

## Unit Plan that Incorporates the Use of Thinking Tools

Author	
First and Last Name	Helen Schwinn
School Name	Lansing High School
School District	USD #469 Lansing
School City, State	Lansing, KS
Classroom Information	
Subject Area	
Secondary Biology	
Grade Level(s)	
Grade 9	
Unit Overview	
Unit Title	
Live Well Now to Live Longer Later	
Unit Summary	
<p>Cells are the basic structural and functional unit of life. Genes making up the DNA in all cells control the proper formation and functioning of cells. Environmental factors can have a negative effect on cells and the genes controlling cell function. Choices are made by individuals throughout their life that affect their health, with very little knowledge of their potentially negative results.</p> <p>Through this unit, student biologists will assume the role of medical researchers in discovering the negative effects of environmental factors on the proper functioning of the human body at the genetic, cellular, tissue, organ and/or system level(s). They will discover how a chosen factor relates to human body dysfunctions, disorders, disease, and potential or premature death. Students will use their knowledge to create presentations to the class explaining the negative effects to their peers. Finally, they will create a children's book summarizing the negative effects of a variety of the presented factors and relate them to choices to help educate and positively influence the choices of the younger generation.</p>	
Building the Foundation	
Habits of Learning Taxonomy	
Knowledge: Access prior knowledge; Acquire new knowledge through research	
Comprehension: Identify information related to topic, Collaborate with group members; Translate information to peers	
Application: Make choices regarding environmental factors; discover correlations between factors and functioning of the human body, demonstrate understanding through peer teaching	
Synthesis: Compose, design and create (children's book)	
Standards	
<b>KS Science Ed. Standards:</b> Standard 3: <b>LIFE SCIENCE</b> <u>Benchmark 1:</u> Understanding the structure and function of the cell <u>Benchmark 2:</u> Understanding chromosomes and genes <u>Benchmark 8:</u> Understanding the diversity of	

structure and function of humans and medical effects	
Standard 1: <b>INQUIRY OF SCIENCE</b> <u>Benchmark 1: Abilities necessary in scientific inquiry</u>	
Learning Objectives	
Students will be able to:	
<ul style="list-style-type: none"> <li>• Discuss the negative effects on the human body of a variety of common environmental influences</li> <li>• Research the negative effects of a chosen factor at the genetic, cellular, tissue, organ, and system levels within the human body. Include an interview with a medical professional as one source of information.</li> <li>• Collaborate with group members and help create a presentation for their peers explaining the effects of a common chosen factor and relate dysfunctions to human disorders, disease, and potential or premature death.</li> <li>• Work with a partner to create a children's book which describes and illustrates the negative effects of seven environmental factors and relates them to life choices in a clear, simple and concise manner</li> </ul>	
Curriculum-Framing Questions	Essential Question
	Do our decisions really make a difference?
	Unit Questions
	What types of decisions does a person make that influence their health? What environmental factors influence our health? In what ways do environmental factors influence our health? What kinds of decisions do individuals make in relation to environmental factors and their health? What specific results do our decisions have on our health?
	Content Questions
	<i>How is life sustained in organisms?</i> <i>What cell processes are necessary for humans to live?</i> <i>What controls the cell cycle?</i> <i>How do substances taken into our body affect cells and the cell cycle?</i> <i>What might disrupt the cell cycle?</i> <i>How do human diseases result from environmental factors?</i> <i>Exactly how do environmental factors influence human diseases or disorders?</i>

## Student Assessment Plan

### Assessment Summary

Through class discussion and brainstorming, the students will consider possible outside (environmental) factors that require student choice that will affect their health. All items will be listed on the board along with current ideas of specific effects those factors/substances/activities/choices will have on a person's bodily functions. The teacher uses this information to gauge readiness and interest in the topic. This information will be transferred to posters to be displayed in the room throughout the project. Students then complete Parts 1 and 2 of the Visual Ranking tool and their reasons are checked. Students will use journals to write down their research notes, design and record their interview of an expert, and answer reflective questions. The teacher provides feedback on their writing through questioning and clarifying comments throughout the project and at the end of the unit. Students will complete the Showing Evidence tool to synthesize their information and evaluate its detriments. Using their research and working collaboratively as a group, students will create a presentation to explain their findings. They will be evaluated on the Collaboration Rubric and the Oral Presentation Rubric. Following all presentations, the students will complete a knowledge-based test over the unit concepts and standards addressed throughout this unit. Students will culminate their understanding by working with a partner to create a children's book to share with younger students.

