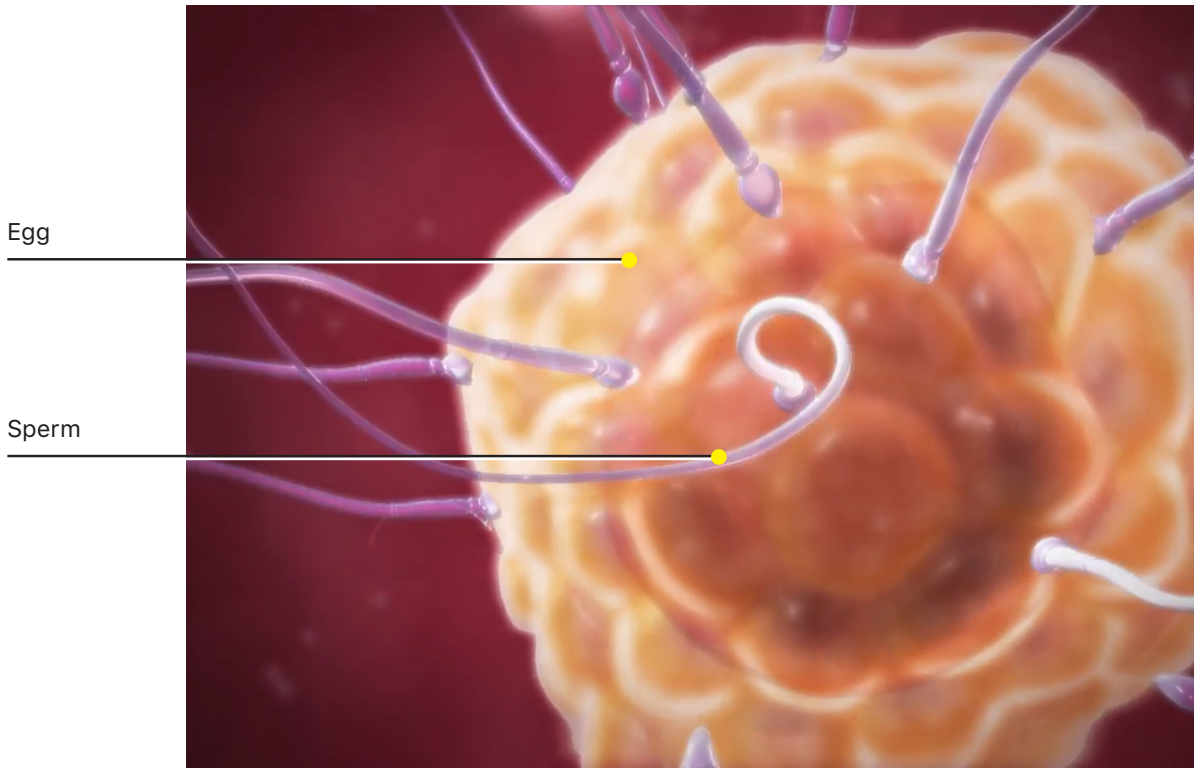
The Reproductive System

A sexual reproduction and development lab activity using Visible Body's Anatomy & Physiology

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PRE-LAB EXERCISES

A. Watch the video for Module 47.1 Reproductive System Overview and answer the following questions.



1. What is the purpose of the reproductive system?

2. What are the purposes of the three categories of organs of the reproductive system?

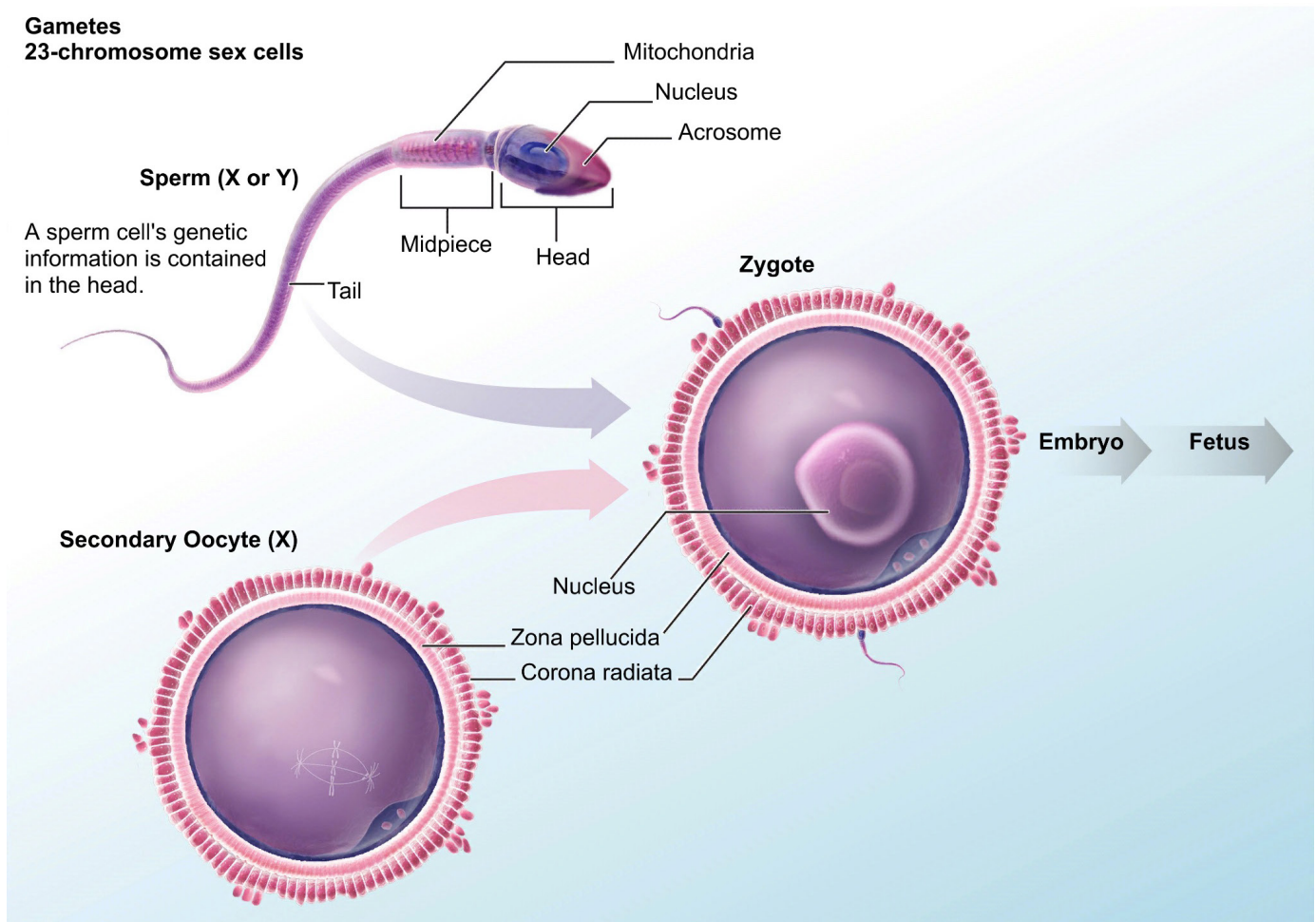
3. When the male and female sex cells unite they form a _____, which develops into an _____ and later into a _____. The events that occur after an embryo implants in the uterus are called _____.

IN-LAB EXERCISES

Use the following modules in Visible Body's Anatomy & Physiology app to guide your exploration of the reproductive system. You can manipulate the images to see different views and isolate each structure. Be sure to select the book icon under the structure name to read information specific to that structure.

As you explore the modules, locate the organs and related structures on any charts, models, or specimens available.

You are responsible for the identification of all **bolded terms**.



