

## Teach21 Project Based Learning Within My Skin Human Anatomy and Physiology

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**Title** Within My Skin

**Project Idea:** Students will prepare a multimedia presentation that will describe the effects of tattooing on the human body. Using a variety of methods, they will research and organize information in order to describe the tattooing process, its effects on the layers of the integument involved, and the potential health risks associated with the process.

**Entry Event:** On the day the project is introduced, the students will enter the classroom as a slide show of different tattoos flash on the screen in the front of the room. (This can be created by the teacher ahead of time using free images from the Internet.) This should loop through until all students have taken a seat. A discussion of tattoos will follow the slide show. Students will then receive an [Entry Event Document](#) detailing the requirement of the project.

Buffy is 15 years old and she would like to get a tattoo. Her parents have reservations about the safety of the process and damage to her skin caused by the procedure. In order to be open-minded; they are willing to give Buffy an opportunity to sway their opinion. Using a scientific approach, she must research and explain the process of tattooing as well as its aesthetic and health consequences. Buffy's friends have offered to help her convince her parents. They break up into groups to research and help Buffy prepare her presentation.

Content Standards & Objectives:	Objectives Directly Taught or Learned Through Discovery	Identified Learning Target	Evidence of Success in Achieving Identified Learning Target
	SC.O.HAP.1.4 design, conduct, evaluate and revise experiments (e.g., compose a question to be investigated, design a controlled investigation that produces numeric data, evaluate the data in the context of scientific laws and principles, construct a conclusion based on findings, propose revisions to investigations based on manipulation of variables and/or analysis of error, or communicate and defend the results and conclusions).	Students will conduct experiments that allow them to determine and examine the functions and structure of the integument and keep accurate records of those experiments.	Student groups will successfully use technology and resources to create and present their project. Students will conduct experiments on the structure and functions of the integument and keep accurate records for experiments and research. Student research groups will evaluate the progress of ongoing research toward the desired outcomes using a <a href="#">Research Evaluation Report</a> .
	SC.O.HAP.2.4 relate the structure of the integumentary system to its function as a/an: <ul style="list-style-type: none"> <li>• sensory organ</li> <li>• environmental barrier</li> <li>• temperature regulator.</li> </ul>	Vocabulary: Epidermis Dermis Adipose tissue Dermal tissue Keratinization Melanocytes Sensory receptors Identify the layers and	Integumentary System Handout – students will successfully label and identify components of the integumentary system.  Students will successfully complete the following activities: What?s Covering You? and Why? (written discussion) <a href="http://mypages.iit.edu/~smile/bi8815.html">http://mypages.iit.edu/~smile/bi8815.html</a>  Skin Function and Structure e-source activity <a href="http://resources.schoolscience.co.uk/ABPI/new/resources/skin/skin2.asp">http://resources.schoolscience.co.uk/ABPI/new/resources/skin/skin2.asp</a>  <a href="#">Skin Assessment Lab</a> Laboratory report  Students will successfully complete the

	<p>structural components and accessory organs of the skin. Relate the functions of each of the components to the overall structure and function of the integument.</p> <p>Devise and construct an accurate model of human skin.</p>	<p><a href="#">Skin Model Lab</a> (model and <a href="#">Skin Model Rubric</a>)</p>
<p>SC.O.HAP.2.23 assess the role of components of the immune system in defending the body.</p>	<p>Vocabulary: spleen lymphatic vessels lymph nodes lymph tissue bone marrow thymus gland</p> <p>Identify functions and components of the immune system and determine its interactions with the integumentary system.</p>	<p>Students will successfully complete the SAS activity. How does my body fight off invaders? –SAS in school audio activity 1281 report. <a href="http://www.sascurriculumpathways.com/">http://www.sascurriculumpathways.com/</a></p> <p>Handout on the Immune system- Students will successfully complete a handout on the components of the immune system and the types of immune response.</p> <p>Students will successfully the findings in the group presentation. <a href="#">Presentation Rubric</a></p>

21st Century Skills	Learning Skills & Technology Tools	Teaching Strategies Culminating Activity	Evidence of Success
<p><b>Information and Communication Skills:</b></p>	<p>21C.O.9-12.1.LS3 - Student creates information using advanced skills of analysis, synthesis and evaluation and shares this information through a variety of oral, written and multimedia communications that target academic, professional and technical audiences and purposes.</p> <p>21C.O.9-12.1.TT1 - Student makes informed choices among available advanced technology systems, resources and services (e.g., global positioning software, graphing calculators, personal digital assistants, web casting, online collaboration tools) for</p>	<p>The teacher facilitates as student groups create a multimedia presentation for parents providing information on the tattooing procedure its short and long term effects on the integument and any possible health risks to the body.</p> <p>The teacher will provide the equipment and instruction students will need in order to employ the use of a variety of technology sources that may include photo story, PowerPoint, flip video.</p>	<p>Student groups will successfully use technology and resources to create and present their project. Students will be assessed using <a href="#">PowerPoint Peer Evaluation</a>, <a href="#">PowerPoint Self-Evaluation</a>, <a href="#">PowerPoint Presentation Planning Guide</a>, <a href="#">Project Debrief Chart</a> and a <a href="#">Presentation Rubric</a></p> <p>Students will successfully produce a multimedia presentation using student created slides, embedded photos, audio and video. Assessment will be done with a <a href="#">Presentation Rubric</a>.</p>

completing curriculum assignments and projects and for managing and communicating personal/professional information.

