Physical Science Unit 1: Motion and Forces

Chapter 1, 11, 12, and 14

Graduate Learner Outcome: As a Henry County graduate, I will understand and analyze forces, mass, motion, and interactions through scientific processes and practices.

Pretest Score: _____ **Post Test Score:** _____

Unit 1 Goal: Write a goal that you have for this unit.

Standards and Learning Targets:

SPS8. Obtain, evaluate, and communicate information to explain the relationship among force, mass, and motion.

a. Plan and carry out an investigation to analyze the motion of an object using mathematical and graphical models.
   - I can distinguish between distance and displacement.
   - I can define and explain the differences between speed, velocity, and acceleration and mathematically solve for each using word problems.
   - I can identify and use appropriate SI units when performing calculations of speed, velocity, and acceleration.
   - I can analyze and interpret a distance-time graph to describe the motion of an object.
   - I can analyze and interpret a velocity-time graph to describe the motion of an object.

b. Construct an explanation based on experimental evidence to support the claims presented in Newton's three laws of motion.
   - I can determine balanced and unbalanced forces and calculate the net force of an object.
   - I can state Newton's three laws of motion and give real examples and/or scenarios in which each apply.
   - I can use F=ma to calculate unknown quantities.

c. Analyze and interpret data to identify the relationship between mass and gravitational force for falling objects.
   - I can explain the difference between gravitational force and mass.
   - I can identify the appropriate SI units for mass and gravity.
   - I can determine the weight of objects based on their mass and the force of gravity.
   - I can describe the effect of drag on the free fall of an object and how it results in the terminal velocity of an object.

d. Use mathematics and computational thinking to identify the relationships between work, mechanical advantage, and simple machines.
   - I can identify and give examples of simple machines.

- I can define work and mechanical advantage.
- I can explain how machines make doing work easier.
- I can calculate the work and mechanical advantage for simple machines.
- I can use mathematical thinking to support explanations for the force-distance trade off that occurs when a simple machine is used.

Activities/Quizzes/Resources: (All resources can be found on my school website.)

1. Unit 1 Planning Guide
2. Unit 1 Learning Path
3. Chapter 1 Powerpoint
4. Chapter 1 Notes Outline
5. Chapter 11 Powerpoint
6. Chapter 11 Outline
7. Section 11.1 Lesson Video
8. Section 11.2 Lesson Video
9. Section 11.3 Lesson Video
10. Velocity Worksheet
11. Chapter 12 Powerpoint
12. Chapter 12 Outline
13. Section 12.1 Lesson Video
14. Section 12.2 Lesson Video
15. Section 12.3 Lesson Video
16. Section 12.4 Lesson Video
17. Mythbusters Bullet Experiment Video
18. Hammer and Feather Drop on the Moon Video
19. Force and Acceleration Worksheet
20. Chapter 14 Powerpoint
21. Chapter 14 Outline
22. Section 14.1 Lesson Video
23. Section 14.2 Lesson Video
24. Section 14.3 Lesson Video
25. Section 14.4 Lesson Video
26. Work and Power Worksheet
27. Chapter 1 and 11 Study Guide
28. Chapter 12 and 14 Study Guide
29. Review Games
30. Extra Practice Sheets
31. Unit 1 Quiz

Performance Task/Test:

Based on the learning targets from this unit, you will demonstrate your understanding of the relationship among force, mass, and motion by completing the following laboratory performance tasks.

- Lab 1 – Acceleration Lab
- Lab 2 – Power Lab

Unit 1 Test (You will complete the post test at the end of this unit to show mastery.)

Unit 1 Reflection: Reflect on what you could have done better to master this unit.