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Glossary of Science Terms - Contains 202 defined terms used in the Engineering & Technology II Course.

Introduction

The **Core Engineering & Technology II Course** teaches about using science to solve problems, scientific investigation using the Scientific Method, engineering design, and analyzing information and results, different areas of science, science jobs, discoveries and inventions and the future of science.

The **Core Engineering & Technology II Course's** learning objectives align with Next Generation Science Standards for grades 3, 4, and 5, including standards 3-5-ETS1-1, 3-5-ETS1-2, and 3-5-ETS1-3. Also supported are math objectives for the Common Core Math Standards 3MD.3, 4MD.4, and 5MD.5.

The **Core Engineering & Technology II Course** has 16 lessons organized in 3 Units with 16 lesson assessments. There are 356 audio-supported instruction pages, 52 printable activity sheet pages, 202 defined vocabulary words, and a set of 240 Quiz questions. Course lessons and assessments are enabled for all commonly used computer devices, including computer tablets and smartphones. Completion is estimated at 14 to 16 hours.

Unit 1: Science Skills

Unit 1 - Lesson 1: Scientific Investigation Next Generation Science Standards (NGSS)

- Grade 3-5-ETS1-1

Learning Objectives

- to learn about how scientific investigation helps to discover facts about the world
- to learn the steps of the Scientific Method

Defined Vocabulary Words

- analyze, conclusion, data, drawing, experiment, hypothesis, inquiry, research, science, scientific investigation, scientific method

Activity Type

- Explain each step in the Scientific Method
- Do some research on salt and ice

Lesson Components

Total Learning Objects – 37

Instruction Pages - 18

Activity Pages - 4

Lesson Quiz Questions– 15 total questions; 5 randomly selected to populate the Lesson Quiz

Unit Test Questions– 75 total questions; 15 total per Lesson of which 3 are randomly selected to populate the Unit Test

Unit 1 - Lesson 2: Engineering Design
Next Generation Science Standards (NGSS)

- Grade 3-5-ETS1-1

Learning Objectives

- to learn about using engineering design to solve problems

Defined Vocabulary Words

- analyze, brainstorm, conclusion, data, drawing, engineering design, field observations, final design, market research, prototype, redesign, research, science, scientific investigation, sketch

Activity Type

- Explain the steps of Engineering Design
- Do market research on running shoes

Lesson Components

Total Learning Objects – 37

Instruction Pages - 19

Activity Pages - 3

Lesson Quiz Questions– 15 total questions; 5 randomly selected to populate the Lesson Quiz

Unit Test Questions– 75 total questions; 15 total per Lesson of which 3 are randomly selected to populate the Unit Test

Unit 1 - Lesson 3: Variables
Next Generation Science Standards (NGSS)

- Grade 3-5-ETS1-1

Learning Objectives

- to learn how variables and constraints can change the outcome of engineering design
- to learn how to make observations about the world around us
- to learn about cause and effect relationships

Defined Vocabulary Words

- cause and effect, constant, constraint, criteria, dependent variable, engineering design, experiment, independent variable, manipulate, manipulated variable, observe, physical properties, responding variable, variables

Activity Type

- Match the phrase with the correct word.
- Investigate the cause and effect relationship of ice cream and grape soda.

Lesson Components

Total Learning Objects – 39

Instruction Pages - 21

Activity Pages - 3

Lesson Quiz Questions– 15 total questions; 5 randomly selected to populate the Lesson Quiz

Unit Test Questions– 75 total questions; 15 total per Lesson of which 3 are randomly selected to populate the Unit Test

Unit 1 - Lesson 4: Measuring
Next Generation Science Standards (NGSS)

- Grade 3-5-ETS1-1

Learning Objectives

- to learn about the different types of measurements
- to learn about the methods and tools used to measure and collect data
- to learn the different units of measurement

Defined Vocabulary Words

- balance scale, beaker, distance, elapsed time, graduated cylinder, height, length, mass, measure, measuring cup, meter stick, metric units, ruler, spring scale, standard units, stop watch, tape measure, temperature, thermometer, tonne, volume, weights, width, yard stick

Activity Type

- Sort the words into the what they measure.
- Practice measuring by making cookies.

