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Glossary of Science Terms - Contains 243 defined terms used in the Engineering & Technology III Course.

Introduction

The **Core Engineering & Technology III 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 III Course's** learning objectives align with Next Generation Science Standards for grades 6, 7, and 8, including standards MS-ETS1-1, MS-ETS1-2, MS-ETS1-3, MS-ETS1-4.

The **Core Engineering & Technology III Course** has 16 lessons organized in 3 Units with 16 lesson assessments. There are 404 audio-supported instruction pages, 52 printable activity sheet pages, 243 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)

- MS-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, experiment, hypothesis, innovation, inquiry, research, science, scientific investigation, Scientific Method

Activity Type

- Answer the questions
- Get a feel for professional journals used by scientists

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

- MS-ETS1-1

Learning Objectives

- to learn about using engineering design to solve problems

Defined Vocabulary Words

- analyze, brainstorm, constraints, criteria, data, engineering design, engineering problem, field observations, market research, metric, prototype, redesign, research, science, scientific investigation, simulation

Activity Type

- Write the letter of the definition beside the word it describes
- Do field observations

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 3: Variables
Next Generation Science Standards (NGSS)

- MS-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, constraint, control, constant, criteria, dependent variable, engineering design, experiment, independent variable, manipulate, manipulated variable, observe, physical properties, responding variable, science, scientific investigation, Scientific Method, variables

Activity Type

- Explain the terms.
- Look at the role constants play in an experiment.

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

- MS-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, beaker, displacement method, distance, elapsed time, graduated cylinder, length, mass, measure, measuring cup, meniscus, metric system, metric units, precision, scale, scientific method, SI, standard units, stopwatch, temperature, thermometer, volume, width

Activity Type

- Match the unit of measurement with what it measures.
- Practice measuring by making cookies.

Lesson Components

Total Learning Objects – 45

Instruction Pages - 26

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 5: Recording Information
Next Generation Science Standards (NGSS)

- MS-ETS1-1

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, histogram, independent variable, key, labels, line graph, line plot, mean, measure of central tendency, median, mode, outcome, pictograph, pie chart, quantitative, range, row, scatterplot, slope, spreadsheet, table, word processing program, x-axis, y-axis

Activity Type

- Make a frequency distribution table, histogram, and pie chart.
- Record growth of a pet for a year.

Lesson Components

Total Learning Objects – 46

Instruction Pages - 28

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)**

- MS-ETS1-2

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, circumference, constant, control, dependent variable, experiment, experimental question, flask, hypothesis, independent variable, manipulate, manipulated variable, materials, observe, question, repeated trials, research, responding variables, scientific investigation, Scientific Method, trial

Activity Type

- For each experimental question, identify the independent and dependent variables. Give a brief description of how to conduct the experiment. Be sure to discuss the constants and the control (if any).
- Perform the experiment described in the lesson.

Lesson Components

Total Learning Objects – 42

Instruction Pages - 24

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)**

- MS-ETS1-2 and MS-ETS1-4

Learning Objectives

- to learn about doing another experiment to answer more questions

Defined Vocabulary Words

- analyze, cause and effect, circumference, constant, control, dependent variable, experiment, experimental question, flask, hypothesis, independent variable, manipulate, manipulated variable, materials, observe, question, repeated trials, research, responding variables, scientific investigation, Scientific Method, trial

Activity Type

- For each experimental question, identify the independent and dependent variables. Give a brief description of how to conduct the experiment. Be sure to discuss the constants and the control (if any).
- Perform the experiment described in the lesson.

Lesson Components

Total Learning Objects – 42

Instruction Pages – 24

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)**

- MS-ETS1-2 and MS-ETS1-4

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, constraints, criteria, data, design, engineering, engineering design, engineering problem, final design, prototype, quantitative, redesign, research, science

Activity Type

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

Lesson Components

Total Learning Objects – 42

Instruction Pages - 24

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)**

- MS-ETS1-2, MS-ETS1-3, and MS-ETS1-4

Learning Objectives

- to learn how to improve the engineering design

Defined Vocabulary Words

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

Activity Type

- List the criteria for deciding if an engineering design is successful.
- Improve the pencil holder created in the previous 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 5: Analyzing Results**Next Generation Science Standards (NGSS)**

- MS-ETS1-2, MS-ETS1-3, and MS-ETS1-4

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

- analyze, bar graph, circumference, column, control, data, data point, experiment, experimental question, line graph, mean, measure, outlier, predict, row, scientific investigation, slope, spreadsheet, table, test, trial

Activity Type

- Answer the questions.
- Track the weather for a few days in attempt to forecast the weather.

