Lesson 1: "Hook" Introduction to Cell Division/Connection to Current Events and Scientific Controversies

(In-class Monday & Independent Tuesday)

1) Materials

- Henrietta Lacks TEDEd video
- Vocab Chart

2) Standards

Michigan Department of Education - Biology Standards

- B1.2k Analyze how science and society interact from a historical, political, economic, or social perspectives
- B4.2c Describe the structure and function of DNA.
- B4.4x Genetic Variation Genetic variation is essential to biodiversity and the stability of a population. Genetic variation is ensured by the formation of gametes and their combination to form a zygote. Opportunities for genetic variation also occur during cell division when chromosomes exchange genetic material causing permanent changes in the DNA sequences of the chromosomes. Random mutations in DNA structure caused by the environment are another source of genetic variation.

3) Lesson Objectives

1. I can explain the relevance of cell division in my daily life
2. I can relate the impact of scientific research on HeLa cells to current medical practices and explain why the use of HeLa cells for research is controversial in science 3. I can define, identify and differentiate between chromosomes, chromatids, chromatin, and centromeres
4. I can differentiate between eukaryotic and prokaryotic cell division

4) Activities

Welcome (5 min):

- Students will be welcomed into a class where they will be presented with the class agenda on the board. They will be asked to type up an answer for a warm-up question asking, "How are cells made? Where do they come from?". Students will send in their answers to the chat when the teacher says "Waterfall".

Introduction to Cell Division (5 mins):

- I will ask students to think about how cell division is an important part of our daily life. It is the process which has allowed us to grow from babies to adults. Cell division is also important for skin and bone regeneration when we scrape our skin or break a bone when we're young. Present students with the statistic that we lose about 30,000 skin cells every minute and 2 trillion of our cells divide everyday!

- Henrietta Lacks TEDEd video (5 mins video, 5 min discussion):
  - https://www.youtube.com/watch?v=22lGbAVWhro
  - Henrietta Lacks, an African American woman, was diagnosed with a severe form of cervical cancer in 1951. 2020 marks 100 years since her birth. Her tumor cells were sent to the lab and the researcher noticed that they were rapidly dividing. These 'immortal' cells, also known as HeLa cells, were sent throughout the world, and have been extremely useful in many major medical breakthroughs. They are still in use today, however, Lacks' permission was not taken before experimenting on her cells. Students will watch the 4 minute video and share their thoughts.
  - **Students will experience how science, history, politics, ethics, and civil rights all overlap and play a role together.**

- DNA review and vocabulary words (25 mins)
  - We will review what we have already learned about DNA, then move into learning some new concepts. Students will be viewing and participating in discussion during a powerpoint presentation with images and drawings. Students will be taking notes in their vocab charts for the words DNA, nucleosome, chromatin, chromatid (& centromere), chromosome (& kinetochore) and karyotype.

- Eukaryotic vs. Prokaryotic Cells (10 mins)
  - In order to prepare for the next class where we will discuss the differences between prokaryotic and eukaryotic cell division, we will review what we have learned about the structural differences between prokaryotic and eukaryotic cells.

Closure/Assessments (10 min):

- Students will be shown their assignments and asked to read and take notes from their DiscvoeryEd Science Techbook Engage section pg.1 paying close attention to the Burn Victim story and the use of technology in the process of cell division to help a victim survive, to review what we have covered in class today. Students will also read Explore pg. 1&3 to prepare for the discussion next class.