Who Was Henrietta Lacks?

Ethics in Scientific Research

Alonna Smith, Lindsey Link
Published by *K20 Center*

Grade Level	7th – 12th Grade	**Time Frame**	4 class periods
Subject	Science		
Course	Biology I		

Essential Question

Should scientists be allowed to use a person's tissues or cells for research without that person's consent?

Summary

This lesson is intended to support life science standards found in biology. The lesson is not intended to cover the standards completely, but rather to supplement them and raise awareness of ethical issues and racism in science and medicine.

Snapshot

Engage

Students reflect on the essential question and then watch a video about Henrietta Lacks and how her cells became the first immortalized human cell line.

Explore

In groups, students use the Jigsaw strategy to read a collection of articles and share what they learned with their peers.

Explain

Students participate in a Socratic Seminar.

Extend

Students watch a video about ethical data collection and use the Inverted Pyramid strategy to debrief the new information.

Evaluate

Students use the “I Used to Think... but Now I Know” strategy to close the lesson.

Standards

Oklahoma Academic Standards (6th Grade)

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.
6.LS1.1.1: All living things are made up of cells, which is the smallest unit that can be said to be alive.
6.LS1.1.2: An organism may consist of one single cell (unicellular) or many different numbers and types of cells (multicellular).
6.LS1.2 : Develop and use a model to describe the function of a cell as a whole and ways parts of cells contribute to the function.
6.ESS2: Within cells, special structures are responsible for particular functions, and the cell membrane forms the boundary that controls what enters and leaves the cell.
6.LS1.3 : Use an argument supported by evidence for how the body is a system of interacting subsystems composed of groups of cells.
6.LS1.3.1: In multicellular organisms, the body is a system of multiple interacting subsystems. These subsystems are groups of cells that work together to form tissues and organs that are specialized for particular body functions.

Oklahoma Academic Standards (6th Grade)

8.LS4: Develop and use a model to describe why structural changes to genes (mutations) located on chromosomes may affect proteins and may result in harmful, beneficial, or neutral effects to the structure and function of the organism.
8.LS3.1.1: Genes are located in the chromosomes of cells, with each chromosome pair containing two variants of each of many distinct genes. Each distinct gene chiefly controls the production of specific proteins, which in turn affects the traits of the individual.
8.LS3.1.2: Changes (mutations) to genes can result in changes to proteins, which can affect the structures and functions of the organism and thereby change traits.
8.LS3.1.3: In addition to variations that arise from sexual reproduction, genetic information can be altered because of mutations.
8.LS3.1.4: Though rare, mutations may result in changes to the structure and function of proteins.
8.LS3.1.5: Some changes are beneficial, others harmful, and some neutral to the organism.

Oklahoma Academic Standards (6th Grade)

B.LS1.2: Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.
B.LS1.2.1: Multicellular organisms have a hierarchical structural organization, in which any one system is made up of numerous parts and is itself a component of the next level.

Attachments

- I-Used-to-Think-but-Now-I-Know-Who-Was-Henrietta-Lacks - Spanish.docx
- I-Used-to-Think-but-Now-I-Know-Who-Was-Henrietta-Lacks - Spanish.pdf
- I-Used-to-Think-but-Now-I-Know-Who-Was-Henrietta-Lacks.docx
- I-Used-to-Think-but-Now-I-Know-Who-Was-Henrietta-Lacks.pdf
- Inside-Out-Who-Was-Henrietta-Lacks - Spanish.docx
- Inside-Out-Who-Was-Henrietta-Lacks - Spanish.pdf
- Inside-Out-Who-Was-Henrietta-Lacks.docx
- Inside-Out-Who-Was-Henrietta-Lacks.pdf
- Lesson-Slides-Who-Was-Henrietta-Lacks.pptx

Materials

- Lesson Slides (attached)
- Inside Out handout (attached; one per student)
- I Used to Think... but Now I Know handout (attached; one per student)

- “The Immortal Life of Henrietta Lacks, the Sequel” (linked; one per group)
- “Henrietta Lacks: The Mother of Modern Medicine” (linked; one per group)
- “Henrietta Lacks: Science Must Right a Historical Wrong” (linked; one per group)
- “Five Reasons Henrietta Lacks Is the Most Important Woman in Medical History” (linked; one per group)
- Student devices with internet access (optional)

20 minutes

Engage

Introduce the lesson using the attached **Lesson Slides**. Display **slide 3** and ask students to consider the essential question: *Should scientists be allowed to use a person's tissues or cells for research without that person's consent?*

Move to **slide 4** and pass out the attached **Inside Out** handout. Using the Inside Out strategy, have students record their individual responses to the essential question in the innermost circle. Emphasize to students that there are no wrong answers here. This is a question many will feel differently about, and students' opinions might shift as they gather more information.

The handout will be used through the Explore portion of the lesson, so ask students to keep theirs on hand.

