



The Gift of Life

Biology



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Grade Level	9th – 10th Grade	Time Frame	215
Subject	Science	Duration	4-5 Periods
Course	Biology		

Essential Question

What are the benefits and risks of organ donation? How does one determine if two people are a match?

Summary

It is recommended that this lesson be taught after students learn the basics of genetics concerning alleles, dominant versus recessive genes, basic Punnett squares, and protein synthesis. In this lesson, students apply what they have learned about genetics to a real-world scenario, centering on codominance as an exception to the rules of heredity. This lesson focuses on the process it takes to receive an organ donation and how to determine and match blood types appropriately. This is a multimodality lesson, which means it includes face-to-face, online, and hybrid versions of the lesson. The attachments also include a downloadable Common Cartridge file, which can be imported into a Learning Management System (LMS) such as Canvas or eKadence. The cartridge includes interactive student activities and teacher's notes.

Snapshot

Engage

Students reflect on what they already know about organ donations. Students watch a video about an organ recipient and their donor.

Explore

Students analyze truths and myths about being an organ donor.

Explain

Students watch a video on how to determine or predict an individual's blood type, then explore Punnett squares in an interactive blood typing game.

Extend

Students watch one career exploration video in which a panel of individuals from LifeShare, an Oklahoma transplant center team, discuss their careers. Students work together using the S-I-T strategy to summarize the video.

Evaluate

Students explore data of organ donations and create a flyer that shows what they've learned.

Standards

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

IOD: Interpretation of Data

IOD202: Identify basic features of a table, graph, or diagram (e.g., units of measurement)

IOD304: Determine how the values of variables change as the value of another variable changes in a simple data presentation

EMI: Evaluation of Models, Inferences, and Experimental Results

EMI401: Determine which simple hypothesis, prediction, or conclusion is, or is not, consistent with a data presentation, model, or piece of information in text

Oklahoma Academic Standards (Biology)

B.LS3.1 : Ask questions to clarify relationships about the role of DNA and chromosomes in coding the instructions for characteristic traits passed from parents to offspring.

B.LS3.1.4: The instructions for forming species' characteristics are carried in DNA. All cells in an organism have the same genetic content, but the genes used (expressed) by the cell may be regulated in different ways.

B.LS3.3 : Apply concepts of statistics and probability to explain the variation and distribution of expressed traits in a population.

Attachments

- [A Match Made in DNA — The Gift of Life.docx](#)
- [Canvas Cartridge — The Gift of Life.zip](#)
- [Justified True or False — The Gift of Life.docx](#)
- [Justified True or False — The Gift of Life.pdf](#)
- [Justified True or False—The Gift of Life - Spanish .docx](#)
- [Justified True or False—The Gift of Life - Spanish .pdf](#)
- [Lesson Slides — The Gift of Life.pptx](#)
- [LifeShare SIT Handout—The Gift of Life - Spanish.docx](#)
- [LifeShare SIT Handout—The Gift of Life - Spanish.pdf](#)
- [LifeShare SIT — The Gift of Life.docx](#)
- [LifeShare SIT — The Gift of Life.pdf](#)
- [My Little Kidney Video Questions—The Gift of Life - Spanish.docx](#)
- [My Little Kidney Video Questions—The Gift of Life - Spanish.pdf](#)
- [My Little Kidney — The Gift of Life.docx](#)
- [My Little Kidney — The Gift of Life.pdf](#)
- [Organ Donation PSA — The Gift of Life.docx](#)
- [Organ Donation PSA — The Gift of Life.pdf](#)
- [Organ Donation PSA—The Gift of Life - Spanish.docx](#)
- [Organ Donation PSA—The Gift of Life - Spanish.pdf](#)
- [Say Something — The Gift of Life.docx](#)
- [Say Something — The Gift of Life.pdf](#)
- [Say Something—The Gift of Life - Spanish.docx](#)
- [Say Something—The Gift of Life - Spanish.pdf](#)
- [Stem Starters for Say Something—The Gift of Life - Spanish.docx](#)
- [Stem Starters for Say Something—The Gift of Life - Spanish.pdf](#)
- [Stem Starters — The Gift of Life.docx](#)
- [Stem Starters — The Gift of Life.pdf](#)
- [The Blood Connection Questionnaire \(online\) — The Gift of Life \(3\).pptx](#)
- [The Blood Connection Questionnaire Slides \(Online\)—The Gift of Life - Spanish.pptx](#)
- [The Blood Connection Questionnaire — The Gift of Life.docx](#)
- [The Blood Connection Questionnaire — The Gift of Life.pdf](#)
- [The Blood Connection Questionnaire—The Gift of Life - Spanish.docx](#)

- [The Blood Connection Questionnaire—The Gift of Life - Spanish.pdf](#)
- [Teacher's Guide_A Match Made in DNA — The Gift of Life.docx](#)
- [Teacher's Guide_A Match Made in DNA — The Gift of Life.pdf](#)

