

Online Vaccination Science Resources for COVID-19 Education



Student Instructions

Welcome

You are invited to make use of our “Online Vaccine Science Resources for COVID-19 Education” educational materials. Each module is assembled as a toolkit with 3-5 instructional videos, assessments, discussion questions, assignments, synthesis activities, and guides for dual infographic and virtual poster (science and general public audiences) activities. Our work focuses on the basic science for COVID-19 education and our modules and associated learning outcomes are in a table on the next page of these instructions. We hope that these materials will help you understand how science works, the SARS-CoV-2 virus, how vaccines are generated, and how we should communicate about the science of the virus and vaccines. Our ultimate goal is to reduce vaccine hesitancy and to help our communities ensure vaccine uptake in the face of the ongoing SARS-CoV-2 infection and subsequent evolution.

The modules can be found on our website <https://www.vaccine-science-education.org/>. Your professor has likely provided you with access to the modules via your learning management system. Each of the modules is centered on a YouTube video recording. Depending on your instructor, you may be using them in class or online, synchronously or asynchronously. For each of the recordings, there may be pre-assignments and post-assignments, and other activities such as discussions and assessments.

For each module follow the instructions of your instructor. Each one is slightly different and may require different activities.

We recommend that you find a quiet space in which to watch the videos and use a computer or tablet with stable internet. A transcript for each video is available and YouTube has the capacity to provide a translation in several languages as the videos progress. The videos can be viewed in succession or as standalone videos. Slides are also provided so you can print them out, download them and use them as needed.

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Module 1

Topic	Module	Learning objectives - Having completed the module students will be able to:
Framing COVID-19 Vaccination through an Understanding of Science	1.1	<ol style="list-style-type: none">1. Describe the scientific process from observations and inferences to the development and defense of theories.2. Perceive the additional synergistic aspects of the process including the roles of feedback, peer review, replication, and communication; and the role of the process in solving societal problems, informing policy, developing technology, and building knowledge.
	1.2	<ol style="list-style-type: none">1. Understand the language of science and be able to use common scientific terms and vocabulary in varied contexts.2. Recognize the value of effective scientific communication and how miscommunication can lead to misconceptions and disengagement with the scientific process.
	1.3	<ol style="list-style-type: none">1. Describe, using examples, the power, and limits of science2. Recognize the value of science to society while acknowledging the limitations of the process as a human endeavor.
	1.4	<ol style="list-style-type: none">1. Justify the tentative nature of science.2. Defend the nature of science as an ever-changing, ongoing, dynamic process, subject to the availability of supporting or refuting evidence.

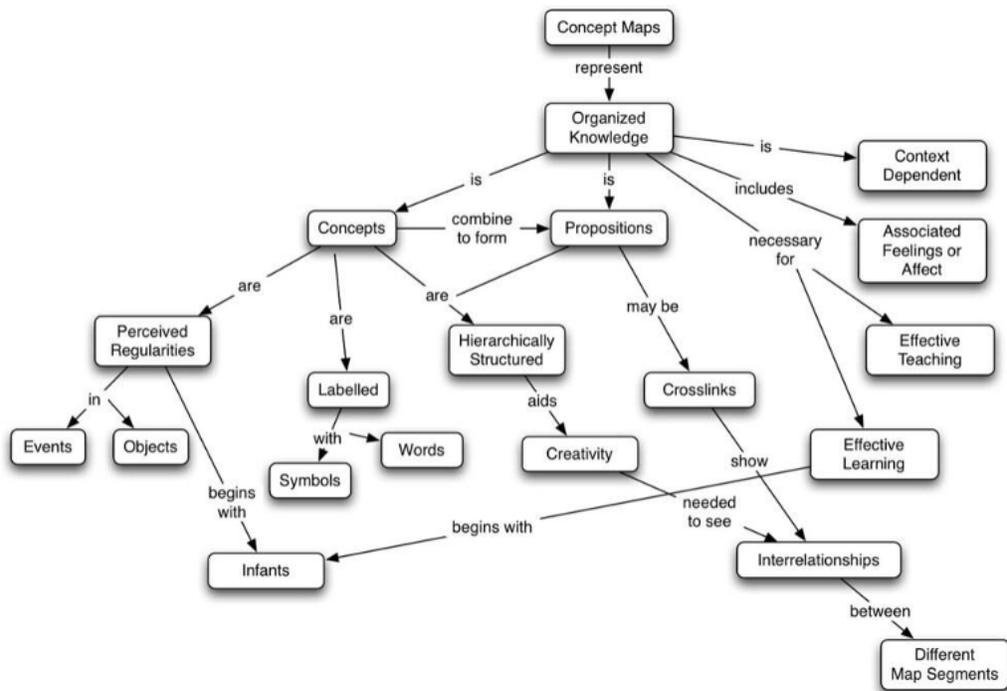
This module is focused on helping you understand science by understanding the scientific process, the language of science, the power and limits of science, and the tentative nature of science. The module is tailored towards an understanding of science using the framework of the COVID-19 pandemic and examples related to the SARS-CoV-2 virus. There are four parts of the module and several learning outcomes associated with the parts. Your instructor may ask you to engage with one or all of the modules depending on your course.