Move to **slide 5** and play the following video, titled "The immortal cells of Henrietta Lacks," to introduce her as the person whose cells became the first immortalized human cell line.

Embedded video
https://youtube.com/watch?v=22lGbAVWhro

After the video, move to **slide 6** and share the lesson's learning objective with students.

50 minutes

Explore

Teacher's Note: Reading Preparation

Before beginning this portion of the lesson, consider accessing the links below so you can print however many copies of each reading you will need for the class. If students have devices with internet access, you may forgo printing copies and have students read online instead.

Display **slide 7** and ask students to get into groups of four. Then, pass out copies of the following readings to each group or have students access them online:

- **Legal**: "The Immortal Life of Henrietta Lacks, the Sequel"
- **Familial**: "Henrietta Lacks: The Mother of Modern Medicine"
- **Societal**: "Henrietta Lacks: Science Must Right a Historical Wrong"
- **Medical**: "Five Reasons Henrietta Lacks Is the Most Important Woman in Medical History"

Optional Reading

If you wish to provide students with a more advanced reading for the Medical category above, consider the article "Vessels for Collective Progress: the use of HeLa cells in COVID-19 research" on how HeLa cells helped scientists research COVID-19 and the coronavirus's effects on human cells.

In their groups, instruct each student to choose just one of the four articles to read. Each group member must read a different article, as they will use the Jigsaw strategy later to share what they learned with the rest of their group.

Display **slide 8** and explain the Why-lighting strategy to students. As they read, students will highlight passages or information they deem important, then annotate in the margins to explain why they highlighted the information.

As students wrap up the reading, move to **slide 9**. In the middle circle of the Inside Out handout, have students write at least three questions or things they wondered about while reading.

Once students have completed the reading, move to **slide 10** and have students form groups with those who read the same article as them. In these groups, each student will share what they wrote in the middle circle of their Inside Out handout and add any additional information they get from their peers. Students also should discuss their general takeaways from the reading.

Move to **slide 11** and have students get back into their original groups. Each member of the group should share what they learned from their reading, as well as new discoveries from their peers, by revealing what they wrote in the middle circle of their Inside Out handout.

Move to **slide 12**. In the outermost circle of the Inside Out handout, students will write important information they learned from their peers about the articles they did NOT read.

Teacher's Note: Socratic Seminar Preparation

Move to **slide 13** and inform students they will participate in a Socratic Seminar during the next class period. In their small groups, ask students to choose the most important question they still want to discuss. Have all groups share out their questions for the class to hear and have students record these questions.

Inform students that the Socratic Seminar will require them to formulate and discuss their opinions on the ethics of using someone's tissue or cells without consent for the “greater good.”

120 minutes

Explain

If this is the first time you are having students participate in a Socratic Seminar, below are some helpful tips.

Structure the Discussion Around a Text

The purpose of a Socratic Seminar is to have an ongoing discussion of a topic using evidence from a text (close textual analysis), so make sure the texts you select provide ample avenues for interpretation, analysis, and discussion. As students read, encourage them to make annotations in the margins.

Give Students Time to Prepare

It is recommended that students have at least 24 hours to prepare for a Socratic Seminar. Remind students that coming prepared with more evidence will enable them to have more valuable, in-depth discussions. Invite them to generate a few open-ended questions of their own ahead of the discussion as well.

Provide the Questions in Advance

During the class period before the Socratic Seminar, you may want to provide students with a handout containing 4–6 questions (2–3 that are closely aligned with the reading and 2–3 that are more philosophical) that will be covered in the discussion. If you attach these questions to the assigned readings, this will enable students to make relevant annotations as they read.

Establish Purpose and Classroom Norms

It is important that students understand the purpose of the Socratic Seminar before the discussion begins. Remind students that they are not debating, but rather working together to gain a deeper understanding of the overall topic and what the author was trying to express through the text. Additionally, be sure to go through the process of Establishing Norms with students. If you already have established classroom norms, review them together as a class before starting.

Display **slide 14** and divide the class into two groups. Explain to students that these two groups will be the inner and outer circles of the Socratic Seminar.

- The role of the ***inner circle*** of students is to answer the questions and have a discussion. Because only half the class will be in this circle, students may be more likely to participate—with fewer people in a speaking role, students generally are more willing to jump into the discussion.
- The role of the ***outer circle*** of students is to quietly record observations of the speakers. The presence of this outer circle will help the speakers be more conscious of their participation. With peers observing and listening, students tend to put more effort into participating in a meaningful way.

When students are ready to begin, ask the inner circle one of the questions that closely aligns with the text to get the conversation started. This helps build students' confidence for later when the tougher, more abstract questions are introduced.

Provide 15–20 minutes for the discussion of each question per group. Once the first group in the inner circle has completed their discussion, instruct students to switch spots with those in the outer circle.

