

Stage 1: Desired Outcomes

Priority Standards

What Priority Common Core and Content Standards frame the learning objectives of this unit?

NGSS

HS-LS1-a. Critically read scientific literature and produce scientific writing and/or oral presentations that communicate how the structure and function of systems of specialized cells within organisms help perform the essential functions of life.

CCSS Mathematics

S.ID Summarize, represent, and interpret data on two categorical and quantitative variables. (HS-LS1-I)

S.IC Make inferences and justify conclusions from sample surveys, experiments, and observational studies.

CCSS Writing in Science

1. Write arguments focused on *discipline-specific content*.

a. Introduce precise claim(s), distinguish the claim(s) from alternate or opposing claims, and create an organization that establishes clear relationships among the claim(s), counterclaims, reasons, and evidence.

b. Develop claim(s) and counterclaims fairly, supplying data and evidence for each while pointing out the strengths and limitations of both claim(s) and counterclaims in a discipline-appropriate form and in a manner that anticipates the audience's knowledge level and concerns.

c. Use words, phrases, and clauses to link the major sections of the text, create cohesion, and clarify the relationships between claim(s) and reasons, between reasons and evidence, and between claim(s) and counterclaims.

d. Establish and maintain a formal style and objective tone while attending to the norms and conventions of the discipline in which they are writing.

e. Provide a concluding statement or section that follows from or supports the argument presented.

Supporting Standards

What supporting Common Core and Content Standards are important to the objectives of this unit?

CCSS Reading in Science:

4. Determine the meaning of symbols, key terms, and other domain-specific words and phrases as they are used in a specific scientific or technical context relevant to *grades 9–10 texts and topics*.

7. Translate quantitative or technical information expressed in words in a text into visual form (e.g., a table or chart) and translate information expressed visually or mathematically (e.g., in an equation) into words

CCSS Writing in Science:

5. Develop and strengthen writing as needed by planning, revising, editing, rewriting, or trying a new approach, focusing on addressing what is most significant for a specific purpose and audience.

10. Write routinely over extended time frames (time for reflection and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences.

21st Century Skills

What 21st Century Skills will students be expected to demonstrate upon completion of this unit?

Learning & Innovation (4 C's)

Information, Media & Technology

Life & Career

21st Century Themes

<p style="text-align: center;">Enduring Understandings</p> <p><i>Big ideas at heart of the discipline; specific understandings desired about them.</i></p> <ol style="list-style-type: none"> 1. Stimulants are drugs that affect the heart and brain function of all organisms. 2. Heart rate increases to move molecules through the body faster so that cells can produce ATP molecules at a faster rate. 3. Critically read scientific literature and produce scientific writing and/or oral presentations 	<p style="text-align: center;">Essential Questions</p> <p><i>What provocative questions will foster inquiry, understanding, and transfer of learning?</i></p> <ol style="list-style-type: none"> 1. Should coffee, nicotine and alcohol be an illegal drug?
<p style="text-align: center;">Key Knowledge</p> <p><i>As a result of this unit, students will know...</i></p> <ol style="list-style-type: none"> 1. The heart moves the materials needed for cellular functions and processes 2. External stimuli can affect the function of the heart 	<p style="text-align: center;">Key Skills</p> <p><i>As a result of this unit, students will be able to...</i></p> <ol style="list-style-type: none"> 1. Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks, attending to special cases or exceptions defined in the text. 2. Critically read scientific literature and produce scientific writing and/or oral presentations 3. Write informative/explanatory text detailing scientific procedures/ experiments. 4. Produce clear and coherent writing in which the development, organization, and style are appropriate to task, purpose, and audience. 5. Present claims and findings in an oral presentation 6. Summarize, represent, and interpret data on two categorical and quantitative variables. 7. Make inferences and justify conclusions from sample surveys, experiments, and observational studies.