**Thinking and Reasoning Skills:**

21C.O.9-12.2.LS1 - Student engages in a critical thinking process that supports synthesis and conducts evaluation using complex criteria.

The teacher will facilitate as students complete experiments and research investigating the integumentary and immune system and interactions of the two systems.

[Skin Assessment Lab](#) laboratory reports

Student produced multimedia presentation and models.  
[Presentation Rubric](#)

21C.O.9-12.2.TT2 - Student collaborates with peers, experts and others to contribute to a content-related knowledge base by using technology to compile, synthesize, produce, and disseminate information, models, and other creative works.

The teacher will provide materials and resources required by students to collaboratively design and to produce a realistic reproduction of the integument and its associated structures.

Students will produce a group model of the skin. [Skin Model Lab](#)  
Students will be assessed with a [Skin Model Rubric](#).

Group project research and presentation development

**Personal and Workplace Skills:**

21C.O.9-12.3.LS5 - Student exhibits positive leadership through interpersonal and problem-solving skills that contribute to achieving the goal. He/she helps others stay focused, distributes tasks and responsibilities effectively, and monitors group progress toward the goal without undermining the efforts of others.

The teacher will introduce the PBL and encourage the students to work cooperatively in order to meet group and individual deadlines.

Students will cooperatively develop a contract and follow its policies.  
[Sample Group Contract](#).

The teacher will facilitate as students create a know and need to know list.

Group [Know and Need to Know Chart](#)

The teacher will facilitate as students create task lists of assignments for each individual and the group.

Use of project task lists and calendars to ensure completion of assigned tasks and duties in a timely manner. [Task Management Chart](#)

The teacher will provide the students with self and peer evaluations to complete.

Use of self and peer evaluations.  
[PowerPoint Peer Evaluation](#),  
[PowerPoint Self Evaluation](#)

Completion of group and individual deadlines.

[Presentation Rubric](#)

**Performance Know: Objectives:**

Types of tissues that are components of the integumentary system  
The structure of the integument  
The function of the integument as an organ  
The function of the accessory organs of the integument  
The role of the integument within the immune system  
The basic functions and components of the immune system  
The basic process of tattooing  
How to create multimedia presentations using PowerPoint or photo story

**Do:**

- Use a variety of resources to create a multimedia presentation for peer review
- Perform basic laboratory procedures
- Collect data and make observations and interpretations from class experiments and activities
- Identify structures and functions of the integument on class handouts
- Be able to describe the role of the integument in immune function
- Identify components of the immune system and their functions
- Access the internet to perform online activities
- Employ basic research techniques
- Write appropriate and relevant interview questions
- Conduct interviews
- Describe the process of tattooing

**Driving Question:** How does tattooing affect the layers of the integument and the immune system?

**Assessment Plan:**

<b>Major Group Products</b>	Group contract( <a href="#">Sample Group Contract</a> ) <a href="#">Task Management Chart</a> <a href="#">Know and Need to Know Chart</a> <a href="#">Skin Model Lab</a> Group multimedia presentations
<b>Major Individual Projects</b>	What?s Covering You? and Why? Lab Report Skin Function and Structure e-source activity Quiz from SAS website, <i>How does my body fight off invaders?</i> Integument handouts <a href="#">Skin Assessment Lab</a> Report Immune System Handouts

**Assessment and Reflection:**

<b>Rubric(s) I Will Use:</b>	Collaboration		Written Communication	
	Critical Thinking & Problem Solving		Content Knowledge	
	Oral Communication <a href="#">Presentation Rubric</a>	X	Other <a href="#">Skin Model Rubric</a> <a href="#">Presentation Rubric</a>	X
<b>Other Classroom Assessments For Learning:</b>	Quizzes/Tests		Lab Reports <a href="#">Skin Assessment Lab</a>	X
	Self-Evaluation <a href="#">PowerPoint Self-Evaluation</a>	X	Notes	
	Peer Evaluation <a href="#">PowerPoint Peer Evaluation</a>	X	Checklists/Observations	X
	Online Tests and Exams		Concept Maps	
<b>Reflections:</b>	Survey <a href="#">Research Evaluation Report</a> <a href="#">Project Debrief Chart</a>	X	Focus Group <a href="#">Sample Group Contact</a>	X
	Discussion		<a href="#">Task Management Chart</a>	X
	Journal Writing/Learning Log <a href="#">Daily Learning Log</a>	X	Other <a href="#">Know and Need to Know Chart</a> <a href="#">PowerPoint Presentation Planning Guide</a>	

**Map The Product:**

Students will collaboratively work to determine how tattoos are produced, their effects on the integumentary system and on the body's immune system. Students will perform laboratory experiments to analyze how the components of the integument create a barrier to infection.

