



Unit Planner: Unit 1: Engineering Design/Nature of Science Science 8

Monday, August 1, 2020

*Archdiocesan Essential Curriculum > 2020-2021 > Grade 8 > Science > Science 8 (BP) > Week 1 - Week 37

Unit 1: Engineering Design/Nature of Science

Stage 1: Desired Results	
General Information A controlled experiment contains an independent variable, dependent variable, and sometimes a control group. The independent variable is what is changed on purpose and the dependent variable is the data you collect in an experiment. The dependent variable measure the effect of the independent variable. The control determines if the independent variable has an effect on the dependent variable. Usually, only one thing is changed in an experiment, so there is usually just one independent variable. Constants are things that are kept the same in each group so the only variable that is changed is the independent variable.	Essential Question(s) <ul style="list-style-type: none">• How do you set up a controlled experiment?• What are the key components of a science experiment?• How can the results/data of an experiment be analyzed?
Enduring Understandings and Knowledge Students will know: <ul style="list-style-type: none">• Scientific processes can be used to answer questions and learn about how natural events occur.• Appropriate methods, tools, and technologies, must be used accurately to answer questions.• Answers to questions should be supported by evidence.• Claims are strengthened when supported by evidence and explanations (reasoning)• Science questions can be answered by recognizing patterns in observations.• Evidence shows that there are consistent patterns in natural systems.• Theories are explanations of observable phenomena that are based on consistent evidence.• Knowledge of patterns in natural systems can be applied to make predictions.• Hypotheses are possible explanations that assist scientists in gaining new knowledge.• Science explanations can changed based on new evidence.	Skills Students will be able to: <ul style="list-style-type: none">• Collect and use graphs and tables to organize observations• Ask testable questions based on observations.• Form a possible answer (hypothesis)• Plan and conduct an investigation, selecting appropriate methods, tools, and techniques.• Objectively collect and record data, making accurate measurements.• Organize data using graphs, drawings, sketches, and diagrams• Use evidence from data to look for patterns to answer a question or explain reasoning.• Evaluate the validity of a claim by collecting and explaining evidence.

<p>Connections to Catholic Identity / Other Subjects</p> <p>Religion</p> <ul style="list-style-type: none"> The foundation of the Catholic faith helps to relate science innovations to morals and responsibilities faced as stewards of God's world and His people. 	<p>Vocabulary</p> <p>Engineering:</p> <ul style="list-style-type: none"> engineer criteria constraint solution technology tool process brainstorm model observation test data evaluate improve iterative prototype model <p>Science:</p> <ul style="list-style-type: none"> observation theory hypothesis plan test data evidence analyze pattern cause and effect reasoning claim
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<p>Standards & Frameworks Addressed</p> <p>NGSS: Science Performance Expectations (2013)</p> <p>NGSS: MS Engineering Design</p> <p>MS.Engineering Design</p> <p>Performance Expectations</p> <p>MS-ETS1-1. Define the criteria and constraints of a design problem with sufficient precision to ensure a successful solution, taking into account relevant scientific principles and potential impacts on people and the natural environment that may limit possible solutions.</p> <p>MS-ETS1-2. Evaluate competing design solutions using a systematic process to determine how well they meet the criteria and constraints of the problem.</p> <p>MS-ETS1-3. Analyze data from tests to determine similarities and differences among several design solutions to identify the best characteristics of each that can be combined into a new solution to better meet the criteria for success.</p> <p>MS-ETS1-4. Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.</p> <p>© Copyright 2013 Achieve, Inc. All rights reserved. Access the interactive version of the NGSS here</p>
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Teaching Ideas/Resources

- [*Content Area Expert Resources*](#)