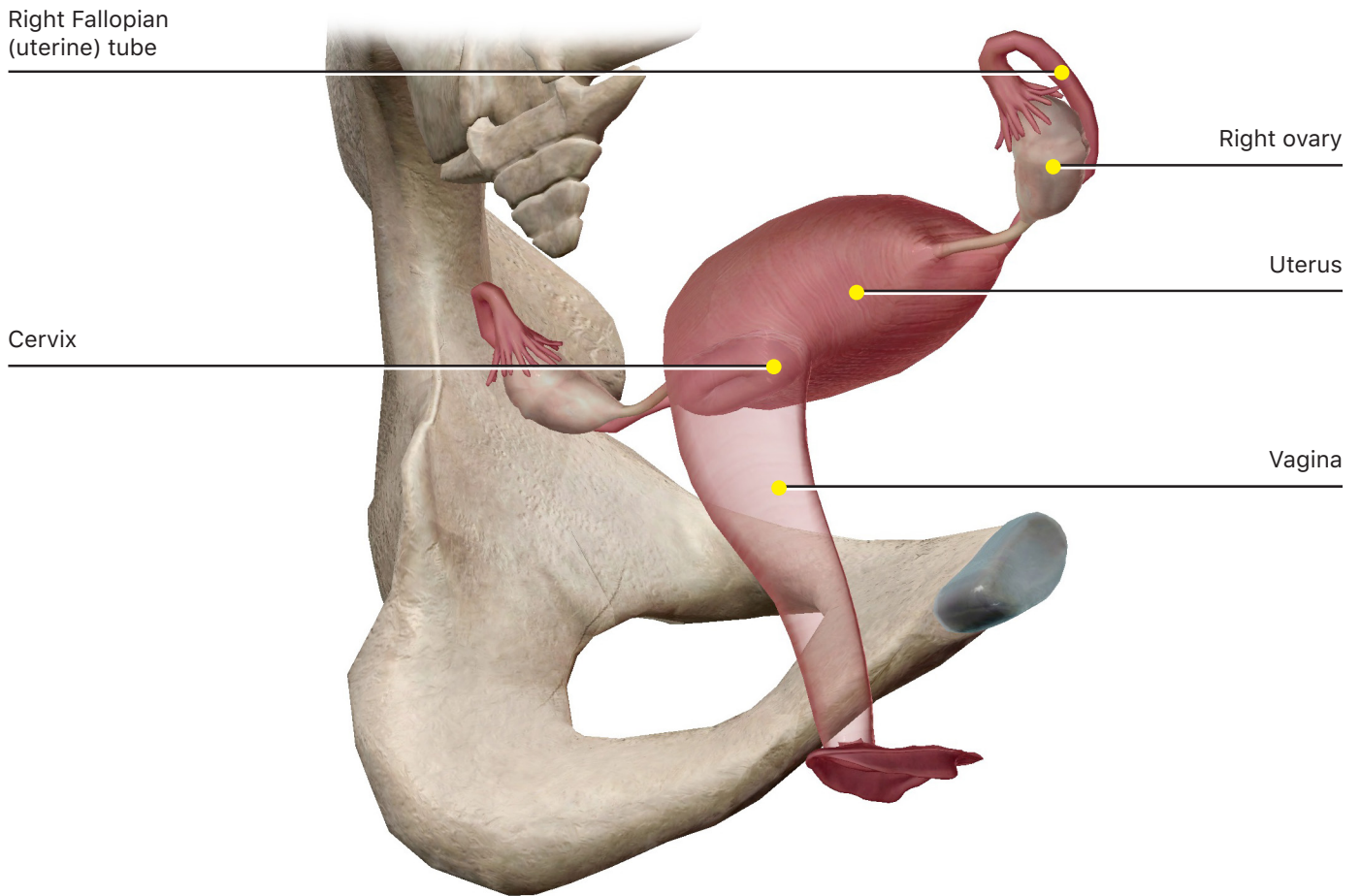
A. Go to Module 50.1 Gametes to Zygote.

This diagram shows the two sex cells on the left, **sperm** and **oocyte**, before fertilization, and the fertilized egg, or **zygote**, on the right. The oocyte has gone through one round of meiosis and is now called a **secondary oocyte**.

Note that they are not drawn to scale. The appropriate size of the sperm compared to the egg is illustrated by the two nonfertilizing sperm cells still attached to the zygote. Only one sperm enters the oocyte to fertilize it and the rest remain outside.

Genetic information is carried in chromosomes.

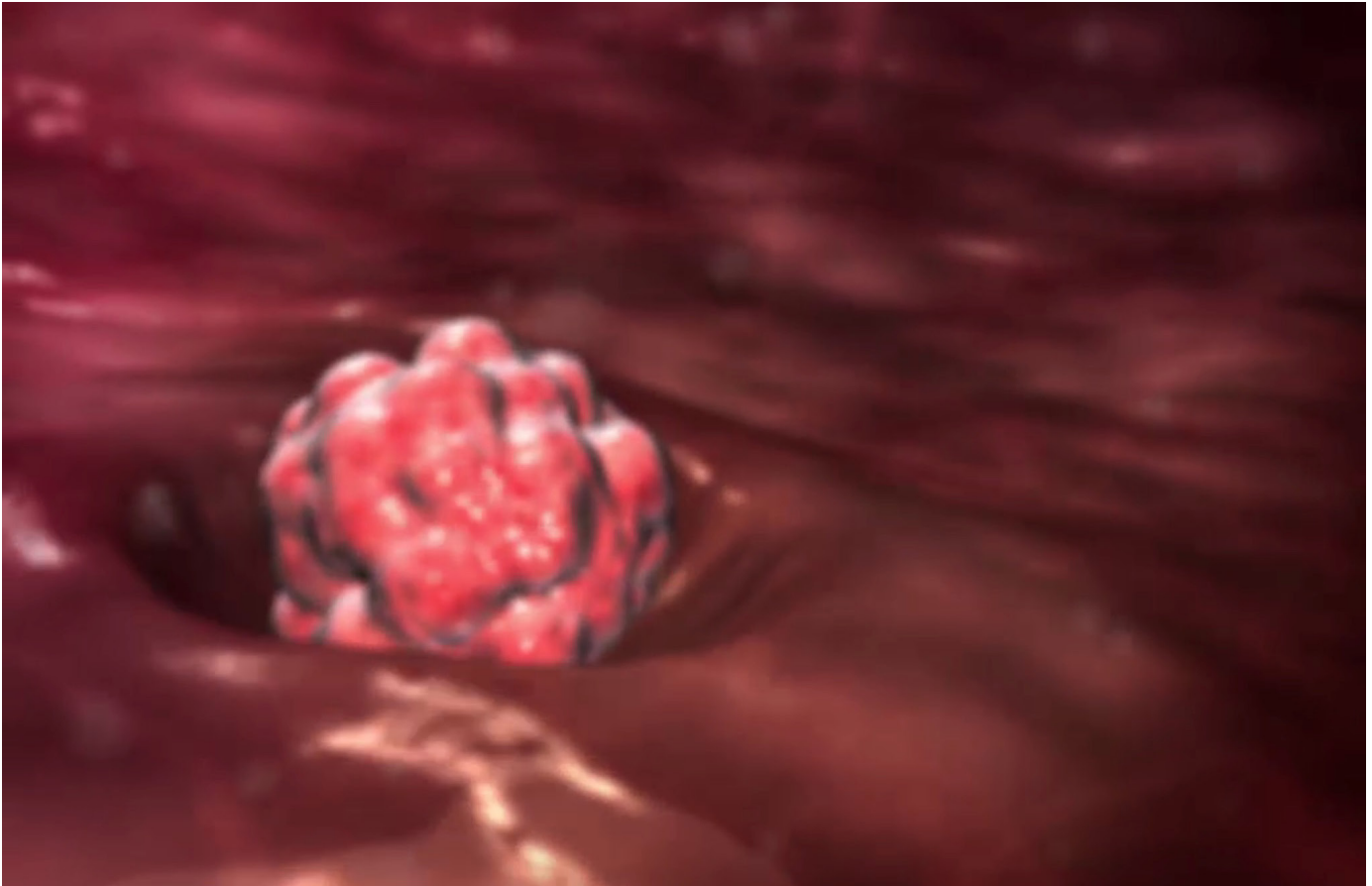
1. How many chromosomes are found in sperm and eggs?
2. Name the three parts of sperm cells.
3. Which part of the sperm contains the chromosomes (contained within the nucleus)?
4. How many chromosomes are found in the zygote?
5. Name the two outer layers that surround the oocyte and the zygote. These layers protect and support the oocyte and zygote during early development.
6. Each sperm carries either an **X** or a **Y** chromosome (along with 22 other chromosomes). Oocytes can carry only _____ chromosomes. After fertilization the embryo will become either an XX (female) or XY (male) depending on which of the two **sex chromosomes (X or Y)** is carried by the sperm.
7. As soon as the genetic information on the chromosomes from the two parents merges into one **nucleus** in the zygote, it divides. Once it begins dividing it is called an _____.