Materials

- Lesson Slides (attached)
- My Little Kidney Video Questions (attached; 1 half-sheet per student)
- Justified True or False Handout (attached; 1 per student)
- Say Something handout (attached; 1 per student)
- Stem Starters for Say Something handout (optional, attached; 1 per student or pair of students)
- The Blood Connection Questionnaire (attached; 1 per student)
- LifeShare S-I-T Handout (attached; 1 per student)
- Organ Donation Flyer Instructions and Rubric (attached; 1 per student)
- 9 x 12 Inch Mini Whiteboard (optional; 1 per student)
- Dry Erase Marker (optional; 1 per student)
- Whiteboard Eraser (optional; 1 per student)
- A Match Made in DNA Questionnaire, Online (optional; 1 per student)
- Sticky Notes
- Internet-enabled student devices

30 minutes

Engage

Optional Activity: Family Surveys

Before starting this lesson, consider having students interview five or more friends, family members, and/or school staff members with driver's licenses. Students should ask the following questions:

- Do you know your blood type?
 - Why or why isn't this important to know for you?
- Do you have your driver's license registered to show you are an organ donor?
 - Why or why not?

Introduce the lesson using the attached **Lesson Slides**. Display **slide 3** and read aloud the essential questions: *What are the benefits and risks to organ donations? How does one determine if two people are a match?*

Display **slide 4** and review the lesson objectives. Review these slides with students to the extent you feel necessary.

Go to **slide 5** and ask students to take out a piece of paper. Review the [Preflections](#) instructional strategy and invite students to write for two minutes everything they know about organ donations. Play the [two-minute](#) timer and instruct students to begin.

Call on students to share out their summaries.

Move to **slide 6** and pass out a copy of the attached **My Little Kidney—The Gift of Life Video Questions** to each student. Inform students that today they will watch a video about a recipient of an organ transplant and their donor.

Have students watch the video ["The Gift of Life—My Little Kidney."](#) Pause at the 4:07 mark for students to answer question 1 in the handout. Resume the video and have students finish watching the remainder of the video before answering question 2.

Teacher's Note: Share Out

Consider having students share out their thoughts concerning the video.

30 minutes

Explore

Teacher's Note: The True/False quiz is on the [LifeShare University](#) page. The questions are followed by the answers and their justification.

Display **slide 7**. Pass out a copy of the attached **Justified True or False** handout to each student. Invite students to use the [Justified True or False](#) strategy to complete the handout, recording whether they believe each statement is true or false with an explanation as to why. After students have written down their responses, divide the room into imaginary halves. Designate one side "true" and the other "false."

Move to **slide 8**. Invite students to move to the "true" or "false" side of the room based on their response regarding the presented statement. Have a few students from each side share out their justifications. Reveal that this statement is **false** according to [LifeShare University](#) (this page also contains answers and explanations for the other statements).

Display each statement on **slides 9-17** one at a time, repeating the procedure above.

Teacher's Note: Mini-Whiteboards

If time or space does not permit students to move around the classroom, consider having students stay in their seats to use mini-whiteboards, markers, and erasers instead. Have each student quickly write their justification—the first thought that comes to mind—on their mini-whiteboard. Have the class display their mini-whiteboards and call on students to share their reasoning.

Optional Activity: Survey Results

If your students completed the optional interview activity in the Engage, have students reflect on the results from their family, friends, and school staff. Engage students in a class discussion of the following questions:

- What myths discussed in the Justified True or False activity do you believe affected most people's decisions?
- Did you hear any of the myths discussed in your participants' responses?
- Did you believe any of the myths discussed?

60 minutes

Explain

Go to **slide 18**. Pass out a copy of the **Say Something** and **Blood Connection Questionnaire** handouts to each student. Invite students to use the [Say Something](#) strategy as they watch the video "[A Match Made in DNA](#)."

Move to **slide 19** and start the video.

As students watch, pause the video at the **1:05** mark. Have students use their Say Something handout to jot down a prediction, ask a question, clarify a source of confusion, comment on what's happening, or connect the video to something they already know. After students have jotted down their Say Something responses, call on students to share their responses.

Optional Facilitation: Stem Starters and Partner Discussion

Consider providing students with a copy of the attached **Stem Starters** handout to help initiate conversation.

You can also have students discuss what they wrote in their "Say Something" statement with a partner before choosing students to share out their responses.

Repeat this procedure three more times, pausing the video at the **3:08** mark, the **4:30** mark, and the **6:09** mark.

Optional Facilitation: DNA Questionnaire

For more scaffolding, you may also choose to pass out the attached **A Match Made in DNA Questionnaire (Online)** to guide students with specific questions as they watch. Students should answer question #1 at the 1:05 break, #2-3 at the 3:08 break, #4-5 at the 4:30 break, & #6 at the 6:09 break.

Optional Activity: Practicing Punnett Squares

Consider taking a brief opportunity to run through a few practice Punnett squares with students before moving to the next activity. You might have students practice on mini-whiteboards and hold them up to display their results.

