Sequencing Rationale

Subjects in biology are sequenced in a specific way that students use the content they are currently learning to build on top of a previous laid foundation of concepts. Therefore, it is important to keep in mind that some of the subjects cannot be taught in a random order. In my curriculum design I decided not to switch up with the sequencing of topics of how a genetics unit would normally be taught, because nothing would really make sense to the student then.

In a typical genetics unit, the topic of meiosis would be the first concept to teach. Luckily for the students, they have prior knowledge of the mitotic process. Therefore, they can extrapolate much of that previous knowledge to the process of meiosis, but heavily noting the major differences. Meiosis lays the foundation for genetics knowledge for students, explaining things such as the sexual life cycle, spermatogenesis, oogenesis, and genetic variation.

The second segment in the curriculum is based on Mendel’s work, and the discoveries that stemmed from it. In this process, students will discover how heredity works with the manipulation of punnett squares. From the work with punnett squares, the students will learn what genotype and phenotype is. Within the topic of heredity, students will also learn the major laws of how genes are expressed with such topics as the law of segregation and the law of independent assortment.

In the third segment, the curriculum is designed to show students how chromosomes are made up of individual genes. It makes sense to have this topic next, because after learning about gene expression, the students will be able to understand how genetic disorders occur. They will also understand that things like blood type and their gender were governed by their parents’ chromosomes

The fourth segment involves all of the topics on DNA. DNA is important to have next, because it is what makes up chromosomes. It relates back to how DNA is the genetic material of all living things. At this point students usually talk about DNA, but they really do not know what it is yet. In this segment, the students understand the structure of DNA, how it is replicated, and how DNA is able to repair itself if there is base pair damage.

The next segment involved what happens when DNA is used as a transcript to make RNA. When RNA synthesis occurs, proteins can be made via transcription and translation. When translation occurs, the result is protein synthesis. The students should realize at the end of this segment that DNA is not only responsible for genetic material, but it is also responsible for making RNA. In turn, RNA is responsible for making proteins. This segment should give the students “the big picture” and importance of DNA, RNA, and proteins.

Viral and Bacterial DNA are next in the sequencing, because they have DNA that is much different than any human’s. This segment represents that all genetic material is not the same in all living things. It is important to include “irregular” forms into the curriculum to give the students an awareness that not everything is the same. This segment will also make the students realize why bacteria and viruses are so successful in reproducing.

Lastly, DNA technology is a great segment to end the unit with. Discussions about what DNA technology can do, will provide a real-life application to everything that was previously mentioned. It is important to integrate a technological element to science since it is not only in the standards, but it can bring light to what scientists can actually do.