**LISBON SCHOOL DEPARTMENT**
***UNIT DESIGN OUTLINE***

Unit Title: Unit 2: Kinematics, Dynamics, Gravity & Momentum

Unit Designers: Jill Denniston

Level(s): Freshmen Time Span: 3 weeks

**Content Area:**

| | | | |
|---|---|---|---|
| ☐ Career Prep | ☐ Health/PE | ☐ M&C Languages | ☐ Social Studies |
| ☐ English Language Arts | ☐ Mathematics | ☒ Science & Tech | ☐ Visual & Perf. Arts |

## Summary of Unit:

Understanding the nature of motion and how to describe it helps one understand why motion occurs. In this unit students will understand and be able to describe that a reference frame is used to measure the position and motion of an object. Students will learn that an object will have a constant velocity unless the object is acted upon by an unbalanced outside force. Students will successfully calculate acceleration, speed, distance and time in regards to objects in motion.

## Content Standards/Performance Indicators:

**B.** The Skills and Traits of Scientific Inquiry and Technological Design
**B.1. Skills and Traits of Scientific Inquiry:** Student methodically plan, conduct and analyze data from, and communicate results of in-depth scientific investigations, including experiments guided by a testable hypothesis.
**B.2.** Students use a systematic process, tools and techniques, and a variety of materials to design and produce a solution or product that meets new needs or improves existing designs.
**D4.** Students understand that the laws of force and motion are the same across the universe.

## Key Pre-Requisites:

***Knowledge*:**

Students should already be familiar with the following vocabulary:
instantaneous speed, velocity, vector, net force, acceleration

***Skills*:**

Answer all essential questions
Use conversion factors to convert between units of measurement
Use a scientific calculator

## Enduring Understandings:

Motion can be described in terms of distance, velocity, time, and acceleration
Force is a push or a pull

**Essential Questions that Guide and Focus This Unit:**
How is frame of reference used in describing motion?
How are velocity and acceleration related?
What is a force?
How do forces affect motion?

**Key Knowledge and Skills students will acquire as a result of this unit:**

***Knowledge:***
How to describe motion through distance, time, velocity and acceleration.

***Skills:***
Answer all essential questions.
Solve mathematical problems involving, speed, distance, time and acceleration.

**How will students provide evidence of their understandings?**
Lesson assignments
Chapter assignments
Chapter test.
Formative assessment through lab activities.
The Physics 50, (velocity) B.1., B.2.
Measuring the Effects of Air Resistance and Measuring Average Speed (forces) B.1., B.2.
Measuring Average Speed (Average Speed) B.1., B.2

**Teaching and Learning experiences used to help students understand:**
Lecture
Demos
Labs and activities (see above)
Reading textbook
Completing a note taking worksheet for the chapter.

**Provisions for Extending Learning:**
Independent extra credit on various car related topics:
Seat Belts, Air Bags, Stopping Distances, Brakes, Safety Features etc.

**How will technology be used to increase student achievement?**
Physical Science with Earth Science Virtual Lab: *What is the relationship between distance, average speed, and time?*

**Instructional Resources:**
Textbook
Handout materials

Attach a copy of the unit assessment tool, including criteria for evaluation of student performance/product.

***Car Trip***