B. View Module 50.2 Sexual Reproduction.

This module illustrates the three tubelike organs that carry sex cells in females. Find the following organs: **ovary, uterine tube, vagina**. Select the vagina and hide it in order to reveal the **cervix**.

1. Trace the path of sperm cells from their release inside the vagina to the upper uterine tube where they meet unfertilized oocytes.



C. Watch the video for Module 50.3 Fertilization to Implantation.

This video shows the sperm and oocyte meeting inside the upper uterine tube. Only one sperm will fertilize the oocyte. You will see the two nuclei, one from the sperm and one from the oocyte, fuse inside the fertilized egg, now called a zygote.

1. What is the term for the time of fertilization, marking the beginning of pregnancy?
2. How many days does it take the embryo to reach the uterus?
3. When the embryo implants in the uterine wall it has _____ of cells and is called a _____.

D. Explore Module 50.4 Path of Zygote.

Here you see the path a zygote takes after **conception**.

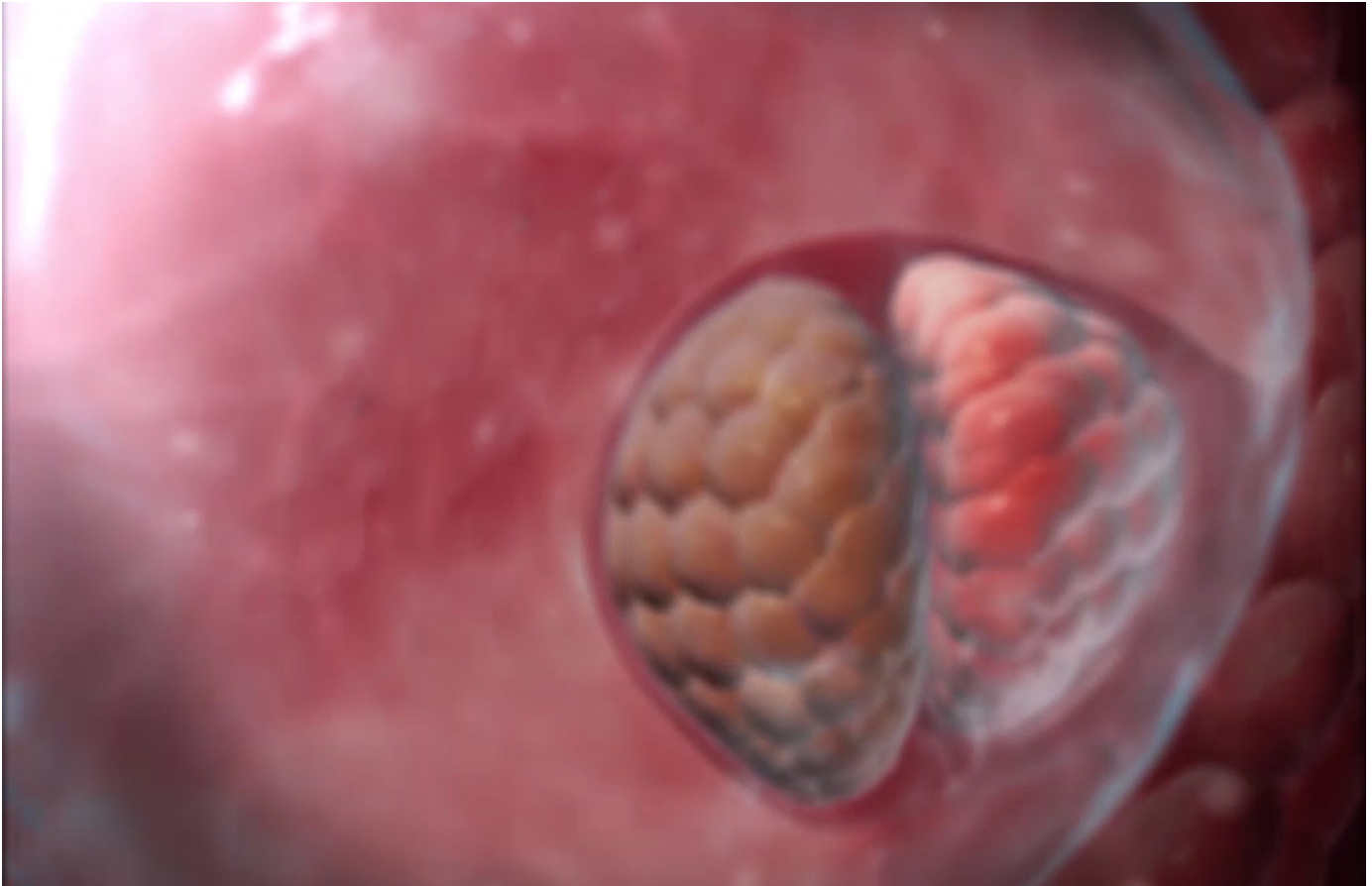
1. Trace the path of the zygote from the site of conception to the site of **implantation**.

