Full STEAM Ahead:
Connecting Library of Congress Primary Sources and Graphic Novels

Lesson Plan Template
Author(s): Christina Allen & Joanna Sargent
Grade Level(s): 6th Grade
Subject: Science and Art
Length of Class: 90 minutes

Insert visual or image that accentuates the lesson plan to make it appealing to educators: must be a public domain image

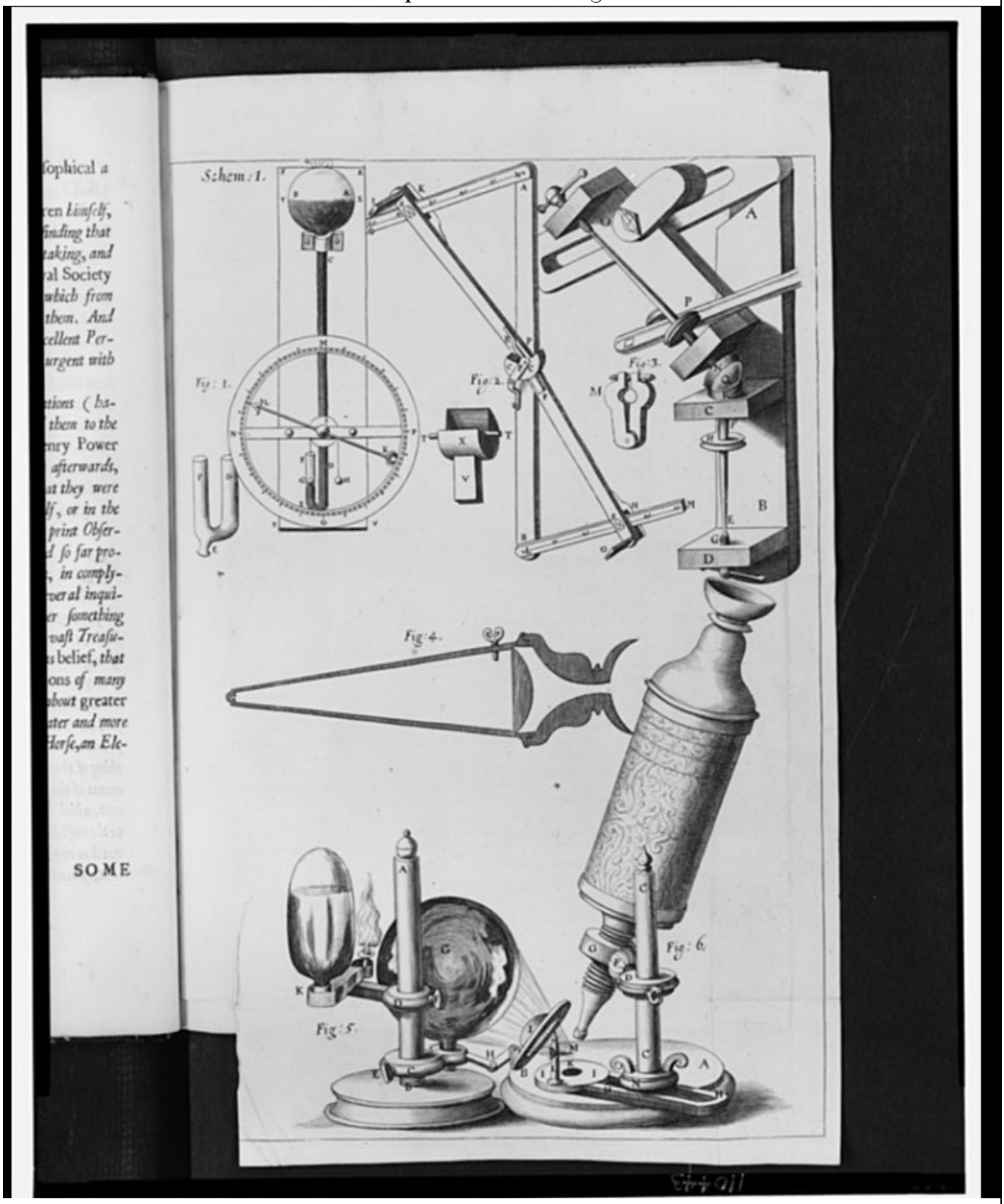

Image Citation: **Hooke, R. (1665) Microscope and Other Scientific Apparatus. , 1665. [Photograph] Retrieved from the Library of Congress, https://www.loc.gov/item/2006690465/.**	
Lesson Title:	What you can't see
Overview:	Using the primary source of the diagram of an early microscope (1665) and the graphic novel, *Human Body Theatre*, students will learn about cells and build a microscope.
Learning Objective:	Desired learner outcomes in precise, measurable, and obtainable terms. Limit your lesson to 1-2 objectives. **Students will learn about the history of the microscope and how they can see cells in order to make their own microscope.** **Students will examine the art of the graphic novel and compare it to what they see under the microscope.**
Standards:	Standards should be aligned with objectives 6-LS1-1. Conduct an investigation to provide evidence that living things are made of cells; either one cell or many different numbers and types of cells. Clarification Statement: Emphasis is on developing evidence that living things are made of at least one cell, distinguishing between living and non-living things, and understanding that living things may be made of one cell or many and varied cells. - Science and Engineering Practices: Planning and Carrying Out Investigations Planning and carrying out investigations in 6- 8 builds on K-5 experiences and progresses to include investigations that use multiple variables and provide evidence to support explanations or solutions. Conduct an investigation to produce data to serve as the basis for evidence that meet the goals of an investigation. - Disciplinary Core Ideas: LS1.A: Structure and Function All living things are made up of cells, which is the smallest unit that can be said to be alive. An organism may consist of one single cell (unicellular) or many different numbers and types of cells (multicellular). ETS2.A: Interdependence of Science, Engineering, and Technology Engineering advances have led to important discoveries in virtually every field of science, and scientific discoveries have led to the development of entire industries and engineered systems. - Crosscutting Concepts: Scale, Proportion, and Quantity

	Phenomena that can be observed at one scale may not be observable at another scale. Visual Art Standard: Anchor Standard 5: I can interpret and evaluate the meaning of an artwork
Essential Question:	Why can't you see a cell?
Supporting Question(s):	How has technology improved our understanding of cells? Can a cell be seen by the naked eye?
Digital Primary and Secondary Sources:	List primary and secondary sources and include links. Primary Source: Hooke, R. (1665) Microscope and Other Scientific Apparatus. 1665. [Photograph] Retrieved from the Library of Congress, https://www.loc.gov/item/2006690465/ Secondary Source: Wicks M. (2015). *Human body theater : a nonfiction revue* (First). First Second.
