



Got Culture?: A Look at Zoonotic Diseases

Zoonotic Diseases

This work is licensed under a [Creative Commons CC BY-SA 4.0 License](https://creativecommons.org/licenses/by-sa/4.0/)

Grade Level	9th – 10th Grade	Duration	3-4 periods
Subject	Science		
Course	Biology I, Environmental Science		

Essential Question

What is a zoonotic disease and what factors lead to their spread in human populations?

Summary

This lesson aims to develop an understanding of Zoonotic Diseases. In this lesson, students will explore how zoonotic diseases spread.

Snapshot

Engage

Students listen to an interview with David Quammen about COVID-19.

Explore

Students complete a digital breakout about zoonotic diseases, specifically Ebola.

Explain

Students discuss the concepts they learned in the digital breakout.

Extend

Students select a zoonotic disease to research and create a webpage of their disease.

Evaluate

Students evaluate and give feedback to their peers.

Standards

Next Generation Science Standards (Grades 9, 10, 11, 12)

HS-LS1-1: Construct an explanation based on evidence for how the structure of DNA determines the structure of proteins which carry out the essential functions of life through systems of specialized cells.

LS1.A: Structure and Function

Oklahoma Academic Standards (Biology)

B.LS1.1: Construct an explanation based on evidence for how the structure of DNA determines the structure of proteins, which carry out the essential functions of life through systems of specialized cells.

B.LS1.1.2: All cells contain genetic information in the form of DNA molecules.

B.LS2.2 : Use mathematical representations to support and revise explanations based on evidence about factors affecting biodiversity and populations in ecosystems of different scales.

B.LS2.2.3: A complex set of interactions within an ecosystem can keep its number and types of organisms relatively constant over long periods of time under stable conditions.

B.LS2.2.4: If a modest biological or physical disturbance to an ecosystem occurs, it may return to its more or less original status (i.e., the ecosystem is resilient) as opposed to becoming a very different ecosystem.

Oklahoma Academic Standards (Biology)

EN.LS2.2: Use mathematical representations to support and revise explanations based on evidence about factors affecting biodiversity and populations in ecosystems of different scales.

EN.LS2.2.3: A complex set of interactions within an ecosystem can keep its number and types of organisms relatively constant over long periods of time under stable conditions.

EN.LS2.2.4: If a modest biological or physical disturbance to an ecosystem occurs, it may return to its more or less original status (i.e., the ecosystem is resilient) as opposed to becoming a very different ecosystem.

EN.LS2.2.5: Extreme fluctuations in conditions or the size of any populations, however, can challenge the functions of ecosystems in terms of resources and habitat availability.

Attachments

- [Bell-Ringer-Got-Culture.docx](#)
- [Bell-Ringer-Got-Culture.pdf](#)
- [Digital-Breakout-Handout-Got-Culture.docx](#)
- [Digital-Breakout-Handout-Got-Culture.pdf](#)
- [Got-Culture-Disease-Website-Rubric.xlsx](#)
- [Lesson-Slides-Got-Culture-1.pptx](#)

Materials

- Lesson Slide (attached)
- Bell Ringer Handout (attached, one per student)
- Digital Breakout Handout (attached, one per student)
- Student devices with Internet Access
- Large Post-it Paper and markers
- Digital Breakout Site
- Disease Project Site
- Disease Website Rubric

Engage

Teacher's Note: Prep Notes

Before implementing this lesson in your class, you will want to explore the digital breakout. If you want to see students' responses, you will need to duplicate the digital breakout and replace the google form with your own google form. [This video](#) can walk you through building a digital breakout.

Go to **slide 3**. Before class begins, invite students to complete a [Bell Ringer](#) activity that will assess their prior knowledge. Give students the **Bell Ringer handout** (virtual or hardcopy) and ask them to record their responses to the following questions:

1. If there were a pandemic/zombie apocalypse, why should we choose you for our survival team?
2. What diseases can people get from animals?
3. What causes diseases?

Teacher's Note: Bell Ringer Questions

Feel free to add questions based on the content you have already covered in class. Encourage students to answer the questions posed even if they aren't sure yet. Avoid giving answers to anything you have not yet covered.

Go to **slide 4** to introduce the essential questions and then to **slide 5** to introduce the lesson objectives.

Go to **slide 6** to allow students to listen to the [David Quammen interview](#) about COVID-19. After students listen to the interview, use the [I Notice, I Wonder](#) strategy to facilitate a class discussion about the interview and revisit the bellringer questions.

Explore

Go to **slide 7**. Provide the **Digital Breakout handout** (virtual or hardcopy) to each student. Students will record their work on the handout in order to refer to later in the class. The first portion of the handout uses the [TIP Chart](#) strategy where students will record Terms, Information, and Pictures for the vocabulary they are exposed to during the Digital Breakout.

Teacher's Note: TIP Chart

You can guide your students on what to include in each column. For example, assign them to write both the scientific and the common names for specific diseases or specific details that are important to note.

Go to **slide 8** to explain the process of a digital breakout. If this is your first time using digital breakouts with students it may take scaffolding to ensure students are navigating through the breakout.

Teacher's Note: Digital Breakout

You may want to practice the digital breakout with a low-stakes example. These can be found at [Breakout Sandbox](#) or [Ditch That Textbook](#).

Allow students to work through the [digital breakout](#) and move through the classroom to support productive struggle. You can allow students to work in pairs. Remind students to record the things they find in the breakout handout.