2. Define the following terms.

a. Zygote -

b. Morula -

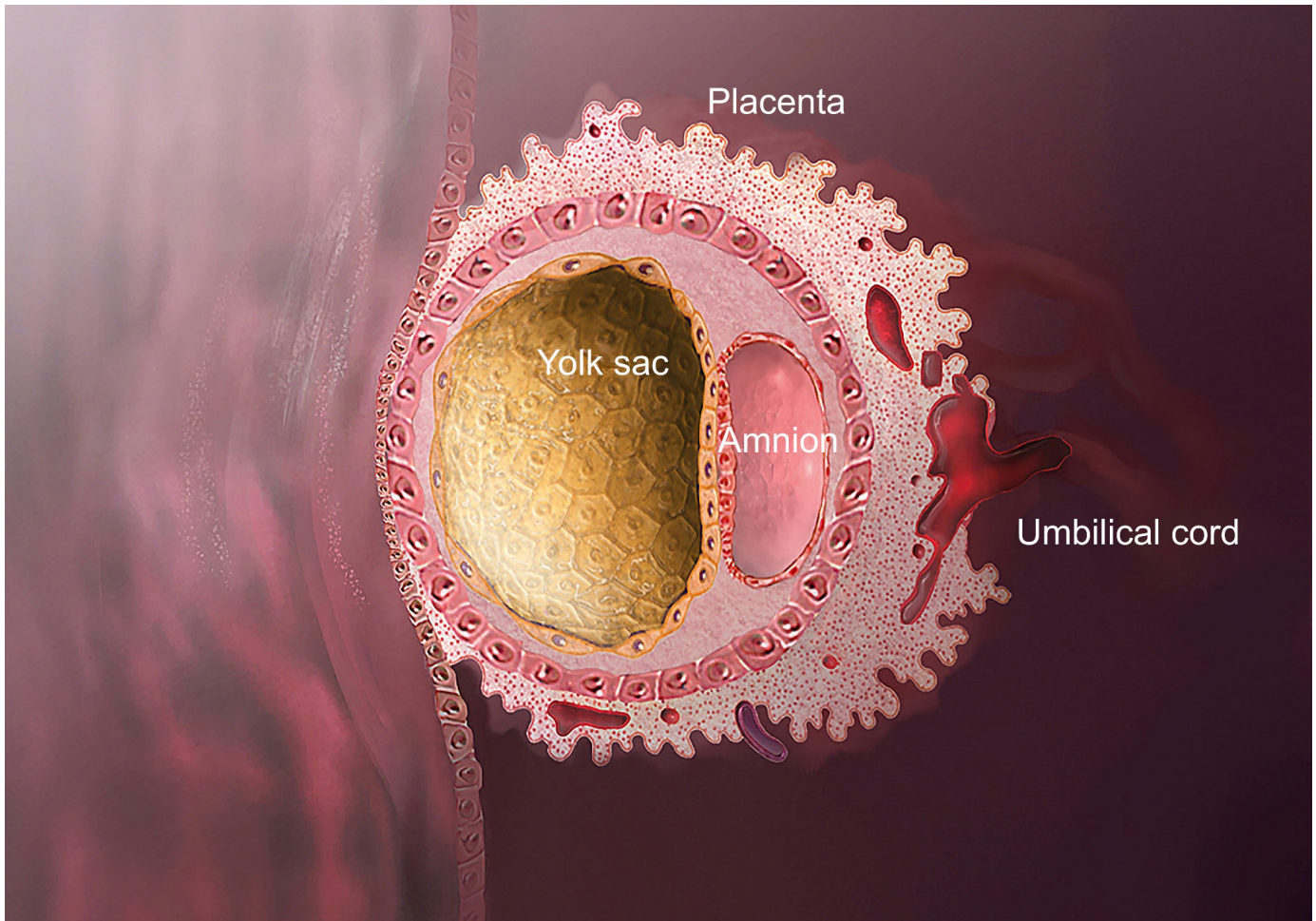
c. Blastocyst -



E. View the animation in Module 50.5 Two Weeks after Conception.

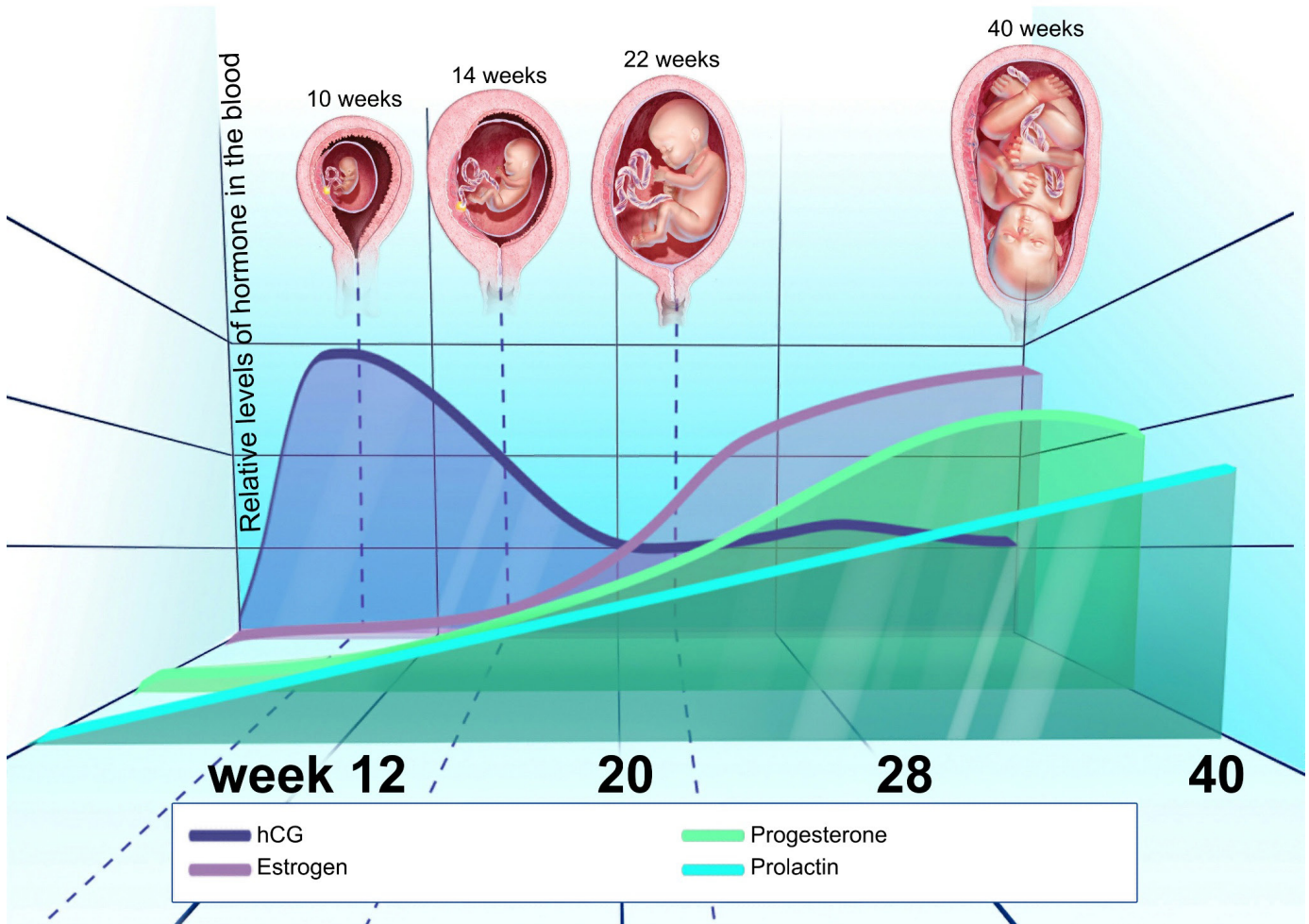
This module shows the development of the embryo during the two weeks after implantation.

1. How many days does it take the blastocyst to divide into two groups of cells?
2. What are the roles of these two groups of cells?
3. Which of these two groups of cells will help to form the placenta?



F. Go to Module 50.6 A Developing Embryo to see the structure of the developing embryo, placenta, and associated structures.

1. What is the role of the amnion?
2. What is the role of the yolk sac?
3. What is the role of the developing placenta and umbilical cord?