Required Classroom Materials:	What materials do you need (computer, projector, etc.)? What materials do the students need (writing journals, laptop carts, textbooks, etc.)? • Smartboard to display primary source and presentation (with selected pages from the graphic novel. • Wicks M. (2015). *Human body theater : a nonfiction revue* (First). First Second. • Microscope Kit to build a microscope • Drawing paper and colored pencils for sketch (exit ticket).
Classroom Environment:	How is the room arranged for the lesson? What considerations will contribute to the lesson --- interactive bulletin board, learning stations/centers, table for panel presentation? **Students will come to the library for the lesson. The library will be set up with materials to build the microscopes in bins on the table.**
Differentiation and Adaptations:	In what ways will you differentiate for learners within the classroom? This is not how your lesson meets the needs of diverse learners, but how you could modify your lesson for a range of diverse learners. **Higher level classes can use real microscopes and look at cells.** **For ESOL, have the captions in Spanish and Mandarin.** **Partnerwork for our IEP students.**

Lesson Sequence/Procedures	
Estimated Time Needed	**Detailed Description of Teaching and Learning**
8 minutes	Introduce students to the primary source on the smartboard. Students will do an annotated inquiry process with teacher or librarian leading them with questions like: What do you wonder? When do you think this was made? What is it?
2 minutes	Reveal the answer.
2-3 minutes	Briefly discuss history of microscopes (led by science teacher)
5 minutes	Students will read pages 1-8 of the graphic novel, Human Body Theatre by Maris Wicks.
10 minutes	In their table groups, students will discuss the connections they can make between the selection from the graphic novel and the primary source (image of the microscope). Questions for discussion: Why can't you see a cell? Can a cell be seen by the naked eye? How has technology improved our understanding of cells? Do you think you could see a cell with the microscope that you saw earlier?
60 minutes	After discussion, students will use the What You Can't See paper to record their observations and begin to design their microscope with materials on the table. Students will use slides of cells to examine under their microscopes. Students will connect what they saw in the graphic novel about cells with what they saw under their microscope and then will draw what they saw as their exit ticket. Librarian will be assisting and then will have on display related books and graphic novels for further reading and extensions.

Assessments:	What are the evaluation (informal and formal) tasks for this lesson? How do the evaluation tasks connect with the learning objectives? How do the evaluation tasks demonstrate student learning? How will students receive feedback? **Exit ticket: draw a scientific drawing to show what you saw through your microscope.**
Learning Extensions:	Connect to books available in our school library such as:

	Green D. & Davis E. (2021). *Human body factory : the nuts and bolts of your insides!* Kingfisher Books. Keyser A. J. Martin C. & Schulz B. (2020). *The basics of cell life with max axiom super scientist*. Capstone Press. Wilsdon C. Daniels P. Agresta J. & Turner C. (2014). *Ultimate body-pedia : an amazing inside-out tour of the human body* (Reinforced library). National Geographic. Wakelet created by Joanna Sargent and Christina Allen was used to collaborate and then was edited for students to access for the lesson: https://wakelet.com/wake/IU-AztTf-nhr5LMRflFDH