**Product:** Multimedia presentation created by student groups that will describe the affects of tattooing on the human body. The presentation will describe the tattooing process, its affects on the layers of the integument and the potential health risks associated with the process. The presentation will be evaluated using the [Presentation Rubric](#).

Knowledge and Skills Needed	Already Have Learned	Taught Before the Project	Taught During the Project
1. Types of tissues	X		
2. Locations and functions of the tissue	X		

3. Access to SAS Curriculum Pathways	X		
4. Structure of the Integument			X
5. Functions of the Integument			X
6. Functions of the immune system			X
7. Components of the Immune system			X
8. Interactions of the immune system and the Integument			X
9. Utilize multimedia presentation software	X		X
10. Basic research techniques	X		X

**Resources: School-based Individuals:**

Library-media/technology specialist,  
Staff Members with Tattoos  
School Nurse

**Technology:**

Presentation software  
Multimedia software  
Word processing software  
Computer with Internet access  
Flip cameras and digital cameras

**Community:**

Parents  
Tattoo artists  
Health Care professionals

**Materials:**

Integumentary System Handout  
I am Joe's Skin Reading Handout  
What's Covering You and Why? Water, pepper, gloves, toothpicks, microscopes, overhead projector, skin slide, paper cups, model of the skin, transparency of the skin, crayons  
[Skin Models Lab](#) – gelatin, food coloring, grapes, string, yarn, pipe cleaners, moon sand, and pint size freezer, boxes, other student determined materials  
[Skin Assessment Lab](#) – microscopes, slides, cotton balls, watch glasses, coins, stop watches, magnifying glasses, rubbing alcohol, water, cup, dropper, dish liquid  
Immune system Handout

**Websites:**

What's Covering You? and Why? <http://mypages.iit.edu/~smile/bi8815.html>  
Skin Function and Structure e-source activity <http://resources.schoolscience.co.uk/ABPI/new/resources/skin/skin2.asp>  
How does my body fight off invaders? –SAS in school audio activity 1281 <http://www.sascurriculumpathways.com/>

**Manage the Process:**

This project will take 3-4 weeks to complete depending on the type of scheduling used by individual schools. The research portion of this activity is usually done intermittently with the classroom activities. Teachers may complete activities for the integumentary system during the week and plan for the computer lab on Mondays or Fridays. After completing this project, the teacher may administer a quiz or test on the content matter.

The teacher should do observations with the groups during research, computer and classroom activities in order to insure all groups are on task and understanding the content. The various types of activities allow for students of differing ability levels to achieve success. Adjustments may be made to individual assignments as needed.

**Step 1:** Before assigning the project to the students schedule time in the computer lab and instruction with the library- media specialist. Check that technology resources are available such as flip video or digital cameras. Gather slides and materials for the labs and activities listed below.

**Step 2:** On the day the project is introduced, the entry event will be a slide show with a variety of tattoos. The teacher can create these using free images from the internet. This will loop through until all students have taken a seat. A discussion on tattoos will follow the slide show. Student should then receive an [Entry Event Document](#) detailing the requirements of the project.

**Step 3:** Students are placed into groups of 3 to 4 based on class size. The groups can be selected by the teacher, or selected by random draw. A class calendar containing due dates and class assignments is

provided to each group for task management and planning purposes. Try to schedule one day a week for the groups to work together in the computer lab. This way they can receive instruction from the librarian/technology specialist, and do research or work on the group presentation. Additional work should be done outside of class and this is up to each group to plan and implement.

**Step 4:** Students should then begin working on a group contract ([Sample Group Contract](#) provided) for the project. Each group will work collaboratively to complete the [Know and Need to Know Chart](#). The teacher should meet with each group to discuss details of the contract and [Know and Need to Know Chart](#). They will then have a short time to make any revisions and final versions will be due at the beginning of the next class. Each group will be given a binder in which to keep copies of contracts and documents created during the duration of the project.

**Step 5:** The teacher should then assign the Skin Function and Structure e-source activity. <http://resources.schoolscience.co.uk/ABPI/new/resources/skin/skin2.asp> This activity introduces the structures and functions of the integument. After completing the internet activity, students should be given reinforcement handouts on the structure of the skin and its associated organs. These are available with most anatomy teacher resource materials.

