Visualizing DNA

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Abstract: The study of DNA in most high school biology classes involve cut and paste paper labs due to the cost of expensive lab equipment. If we're to prepare students for jobs in a biotechnological world they must have the opportunity to learn to use equipment that is standard for the job setting and to use this equipment to carry out experimental procedures. Allowing students to use this sophisticated equipment to conduct an investigation involving DNA and then interpretation of those results would not only expand their knowledge of DNA but also equip them with skills that are standard in industry. Students will learn how to use a micropipette and electrophoresis equipment to solve a mystery involving DNA.

Mission Statement: To develop a purposeful DNA lab that both interests the student and teaches them skills using equipment that are standard for industry and research institutions.

Description of Teaching Unit

1. Lecture on DNA and its role in organisms**.**
2. Students will read the book, Double Helix
3. Complete the activity, "Designer Micropipettes" (Gator, DNA and other images)
4. Complete the lab, Outbreak! Fingerprinting Virus DNA, (E-Gel Electrophoresis, Julie Boker)

Expected Outcome: After completing this unit students will be able to:

1. Identify the components of DNA.
2. Identify the different types of micropipettes and when each is used.
3. Properly use a micropipette.
4. Demonstrate learning by completing a pretest and posttest on DNA, its role in organisms, and how our knowledge of DNA can be used to solve problems in our world.
5. Evaluate the impact of biotechnology on the characters in the book, Double Helix by Nancy Werlin

Data Collection:

A pre and post test will be administered to students. Students will demonstrate their ability to use micropipettes and E-Gel equipment. Students will discuss how technology impacted the lives of the characters in the book, Double Helix.

ICORE Elements:

ICORE provided instruction on how to properly use micropipettes and the E-Gel electrophoresis apparatus. ICORE provided use of micropipettes and E-Gel electrophoresis apparatus.

Literature:

America's Lab Report. Investigations in High School Science. (2005).
ICORE Lab Manuel (2010).

Budget and Budget Justification

1. 30 copies of the book Double Helix by Barnes and Noble 30 X 6.29 = $188.70
2. Micropipets, United, Carolina Biological 16 @ $1984.00
3. E-Gel starter kits, Carolina Biological, 6 X 102.00 = $612
4. Outbreak! Fingerprinting Virus DNA Kit Carolina Biological 6 X $49.95 = $299.70
5. Pipet tips $27.20
6. Wells