

Who Was Henrietta Lacks?

Ethics in Scientific Research

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Published by *K20 Center*

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Grade Level	6th – 12th Grade	**Time Frame**	4 class periods
Subject	Science		
Course	Biology		

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 to supplement them and raise awareness of ethical issues and racism in science and medicine.

Snapshot

Engage

Students reflect on the essential question, 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

ACT College and Career Readiness Standards - Science (6-12)

IOD302: Understand basic scientific terminology
SIN201: Find basic information in text that describes a simple experiment
EMI502: Determine whether presented information, or new information, supports or contradicts a simple hypothesis or conclusion, and why

Next Generation Science Standards (Grades 6, 7, 8)

MS-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.
MS-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.
MS-LS1-3: Use argument supported by evidence for how the body is a system of interacting subsystems composed of groups of cells.

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.LS1.2 : 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.LS1.3 : Use an argument supported by evidence for how the body is a system of interacting subsystems composed of groups of cells.

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.LS3.2 : Develop and use a model to describe why asexual reproduction results in offspring with identical genetic information and sexual reproduction results in offspring with genetic variation.

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 student)
- I Used to Think... But Now I Know handout (attached; one per student)
- “Henrietta Lacks' family settles lawsuit with a biotech company that used her cells without consent” (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)
- 3x5 Cards (three per student)

Engage

Use the attached **Lesson Slides** to guide the lesson.

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. Review the Inside Out strategy and 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 people have varied feelings about, and students' opinions might shift as they gather more information.

Ask students to keep their Inside Out handouts on hand to use later in the Explore phase.

Move to **slide 5** and play the video "The immortal cells of Henrietta Lacks" to introduce 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.

Explore

Display **slide 7** and ask students to get into groups of four. Have each group access the following articles online:

- **Legal**: "Henrietta Lacks' family settles lawsuit with a biotech company that used her cells without consent"
- **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: More Than a Cell

If you wish to provide students with a more advanced reading for the medical category above, consider the article "More than a cell: the legacy of Henrietta Lacks" on how HeLa cells helped scientists research COVID-19 and the coronavirus's effects on human cells.

Teacher's Note: Printing Articles

If you prefer to pass out copies of the articles to students, navigate to each website and print as many copies as you need from there.

Introduce the Jigsaw strategy, and have one member of each group take responsibility for reading one of the articles.

Display **slide 8** and introduce the S-I-T strategy. Pass out three 3x5 index cards to each student. Explain that as they read, students should use their 3x5 cards to identify one surprising fact, one interesting fact, and one troubling fact from their article.

Give students time to read. Move to **slide 9** and have students revisit their Inside Out handout. Ask students to write in the middle circle at least three questions or things they wondered about while reading.

Display **slide 10**. 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. Encourage students to also discuss their general takeaways from the reading.

Display **slide 11** and have students return to 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.

Move to **slide 13** and inform students they will participate in a Socratic Seminar during the next class period and review the strategy with them. Begin the five-minute timer and allow students to discuss and decide on one question they feel is most important and want to discuss. Instruct students to write this question on a piece of paper.

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.

25 minutes

Explain

Teacher's Note: Socratic Seminar

If this is the first time you are having students participate in a Socratic Seminar, consider these 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, it 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 working together to gain a deeper understanding of the overall topic and what the author was trying to express through the text.

Before beginning the Socratic Seminar, display **slide 14** and review the Establishing Norms strategy with the class. Follow the instructions to establish norms for the upcoming Socratic Seminar. This should result in a collaborative effort from your classes to help them set parameters, which should in turn encourage them to participate in the activity.

Once norms have been established as a class, display **slide 15** 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 are generally 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.

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.

Move to **slide 16** and begin the 10-minute timer 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. Restart the 10-minute timer on **slide 16**.

Teacher's Note: 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.

Display **slide 17** and have students take out a piece of paper. On their paper, instruct students to complete a general evaluation of the activity itself and a self-reflection on their performance throughout the activity. Below are some guiding questions to consider asking students:

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

Extend

Display **slide 18** and show students the video "Henrietta Lacks, the Tuskegee Experiment, and Ethical Data Collections: Crash Course Statistics #12."

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

Optional Video: the Tuskegee Syphilis Study

If you'd like to show students an additional, optional video, titled "The unknowns about the Tuskegee syphilis study," move to **slide 19**.

Embedded video
https://youtube.com/watch?v=J3tQ93fQf8U

After students have watched the video(s), display **slide 20** and ask students to pair up. Student pairs should 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 21**. Have each pair join another pair of students to form a small group and discuss the same prompts.

Move to **slide 22** 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. If so, how and why?

Evaluate

Display **slide 23** 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 earlier: Should scientists be allowed to use a person's tissues or cells for research without that person's consent? Why or why not?

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

Resources

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