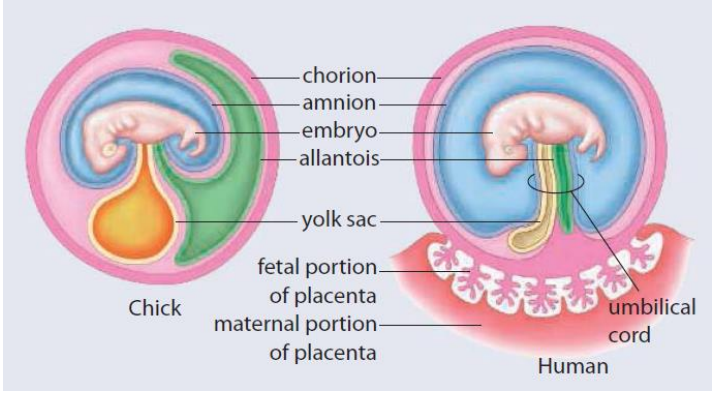
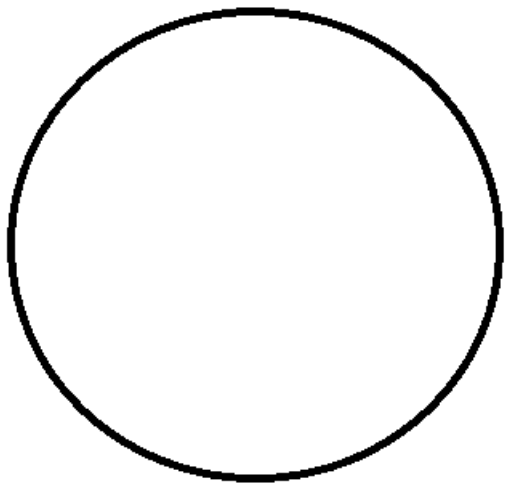


1.) Examine the diagrams of extra-embryonic membranes of an embryonic chick and an embryonic human. What similarities and differences do you observe in the structure of these membranes?



Station 1

Set 60 – Cleavage (starfish) – 1 – One-cell Stage (320x)



Like all living things, the starfish begins its life as a single cell. Fertilization takes place when the sperm enters the egg. The nuclei of the sperm and of the egg cell fuse to form the zygote nucleus. The fertilized egg is called a zygote. The cytoplasm (A) of the cell is filled with yolk, a rich supply of store food. It will nourish the developing embryo. In the nucleus are the chromosomes of both parents. These chromosomes will control the development of the cells into the different special parts of the starfish. **Draw the slide to the left.**

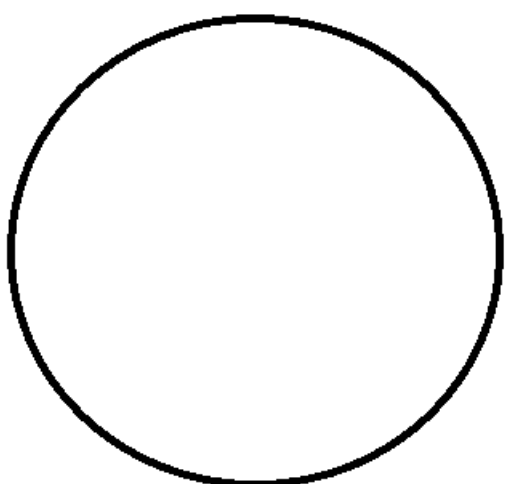
What is the yolk for?

Set 60 – Cleavage (starfish) – 2 Two-cell Stage – 3 Four-cell Stage – 4 Eight-cell Stage – 5 A Mass of Cells – (320x)

Examine all of the microslides listed above.

As the zygote divides through mitosis to form more cells the cells get _____ (smaller/bigger), but the size of the developing embryo does not really change, this is called **cleavage**.