Lesson Components

Total Learning Objects – 39

Instruction Pages - 21

Activity Pages - 3

Lesson Quiz Questions– 15 total questions; 5 randomly selected to populate the Lesson Quiz

Unit Test Questions– 75 total questions; 15 total per Lesson of which 3 are randomly selected to populate the Unit Test

Unit 1 - Lesson 5: Recording Information
Next Generation Science Standards (NGSS)

- Grade 3-5-ETS1-1

Common Core Math Objectives

- 3MD.3, 4MD.4, 5MD.5

Learning Objectives

- to learn about the recording data in an organized way
- to learn about tables and graphs
- to learn how to interpret data collected through experiments and observations

Defined Vocabulary Words

- axis, bar, bar graph, cell, column, data, data point, frequency distribution table, graph, graph paper, key, labels, line graph, line plot, outcome, pictograph, row, slope, spreadsheet, table, word processing program, x-axis, y-axis

Activity Type

- Make a frequency distribution table and a line plot.
- Record height of two people for a year.

Lesson Components

Total Learning Objects – 41

Instruction Pages - 23

Activity Pages - 3

Lesson Quiz Questions– 15 total questions; 5 randomly selected to populate the Lesson Quiz

Unit Test Questions– 75 total questions; 15 total per Lesson of which 3 are randomly selected to populate the Unit Test

Unit 2: Sample Investigations and Designs

Unit 2 - Lesson 1: Doing an Experiment Next Generation Science Standards (NGSS)

- Grade 3-5-ETS1-1

Learning Objectives

- to learn how to do an experiment using the Scientific Method
- to learn about cause and effect relationships

Defined Vocabulary Words

- analyze, cause and effect, constant, dependent variable, experiment, experimental question, hypothesis, independent variable, manipulate, manipulated variable, materials, observe, question, repeating, research, responding variable, scientific method, trial

Activity Type

- Identify the independent and dependent variables for each of the experimental questions.
- Perform the experiment described in the lesson.

Lesson Components

Total Learning Objects – 41

Instruction Pages - 23

Activity Pages - 3

Lesson Quiz Questions– 15 total questions; 5 randomly selected to populate the Lesson Quiz

Unit Test Questions– 75 total questions; 15 total per Lesson of which 3 are randomly selected to populate the Unit Test

Unit 2 - Lesson 2: Doing a Second Experiment Next Generation Science Standards (NGSS)

- Grade 3-5-ETS1-1 and 3-5-ETS1-3.

Learning Objectives

- to learn about doing another experiment to answer more questions

Defined Vocabulary Words

- analyze, cause and effect, constant, dependent variable, experiment, experimental question, hypothesis, independent variable, manipulate, manipulated variable, materials, observe, question, repeating, research, responding variable, scientific method, trial

Activity Type

- Briefly describe how to do an experiment to answer the experimental questions.
- Perform the experiment described in the lesson.

Lesson Components

Total Learning Objects – 41

Instruction Pages – 23

Activity Pages - 3

Lesson Quiz Questions– 15 total questions; 5 randomly selected to populate the Lesson Quiz

Unit Test Questions– 75 total questions; 15 total per Lesson of which 3 are randomly selected to populate the Unit Test

Unit 2 - Lesson 3: A Sample Engineering Design**Next Generation Science Standards (NGSS)**

- Grade 3-5-ETS1-1 and 3-5-ETS1-3.

Learning Objectives

- to learn about creating and testing prototypes
- to learn how to optimize solutions to create a final design

Defined Vocabulary Words

- analyze, brainstorm, constraint, data, design, durability, engineering, engineering design, final design, optimize, problem, prototype, redesign, research, science

Activity Type

- Brainstorm ideas on how to build a string telephone. List some possible constraints.
- Fix the problem from the lesson.