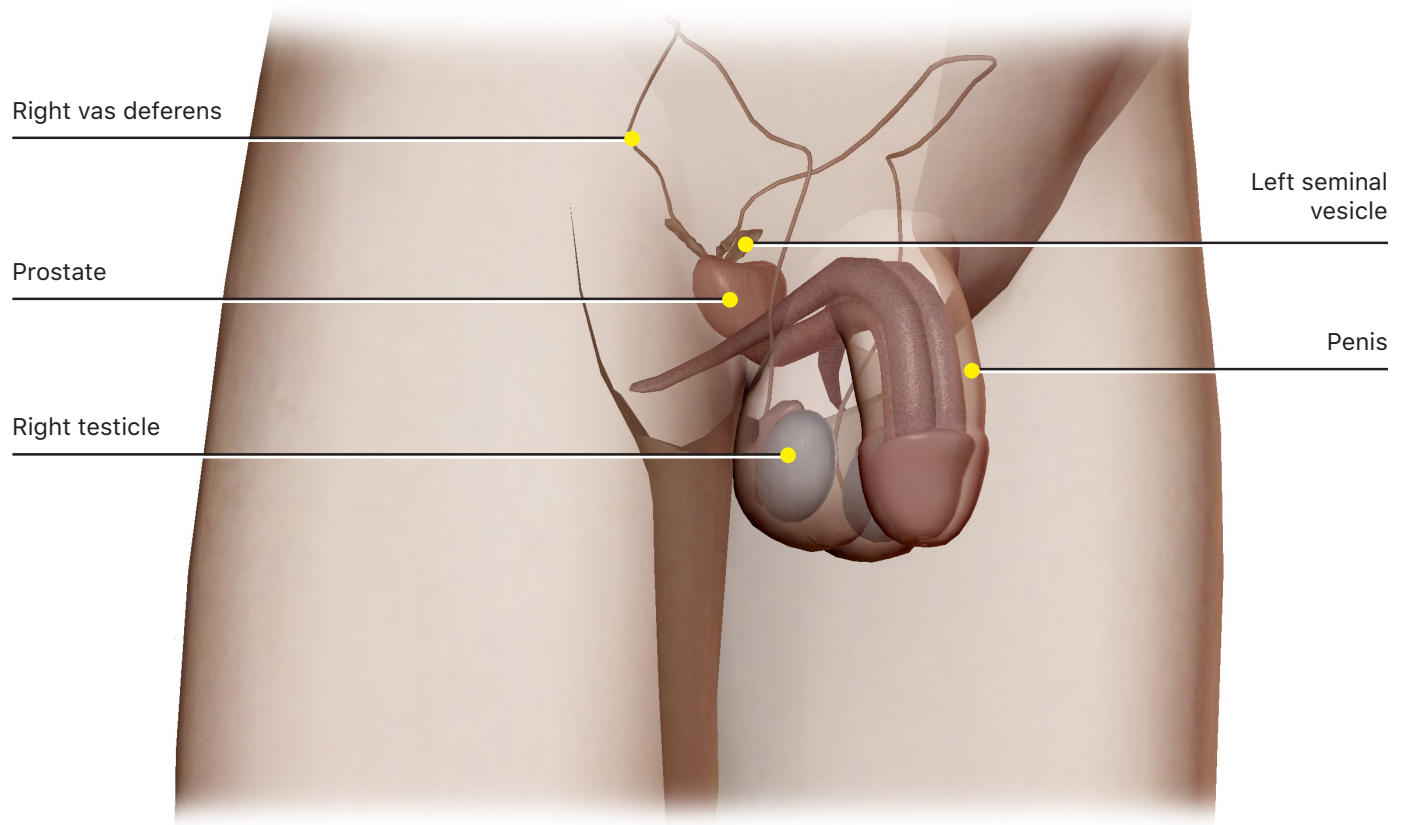


G. Go to Module 50.7 Hormones During Pregnancy.

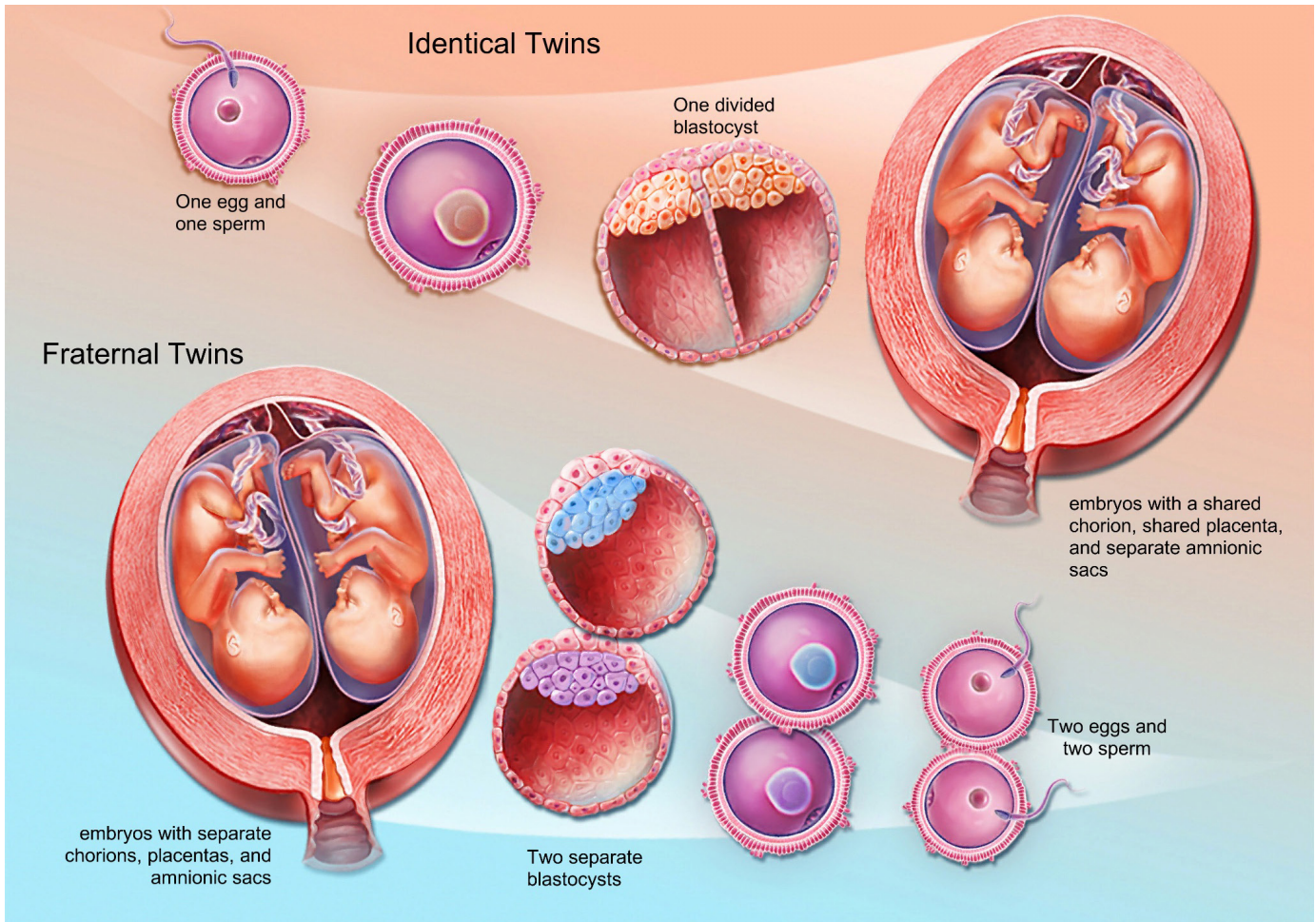
The graphic in this module describes the roles of the four main pregnancy hormones during the 40 weeks of pregnancy.

1. Complete this table:

Hormone Name	Secreted By:	Role	Highest Blood Levels During
	First by the: Later by:		Weeks 1-20
			Weeks 20-40
			Weeks 20-40
	Anterior pituitary gland		Weeks 20-40



Module 50.8 Hormones and Fetal Development illustrates the male organs that develop if the sperm fertilizing the oocyte carries a Y chromosome. If a Y chromosome is present then male organs develop. If no Y is present then female organs develop.

