We have created a guide to get you started. This is designed to be a starting point that can be tweaked to your individual style/needs. Included in the general plan are the standards/access points, vocabulary, key questions and links to a variety of resources including tutorials, informational text, videos, experiments and sample activities. All of the links in this file are live and clicking on the standard will take you directly to C-Palms.

PowerPoints for The Nature of Science:

Visual Vocabulary [Click here](http://accesstoflsresources.weebly.com/uploads/2/3/7/3/23739164/1.__nature_of_science._visual_vocab.pptx)

Key Questions [Click here](http://accesstoflsresources.weebly.com/uploads/2/3/7/3/23739164/1.__the_nature_of_science.essential_questions.pptx)

*Drafted by Sarasota County Teachers Dawn Byrne, Jeremy Johnson and Elizabeth Lewis, piloted 2016-17 in 5 classes and general education content review by Betsy Summerlee.*

|  | The Nature of Science |
| --- | --- |
| **Unit/Topic Standard** | [SC.912.N.3.1:](http://www.cpalms.org/Public/PreviewStandard/Preview/1871) Explain that a scientific theory is the culmination of many scientific investigations drawing together all the current evidence concerning a substantial range of phenomena; thus, a scientific theory represents the most powerful explanation scientists have to offer.  [SC.912.N.2.5:](http://www.cpalms.org/Public/PreviewStandard/Preview/1870) Describe instances in which scientists' varied backgrounds, talents, interests, and goals influence the inferences and thus the explanations that they make about observations of natural phenomena and describe that competing interpretations (explanations) of scientists are a strength of science as they are a source of new, testable ideas that have the potential to add new evidence to support one or another of the explanations.  [SC.912.N.3.5:](http://www.cpalms.org/Public/PreviewStandard/Preview/1875) Describe the function of models in science, and identify the wide range of models used in science.  [SC.912.N.4.1:](http://www.cpalms.org/Public/PreviewStandard/Preview/1876) Explain how scientific knowledge and reasoning provide an empirically-based perspective to inform society’s decision making.  [SC.912.N.1.5:](http://www.cpalms.org/Public/PreviewStandard/Preview/1860) Describe and provide examples of how similar investigations conducted in many parts of the world result in the same outcome.  [SC.912.N.1.6:](http://www.cpalms.org/Public/PreviewStandard/Preview/1861) Describe how scientific inferences are drawn from scientific observations and provide examples from the content being studied  [SC.912.N.1.4:](http://www.cpalms.org/Public/PreviewStandard/Preview/1859) Identify sources of information and assess their reliability according to the strict standards of scientific investigation.  [SC.912.N.2.4:](http://www.cpalms.org/Public/PreviewStandard/Preview/1869) Explain that scientific knowledge is both durable and robust and open to change. Scientific knowledge can change because it is often examined and re-examined by new investigations and scientific argumentation. Because of these frequent examinations, scientific knowledge becomes stronger, leading to its durability. |
| **Access Points** | [SC.912.N.3.In.1:](http://www.cpalms.org/Public/PreviewAccessPoint/Preview/8187) Recognize that a scientific theory is developed by repeated investigations of many scientists and agreement on the likely explanation.  [SC.912.N.3.Su.1:](http://www.cpalms.org/Public/PreviewAccessPoint/Preview/8188) Recognize that scientific theories are supported by evidence and agreement of many scientists.  [SC.912.N.3.Pa.1:](http://www.cpalms.org/Public/PreviewAccessPoint/Preview/8189) Recognize examples of cause-effect descriptions or explanations related to science.  [SC.912.N.2.In.4:](http://www.cpalms.org/Public/PreviewAccessPoint/Preview/8185) Identify major contributions of scientists.  [SC.912.N.2.Su.3:](http://www.cpalms.org/Public/PreviewAccessPoint/Preview/8186) Recognize major contributions of scientists.  [SC.912.N.2.Pa.1:](http://www.cpalms.org/Public/PreviewAccessPoint/Preview/8180) Recognize an example of work by scientists.  [SC.912.N.4.In.1:](http://www.cpalms.org/Public/PreviewAccessPoint/Preview/8195) Identify ways scientific knowledge and problem solving benefit people.  [SC.912.N.4.Su.1:](http://www.cpalms.org/Public/PreviewAccessPoint/Preview/8196) Recognize ways scientific knowledge and problem solving benefit people.  [SC.912.N.4.Pa.1:](http://www.cpalms.org/Public/PreviewAccessPoint/Preview/8197) Recognize science information that helps people.  [SC.912.N.3.In.3:](http://www.cpalms.org/Public/PreviewAccessPoint/Preview/8192) Identify ways models are used in the study of science.  [SC.912.N.3.Su.3:](http://www.cpalms.org/Public/PreviewAccessPoint/Preview/8193) Recognize ways models are used in the study of science.  [SC.912.N.3.Pa.2:](http://www.cpalms.org/Public/PreviewAccessPoint/Preview/8194) Recognize a model used in the context of one’s own study of science.  [SC.912.N.1.In.3:](http://www.cpalms.org/Public/PreviewAccessPoint/Preview/8172) Identify that scientific investigations are sometimes repeated in different locations.  [SC.912.N.1.Su.3:](http://www.cpalms.org/Public/PreviewAccessPoint/Preview/8173) Recognize that scientific investigations can be repeated in different locations.  [SC.912.N.1.Pa.3:](http://www.cpalms.org/Public/PreviewAccessPoint/Preview/8174) Recognize that when a variety of common activities are repeated the same way, the outcomes are the same.  [SC.912.N.2.In.3:](http://www.cpalms.org/Public/PreviewAccessPoint/Preview/8182) Recognize that scientific knowledge can be challenged or confirmed by new investigations and reexamination.  [SC.912.N.2.Su.2:](http://www.cpalms.org/Public/PreviewAccessPoint/Preview/8183) Recognize that what is known about science can change based on new information.  [SC.912.N.1.In.1:](http://www.cpalms.org/Public/PreviewAccessPoint/Preview/8166) Identify a problem based on a specific body of knowledge, including life science, earth and space science, or physical science, and do the following: 1. Identify a scientific question 2. Examine reliable sources of information to identify what is already known 3. Develop a possible explanation (hypothesis) 4. Plan and carry out an experiment 5. Gather data based on measurement and observations 6. Evaluate the data 7. Use the data to support reasonable explanations, inferences, and conclusions.  [SC.912.N.1.Su.1:](http://www.cpalms.org/Public/PreviewAccessPoint/Preview/8167) Recognize a problem based on a specific body of knowledge, including life science, earth and space science, or physical science, and do the following: 1. Recognize a scientific question 2. Use reliable information and identify what is already known 3. Create possible explanation 4. Carry out a planned experiment 5. Record observations 6. Summarize results 7. Reach a reasonable conclusion.  [SC.912.N.1.Pa.1:](http://www.cpalms.org/Public/PreviewAccessPoint/Preview/8168) Recognize a problem related to a specific body of knowledge, including life science, earth and space science, or physical science, and do the following: 1. Observe objects and activities 2. Follow planned procedures 3. Recognize a solution. |
| **Vocabulary** | hypothesis, experiment, data, analysis, drawing conclusions, observation, inference, variables, constant variables, independent variables, dependent variables, fair test |
| **Key Concepts** | * What is Science? * What is a Scientist? * What are the Branches of Science * What is the difference between a hypothesis, a theory and a law? * What is the Scientific Method? |
| **References** | * Tutorial on defining science: [Click Here](http://www.cpalms.org/Public/PreviewResourceStudentTutorial/Preview/110926) * Theory vs. Hypothesis vs Law explained, PBS video 7 minutes: [Click Here](https://www.youtube.com/watch?v=lqk3TKuGNBA) * The Steps of the Scientific Method for Kids – Science for Children: [Click Here](https://www.youtube.com/watch?v=qAJ8IF4HI20) * Article on who scientists are and what they do: [Click Here](http://weirdsciencekids.com/WhatDoScientistsDo.html) * We are all Scientist, video 2 minutes, quick interviews of what a scientist is: [Click Here](https://www.youtube.com/watch?v=sHjjOd5FmmE) * What is a Scientist? Video 5 minutes, students get to learn about what a scientist does: [Click Here](https://www.youtube.com/watch?v=GfZJlFQNdIU) * Citizen Science, video on how everyone can be a citizen scientist: [Click Here](http://www.cpalms.org/Public/PreviewResourceUrl/Preview/18558) * Split Brain Experiments-practice the scientific method: [Click Here](http://www.cpalms.org/Public/PreviewResourceUrl/Preview/53212) * Can You Read My Mind? Experiment relying on logic: [Click Here](http://www.cpalms.org/Public/PreviewStandard/Preview/1861) * Current Event Assignment; looking for current events in science today, lesson plan gives articles: [Click Here](http://www.cpalms.org/Public/PreviewResourceLesson/Preview/28723) * Cool Case Files, Scientific Theories online tutorial: [Click Here](http://www.cpalms.org/Public/PreviewResourceStudentTutorial/Preview/119155)   http://www.cpalms.org/Public/PreviewStandard/Preview/1870 3 interactive examples of “experiments”   * Integrated Circuit: This interactive game will help you learn about integrated circuits, which can be found in almost every modern electrical device such as computers, cars, television sets, CD players, cell phones, etc... The challenge in this game is to make it to the end. * Pavlov's Dog Game: In this game, you will find out if you can train a dog to drool on command - an example of a conditioned reflex. Ivan Pavlov's description of how animals (and humans) can be trained to respond in a certain way to a particular stimulus, paved the way for a new and objective method of studying animal and human behavior. * The Tuberculosis Experiments and Discoveries Game: This game explores the 1905 Nobel prize in Physiology or Medicine, which was awarded for investigations and discoveries concerning the disease tuberculosis or "TB." The game is a sort of old fashioned laboratory simulation and allows students to discover and experience some of the classic methods used to detect whether a specific bacterium causes a disease. |