Set 60 – Cleavage (starfish) – 6 – The Blastula (320x)

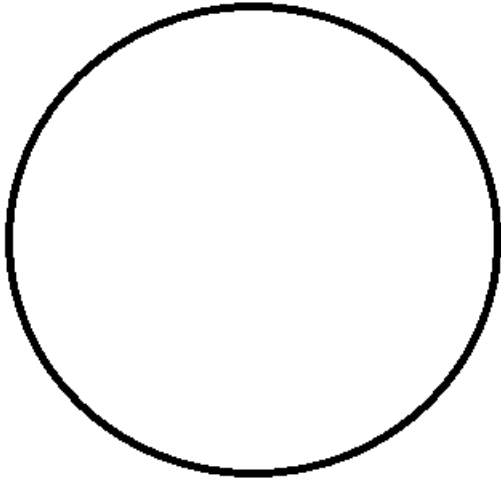


The overall size of the embryo is still about the same, with the individual cells now greatly increased in number and decreased in size. In shape, the mass of cells is like a ball, and, as the cells move to the surface the hollow becomes more apparent. This stage is called the blastula. There is no top or bottom yet, no left or right and no front of back. Cell differentiation has not begun. **Draw the slide to the left.**

When the cell mass forms into a hollow ball it is know as a _____.

Station 2

Set 60 – Cleavage (starfish) – 7 – Early Gastrula (160x)



By reducing the magnification to half that of the previous slides, we can see two different embryos in the gastrula stage. Embryo A shows the first signs of cells beginning to change because of the different functions they will have to perform. In this proves, which is called differentiation, the cells at one end (C) become slightly larger, making that part of the embryo somewhat thicker. Embryo B shows a later development. The thicker part is beginning to fold inward. The process of differentiation is definitely going on in this embryo. The cell later (D) remaining as the outer surface is called the ectoderm, meaning outer skin. The part folding inward (E) is called the endoderm meaning inner skin.

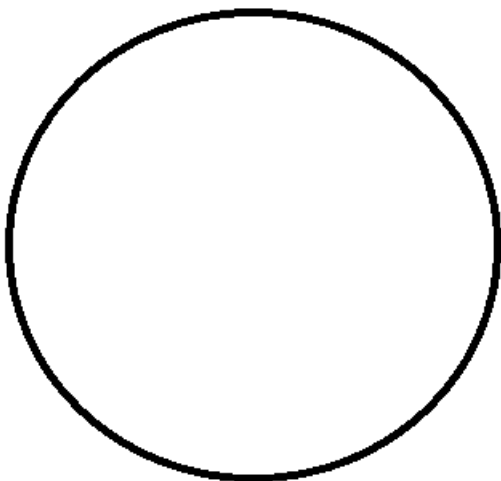
During gastrulation the embryo folds in on itself to form a _____.

The process of cells changing to perform specific functions is known as _____.

The outer layer that will form the skin is known as the _____.

Station 3

Set 61 – Embryology of the Frog – 3 – Neural Groove (48x)



This view was prepared by cutting across the middle of a frog embryo after about 15 days growth. At the top, two ridges have developed with a groove (G) between them. In this cross-section you can see that the ridges and groove are part of a very thick mass of cells. These will form the central nervous system. We shall refer to them as neural ridges and neural groove. We see here now the nervous system develops from the ectoderm (E). The large, distinct cavity inside the embryo is surrounded by the endoderm (N). This is a kind of inner tube which forms the digestive tract. Between the ectoderm (E) and the endoderm (N), the space is filled by the mesoderm (M). At S is a mass of cells from the mesoderm that will form the backbone. **Draw the slide to the left.**

The process of creating a neural tube is called neuralization, after the neural tube has formed the blastocysts is now known as a _____.

Think About It

Why do your drawings of the blastula, gastrula and neurula in the star fish all look the same as we observed in class for the human embryo?

Why don't frogs, turtles, sea stars, fish, or crows have a placenta in their development?

What forms from each layer of the embryo?

Ectoderm: _____

Mesoderm: _____

Endoderm: _____