Stage 2: Assessment	
<p>Performance Task: Written argument to the government supporting or opposing the passage of a bill that will outlaw the production and selling of coffee, alcohol and nicotine in the United States.</p>	<p>Other Evidence: <i>(project benchmarks quizzes, unit tests, multiple choice tests, etc)</i></p>
<p>See attached</p>	<p style="text-align: center;">•</p>

Name of Project:	Legal or illegal?	Duration:	3 weeks	
Subject/Course:	High School Biology	Teacher(s):	Grade Level: 9-12	
Other Subject Areas to Be Included:	ELA Math			
Project Idea Summary of the issue, challenge, investigation, scenario, or problem:	Students will learn how to measure the pulse of another person. They will also test the effects of stimulants on the heart rate of Daphnia. Students will then design their own experiment to determine how other stimulants affect the heart rate of Daphnia. Students will present their findings to an audience that will include			
Driving Question	Should the United States ban companies from producing and selling coffee, nicotine and alcohol?			
Content Standards to be taught and assessed:	<p>What Key Knowledge will student's master? What will they know? Enduring Understandings?</p> <p><i>Key Knowledge</i> The heart moves the materials needed for cellular functions and processes External stimuli can affect the function of the heart</p> <p><i>Enduring Understandings</i></p> <ol style="list-style-type: none"> 1. Stimulants are drugs that affect the heart and brain function of all organisms. 2. Heart rate increases to move molecules through the body faster so that cells can produce ATP molecules at a faster rate. <p>What Key Skills will students be asked to develop and/or apply? Critically read scientific literature and produce scientific writing and/or oral presentations</p>			
21st Century Skills to be taught and assessed: <i>How will they be taught and assessed?</i>	Collaboration See bie.org collaboration rubric	<input checked="" type="checkbox"/>	Creativity/Innovation	<input type="checkbox"/>
	Communication (Oral Presentation) See bie presentation rubric	<input checked="" type="checkbox"/>	Critical Thinking/Problem Solving	<input type="checkbox"/>
	Life & Career:	<input type="checkbox"/>	Other:	<input type="checkbox"/>

Major Products & Performances	Group:	Lab experiment Rough draft peer review	Presentation Audience (<i>entire project</i>) Presentation Audience: Class School	
	Individual:	Final argument letter Quiz Unit Test	<input checked="" type="checkbox"/> Class	<input type="checkbox"/> School
			<input checked="" type="checkbox"/> Community	<input checked="" type="checkbox"/> Experts
			<input type="checkbox"/> Web	<input type="checkbox"/> Other:

LEARNING PLAN		Does it incorporate Authenticity, Choice, Inquiry & students playing the Active Role?	
PBL Guiding Principles:			
<input checked="" type="checkbox"/> Authentic , compelling scenario that matters to student, field, or community	<input checked="" type="checkbox"/> Allows for student choice	<input checked="" type="checkbox"/> Point of view/argument that faces opposition	
<input checked="" type="checkbox"/> Considers multiple roles/perspectives	<input checked="" type="checkbox"/> Engaging, high stakes, with a sense of urgency	<input checked="" type="checkbox"/> Transforms or creates content, and opens new questions or cycles of inquiry	
<input checked="" type="checkbox"/> Leads to a product for an authentic audience			
What Performance Assessment Task(s) will be generated by this project <i>that is aligned to standards and key skills</i> :			
<input checked="" type="checkbox"/> Math Analysis (Problem Solving)	Notes: Attach Stage 2 Task Planning Document		
<input type="checkbox"/> English Textual Analysis			
<input checked="" type="checkbox"/> English Research/Argumentation			
<input checked="" type="checkbox"/> Scientific Research			
<input checked="" type="checkbox"/> Scientific Inquiry			
<input type="checkbox"/> History/Social Science Research/Inquiry			
<input type="checkbox"/> Other:			

