REQUIREMENTS FOR NARRATIVE

Science Instructional Strategies and Science Teaching Philosophy

Explain:

★ Your science teaching philosophy

★ Strategies currently used to teach science

Science Instructional Strategies:

I became a teacher to empower students to grow in ways they didn't think possible. I strive to be a reliable mentor to my students and share my enthusiasm for learning along the way. I want to unlock students' unique strengths, build their confidence as well as spark some Biology related interest along the way. My aim is to allow students to explore content, visualize processes using models as well as inquiry-driven labs, and relate the curriculum to current phenomena. I also expect my students to demonstrate their learning individually in various ways such as summary videos, lab reports, collaborative group sessions, expert talks, and 2-minute spiral summaries to name a few.

Science Teaching Philosophy:

My hope is for every student to appreciate the world around them, what it's made up of as well as what they themselves are made up of when leaving me.

Current and Desired Lab Resources (2700 characters including spaces)

Explain:

★ Your current lab facilities, equipment, and/or resources

★ Why laboratory upgrade support is needed

★ How a lab upgrade would impact your teaching, and your students' content knowledge.

Current and Desired Lab Resources: I currently have a newer classroom lab area but it is completely missing the lab supplies/tools to allow students the opportunity to do labs and elevate their learning. We need supplies as well as chemicals to elevate our instruction. Students always learn better when they can apply their learning to an experience, and we strive to provide the experiences for them. There are new TEK changes in the 2024 -25 school year gearing our labs towards engineering and STEM with model-based learning that will require new supplies. We will need to purchase pipets, polymerase chain reaction apparatuses, microcentrifuges, water baths, incubators, data collection probes, test tube holders, microscopes, models, and fast plants to enhance our students learning. The polymerase chain reaction apparatuses will help show students how to amplify a small segment of DNA or RNA. This can be used in a variety of genetic tests ranging from genotyping, mutation detection, DNA fingerprinting,

detecting specific bacteria and viruses present, and diagnosing genetic disorders. This will show students what can be done in the field of DNA technology. Now, during this section, we show a video and I believe having this experience will be more impactful on exposing the field. To complete this series of labs using the PCR machine we will need the microcentrifuges to spin down the DNA or RNA to extract it as well as the pipets and the data collection probes.
The microscopes that we have we are thankful for, but they are very old and when looking through them the view is not as accurate as a modern microscope would be. The bases do not have proper knobs where you can screen the whole slide by looking at each field of view. Instead, we have to slowly move the slide with our hands until we find what we are looking for. We use microscopes with bacteria, showing how small bacteria can be as well as the different shapes bacteria have. We use the microscopes during the cell cycle showing the stages of mitosis, during plant and animal systems. Models on viruses, bacteria, plants, animals, protists, the cell cycle, and protein synthesis will be great aids to have in the classroom to help provide a visual with the current instruction. The students will use the models and be given tools to create their own models. This will help them see, hear, and think for themselves how to explain the topic that we are currently on.

Laboratory Activity (2700 characters including spaces)

Describe:

★ An innovative, replicable lab/science class activity that you have implemented using limited school lab resources with impact assessments

- **Purpose and outcome with materials needed to implement lesson**
- **List of any standards used (i.e. NGSS, state and/or national standards)**
- **List of safety challenges and how you resolved them. (www.nsta.org/about/positions/safety.aspx)**

Laboratory Activity:
B.5A: Describe the stages of the cell cycle, including deoxyribonucleic acid (DNA) replication and mitosis, and the importance of the cell cycle to the growth of organisms.

In this activity, students will create the stages of mitosis using limited resources as well as create a summary.

Supplies needed:
6 Toothpicks
Yarn
6 small pipe cleaner pieces (about 2 inches)
2 1/2 inch pipe cleaner pieces (that are a different color) shaped like a T
1 chalk marker

Directions:

1. Using your chalk marker, draw a circle that represents a cell, then a smaller circle inside that represents the nuclear membrane on your lab table. You and your group will create the phases of mitosis with the supplies given.

The supplies should be used according to the following key:

Yarn - chromatin

6 white pipe cleaners - chromosomes

2 blue pipe cleaners - centrioles

6 tooth picks - spindle fibers

2. You will use the appropriate materials that represent each phase, focusing on what the DNA looks like, where the spindle fibers and the centrioles are, and the state of the nuclear membrane. You must start with interphase and show what the DNA looks like before mitosis begins.

Example - In prophase, the chromatin condenses to chromosomes so you will replace the yarn with the white pipe cleaners, the nuclear membrane begins breaking down so you will put spaces throughout the membrane. The centrioles, pipe cleaners in the shape of a T, begin to move to opposite sides of the nucleus and the spindle fibers, toothpicks, are released.

3. As you complete each phase you will take a picture on your iPad.

4. When you are finished, as a group you will create a video explaining what is taking place in each of the phases of mitosis using your pictures. Everyone must talk in the video.

Before entering the lab area, review safety rules on how to be responsible for the items given. Toothpicks should remain on the table. They should not be thrown or end up in someone's mouth, etc.… this will get you immediately removed from the lab and an alternate assignment will be given. Other than that, there are no safety challenges involved in this activity.