Sample Prompts to Facilitate Discussion

If the conversation begins to lag, that's okay! You may prompt students to elaborate by asking a question, such as:

- "Where in the text does it say ___?"
- "Is this what you meant when you said ___?"
- "What do you think the author was trying to say when ___?"

Once both groups have had a chance to participate as speakers in the inner circle, take some time as a class to reflect and evaluate. Have students complete 1) a general evaluation of the activity itself, and 2) a self-reflection on their performance throughout the activity. Below are some guiding questions to consider asking students:

1. At any point, did the seminar revert to something other than a dialogue? If so, how did you handle this?
2. What evidence did you see of people actively listening and building on others' ideas?
3. How has your understanding of the text been affected by the ideas explored in this seminar?
4. What parts of the discussion did you find most interesting? In what parts were you least engaged?
5. What would you like to do differently as a participant the next time you are in a seminar?

20 minutes

Extend

Display **slide 15** and show students the following video, titled "Henrietta Lacks, the Tuskegee Experiment, and Ethical Data Collections: Crash Course Statistics #12."

Embedded video
https://youtube.com/watch?v=CzNANZnoiRs

After students have watched the video(s), display **slide 17** and ask students to pair up. Student pairs will use the Inverted Pyramid strategy to discuss the implications of the Tuskegee study, the harm it has done to Black Americans, and students' feelings about scientific research on human subjects.

Move to **slide 18**. Have each pair join another pair of students to form a small group and discuss the same prompts.

Move to **slide 19** and bring everyone back together for a whole-class discussion. Ask students if watching the video(s) and discussing with their peers changed their perspective in any way, and if so, how and why?

15 minutes

Evaluate

Display **slide 20** and pass out the attached **I Used to Think… but Now I Know** handout.

To close the lesson, have students use the "I Used to Think… but Now I Know" strategy to write a personal reflection that includes their stance on the essential question posed at the beginning: *Should scientists be allowed to use a person's tissues or cells for research without that person's consent?*

Students should begin their written reflection with "I used to think…" and then copy what they initially wrote in the innermost circle of the Inside Out handout.

Resources

- CrashCourse. (2018, April 18). Henrietta Lacks, the Tuskegee Experiment, and Ethical Data Collection: Crash Course Statistics #12 [Video]. YouTube. https://www.youtube.com/watch?v=CzNANZnoiRs
- Jackson, N., & Utter, D. (2020, September 4). Vessels for Collective Progress: The use of HeLa cells in COVID-19 research [Blog post]. Harvard Science in the News. https://sitn.hms.harvard.edu/flash/2020/vessels-for-collective-progress-the-use-of-hela-cells-in-covid-19-research/
- K20 Center. (n.d.). Establishing Norms. Strategies. https://learn.k20center.ou.edu/strategy/188
- K20 Center. (n.d.). I Used to Think... but Now I Know. Strategies. https://learn.k20center.ou.edu/strategy/d9908066f654727934df7bf4f50639f2
- K20 Center. (n.d.). Inside Out. Strategies. https://learn.k20center.ou.edu/strategy/93
- K20 Center. (n.d.). Inverted Pyramid. Strategies. https://learn.k20center.ou.edu/strategy/d9908066f654727934df7bf4f507a918
- K20 Center. (n.d.). Jigsaw. Strategies. https://learn.k20center.ou.edu/strategy/d9908066f654727934df7bf4f507c1b8
- K20 Center. (n.d.). Socratic Seminar. Strategies. https://learn.k20center.ou.edu/strategy/781
- K20 Center. (n.d.). Why-lighting. Strategies. https://learn.k20center.ou.edu/strategy/d9908066f654727934df7bf4f505e7d5
- Moorhead, J. (2010, June 23). Henrietta Lacks: the mother of modern medicine. The Guardian. https://www.theguardian.com/science/2010/jun/23/henrietta-lacks-cells-medical-advances
- Nature Research Editors. (2020, September 1). Henrietta Lacks: science must right a historical wrong [Editorial]. Springer Nature. https://www.nature.com/articles/d41586-020-02494-z
- Newsy. (2016, August 25). The unknowns about the Tuskegee syphilis study [Video]. YouTube. https://www.youtube.com/watch?v=J3tQ93fQf8U
- Popular Science. (2010, February 5). Five reasons Henrietta Lacks is the most important woman in medical history. Camden Media. https://www.popsci.com/science/article/2010-01/five-reasons-henrietta-lacks-most-important-woman-medical-history/
- Skloot, R. (2013, March 23). The Immortal Life of Henrietta Lacks, the Sequel. The New York Times. https://www.nytimes.com/2013/03/24/opinion/sunday/the-immortal-life-of-henrietta-lacks-the-sequel.html
- TED-Ed. (2016, February 8). The immortal cells of Henrietta Lacks - Robin Bulleri [Video]. YouTube. https://www.youtube.com/watch?v=22lGbAVWhro