Part 1: The Process of Science

You will watch the slides and complete the assignments as instructed. There are four assignments.

- The first one is a fill-in-the-blank assignment where you will add the words to the table according to the location in the princess diagram. Your instructor may ask you to do this before you review the slides and video associated with [Module 1 Part 1 - Process of Science A](#)
- The second assignment is composed of three multiple-choice questions that your instructor may ask you to answer before or after viewing the slides and video associated with [Module 1 Part 1 - Process of Science B](#)
- The third assignment is a series of open-ended questions which will push you to describe your understanding of the various terms and concepts more deeply. Your instructor may again choose to administer these before or after you've viewed the slides and video associated with [Module 1 Part 1 - Process of Science C](#)

- The fourth assignment asks you to draw a visual narrative/concept map having completed viewing all the slides/videos including [Module 1 Part 1 - Process of Science D](#). This assignment is best completed after you've viewed all the parts. Here are some instructions that will help you complete the task. Your instructor will likely ask you to upload your map to the learning management system or they might ask you to collaborate on this in class.
 - Start by thinking about the concept you wish to map (i.e. how science is communicated, the process of peer review, the difference between theories and laws). Make a list of terms or phrases that relate to this concept. You can go through the slide deck and highlight any important terms or phrases that relate to the overarching concept. You may also consult the glossary that accompanies these materials.
 - Write the terms on Post-it notes, or index cards. Either alone or with a study partner, begin to organize the terms on a large sheet of paper or on a chalkboard according to the relationships between the terms. Often it is best to start with the most inclusive terms or broadest concepts at the top of the page and work down, or at the center of the page and work out from the center.
 - Once you have the terms organized, draw lines (use a pencil or chalk to do this initially) that help you to logically connect the individual terms or phrases, and write a phrase next to the line that explains the connection. You can also use different colored lines to show distinct "concept routes" within the whole map. Try and make as many connections as you can. If you are working with others this will generate much discussion about how the map should be organized and will reveal where you are not making important connections or where you are making inaccurate connections. The more minds the merrier!
 - Once you have completed your map, remove the Post-it notes or index cards, and write the terms/phrases on the sheet of paper. This will give you a permanent record of your concept map. Hand in a copy of your concept map to your instructor. Here's an example.



"Concept Mapping" by Laura B. Dahl is licensed under CC BY-NC 2.0

Part 2: The Language of Science

You will watch the slides and complete the assignments as instructed. There are four assignments.

- The first assignment is to use the Word Map template that will be provided to you either on paper or online via the learning management system for the terms provided. Your instructor may ask you to do this before you review the slides and video associated with [Module 1 Part 2 - Language of Science A](#)
- The second assignment is to use the table provided and the prefix/suffix list provided to enter the meaning of each and use it in a word. These may all be in the slides or some may not be. You will need to watch them to find out. Your instructor may ask you to answer before or after viewing the slides and video associated with [Module 1 Part 2 - Language of Science B](#)
- The third assignment is composed of five true-false questions that your instructor may ask you to answer before or after viewing the slides and video associated with [Module 1 Part 2 - Language of Science C](#)
- The fourth assignment is a series of open-ended questions which will push you to describe your understanding of the various terms and concepts more deeply. Your instructor may again choose to administer these before or after you've viewed the slides and video associated with Module 1 Part 2 A-C.

Part 3: The Power and Limits of Science

You will watch the slides and complete the assignments as instructed. There is one assignment.

- The assignment is a series of open-ended questions/prompts which will push you to describe your understanding of the various terms and concepts more deeply. Your instructor may ask you to complete these in class or to upload your answers to the learning management system. If asked to upload them, be as detailed as you can be and write at least 50-100 words to explain your answers. Use examples from the slides to support your viewpoint. Your instructor may again choose to administer these before or after you've viewed the slides and video associated with [Module 1 Part 3.](#)

Part 4: The Tentative Nature of Science

You will watch the slides and complete the assignments as instructed. There are three assignments.

- The first assignment is to respond to two questions related to two statements regarding the work of John Snow and how he discovered the cause of cholera outbreaks in London. Your instructor may ask you to do this after you have reviewed the slides and video associated with [Module 1 Part 4 - Tentative Nature of Science A](#)
- The second assignment relates to publications and peer review. There are two multiple-choice questions. You'll choose your answers. Your instructor may ask you these questions before or after viewing the slides and video associated with [Module 1 Part 4 - Tentative Nature of Science B](#)
- The third assignment poses a scenario and asks you to respond to the prompt. Use what you have learned from the modules so far to generate your response. Your instructor may ask you to do so in class, or in writing and may ask you to upload your answer to the learning management

system. Your instructor may also ask you to answer before or after viewing the slides and video associated with [Module 1 Part 4 - Tentative Nature of Science C](#)