SEMI-DETAILED LESSON PLAN
IN SCIENCE 8
QUARTER ___

I. Learning Objectives

A. *Content Standard*:
The learners demonstrate an understanding of Newton's three laws of motion and uniform circular motion.

B. Performance Standard:
The learners shall be able to:
develop a written plan and implement a "Newton's Olympics"

C. Learning Competency:
1. Investigate the relationship between the amount of force applied and the mass of the object to the amount of change in the object's motion;
2. Infer that when a body exerts a force on another, an equal amount of force is exerted back on it;
3. Demonstrate how a body responds to changes in motion.

II. Learning Content

Content:
Laws of Motion
1.1 Law of Inertia
1.2 Law of Acceleration
1.3 Law of Interaction

LC Code:
S8FE-Ia-15,
S8FE-Ia-16 and
S8FE-Ib-17

Values Integration:
Cooperation with peers, Sense of responsibility

References:

- Newton's Laws of Motion - 8TH GRADE SCIENCE (weebly.com)
- Mrs. Ligon - Science 7/8 / Newton Laws of Motion (ajusd.org)
- https://www.ajusd.org/Page/726 Microsoft Word - Easy as 1-2-3.docx (faa.gov)
- https://www.faa.gov/education/educators/activities/highschool/media/Easy-as-1-2-3.pdf
- https://assist.asta.edu.au/sites/assist.asta.edu.au/files/Newton%27s%20Laws%20of%20 motion.pdf

III. Learning Procedure

Teachers Activity	Materials and Assessment Tools
A. Preliminaries ✓ *Prayer* ✓ *Checking of Attendance* ✓ *Motivation/ Engagement* Conduct a group discussion by making a journal entry to find out how much they know before starting the unit on Newton's Laws. The students will be group into 3-4 members and after discussing what they have written, they will choose a representative to report their journal entries. Pre-assessment: (Journal Entry) ➢ Who is Sir Isaac Newton? ➢ What is he most known for? ➢ Have you heard of the three laws of motion before? ➢ What are the three laws of motion?	Journal notebook and Rubrics/scoring criteria
B. Presentation of Lesson The teacher will introduce the objectives to the class and explain the relationship of the activity to the new topic of the day.	
C. Development of Lesson ***Explore*** Each group will now explore how forces affect the motion of objects by performing the activity lab with a provided worksheet. The students must record their observations and afterwards report their findings by answering the guide questions. **Act 1: A CURIOUS COIN: NEWTON'S FIRST LAW** **Procedure**: 1. Set the plastic cup on a flat surface and place the index card on top.	**Activity Worksheet** Title: Easy as 1-2-3: Newton's 3 Laws of Motion

2. Position the coin in the center of the index card. 3. Quickly flick the card to shoot off the coin into the cup. 4. Continue until the coin drops into the cup.	**Materials:** plastic cup, index card, coin
Act 2: WHO'S FASTER? NEWTON'S SECOND LAW **Procedure:** 1. Lay a board about 2 meters long in the floor. 2. Lift the end of the board with a specific height. 3. Measure the initial mass of the toy car. Record the data 4. Place the car in the elevated part of the board. Release the car until it begins to move. Record the time the toy car reaches the end of the board. 5. Next, press a piece of modeling clay on the top of the car to increase its mass. Record the new mass of the car. Repeat step 4. 6. Predict how adding a second piece of clay to the top of the toy car affects its mass. 7. Test your prediction and record your data.	**Materials:** A board (about 2 m long), toy car, modeling clay, measuring tape, timer, weighing instrument.
Act 3: BALLOON ROCKET: NEWTON'S THIRD LAW **Procedure:** 1. Tie one end of a string to a chair, doorknob, or other support. 2. Put the other end of the string through a straw. Then pull the string tight, and tie it to another support in the room. 3. Blow up the balloon, and pinch the end of the balloon to keep the air inside. Do not tie the balloon. 4. Tape the balloon to the straw so that the opening of the balloon is horizontal with the ground. You may need two students for this: one to keep the air pinched inside the balloon and the other to tape the balloon to the straw. 5. Have one student pull the balloon all the way back to the end of the string (the starting line), so the balloon opening is against one support. That student should hold the balloon opening closed. Have another student use the marker to draw a finish line near the other end of the string.	**Materials:** long string, balloon, tape, marker, straws, small box for "cargo", Cargo (paper clips, bottle caps, candy, etc.)

6. Let go of the balloon and watch it move along the string. 7. Then, have students test different methods to transport "cargo" across the string to the finish line	
Explain Each group will now present their laboratory report. After the report, the teacher will give inputs on important concepts missed by the students. Answered worksheets The teacher will also give feedback on their laboratory activity group performance. These guide questions must be answered by the students in their report: *Act 1: Guide questions* 1. What happened to the coin when the card slid out from underneath it? 2. What do you think is the force that acted on the card to set it in motion? 3. What force acted on the coin after step 3? 4. Why does the coin fall into the cup? 5. How is this related to inertia? *Act 2: Guide questions* 1. Which mass of the car has the longest time to reach the end of the board? Which has the shortest time? 2. What happens when you add more clay on the top of the toy car? 3. Which causes more acceleration, a small or huge force? How do acceleration and force relate? 4. What does Newton's second law describe? 5. Explain the relationship between mass and acceleration. *Act 3: Guide questions* 1. What happened when the opening of the balloon was released and the gas was allowed to escape? 2. Once you have the balloon set, what causes this to happen? 3. What do you think will make the balloon move faster? 4. What happens when you add cargo to the balloon rocket?	Output, Presentation, and Rating Sheet

5. Is your hypothesis in question number 4 valid? Why or why not? If not, what would be your next steps?	
Elaborate The teacher give the most important points based on the students' presentation. Then clarify misconceptions and reiterate the primary essence of the topic. He/she also connects the different activities and provide other examples. The objective is met in a gradual pace.	
Application Students identify their day-to-day experiences that shows the concept of Newton regarding motion. Then identify the kind of law it exhibits. They will write a journal entry about their observation and they should provide reasons of the vitality of studying these concepts.	
Evaluation 1. A 50 item assessment test will serve as the "evaluation". 2. Create a poster illustrating each of Newton's Laws of Motion. A copy of the rubric will be given before beginning the project.	Answer sheets, Grading rubric (poster) and performance rating sheets
Assignment. 1. Study the Second Law of Motion. 2. Familiarize the formula. 3. Make at least 5 problems regarding the Law of Acceleration. Answer those 5 problems and show a complete solution.	Science notebook, and scientific calculator

Prepared by: _____