After completing the video, go to **slide 20**. Invite students to play the [Blood Connection Game](#). Direct students to use their school device, like a Chromebook, to navigate to the website to play the game. Students should answer the questions throughout the game on their **Blood Connection Questionnaire** handout.

35 minutes

Extend

Teacher's Note: Career Exploration

The following activity adds a career exploration element to this lesson. This way, students can discover different types of organ transplants, eligibility requirements for transplants, and how they can help spread the word about organ donations.

Move to **slide 21**. Pass out a copy of the attached **LifeShare S-I-T** handout to each student. Before playing the video, ask students to consider the number of individuals it takes to make a transplant happen, the variety of jobs involved in the transplant process, the different types of donations that can occur, and how the donors and recipients are chosen. Inform students that they will learn about a professional who assists with organ donations on a daily basis. In particular, they will meet a person on the LifeShare, Oklahoma's Transplant Center Team.

Select or allow the students to vote on which profession they would like to learn about:

- **Slide 21:** [Community Outreach Coordinator](#) - Robin Morris
- **Slide 22:** [Organ recovery Coordinator](#) - Brittany Wineland
- **Slide 23:** [Surgery Recovery Coordinator](#) - Meagan Lenhart
- **Slide 24:** [Tissue Recovery Coordinator](#) - Tashira Bass

Explain to students that as they watch the selected video, they should complete the first row of the handout using the [S-I-T \(Surprising, Interesting, Troubling\)](#). In doing so, students should individually identify one surprising fact or idea, one interesting fact or idea, and one troubling fact or idea from the video.

Once each student has identified their S-I-T facts or ideas, sort students into groups of four. Review the [Chain Notes](#) instructional strategy with students on **slides 25** and **26**. Have them pass their papers clockwise. Each student should add to their group member's list one additional fact, comment, correction, or image to extend the ideas present.

Repeat this pass-and-add process until students get their original papers back. Have each group formulate and draft a group summary of the main lessons regarding organ donations based on the video. Call on one student from each group to share their group's summary.

Optional Facilitation: S-I-T Alternative

If time does not allow for students to pass their handouts around and discuss, consider having students identify three surprising facts or ideas, three interesting facts or ideas, and three troubling facts or ideas from the video.

After the video is completed, call on some students to share one of their responses from each section.

60 minutes

Evaluate

Display **slide 27**. Pass out a copy of the **Organ Donation PSA** handout to each student. Have students complete their [Preflections](#) by researching information on organ donation and creating a flyer to share with others through social media. The flyer should connect data they found with their knowledge of how organ matches are determined.

Optional Sources

You may consider sharing the [U.S. Government Information on Organ Donation and Transplantation](#) data collection as well as [LifeShare's: Transplant Donor Services of Oklahoma](#) website as resources for students to explore and collect data for their flyer.

Teacher's Note: Social Media

Students are not required to share their flyers via social media, but you may have them display their work around the school, especially during the week leading up to blood donations. If students do share their posts on social media, invite them to tag [LifeShare](#) in their posts.

- Facebook: @LifeShareOK
- Instagram: lifeshareok

Once students have finished their flyers, post or display each flyer around the classroom. Pass out sticky notes to each group. Move to **slide 28** and review the [Gallery Walk](#) instructional strategy with students. Explain to them that they will walk around the room observing their classmates' work. They should use the sticky notes to leave at least two comments or questions on each poster.

Optional Activity: Forensic Activities

Consider having students expand their knowledge and skills about DNA isolation and analysis within a forensic activities. By stepping into the role of a forensic scientist, students can isolate DNA, learn about DNA structure and replication, make comparisons, and draw conclusions using authentic investigative techniques. [Flinn Modeling, Inquiry and Analysis: DNA Structure - Lab Kit](#) and [DNA Isolation - Laboratory Kit](#) includes DNA activities that supports this type of analysis, along with additional activities that reinforce a range of core skills essential to forensic science.

Resources

- *DNA Isolation Laboratory kit for biology and life science*. (n.d.). https://www.flinnsci.com/dna-isolation---super-value-laboratory-kit/fb2065/?_gl=1*10s86dz*_up*MQ..&gclid=CjwKCAjw1tLOBhAMEiwAiPkRHmOj75BEiTeaKJ1usFJAj1zAYVBdeZZv0y7N5XDj7-q2lzsMiXD63hoCRTwQAvD_BwE&gbraid=0AAAAADgmlc863S1f-WEn69MnX5qWba8-K
- *DNA Structure and FLINN Modeling, Inquiry and Analysis kit for biology and life science*. (n.d.). https://www.flinnsci.com/flinn-modeling-inquiry-and-analysis-dna-structure---student-laboratory-kit/fb2202/?_gl=1*uz7s5w*_up*MQ..&gclid=CjwKCAjw1tLOBhAMEiwAiPkRHmOj75BEiTeaKJ1usFJAj1zAYVBdeZZv0y7N5XDj7-q2lzsMiXD63hoCRTwQAvD_BwE&gbraid=0AAAAADgmlc863S1f-WEn69MnX5qWba8-K
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