

Online Vaccination Science Resources for COVID-19 Education

Faculty Instructions



Welcome

The Online Vaccine Science Resources for COVID-19 Education project provides educational materials for educators and community groups in the form of four modules and general public FAQ videos. 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 faculty promote a greater understanding of how science works, the SARS-CoV-2 virus, how vaccines are generated, and how we best communicate science, among our students. 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/>.

Each of the modules is centered on a YouTube video recording. We designed these modules to work as standalone or to build on one another. They were also designed for maximum flexibility allowing for their use in real-time or asynchronously, in class or online. For each of the recordings, there may be pre-assignments and post-assignments, and other activities such as discussions and assessments that you can use or modify as necessary. We recommend that you watch each of the videos before assigning them in class so as to identify areas of difficulty and possible concerns/questions your students may have.

Module 1: Several assignments are provided in this module that could be used as a pre-assessment such as fill-in-the-blanks, concept mapping, or word maps. Each part has suggested homework such as multiple choice questions, open-ended questions, and visual assessments such as concept maps. Pre-assessments could be administered in the first 5 minutes of class time on paper and collected or uploaded to the learning management system. Post assignments would be administered after the

students have watched and reviewed the videos. The videos have been designed in blocks allowing for time to complete the assessments as the videos are watched. If administered in class, students could be encouraged to think-pair-share on several of the questions or to collaborate on concept mapping and fill-in-the-blank exercises.

Module 2: This module provides two assignments, one is a Jigsaw activity that involves the students delving deeper into reports on the virus and mutations associated with clinical significance. The media reports have been selected along with suggested and additional readings. In addition, suggestions for how the class should be designed and structured are provided along with ideas for communication strategies the student could employ to disseminate their findings. This activity could work in class or online. The other is designed for use during the laboratory portion of a course and takes the students on a journey to investigate mutations in the SARS-CoV-2 genome. This would require access to computers and a stable internet connection and could be performed in a computer lab during class time or at home via Zoom. A detailed set of instructions are provided for both activities on the project website.

Module 3: This module has three parts with suggested activities. The first activity is best conducted before watching the videos or using other module materials. Responses may be written or oral, individual or group, spontaneous or pre-assigned. It may be useful to construct a concept map, mind map, or word cloud to show the frequency, similarity, and/or classification of the responses. Students may be asked to give personal responses that reflect their experiences and beliefs, or they may represent the beliefs of others. You may invite participants to follow up with clarifying statements and questions. For the second and third parts, the activities are best conducted after watching the videos. Responses may be written or oral, individual or group, spontaneous or pre-assigned and you again may invite students to follow up with clarifying statements and questions. More detailed instructions are found accompanying the materials on the website.

Module 4: You will ask students to watch the videos and to complete an assignment which is to ask your students to help refute a piece of vaccine misinformation. This could be done either as a project or as a written assignment as homework. Assignments could be uploaded to the learning management system. Students could be asked to present their findings to the class or their peers. You could ask them to role-play. The assessments provided are in the form of questions that could be administered on paper or using the learning management system.

Recommendations

Your students will need to have access to a quiet space in which to watch the videos and need access to a computer or tablet with stable internet. We have provided a transcript for each video and YouTube has the capacity to provide a translation in several languages as the videos are progressing. The videos can

be viewed in succession or as standalone videos. You may choose to use one module or all the modules depending on your course or course structure. Slides are also provided to the students and instructors that you can edit as needed or upload to your learning management system. All materials are freely available, we just ask that you credit us as the original creators.

We also encourage you to contact us with suggestions to improve or additions you think we could make. We anticipate updating the modules at least annually so they continue to have value to our community.

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Topic	Module	Learning objective - 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 science 2. 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.
COVID-19 Science	2	<ol style="list-style-type: none"> 1. Identify the virus that causes COVID-19 2. Characterize the components of SARS-CoV-2 3. Describe the process by which SARS-CoV-2 infects a human cell 4. Distinguish between different types of SARS-CoV-2 tests
Vaccine Science	3	<ol style="list-style-type: none"> 1. Describe the basic science of immunity and vaccine activity 2. Interpret emerging information on Covid-19 vaccine development and distribution 3. Discuss benefits, risks, and priorities for vaccination
COVID-19 Vaccination Communication	4	<ol style="list-style-type: none"> 1. Explain reasons for vaccine hesitancy. 2. Discuss theoretical approaches for understanding vaccine hesitancy. 3. Describe how misinformation contributes to vaccine hesitancy. 4. Identify strategies for addressing vaccine hesitancy.