**Step 6:** After this activity, plan a day in the lab for group work and research. At the end of each computer lab day, the students should complete a [Daily Learning Log](#) and review their [Know and Need to Know Chart](#). These are placed in the group project binder as a record of the individual work and group work completed that day. Days in the computer lab days should now be scheduled on a weekly basis.

**Step 7:** A good outside reading is the article *I am Joe's Skin*. A few questions about the reading may be assigned. This is based on a series of articles on the human body written for Readers Digest. The book was made into a set of educational videos that can be purchased if monetary resources are available. (Amazon.com for the book and Pyramid Media for the videos)

**Step 8:** After the reading, students will be directed to complete the *What's Covering You and Why?* mini-lab <http://resources.schoolscience.co.uk/ABPI/new/resources/skin/skin2.asp> on skin functions. In this activity the students will use knowledge gleaned from the reading to infer the functions of the skin that are modeled in the mini-lab.

**Step 9:** Students will be assigned an open-ended modeling activity in which project groups are given the task of creating a three dimensional model of a section of skin. They will receive a [Skin Model Lab](#) handout and a copy of the grading rubric [Skin Model Rubric](#). This outlines the requirements of the assignment and the way points are allotted. Students then have the option of using the models as part of the overall project presentation. The teacher should allot sufficient time for completion and submission of the models.

**Step 10:** At this point, the groups should have a second trip to the computer lab and should be given the [PowerPoint Presentation Planning Guide](#). If students are using a presentation other than Power Point, they may modify this document. Students may work with the technology integration specialist to receive help with use of Flip cameras, merging media and presentation production. Along with the planning guide the groups should complete a [Task Management Chart](#) that identifies the responsibilities of each group member and time lines for completion of each task. This should be placed in the group binder and updated as needed.

**Step 11:** For approximately, two days, the students will explore the structure of the integument and its accessory structures. The students will complete the [Skin Assessment Lab \(Skin Assessment Lab Key\)](#). In this lab the students explore the structure of hair, location and distribution of sensory receptors, and functions of the glands. Students individually answer the Summary and Analysis questions at the end of the lab.

**Step 12:** The teacher should schedule computer/research days when convenient. Students will complete the [Daily Learning Log](#) each time for their binders.

**Step 13:** The students should be given a chance to meet with each other to evaluate progress on the project. During this time, the teacher should rotate around the groups and ask questions and offer help. Before the students leave for the day, each student should complete an interim progress [Research Evaluation Report](#). By comparing these individual reports, the teacher can determine whether adequate progress is being made and the involvement of each group member. It also allows the teacher to insure the groups are on target with the goals of the project.

**Step 14:** The teacher should do a quick introduction to the immune system. Students should then complete the SAS in schools activity, *How Does My Body Fight off Invaders* (SAS in school audio activity 1281).

<http://www.sascurriculumpathways.com/> They will complete the quiz at the end and print the results to be handed in for class credit. SAS in schools is free to educators and only involves registering for the program.

**Step 15:** After completing the SAS activity, students should complete the immune system handouts. These are available with most anatomy teacher resource materials

**Step 16:** The students may need to return to the computer lab to complete their multimedia presentations. Any additional time needed to complete presentations will be scheduled by the groups.

**Step 17:** On the day of the presentation, the audience should consist of several parents, other school personnel and possibly a representative of the medical or tattooing profession. Students are expected to present in a professional manner and will be evaluated by their peers using a [PowerPoint Peer Evaluation](#) and evaluated by guests and the instructor using a [Presentation Rubric](#).

**Step 18:** After all the presentations are completed; the students should review the peer evaluations, fill out [PowerPoint Self Evaluation](#) and the [Project Debrief Chart](#). This will allow the students an opportunity to reflect on their experiences during the project and suggest improvements to the PBL design.

**Project Evaluation:** During the project the teacher should make observations of the groups and individuals in order to assess which activities were successful and which ones may need to be revised and adjusted.

The teacher should read and consider comments and input from the parents, health professionals and tattoo artists present as guests during the presentations this may improve the manner in which the projects are presented.

Peer evaluations and self evaluations done during the presentations and after can be used to assess the impact of the learning experience on the individual students.

Finally a [Project Debrief Chart](#) should be completed by each student in order to help the teacher determine what can be improved upon before using the PBL again.

#### Resource Files Uploaded

#### Resource Files

- [UP3423WS2.doc](http://wveis.k12.wv.us/Teach21/CSO/Upload/UP3423WS2.doc)  
(http://wveis.k12.wv.us/Teach21/CSO/Upload/UP3423WS2.doc)
- [UP3423WS3.doc](http://wveis.k12.wv.us/Teach21/CSO/Upload/UP3423WS3.doc)  
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- [UP3423WS16.doc](http://wveis.k12.wv.us/Teach21/CSO/Upload/UP3423WS16.doc)  
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