

## SPEED AND FORCE UNIT ORGANIZER

Prepared by Miss Dawn Dow

### STATE AND DISTRICT STANDARDS

#### STANDARD 1

- \*Students use appropriate tools to measure.
- \*Follow a plan to conduct a scientific investigation that involves: questions, hypotheses, controlling variables, collecting data, drawing conclusions, and making predictions.
- \*Communicate with reports, orally, graphs, charts, spreadsheets and art.
- \*Establish relationships based on evidence and logical argument.

#### STANDARD 2

- \*Measure quantities associated with energy forms.

#### STANDARD 6

- \*Identify variables and conditions related to change.
- \*Know that women and men of diverse interests, talents, qualities, and motivations and of various social and ethnic backgrounds, engage in the activities of science, engineering, and related fields; some scientists work in teams, some work alone, but all communicate with others.

### CORE KNOWLEDGE UNIT

#### I. Speed

- A. Understand the definition
- B. Know and demonstrate use of the formula to calculate speed
- C. Use correct units for speed

#### II. Force

- A. Understand the concept of force
- B. Know examples of familiar forces
- C. Measure force
- D. Use correct units for force

#### III. Biographies

- A. Isaac Newton

### STANDARDS FOR ACHIEVEMENT AND PERFORMANCE

- \*Can you use appropriate tools to measure distance, time, and mass?
- \*Can you write a plan to conduct a scientific investigation?
- \*Can you communicate information with reports, charts, and graphs?
- \*Can you establish relationships among distance, time, and speed based on evidence and logical argument?
- \*Can you identify variables and conditions related to change in speed and force?
- \*Can you communicate about Isaac Newton's experiments and findings in relation to speed and force?

### HABITS OF MIND

- \*Keep honest, clear, accurate records.
- \*Know that hypotheses are valuable, even if they turn out not to be true, if they lead to fruitful investigations.
- \*Know that often different explanations can be given for the same evidence, and it is not always possible to tell which one is correct.
- \*Organize information in simple tables and graphs and identify relationships they reveal.

#### PREVIOUS UNIT

Scientific Method  
Experimental Design

#### NEXT UNIT

Work  
Power

## WORK SCHEDULE

1. Review unit and unit organizer.
2. Read and answer the questions in chapter one of Motion, Forces, and Energy.
3. Use the data from the paper airplane experiment (scientific method unit) to calculate speed.
4. Read and answer the questions in chapter two of Motion, Forces, and Energy.
5. Participate in and record results of “balloon rocket” activity.
6. Design and perform an experiment demonstrating that different surfaces cause different amounts of friction.
7. Recreate an experiment that Isaac Newton could have performed to test the “theory” of gravity.
8. Post test

## ASSESSMENTS

Chapter 1 questions	5 points
Paper airplane experiment calculations	5 points
Chapter 2 questions	5 points
Balloon rocket activity	10 points
Friction experiment	10 points
Newton/Gravity experiment	10 points
Oral report on one experiment	5 points
Post test	25 points

## IN THIS UNIT YOU WILL:

1. Learn about speed, force, friction, and Isaac Newton.
2. Design and perform experiments and write lab reports.
3. Show data in charts and graphs.
4. Give one oral lab report.
5. Achieve 70% mastery or more or work to do so.