Lesson Components

Total Learning Objects – 40

Instruction Pages - 22

Activity Pages - 3

Lesson Quiz Questions– 15 total questions; 5 randomly selected to populate the Lesson Quiz

Unit Test Questions– 75 total questions; 15 total per Lesson of which 3 are randomly selected to populate the Unit Test

Unit 2 - Lesson 4: Improving Our Engineering Design**Next Generation Science Standards (NGSS)**

- Grade 3-5-ETS1-1, 3-5-ETS1-2, and 3-5-ETS1-3.

Learning Objectives

- to learn how to improve the engineering design

Defined Vocabulary Words

- analyze, brainstorm, constraint, criteria, data, engineering design, final design, isolate, problem, prototype, redesign, research

Activity Type

- List the criteria for deciding if an engineering design is successful.
- Improve the string telephone created in the previous lesson.

Lesson Components

Total Learning Objects – 40

Instruction Pages – 21

Activity Pages - 4

Lesson Quiz Questions– 15 total questions; 5 randomly selected to populate the Lesson Quiz

Unit Test Questions– 75 total questions; 15 total per Lesson of which 3 are randomly selected to populate the Unit Test

Unit 2 - Lesson 5: Analyzing Results**Next Generation Science Standards (NGSS)**

- Grade 3-5-ETS1-2 and 3-5-ETS1-3

Common Core Math Objectives

- 3MD.3, 4MD.4, 5.MD5

Learning Objectives

- to learn how to analyze and predict results from an experiment
- to learn how to use tables and graphs to organize data

Defined Vocabulary Words

- bar graph, cell, column, data, experiment, graph, guess, hypothesis, line graph, mean, measure, pattern, pie chart, predict, result, row, slope, spreadsheet, table, test, trial

Activity Type

- Answer the questions in relation to the graphs provided.
- Use a computer spreadsheet to organize data and create charts.

Lesson Components

Total Learning Objects – 46

Instruction Pages - 27

Activity Pages - 4

Lesson Quiz Questions– 15 total questions; 5 randomly selected to populate the Lesson Quiz

Unit Test Questions– 75 total questions; 15 total per Lesson of which 3 are randomly selected to populate the Unit Test

Unit 3: Science and Society**Unit 3 - Lesson 1: Scientific Fields****Next Generation Science Standards (NGSS)****Learning Objectives**

- to learn about the different areas of science: Life Science, Earth and Space Science, Physical Science
- to learn about the branches of Engineering
- to learn about STEM

Defined Vocabulary Words

- astronomy, biology, branch, chemical engineering, chemistry, civil engineering, data, earth and space science, electrical engineering, electricity, engineering, field, geoscience, life science, mathematics, mechanical engineering, physical science, physics, science, technology

Activity Type

- Match the definition with the word.
- Build a balloon rocket.

Lesson Components

Total Learning Objects – 40

Instruction Pages - 22

Activity Pages - 3

Lesson Quiz Questions– 15 total questions; 5 randomly selected to populate the Lesson Quiz

Unit Test Questions– 75 total questions; 15 total per Lesson of which 3 are randomly selected to populate the Unit Test

**Unit 3 - Lesson 2: Careers in Science
Next Generation Science Standards (NGSS)****Learning Objectives**

- to learn about the different types of science jobs

Defined Vocabulary Words

- astronomer, astronomy, biologist, botanist, chemist, chemistry, climate, climatologist, computer scientist, earth and space science, engineer, entomologist, geologist, global warming, marine biologist, mathematician, medical doctor, meteorologist, microbiologist, oceanographer, pharmacist, physicist, physics, predict, program, scientist, technician, technologist, veterinarian, zoologist

Activity Type

- Match the type of scientist with their job description.
- Spend the day with a scientist at work.