Lesson Components

Total Learning Objects – 43

Instruction Pages - 24

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)

- Grades 6, 7, and 8

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, atomic and nuclear physics, biochemistry, cellular biology, chemical engineering, chemistry, civil engineering, climate, cosmology, earth and space science, ecology, electrical engineering, electricity, engineering, evolutionary biology, formal science, functional biology, geology, geosciences, life science, logic, mathematics, mechanical engineering, medicine, oceanography, philosophy, physical science, physics, physiology, planetary science, psychology, science, social science, sociology, statistics, stem, technology

Activity Type

- Match the definition with the word.
- Visit a science museum.

Lesson Components

Total Learning Objects – 49

Instruction Pages - 31

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)

- Grades 6, 7, and 8

Learning Objectives

- to learn about the different types of science jobs

Defined Vocabulary Words

- astronomer, astronomy, biologist, botanist, cardiologist, chemist, chemistry, climate, climatologist, computer scientist, dermatologist, dietitian, engineer, entomologist, geologist, global warming, hematologist, marine biologist, mathematician, medical doctor, meteorologist, microbiologist, mycologist, oceanographer, optometrist, pharmacist, physicist, physics, scientist, technician, technologist, veterinarian, zoologist

Activity Type

- Describe what each scientist studies.

- Visit a university or college and answer questions about science careers.

Lesson Components

Total Learning Objects – 45

Instruction Pages - 27

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)

- Grades 6, 7, and 8

Learning Objectives

- to learn about the different tools used in science

Defined Vocabulary Words

- agar, aquarium, anemometer, balance scale , barometer, beaker, barometer, beaker, binoculars, bunsen burner, electronic devices, experiment, eye dropper, flask, graduated cylinder, hand lens, hot plate, hygrometer, incubator, laboratory, meter stick, microscope, mirror, optical tool, petri dish, pipette, rain gauge, ruler, scale, spring scale, stopwatch, tape measure, telescope, terrarium, test tube, thermometer, tongs, water bath, weather vane, wind vane, yard stick

Activity Type

- Categorize the tools.
- Build a simple microscope.

Lesson Components

Total Learning Objects – 48

Instruction Pages – 30

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 4: Safety

Next Generation Science Standards (NGSS)

- Grades 6, 7, and 8

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

- acrylic fingernails, bunsen burner, electricity, eye wash station, first aid kit, fire extinguisher, fume, goggle, hot pad, hot plate, lab coat, label, poisonous, safety gear, safety shower, shock, short circuit, tongs, ventilation

Activity Type

- Explain each safety precaution.
- Design a safety check list and then use it to rate the safety of various locations used for scientific investigation.

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

- Grades 6, 7, and 8

Learning Objectives

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

Defined Vocabulary Words

- Alexander Fleming, antibiotic, Benjamin Franklin, Charles Goodyear, discovery, electricity, Galileo Galilei, heliocentric, industrial revolution, internal combustion engine, invention, Johannes Gutenberg, Louis Pasteur, Nicolas Copernicus, phonograph, plastic, plumbing, printing press, Thomas Edison, steam engine, Wright brothers

Activity Type

- Draw a picture of an invention that has had the greatest impact on society and describe why.
- Make homemade plastic.

Lesson Components

Total Learning Objects – 48

Instruction Pages – 30

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)

- Grades 6, 7, and 8

Learning Objectives

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

Defined Vocabulary Words

- apps, artificial limbs, cell phone, desktop computer, discovery, engineering, genetic engineering, genome, invention, laptop computer, mathematics, mobile phone, renewable energy, science, STEM, tablet, technology

Activity Type

- Draw a picture of a cell phone and list the ways it can be used.
- Participate in a robotics club or team.

Lesson Components

Total Learning Objects – 42

Instruction Pages – 24

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