L E A R N I N G P L A N

Entry Event to launch inquiry, engage students: <i>See part B</i>	Benchmark Order	Benchmark Category	Benchmark Description - what is the assessment?	Benchmark Skills – what will this help them to be able to do? <i>If a benchmark asks them to report on what they have researched, then they will be able to complete independent research, summarize information, synthesize information, etc.</i>	
Assessments <i>Under each type of assessment there are ideas as to some you might use. These lists are not exhaustive. You may choose to include others not listed.</i> <i>The number of benchmarks may be more or less than the number listed. Feel free to document the amount that you will use. If you need more, you may use another sheet.</i>	Formative Assessments (During Project) <i>i.e., Quizzes/Tests, Journal/Learning Log, Preliminary Plans/Outlines/Prototypes, Rough Drafts, Practice Presentations, Notes, Checklists, Concept Maps</i>	Benchmark 1:	<input checked="" type="checkbox"/> Know (mastery) <input type="checkbox"/> Do (application) <input type="checkbox"/> Reflect (metacognition)	Function and structure of the heart quiz	
		Benchmark 2 :	<input type="checkbox"/> Know (mastery) <input checked="" type="checkbox"/> Do (application) <input type="checkbox"/> Reflect (metacognition)	Guided Heart Rate lab	
		Benchmark 3:	<input type="checkbox"/> Know (mastery) <input checked="" type="checkbox"/> Do (application) <input type="checkbox"/> Reflect (metacognition)	Inquiry portion of heart rate lab	
		Benchmark 4 :	<input type="checkbox"/> Know (mastery) <input checked="" type="checkbox"/> Do (application) <input type="checkbox"/> Reflect (metacognition)	Rough draft of argument	
		Benchmark :	<input type="checkbox"/> Know (mastery) <input type="checkbox"/> Do (application) <input type="checkbox"/> Reflect (metacognition)		
	Summative Assessments (End of Project) <i>i.e., Written Product(s) with rubric, Oral Presentation with rubric, Multiple Choice/Short Answer Test, Essay Test, Other Product(s) or Performance(s) with Rubric, Self-Evaluation, Peer Evaluation</i>	Benchmark 1 :	<input type="checkbox"/> Know (mastery) <input checked="" type="checkbox"/> Do (application) <input type="checkbox"/> Reflect (metacognition)	Experimental write-up	
		Benchmark 2 :	<input type="checkbox"/> Know (mastery) <input checked="" type="checkbox"/> Do (application) <input type="checkbox"/> Reflect (metacognition)	Final Draft of argument	
		Benchmark 3:	<input checked="" type="checkbox"/> Know (mastery) <input type="checkbox"/> Do (application) <input type="checkbox"/> Reflect (metacognition)	Unit Test	

PART B:

Project Launch – Start with a Bang!

Students will watch various ads, both for and against alcohol, smoking and other stimulants. Students will then be introduced to the performance task.

Launch Guiding Principles:

- High interest, provocative, communicates a sense of urgency
- Provides overview of project without going into too much detail
- Provides models/examples of culminating products
- Provides timeline with major benchmarks
- Motivating - urges students to explore what is possible within the project
- Presents an exciting challenge that also feels attainable, students can imagine themselves accomplishing the project
- Addresses the question of “So what...?”

What venue will you use to launch this project (community meeting, multiple classes, within your class, field trip, etc.)?	Who will be involved in the launch (multiple teachers, just you)?	When will you launch this project?
Launch Agenda: In the classroom	Staff Roles:	
Action Steps/Follow Up after the launch: <ul style="list-style-type: none">• Provide details of the performance assessment• Obtain and/or order Daphnia for experimentation		

Resources Needed	On-site people, facilities:				
	Equipment:		Clock, microscope, depression slides		
	Materials:		Daphnia, diluted nicotine, alcohol, monster, coffee, etc.		
	Community resources:				
Reflection Methods	(Individual, Group, and/or Whole Class)	Journal/Learning Log	<input checked="" type="checkbox"/>	Focus Group	<input type="checkbox"/>
		Whole-Class Discussion	<input type="checkbox"/>	Fishbowl Discussion	<input type="checkbox"/>
		Survey	<input type="checkbox"/>	Other:	<input type="checkbox"/>