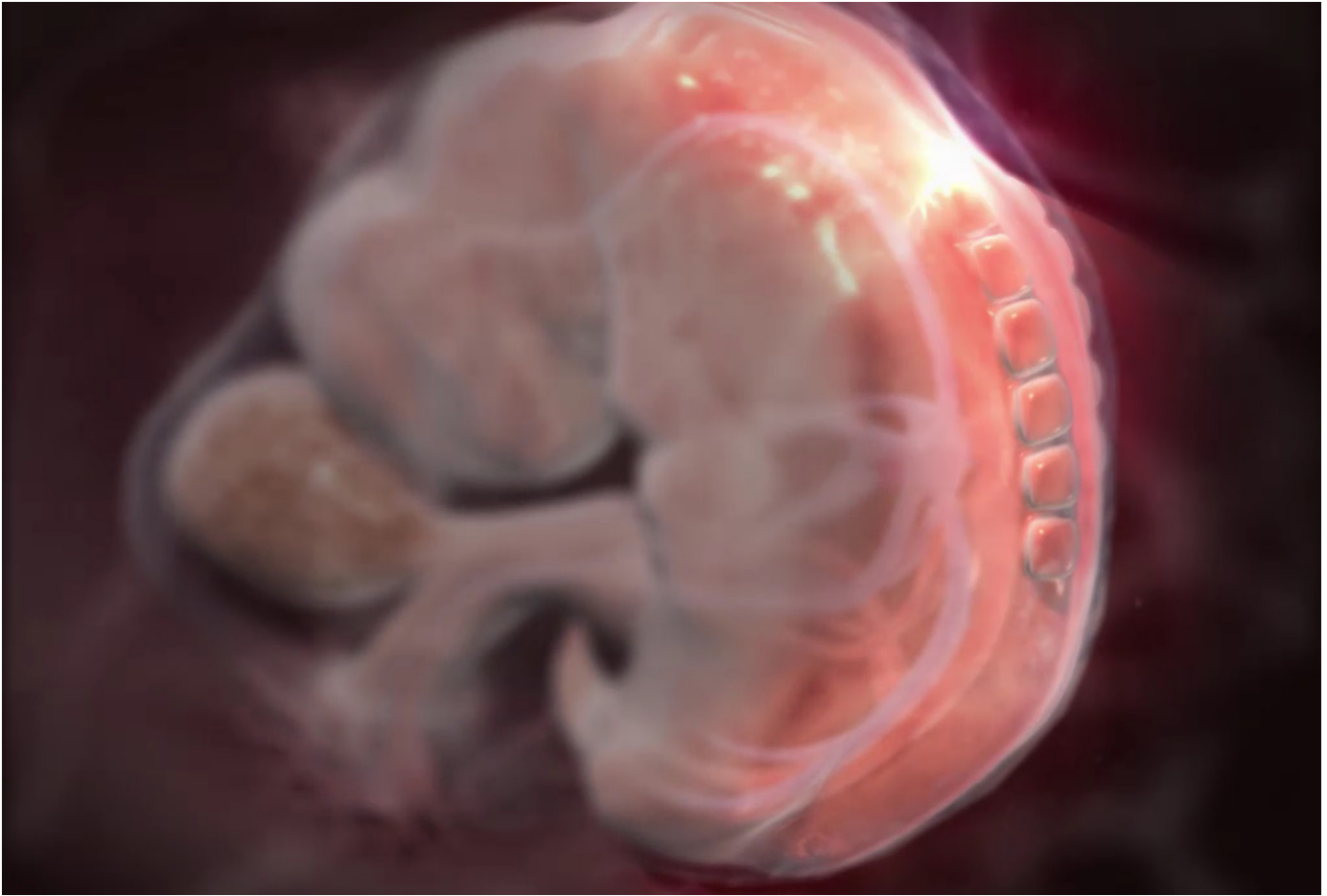


H. Review Module 50.9 How Twins Develop to learn about ways that twins can develop.

Fraternal (dizygotic) twins develop when two oocytes are released at the same time. Each oocyte is fertilized and both embryos implant, but they develop separate placentas, chorions, and amniotic sacs. Fraternal twins are as genetically alike as any other pair of siblings.

1. Identical (monozygotic) twins develop from a single zygote that splits in half at some point during development. They usually share a _____ and a _____. Rarely, **identical twins** will share **amniotic sacs**.

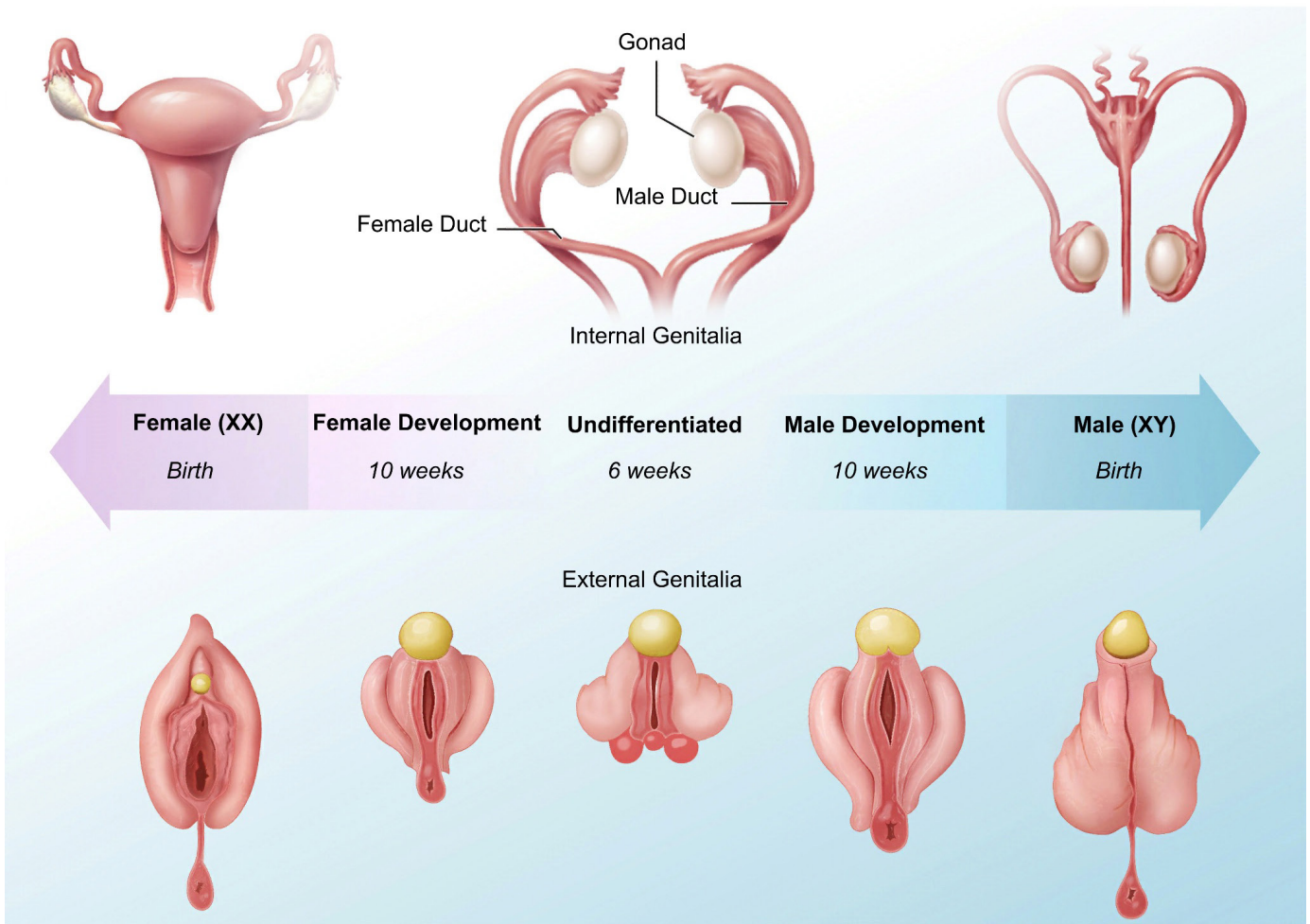
2. What percent of genetic information is shared by identical twins?