### Assessment Timeline

Before Project Work Begins	While Students Work on Projects	After Project Work Ends
<ul style="list-style-type: none"> <li>Cover units over Cell structures and functions and Cell reproduction and Control of the Cell cycle</li> <li>Pre-assess prior knowledge of what can affect one's health, what is due to environmental influences vs choices; create posters to display this knowledge</li> </ul>	<ul style="list-style-type: none"> <li>Provide journal feedback on student research on chosen factor</li> <li>Provide journal feedback on Interview of medical expert regarding their chosen factor</li> <li>Showing Evidence (Research rubric)</li> <li>Collaboration Rubric over group analysis, synthesis and evaluation of information to create an accurate and informative presentation</li> </ul>	<ul style="list-style-type: none"> <li>Oral Presentation Rubric = teacher evaluation</li> <li>Knowledge-based unit test</li> <li>Rubric for children's book</li> </ul>

### Visual Ranking Elements (Complete this section if this tool will be used in the unit)

Visual Ranking Project Name (For the *Visual Ranking* workspace)

Detrimental Choices

Project Description (For the *Visual Ranking* workspace)

*We all make choices every day that affect our health and determine whether or not we are living a "healthy" lifestyle. These choices either allow our bodies to function properly and as designed, or they tend to cause our bodies to work too hard which, over time, can have serious side-effects leading to serious illness or premature death.*

*Teens and adults especially are faced with decisions regarding the use of certain substances or participating in certain activities. You must make up your own mind throughout your life as to what is right or wrong for you and your own health.*

Prompt (For the *Visual Ranking* workspace)

Rank the list of substances and behaviors from most to least detrimental to a person's health if exposed to on a regular bases.

Sorting List (For the *Visual Ranking* workspace)

Smoking cigarettes  
Eating fast food  
Drinking alcoholic beverages  
Being sexually active  
Smoking marijuana  
Not wearing a seatbelt  
Doing illegal drugs  
Tanning/Exposure to UV rays  
Not exercising regularly  
Living in a city/exposure to pollution  
Chewing tobacco

Practice Ranking (For your future quick reference)

Teacher ID: Mrs. Schwinn	Password: biology
Practice Team ID 1: Team01	Password: Team01
Practice Team ID 2: Team02	Password: Team02

<b>Seeing Reason Elements</b> (Complete this section if this tool will be used in the unit)	
Seeing Reason Project Name (For the <i>Seeing Reason</i> workspace)	
Project Description (For the <i>Seeing Reason</i> workspace)	
Research Question (For the <i>Seeing Reason</i> workspace)	
Practice Map (For your future quick reference)	
Practice Team ID:	Password:
<b>Showing Evidence Elements</b> (Complete this section if this tool will be used in the unit)	
Showing Evidence Project Name (For the <i>Showing Evidence</i> workspace)	
Is it really that harmful to me?	
Project Description (For the <i>Showing Evidence</i> workspace)	
The harmful effects of the choices people make related to substances, behaviors, environmental influences, etc., are unclear regarding their impact on the "healthy", normal, efficient functioning of the human body. This project will help students to form an opinion related to their researched topic regarding it's overall detriment effects on one's health.	
Prompt (For the <i>Showing Evidence</i> workspace)	
Are the effects of _____ (assigned factor for research) really that detrimental to one's health?	
Practice Case (For your future quick reference)	
Practice Team ID:	Password:
Reviewing Team ID:	Password:
Claims	
No claims are pre-populated as each student group will form their own claim based on their own research.	
Evidence	
No evidence is pre-populated as each student group will individualize their own most-convincing evidence based on research to support their claim.	

