BIO 26 PAL Worksheet
Week 14 (#1): The Reproductive System

Let's begin this session by reviewing the most important male and female reproductive system structures/organs. Then, we will investigate the most important factors for successful fertilization of a secondary oocyte by a sperm cell.

Start by dividing your whiteboard in half.

1. On one side of your whiteboard, create a 'box and arrow' - diagram for the pathway of a sperm cell (spermatozoon) from spermiation to ejaculation.
   a) Include all the main structures/organs along the way.
   b) Discuss how the sperm cell moves/is moved through all these structures/organs.

2. On the opposite side of your whiteboard, create a 'box and arrow' - diagram for the pathway of an egg cell (oocyte) from ovulation to arrival in the uterus.
   a) Include all the main structures/organs along the way.
   b) Discuss how the egg cell moves/is moved after ovulation.

3. The released sperm cell is determined to fertilize the egg. Connect your diagrams of the male and female reproductive systems by adding boxes and arrows between both systems with missing structures/organs to allow fertilization.
   a) Where in the female reproductive system does the sperm cell usually fertilize the egg cell?
   b) To get to that location, the sperm cell has to endure unfavorable environmental conditions. What are they?
   c) How was the sperm cell prepared to travel the distance AND survive these unfavorable conditions? Hint: think of sperm cell form/function and helpful glands along its pathway.
   d) How many chromosomes does the sperm cell and egg cell each have? How many chromosomes does the zygote have after sperm-cell fusion?
   e) Where does the zygote travel to after fertilization?
   f) How does the zygote grow into an embryo/fetus, and how long does the embryo/fetus stay? Hint: that's a silly question 😉
   g) What happens to the nourishing and protective lining of the uterus if the zygote never arrives?

Bonus:

a) Which male sex hormone supports the development of the sperm cell we followed here, and where is it produced?
b) Which two female sex hormones support the uterus in its quest to nourish and protect the developing embryo/fetus?

Bonus Bonus: How does the embryo/fetus signal that it's here and in need of a nourishing environment?