As students begin the breakout, ask them if they have ever been in an escape room before. Tell them that this breakout will be similar to an escape room. As they work together and listen for clues, more and more pieces of the puzzle will come together. With each correct guess they make, they will be able to move on to the next lock, and they will come closer to completing the breakout successfully.

Reference the [teacher guide](#) to help scaffold students' work in the breakout.

Teacher's Note: Pairing Strategies

You might choose to use a strategy such as [Fold the Line](#), [Appointment Clocks](#), or [Elbow Partners](#) to pair students.

Explain

Go to **slide 9**. Have a discussion with students after the digital breakout (this can include reviewing the answers) and before moving to the Extend activity. Discussion topics could include:

- How do cell and virus structures differ and how does that affect our response to different diseases?
- Zoonotic diseases are becoming more common, why do you think that is?
- Why are zoonotic diseases more prevalent in specific areas of the world? (A [hot zone map](#) can be used to show this)
- If you have discussed transcription and translation, compare how mRNA and DNA vaccines work.
- Scientists often theorize on the “Next Big One (NBO),” the next global pandemic, do you think there will be a next big one?
- What have we learned living through a global pandemic?

Throughout the discussion, have students make an [Anchor Chart](#) of the important ideas of Zoonotic Diseases and clarify any misconceptions.

Extend

Go to **slide 10**. Have students return to their partners to discuss the new things that they have learned. Together, students should create a page on a Google site. The webpage should focus on a specific zoonotic disease ([Example Here](#)). Make sure to emphasize to students that the five criteria listed in the slide must be included in their webpages.

Teacher's Note: New Google Site

You should make a new Google site to resemble the example.

Evaluate

Go to **slide 11**. Allow pairs to form a group of 4 students. Have students trade projects and give feedback using the [Exclaim and Question Strategy](#). The projects will serve as a summative assessment, which you will grade using the attached **Disease Website Rubric**.

Teacher's Note: Closing the Lesson

After the presentations, consider facilitating a whole-class conversation to close the lesson. This could be facilitated through [What Did I Learn Today?](#), [POMS](#), [Triangle-Square-Circle](#), or [Muddiest Point Strategies](#).

Resources

K20 Center. (n.d.). Anchor chart.

Strategies. <https://learn.k20center.ou.edu/strategy/64f2b35101a470dda36d44421900af08>

K20 Center. (n.d.). Appointment clock.

Strategies. <https://learn.k20center.ou.edu/strategy/d9908066f654727934df7bf4f505c91e>

K20 Center. (n.d.). Bell ringers and exit tickets. Strategies. Retrieved

from <https://learn.k20center.ou.edu/strategy/d9908066f654727934df7bf4f505d6f2>

K20 Center. (n.d.). Elbow partners. Strategies.

<https://learn.k20center.ou.edu/strategy/cc07ea2d6099763c2dbc9d05b00c4b4>

K20 Center. (n.d.). Exclaim and question.

Strategies. <https://learn.k20center.ou.edu/strategy/a89b55a468ff764491d10ec5b201cc3d>

K20 Center. (n.d.). Fold the line. Strategies.

<https://learn.k20center.ou.edu/strategy/d9908066f654727934df7bf4f5079658>

K20 Center. (n.d.). I notice, I wonder.

Strategies. <https://learn.k20center.ou.edu/strategy/d9908066f654727934df7bf4f507d1a7>

K20 Center. (n.d.). Muddiest point.

Strategies. <https://learn.k20center.ou.edu/strategy/baee4e90c5fa1a7060ca04dd8b003a81>

K20 Center. (n.d.). POMS: point of most significance.

Strategies. <https://learn.k20center.ou.edu/strategy/b30762a7557ba0b391f207f4c600f5ac>

K20 Center. (n.d.). Tip chart. Strategies. <https://learn.k20center.ou.edu/strategy/185>

K20 Center. (n.d.). Triangle-Square-Circle.

Strategies. <https://learn.k20center.ou.edu/strategy/6f19b778b73e4c339d1a7d9653006816>

K20 Center. (n.d.). What did I learn today?

Strategies. <https://learn.k20center.ou.edu/strategy/d9908066f654727934df7bf4f5078797>

Kessler, R., & Peterson, H. (n.d.). *Global Disease Hotspots 2.0*. Retrieved from EcoHealth Alliance:

<https://www.ecohealthalliance.org/2017/10/global-disease-hotspots-2-0>

Pioneer RESA Tech. (2017, November 3). *Digital Breakouts Using Google Sites and*

Forms. Youtube. <https://www.youtube.com/watch?v=SLPPHgXMwTE>

Quammen, D. (2020, March 28). David Quammen: How Animal-Borne Infections Spill Over to Humans. (S.

Simon, Interviewer) NPR. <https://www.npr.org/2020/03/28/823071230/david-quammen-how-animal-borne-infections-spill-over-to-humans>

Sandbox. (n.d.). Retrieved from Breakout EDU <DIGITAL>:

<https://sites.google.com/site/digitalbreakoutjb/sandbox>

Tolen, M., & Moura, K. (2020, October 28). *40+ FREE Digital Escape Rooms (Plus a Step by Step Guide for Creating Your Own)*. Retrieved from Ditch That Textbook: <https://ditchthattextbook.com/30-digital-escape-rooms-plus-tips-and-tools-for-creating-your-own/>