I. Watch the video for Module 50.10 Taking Shape.

It depicts the early stages of **embryonic development**. During this time, **organogenesis**, the formation of organs and body structure, occurs.

1. Neurulation occurs at week _____.
2. Folds that develop along the neural plate fuse to form a _____.
3. This tube becomes the _____ and the _____.



J. Go to Module 50.11 Fetal Reproductive Development.

This illustration shows the sex organs and other structures that will develop depending on whether the fertilizing sperm carried a Y chromosome or an X chromosome.

1. What hormone dominates the development of sex organs if the embryo carries a Y chromosome?
2. How many weeks old is the developing embryo when sex determination begins?

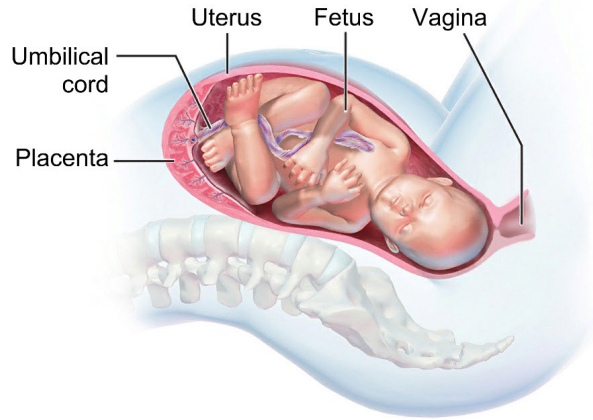


K. View the animation in 50.12 Fetal Development.

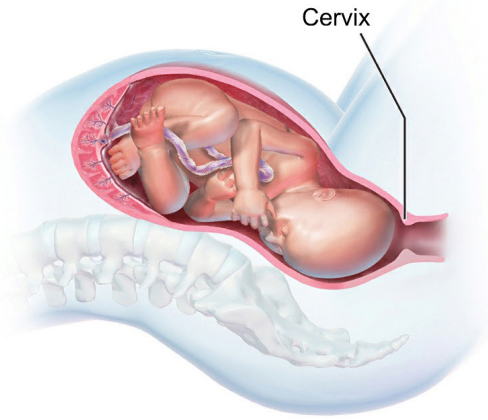
It shows you the stages of development from 5 weeks until birth. When the organs are formed and begin to grow and mature, the embryo is called a **fetus**.

1. At how many weeks of pregnancy does the embryo become a fetus?

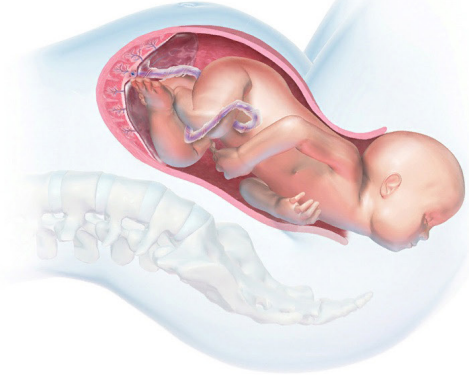
(1) Contraction begins



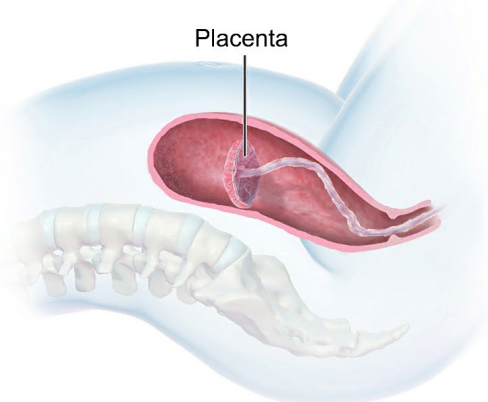
(2) Cervix dilates



(3) Contractions and dilated cervix facilitate birth



(4) Placenta is expelled



L. View Module 50.13 Birth which illustrates the stages of birth that begin with hormonal signals.

The baby is moved from the uterus and through the vagina to be born.

1. What is the first event of labor?
2. These contractions are regulated by what hormone?
3. As the baby moves toward the birth canal, the _____ dilates.
4. After the baby is delivered, contractions expel the _____.

TIME TO PRACTICE!
GO TO THE QUIZZES MENU AND COMPLETE QUIZ 50A.

