

Immunity: Innate and Adaptive

Lesson Plan for Grade 10, Biology

Prepared by Ms. Carufel 7/31/2020

Estimated time: 50 min.

MATERIALS NEEDED:

- Chromebook to access the internet
- Assigned reading: <https://www.niaid.nih.gov/research/immune-system-overview>
- Assigned Videos: <https://www.youtube.com/watch?v=fSEFXl2XQpc>
+<https://www.youtube.com/watch?v=PzunOgYHeyg>
- A partner to read and discuss with
- A notebook and pencil
- Colored pencils, markers, crayons, large sheets of white paper.

STANDARDS

- Standard: **Performance Standard HS-LS1-2 Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.**
- Real world immune boosting standards:**
<https://www.health.harvard.edu/staying-healthy/how-to-boost-your-immune-system>

OBJECTIVES

- ❑ After the lesson, students should be able to demonstrate comprehension of the immune system of the body: innate and adaptive immunity, as it applies to the standard.
- ❑ Real world problem: How can we keep our bodies healthy and immune systems strong in the face of a pandemic to avoid falling ill?
- ❑ Students should show comprehension of the immune system by recognizing parts of the body and what cells contribute to immune defense. Prior knowledge of the immune system is required to complete the learning activities and can be gained through reading the assigned text and watching the assigned videos.

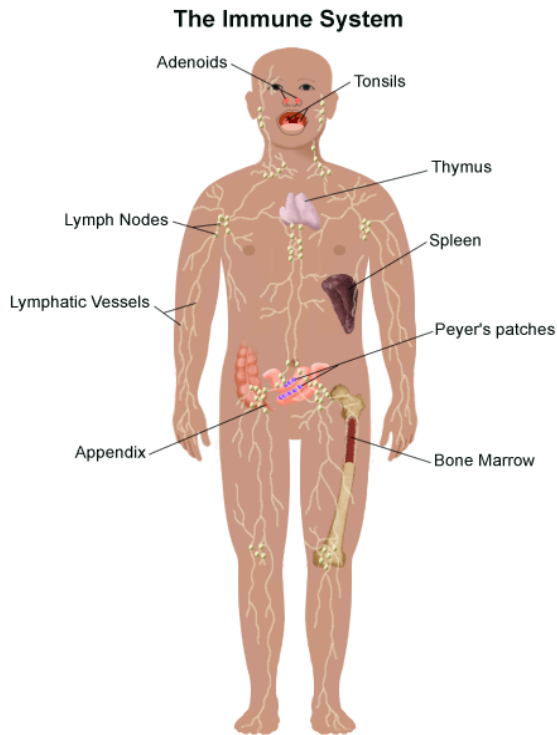
OBJECTIVES--Learning Targets

- ❑ After the lesson students should be able to comprehend and demonstrate:
 - What our immune systems do for us
 - What parts of the body make up the immune system
 - The difference between innate and adaptive immunity
 - The connection between immunity and disease and how to keep ourselves healthy (COVID-19 DISCUSSION and smallpox discussion)

LEARNING ACTIVITIES:

- ❑ Students should read the assigned text from the web-page the night before the lesson, as well as watch the assigned videos.
- ❑ Students should make notes on the assigned reading and videos and discuss what aspects of the immune system are critical to immunity with their chosen partner to keep them actively engaged on the topic and discussion.
- ❑ Students will be invited to engage in discussion on immunity, disease and how they apply to the current pandemic (COVID-19) with the educator to discuss any areas of question and to look at important visuals as a class.
- ❑ Students should demonstrate comprehension by creating their own “full body” drawing of the human body with their partner with captions detailing important body parts and cells involved with the immune system. They will take their supplies (Large pieces of paper, drawing utensils) and have one partner lay down

so they can trace the shape of the body and then add pertinent details. Once completed, they will be hung on the walls or in the halls. **This assignment is authentic because it engages creativity, body awareness, team building/cooperative learning and gets students thinking on the importance of their health during a global pandemic.**



LEARNING ACTIVITIES-- Guiding Questions

-- To be asked at the beginning of the lesson: "Why do we need to be able to protect ourselves from pathogens?"