Lesson Components

Total Learning Objects – 43

Instruction Pages - 25

Activity Pages - 3

Lesson Quiz Questions– 15 total questions; 5 randomly selected to populate the Lesson Quiz

Unit Test Questions– 75 total questions; 15 total per Lesson of which 3 are randomly selected to populate the Unit Test

Unit 3 - Lesson 3: Science Tools
Next Generation Science Standards (NGSS)**Learning Objectives**

- to learn about the different tools used in science

Defined Vocabulary Words

- aquarium, anemometer, balance scale, barometer, beaker, binoculars, Bunsen burner, electronic devices, experiment, eye dropper, flask, graduated cylinder, hand lens, hot plate, laboratory, lens, glassware, magnifying glass, meter stick, microscope, petri dish, pipette, rain gauge, ruler, scale, spring scale, stop watch, tape measure, telescope, terrarium, test tube, thermometer, weather vane, wind vane, yard stick

Activity Type

- Draw a picture of each tool.
- Build an anemometer.

Lesson Components

Total Learning Objects – 44

Instruction Pages – 25

Activity Pages - 4

Lesson Quiz Questions– 15 total questions; 5 randomly selected to populate the Lesson Quiz

Unit Test Questions– 75 total questions; 15 total per Lesson of which 3 are randomly selected to populate the Unit Test

Unit 3 - Lesson 4: Safety
Next Generation Science Standards (NGSS)**Learning Objectives**

- to learn about safety equipment
- to learn how to safely perform experiments
- to learn how to label items used in an experiment

Defined Vocabulary Words

- electricity, fumes, goggles, lab coat, label, poisonous, safety gear, shock, short circuit, tongs, ventilation

Activity Type

- Write the consequences of not using safety precautions.
- Do a simple test to demonstrate the importance of labeling.

Lesson Components

Total Learning Objects – 35

Instruction Pages – 17

Activity Pages - 3

Lesson Quiz Questions– 15 total questions; 5 randomly selected to populate the Lesson Quiz

Unit Test Questions– 75 total questions; 15 total per Lesson of which 3 are randomly selected to populate the Unit Test

Unit 3 - Lesson 5: Discoveries and Inventions
Next Generation Science Standards (NGSS)**Learning Objectives**

- to learn about discoveries made by inventors
- to learn about inventions that changed the world

Defined Vocabulary Words

- antibiotic, Benjamin Franklin, discovery, electricity, Galileo Galilei, industrial revolution, internal combustion engine, invention, pesticide, plastic, plumbing, printing press, telescope, Thomas Edison, steam engine, synthetic rubber

Activity Type

- Draw a picture of each invention and describe the benefit it provides.
- Make a homemade printing press

Lesson Components

Total Learning Objects – 44

Instruction Pages – 26

Activity Pages - 3

Lesson Quiz Questions– 15 total questions; 5 randomly selected to populate the Lesson Quiz

Unit Test Questions– 75 total questions; 15 total per Lesson of which 3 are randomly selected to populate the Unit Test

Unit 3 - Lesson 6: The Future of Science
Next Generation Science Standards (NGSS)**Learning Objectives**

- to learn how STEM influences society and addresses changing needs of the world

Defined Vocabulary Words

- apps, artificial limbs, cell phones, computer monitor, desktop computer, electronics, engineering, genetic engineering, genome, laptop computer, mathematics, mobile phone, renewable energy, science, STEM, tablet, smartphone, technology

Activity Type

- Draw a picture of a cell phone and list the ways it can be used.
- Conduct a survey about computers.

Lesson Components

Total Learning Objects – 41

Instruction Pages – 23

Activity Pages - 3

Lesson Quiz Questions– 15 total questions; 5 randomly selected to populate the Lesson Quiz

Unit Test Questions– 75 total questions; 15 total per Lesson of which 3 are randomly selected to populate the Unit Test