Unit Details
Approximate Time Needed
3-4 Weeks, 5 class periods a week, 50 minute classes
Prerequisite Skills
Basic computer function skills, internet searching, research skills, knowledge of cells, cell reproduction, and basic human body.
Procedures
<p><b>BEFORE:</b></p> <ul style="list-style-type: none"> <li>• Complete units on Cell Structures and their functions, Cell Reproduction, Control of the Cell Cycle, Pre-assess prior knowledge of types of environmental factors affecting health, recognizing negative choices and possible specific effects on human body functioning. Students may contribute information learned through 9<sup>th</sup> grade health as well.</li> <li>• As a result of brainstorming, students will create posters displaying ideas and information over suggested factors. Posters will be displayed around the room throughout the unit as a reminder of the starting point.</li> <li>• Complete the Visual Ranking tool “Detrimental Choices” to include each student’s own reasonings for their choices. In small groups the students will share and discuss their choices.</li> <li>• Complete the second Visual Ranking tool “Personal Detrimental Choices”. Through class comparison of top choices among individuals, the teacher will establish research groups.</li> </ul> <p><b>DURING:</b></p> <ul style="list-style-type: none"> <li>• Students will first work individually to research and gather information related to their choice.</li> <li>• They record their information, details and illustrations in a journal. They will include a list of the sites and sources used in proper format.</li> <li>• They will interview a professional or medical expert in an area related to their topic. They may use an on-line expert. They will create the interview questions and record them in their journal. Following feedback from the teacher, students will conduct their interview and record the responses in their journal.</li> <li>• Students will then be grouped by the teacher based on similar research topics. Students will collaborate in order to synthesize and evaluate all information in order to make decisions on what should be included in their presentation.</li> <li>• In their groups, students will decide and create a presentation. Power point presentations will be encouraged. They may choose their presentation format, but 2 different visual aids will be required. Each group also must create a handout that summarizes their important information to include 5 short-answer questions on their topic. Audience students should be able to get the answers to these questions while listening and watching the presentation. Each student will be assessed by the teacher on their group participation and input, as well as the effectiveness of their presentation.</li> <li>• Following all presentations, students will be divided by the teacher into groups of 2-3 such that each group represents individuals from different presentation groups (different factors/topics are represented). Students will collaborate to create a children’s book that describes and illustrates the negative results of seven (7) of the factors presented. A target grade level will be assigned.</li> </ul> <p><b>COMPLETION:</b></p> <ul style="list-style-type: none"> <li>• The teacher will provide feedback to groups and individuals through the Oral Presentations Rubric, final journal review, Collaboration rubric, and Children’s book rubric.</li> <li>• Students will complete a knowledge-based unit test</li> <li>• Students will go to an elementary classroom and share their information by reading their book to students at the targeted grade level and generate a discussion over the topics covered.</li> </ul>
Accommodations for Differentiated Instruction

<b>Resource Student:</b>	Steps to be followed on the computer will be demonstrated. Para-professionals will be available for most resource students. Classroom teacher will communicate with para. to clarify baseline expectations for resource students. Resource students will be grouped and partnered with other students who will be sensitive to their special needs.
<b>English Language Learner:</b>	Students will work in groups. Visuals throughout the project will assist students. Students can find information on websites in their primary language. Consideration will be made in scoring their presentation piece.
<b>Gifted Student:</b>	<ul style="list-style-type: none"> <li>Depending on availability of time required for the entire unit as described, the Children's book aspect could be assigned as an extension to the gifted kids. Other students, then, could be in charge of the reading and discussion aspect in the sharing of the books with the elementary students.</li> <li><b>OR...</b>Have gifted students choose a particular disease or disorder that may result from environmental factors as described in the class presentations. They should be encouraged to explore a disease that they are familiar with due to personal experience (i.e. family member or close friend). They will then use the disease or disorder as the topic of their children's book. They will then work backward (sort of) by describing the symptoms, general causes, and the effects of the disease at the system, organ, tissue and cellular level---relating these disorders</li> </ul>
<b>Materials and Resources Required For Unit</b>	
<b>Printed Materials:</b>	9 <sup>th</sup> grade Biology textbook(Glencoe: Dynamics of Life), 9 <sup>th</sup> grade Health textbook, Additional available sample textbooks in biology and human anatomy, sample children's books on human body disease and disorder
<b>Supplies:</b>	Nothing special beyond classroom supplies such as poster board, markers, colored pencils, construction paper, scissors, glue, etc. (for posters and children's book)
<b>Technology – Hardware</b>	Computers with Internet access to Intel website and printer access, LCD projector for power point presentations, Laptop for presentations
<b>Technology - Software</b>	Internet Explorer (or equivalent), Microsoft Word or Publisher, Power Point
<b>Internet Resources:</b>	<a href="http://www.intel.com/education/thinkingtools">www.intel.com/education/thinkingtools</a>
<b>Other Resources:</b>	Elementary teacher/classroom K-5, community health/medical professionals