LESSON PLAN

OBJECTIVES :

1. Students will be able to describe the process of mitosis .

2. Students will be able to simulate the process of mitosis and construct a model of the four stages.

MATERIALS:

red pipe cleaners blue pipe cleaners Tape or glue

pieces of white papers piece of scissors

PROCEDURE:

1. Focus/ Motivation:

·Ask the students : Why do we grow? Can the cells change?

2. Review : Parts of the cell.

3. Introduction: Mitosis and Meiosis are very important concepts in Biology.

Through these processes species grow, evolve and persists. Therefore it is important for you to learn these two processes.

4. Lesson Proper : Students will read the handout : How your body makes new cell.

Check for understanding by asking them questions on what they read.

5. Simulation Activity : Mitosis simulation

6. Presentation of Models

7. Assessment *I* Evaluation : Students will be called to present their models. Gauge the discussion and remodel misconceptions. Check that students followed the directions correctly and are able to provide an accurate model of the four stages. Further any questions that developed instead of answering them in class. Quiz

the students to further check on understanding. ( If there are onion root tip slides available, let them view the slides and use the Investigation X-Mitosis handout to check if they can identify the stages of mitosis.)

Rubric for grading the model :

1. All of the stages of mitosis were correctly shown in the model - 10

2. All of the parts that are involved in the process were clearly labeled whenever they appeared in the process - 5

3.· Effort and Creativity is evident - 2

4. Presentation --------------------- 3 pts

Total Points------------------------ 20 pts

8. Extension Activity:

1. Explain what happens in each stage of mitosis. You'll find useful resources online, such as Cells Alive!, which features animations of cell processes at [www.cellsalive.com,](http://www.cellsalive.com/) or the Biology Project, an interactive resource found at [www.biology.arizona.edu.](http://www.biology.arizona.edu/)

2. Create a mitosis flip-book using the given template.

LESSON PLAN

OBJECTIVES:

1. Students will be able to extract their own DNA from their cheek cells.

2. Describe the components of deoxyribonucleic acid ( DNA) and explain functions of each component

3. Simulate the DNA replication using DNA models.

MATERIALS:

Cheek swab, Gatorade, 95 % ethyl alcohol, small plastic cup, coffee stirrer , ice, dishwashing liquid or detergent, ice and water, DNA kit

PROCEDURE:

1. Focus/ Motivation:

Short video on Forensic DNA fingerprinting, paternity test, etc.

2. PowerPoint Presentation :What is DNA?

3. Lab Activity : DNA Extraction (Check individual DNA)

4. Replication Simulation using the DNA Model Kit

5. Post-lab Discussion/ Closure: Let students present their models of replication, identify the parts of DNA and explain the functions. Furthermore, let the students explain the replication process using their models.

6. Evaluation : Quiz on DNA structure and replication may be given. Students may also be challenged to create a model of replication using different materials.

7. Extension Activity:

Research on transcription and translation processes. Draw the steps in these processes.

8. Teacher Reflection :

I have done this activity before using strawberry instead of cheek cells. The students actively participated in the lab and they were so excited to see their own DNA. Some were able to do a very good extraction, others collected a few and still others failed to collect some DNA. But in general, the lab was fun and the students enjoyed and learned at the same time.

The modeling of DNA replication gave the students a very concrete concept of replication. Since most of the students are tactile and visual learners, modeling and hands-on activities kept them engaged the whole time. There was better understanding.and learning as a result.

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LESSON PLAN

OBJECTIVES :

1. Students will be able to describe the process of meiosis.

2. Distinguish between mitosis and meiosis in the results of both cellular processes.

3. Students will also be able to simulate and construct an electronic flip-book showing the different stages of meiosis.

MATERIALS:

Computer, pipe cleaners, pair of scissors glue or tape, pieces of white paper, handouts, meiosis models ·

PROCEDURE:

1. Focus/ Motivation:

So do you think cells can grow? Does the growth of cells result to genetic variations?

2. Review : Mitosis

3. Introduction: Your body cells divide by the process of mitosis. The only exception are the gametes or the sex cells. They are produced by the process called

. meiosis. During fertilization, the sperm cell unites with the egg cell and produces a fertilized egg called the zygote. The zygote grows because of the process of mitosis. But the body cannot use mitosis to produce sperms or eggs. We are going to learn the process of meiosis which produces the gametes or the sex cells.

4. Lesson Proper : Students will read the handout : How your body makes Sperm or Eggs and Meiosis handout. (This is the time for vocabulary building zygote, chromosomes, meiosis, haploid cells, diploid cells. ) Check for understanding if they comprehend what they are reading.

5. Simulation Activity : Meiosis simulation handout

6. Discussion of the process of meiosis and how it compares with mitosis. Let them create a compare and contrast graphic organizer. ( If a video is available, it will help a lot).

7. Assessment *I* Evaluation :

Students will be given a quiz. Models of the stages of meiosis will be set on the table . The stages are not in order. Students will arrange the models according to how they occur in meiosis 1 and meiosis 2.

8. Extension Activity :

Create an electronic meiosis flip-book,based on the mitosis flip book template.

Rubric for grading the electronic flip-book.

1. All of the stages of meiosis were correctly shown in the model - 10

2. All of the parts that are involved in the process were clearly labeled whenever they appeared in the process - 5

3. Effort and Creativity is evident - 2

4. Presentation --------------------- 3 pts

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Total Points ------------------------ 20 pts

THE GREAT FOSSIL FIND EVALUATION

This lesson was taught to gth graders of LBJ High School. This was used to reinforce the knowledge and skills of the students on scientific processes like solving problem, formulating hypothesis, refining the hypothesis if it is not supported by fossil evidences and making conclusions.

A little modification was used so the students can relate more to the activity. The location was modified,the ranch in the front of LBJ was used as the site of the fossil find and the students showed a lot of enthusiasm because they are familiar with the place. The teacher was the one who read the story and the students followed the directions. This was done so the students will pay more attention to the directions and all ofthem will finish at the same time. About 5-10 minutes was given to the groups to figure out and formulate a hypothesis as to

what the fossil was before proceeding to the next direction. One class period is enough to finish the activity,process the findings and discuss the concepts. The activity needs a lot of preparation time but it is done only once and the materials can be used again for many times.

The students were very enthusiastic and all ofthem were engaged while doing the activity. This is an indication that this is a very good student-centered activity. A lot of discussions were observed as they figure out the find and when they got new evidences which then lead them to change their hypothesis. As more and more fossils were found, they got more involved in the discussion and modifying their guess. It gave them an opportunity to experience how the scientific method works, that hypothesis can be changed based on what observations and evidences are collected.

The student learning was assessed by asking them to describe what they experienced when they were doing the activity . They analyzed the steps in the activity and related them to the steps in the scientific method. It was easy for them to identify and understand the step as they were applied in a "real-life situation". However, the drawback of this assessment was that some of them were still not very good in expressing themselves and were shy to talk. A different assessment could be planned to better 'evaluate the student learning.