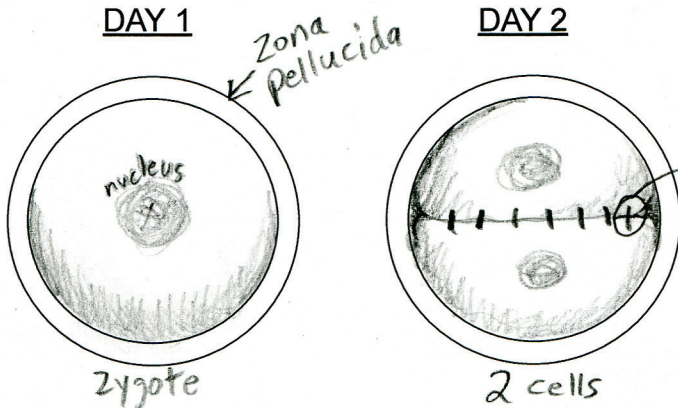
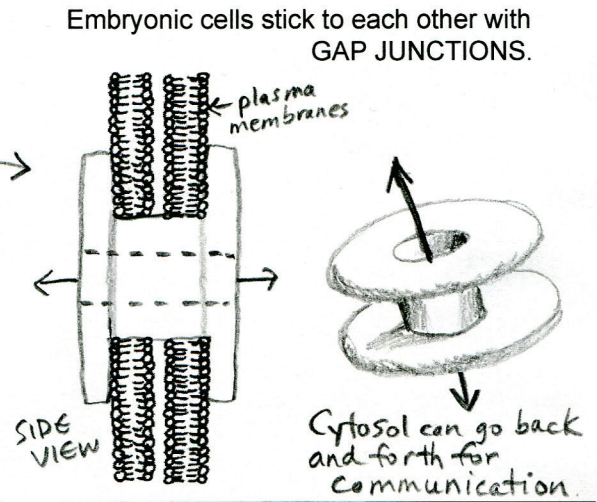


EMBRYOLOGY: WEEK 1 ("Pre-embryo" stage)

The zygote is a **TOTIPOTENT** cell. ("Toti" means "totally" and "potent" means "powerful or capable.") In what sense is this cell totally powerful? It can turn into ANY type of human cell, even supporting cells such as the placenta and amniotic sac. All the DNA in this cell is open and accessible. None of it is methylated or closed in any way. As the embryo develops, the cells will become less "potent" and will have much of their DNA closed.

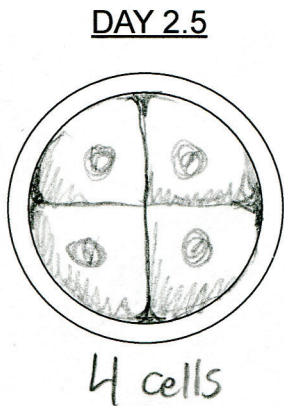


The zygote takes an entire day to make the first division. This split is called CLEAVAGE.

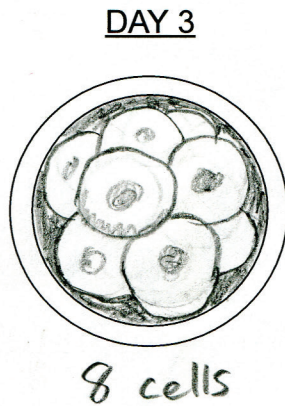


Embryonic cells stick to each other with **GAP JUNCTIONS**.

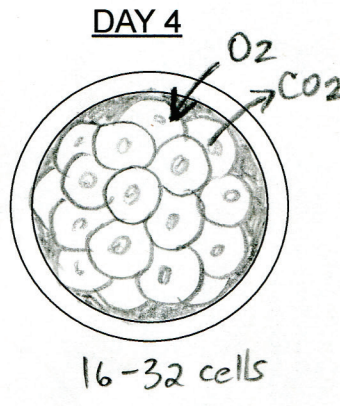
Cytosol can go back and forth for communication.



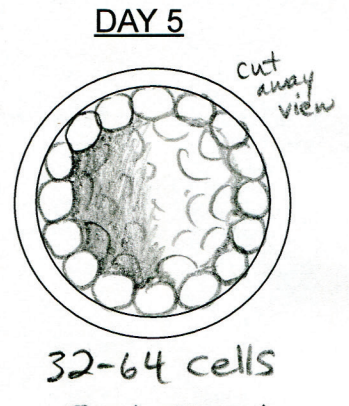
Cells are getting smaller while overall size is staying the same.



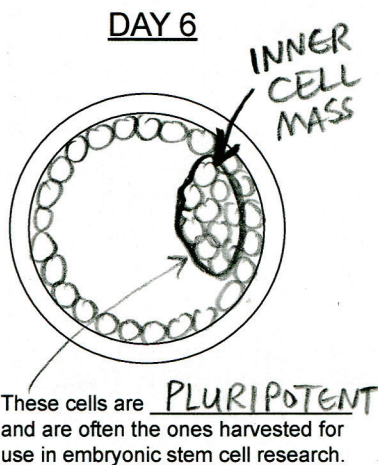
This is a critical stage for unknown reasons. Some embryos don't make it past this stage.



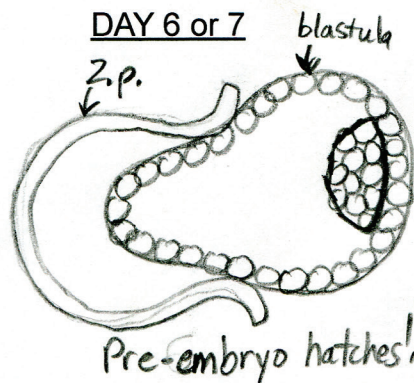
MORULA ("mulberry")
Inner cells will start to have trouble getting O₂.



BLASTULA (blastocyst)
(Blast means "bud.")
There is a cavity filled with fluid.

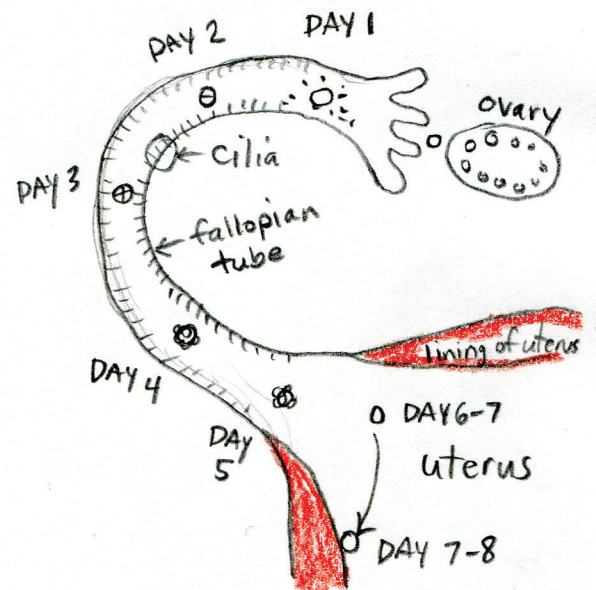


These cells are PLURIPOTENT and are often the ones harvested for use in embryonic stem cell research.



Blastocyst secretes enzymes that soften the zona pellucida, then it enlarges suddenly and breaks free.

Map of where this is happening:



AMAZING FACT: The first week is the same for ALL placental mammals, regardless of how long the gestation period is. (mice: 3 wks, elephants: 2 yrs)
SECOND AMAZING FACT: Some mammals can pause pregnancy at this stage and hold the embryo for several months, waiting for the right season.