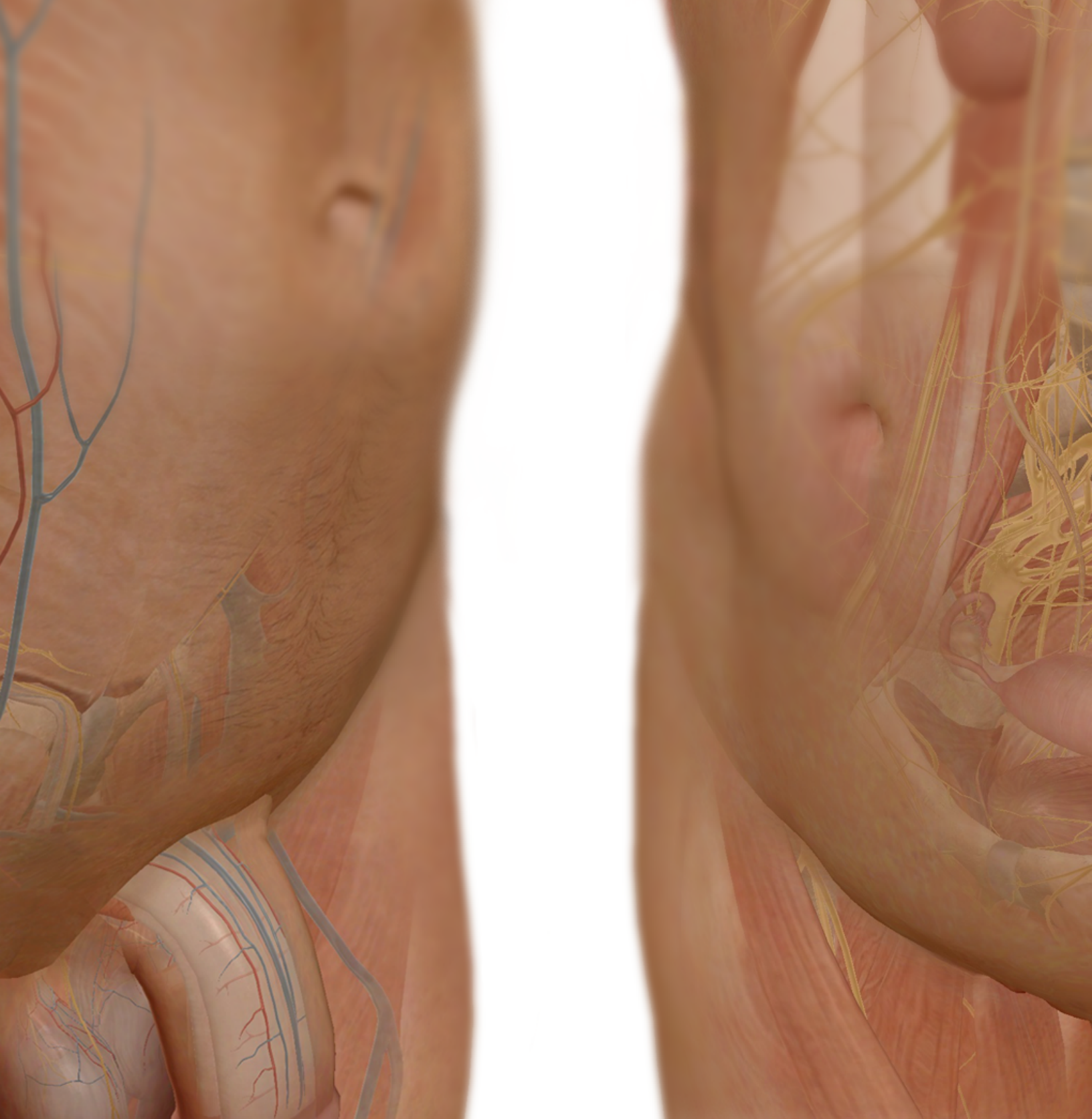
PUTTING IT ALL TOGETHER

1. List the stages of development from secondary oocyte to birth. Also indicate where each of these stages are located.

2. Which of the above stages is fertilized by a sperm and where?

3. The sex of the baby (boy or girl) is determined by _____
_____.

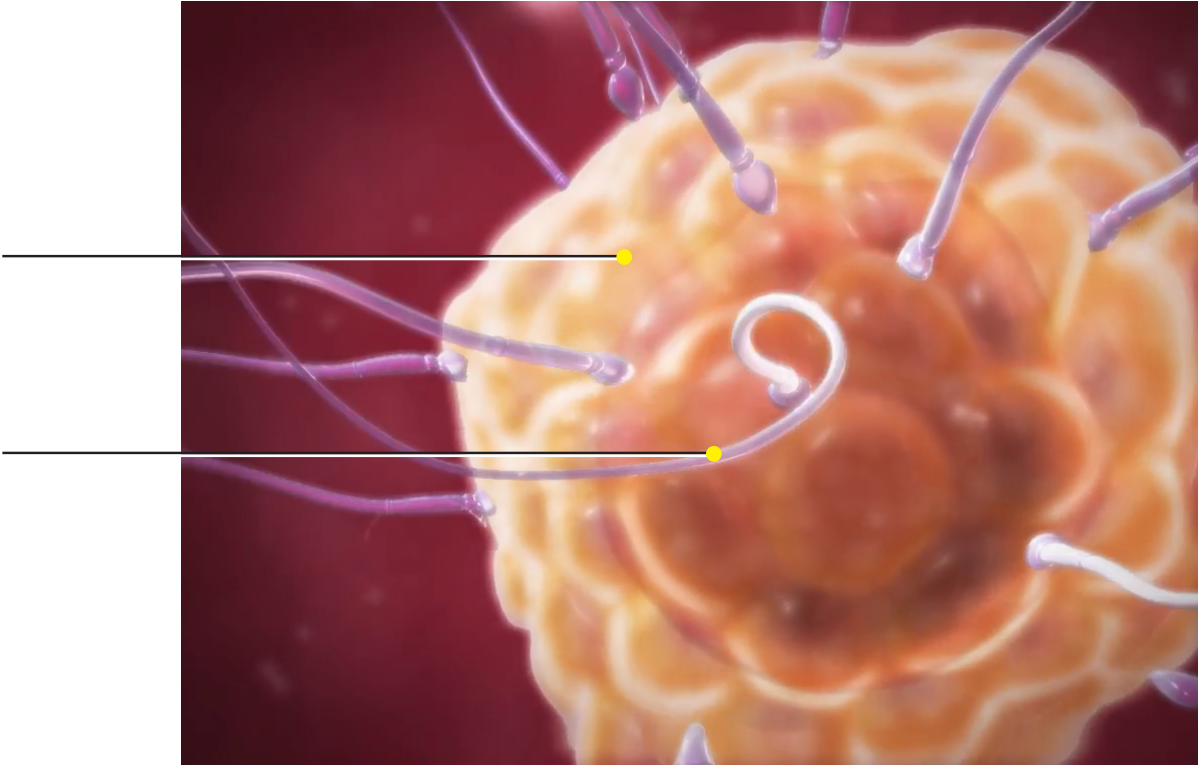
4. During pregnancy and labor, the uterus, the placenta, and the growth of breasts are maintained and controlled by _____.



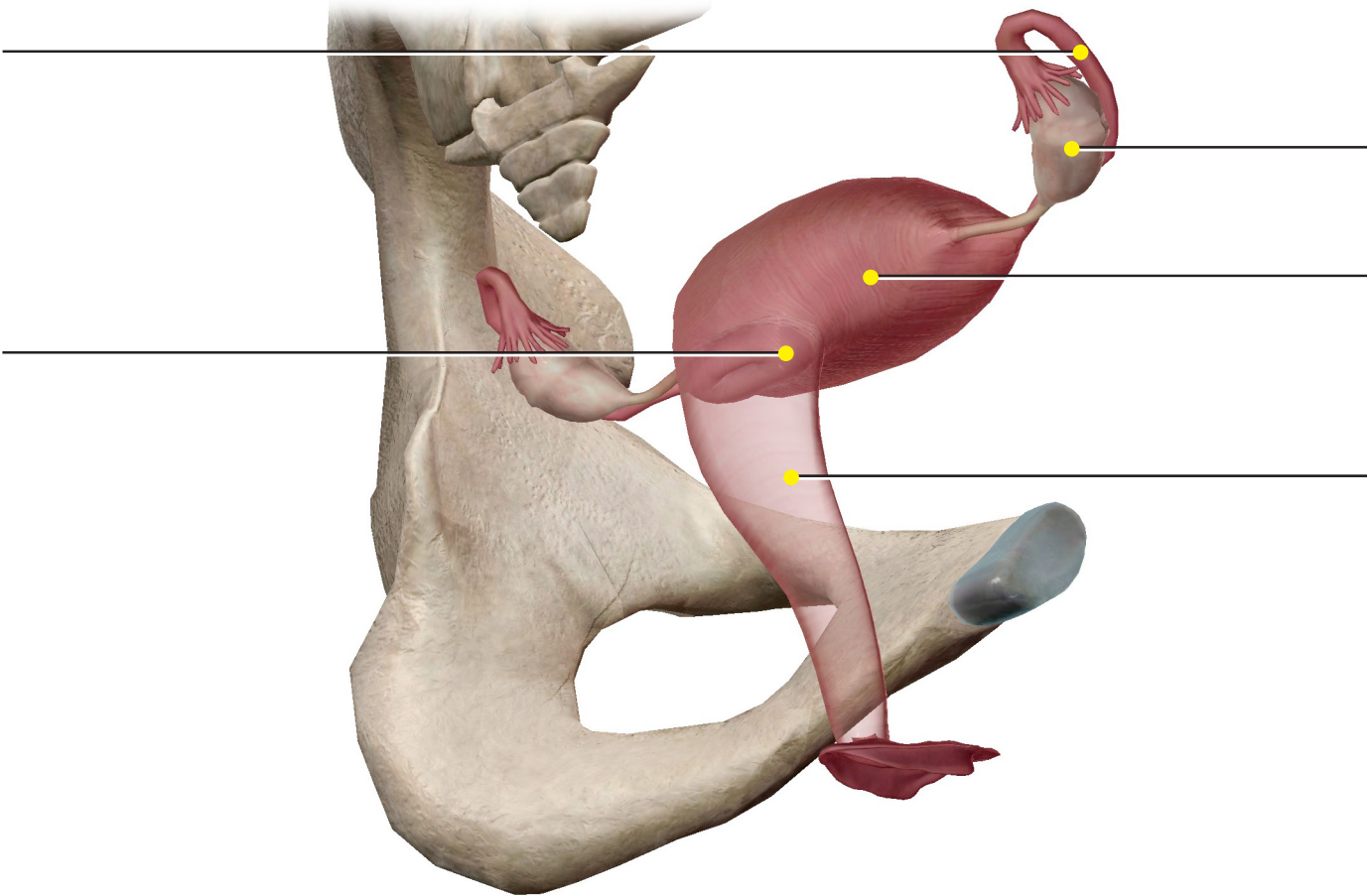
Student Practice

Label all the structures on the following images:

Module 47.1 Reproductive System Overview



Module 50.2 Sexual Reproduction



Module 50.8 Hormones and Fetal Development

