

Small Engines – Warm It Up!	
Level 2 – Grade 6 - 8	
Project 2061 Benchmarks (Grade 6 - 8)	
The Nature of Science	
Activity	Scientific Inquiry
9 - 11	Scientists differ greatly in what phenomena they study and how they go about their work. Although there is no fixed set of steps that all scientists follow, scientific investigations usually involve the collection of relevant evidence, the use of logical reasoning, and the application of imagination in devising hypotheses and explanations to make sense of the collected evidence.
The Physical Setting	
	Energy Transformation
9	Energy appears in different forms. Heat energy is in the disorderly motion of molecules; chemical energy is in the arrangement of atoms; mechanical energy is in moving bodies or in elastically distorted shapes; gravitational energy is in the separation of mutually attracting masses.
	Forces of Nature
10	Every object exerts gravitational force on every other object. The force depends on how much mass the objects have and on how far apart they are. The force is hard to detect unless at least one of the objects has a lot of mass.
The Designed World	
	Energy Sources and Use
1	Different ways of obtaining, transforming, and distributing energy have different environmental consequences.

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Level 2 – Grades 6 - 8	
NH Science Frameworks (Grade 7 - 10)	
Science as Inquiry	
Activity	1a. Students will demonstrate an increasing understanding of how the scientific enterprise operates
10, 11	Formulate questions and use appropriate concepts to guide scientific investigations and to solve real world problems
9	Use ratios as a means of comparing very large/very small numbers, e.g. building scale models
9	Design and conduct a controlled scientific investigation
9	Use technologies as tools in conducting investigations, e.g. microscopes, computer, calculator
Physical Science	
	5a. Students will demonstrate an increasing ability to distinguish among materials by utilizing observable properties.
4, 5, 9, 11	Obtain reliable and valid quantitative data through careful and skilled use of measuring instruments, e.g. balances, graduated cylinders, computer probes
4, 5, 9	Use derived measurements of objects or substances to determine non-observable properties, e.g. density
	5c. Students will demonstrate an increasing ability to understand the relationships among different types and forms of energy
9	Experimentally perform the transformation of one energy form to another, e.g. by building a simple electric motor
	5e. Students will demonstrate an increasing understanding of how an unbalanced force exerted on an object causes a change in the state of rest or motion of that object in the direction of the unbalanced force.
9	Formulate questions, design an exploration, and collect data about objects in motion
Unifying Themes and Concepts	
	6a. Students will demonstrate an increasing ability to recognize parts of any object or system, and understand how the parts interrelate in the operation of that object or system.
2	Demonstrate how systems include processes as well as parts, e.g. human body, telephone system, solar system
4, 6	Predict how certain changes in the system will/will not affect the operation of the system
	6d. Students will increasingly quantify their interactions with phenomena in the natural world, use these results to understand differences of scale in objects and systems, and determine how changes in scale affect various properties of those objects and systems.
4, 5, 9	Calculate from direct measurements, many of the derived measurements of objects such as density, velocity, inner and surface areas, volumes, perimeters, and changes in heat content

Small Engine – Warm It Up!	
Level 2 – Grades 6 - 8	
NH Career Development Frameworks (Grade 5 - 8)	
Core Educational Learning	
	1. Students will demonstrate a firm grounding in the interactive language processes of reading, writing, speaking, listening, and viewing, as well as the ability to use those skills to communicate effectively.
2 – 4	Demonstrate the capacity to use a variety of tools, such as libraries, museums, technology, etc., to enhance learning.
12	Demonstrate the capacity to compare, contrast, and use information presented in written, oral, audio-visual, and graphic forms.
	2. Students will demonstrate a firm grounding in essential computational skills as well as strong problem-solving and reasoning abilities.
4, 5, 9	Select appropriate computational techniques to help solve problems and, if appropriate, use mental computation and estimation strategies to check the reasonableness of results.
5, 6, 10, 11	Describe the process used to solve a problem and apply the process to a new problem.
5 – 7	Identify the operating principles underlying a system (people, machines, processes) and evaluate the operation of a system.
Career Learning	
	6. Students will acquire the knowledge, attitudes and skills to make a successful transition from school to the world of work and adult life.
13	Make decisions and set appropriate career goals.
	7. Students will understand the relationship between individual qualities, education and training, and the world of work.
2, 3, 5 - 11	Employ appropriate safety practices related to the world of work.