(Hopefully here we are getting learners to think about how and why we stay healthy, and why we do not get sick even though we encounter lots of bacteria, thinking about their own anatomy and experiences.)

--To be asked in the middle of the lesson: "What do you think would happen if our bodies did not have defenses in place to protect us?"

(Hopefully with this question, learners are thinking of the ramifications of our immune systems not protecting us and what that could mean for our health.)

--To be asked at the end of the lesson: “How can we make sure our immune systems are supported by our habits to keep us healthy?”

(Hopefully this question leads to a bigger discussion about personal health, eating, hygiene, and genetics. Also incorporating these ideas when talking about the current pandemic.)

ASSESSMENT

- ❑ As an educator, I will know my students have achieved comprehension by discussing immunity with them, answering their questions, and having them take notes on what they find to be the most pertinent information. I will allow them to talk out their questions, fears, passions, and concerns with this current pandemic and give them tools to boost their immunity (more sleep, more water, hand-washing, eating an enriching diet.) If my students can successfully create a full body drawing of the immune system, including captions with important mechanisms and facts about each body part and type cell doing immune work, I will know they have mastered the standard and understood how immunity works. Cooperative learning with a partner, and creating visual diagrams are the two learning strategies that will be employed. This assessment is directly correlated to the standard as it pertains to a body system. I will assess the performance of diverse learners by discussing their model with them, to ensure I am available to answer their questions and enhance comprehension with discussion and revision.
- ❑ Formative Assessment: Discussion participation.
- ❑ Summative Assessment: I will be assessing their full body drawing for accuracy with the rubric listed below.

Rubric for Immune System Drawing

Immune System Body Part and Caption	Check- drawn in the right place? Right function?
Skin	
Mucous Membranes, Mucous.	
Spleen	
Thymus	
Lymphatic System-Lymph Nodes	
Bone Marrow	
Appendix	
Peyer's Patches	
Tonsils + Adenoids	
Cells of the Immune System	Check: Are the cells drawn out? Labelled? Captioned correctly?
White blood cells	
T-helper cells	
Mast Cells	
B-cells	
Natural Killer cells (NK CELLS)	

REFLECTION

Hopefully this lesson is fun and engaging for my students. Cooperative learning will assist students in engaged group work and discussion of the content and interpretation of visuals as a team. Discussing the content as a class will assist my students in deepening their comprehension by allowing them to ask questions on areas they are not comprehending fully and will give them a resource (Me) with which to interpret information from text and visuals. Drawing and coloring of a model will engage their creativity and get them thinking on the mechanisms, body parts, and parts of a cell that are required for a healthy and functioning immune system.

The formative assessment will reinforce the learning done throughout the lesson and will give me some feedback about where certain students are needing more support with the content presented for that day. I think this will “clearly communicate to students and teachers how well students are performing” (Knight, 2012, p. 69). Figure 3.4 of Knight's text says that an assessment must “clearly tell students how well they are performing, clearly tells teachers how well all students are performing, is easy to use, and takes little time to implement.” (Knight, 2012, p.69). I believe this formative assessment checks all those boxes and gives the added bonus of allowing students to get up from their seats and contribute to discussion and receive feedback directly. They will have access to the rubric so that their model meets the expectations for the standard.

This lesson is authentic because it ties into a real-world issue (COVID-19 pandemic, immune health) engages the students in cooperative learning strategies, gets them thinking on their own bodies and how to care for them to stay healthy while engaging their creativity, and allows for discussion on a topic where they will be able to pose questions, voice concerns and fears, and talk about what they are experiencing with today's pandemic while gaining comprehension.

References:

Knight, J. (2012). *High-Impact Instruction: A Framework for Great Teaching* (1st ed.). Thousand Oaks, California: Corwin.