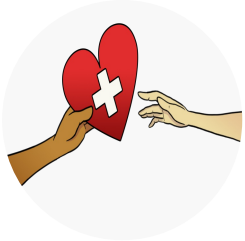

The Gift of Life

Biology

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Published by *K20 Center*

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

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 appropriately determine and match blood types. 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 an ICAP 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

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 Questionnaire (Online)—The Gift of Life - Spanish.docx
- A Match Made in DNA Questionnaire (Online)—The Gift of Life - Spanish.pdf
- A Match Made in DNA Questionnaire (Online)—The Gift of Life.docx
- A Match Made in DNA Questionnaire (Online)—The Gift of Life.pdf
- Common Cartridge—The Gift of Life.zip
- Justified True or False—The Gift of Life - Spanish.docx
- Justified True or False—The Gift of Life - Spanish.pdf
- Justified True or False—The Gift of Life.docx
- Justified True or False—The Gift of Life.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 Handout—The Gift of Life.docx
- LifeShare SIT Handout—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 Video Questions—The Gift of Life.docx
- My Little Kidney Video Questions—The Gift of Life.pdf
- Organ Donation Flyer Instructions and Rubric—The Gift of Life - Spanish.docx
- Organ Donation Flyer Instructions and Rubric—The Gift of Life - Spanish.pdf
- Organ Donation Flyer Instructions and Rubric—The Gift of Life.docx
- Organ Donation Flyer Instructions and Rubric—The Gift of Life.pdf
- Say Something—The Gift of Life - Spanish.docx
- Say Something—The Gift of Life - Spanish.pdf
- Say Something—The Gift of Life.docx
- Say Something—The Gift of Life.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 for Say Something—The Gift of Life.docx
- Stem Starters for Say Something—The Gift of Life.pdf
- The Blood Connection Questionnaire Slides (Online)—The Gift of Life - Spanish.pptx
- The Blood Connection Questionnaire Slides (Online)—The Gift of Life.pptx
- The Blood Connection Questionnaire—The Gift of Life - Spanish.docx
- The Blood Connection Questionnaire—The Gift of Life - Spanish.pdf
- The Blood Connection Questionnaire—The Gift of Life.docx
- The Blood Connection Questionnaire—The Gift of Life.pdf

Materials

- Common Cartridge (attached)

- 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)
- Internet-enabled student devices

30 minutes

Engage (Face to Face)

Optional: 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** to 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** to go over the lesson objectives. Review these slides with students to the extent you feel necessary.

Go to **slide 5**. Invite students to participate in the Preflections strategy. Have students take out a sheet of paper and write for two minutes everything they know about organ donations. Call on students to share out their summaries.

Move to **slide 6**. Pass out a copy of the attached **My Little Kidney 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 "My Little Kidney." Pause at the 4:17 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.

Embedded video

https://youtube.com/watch?v=I--dFKKI9Y0

Teacher's Note: Share Out

Consider having students share out their thoughts concerning the video.

30 minutes

Explore (Online)

Teacher's Note: Canvas Cartridge

Please note the downloadable Canvas cartridge for the online version of this lesson is not yet available.

In your learning management systems (LMS), create a discussion board and invite students to participate using the Justified True or False strategy. In the discussion board, provide students with the statements in the **Justified True or False** handout. Have students choose which statements they believe are true by selecting them with the "like" function (or an equivalent).

Next, in an online quiz format, have students answer the following questions:

1. Give your justification for one of the statements that you believed was true and one that you believed was false.
2. Review the correct answers to the statements from the true or false statements at LifeShare's Student Quiz website. 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 others' responses?
3. Ask at least five individuals with driver's licenses to answer the following questions: "*Do you know your blood type? Why or why not?*"
   Out of the five people you asked, how many know their blood type? Give a summary of why it is or is not important for them to know.
4. Out of the five individuals, how many of their driver's licenses show them as registered organ donors? Give a summary as to why or why not.
5. Based on how your peers voted in the discussion board and the comments from your friends or family, how do other people seem to view organ donation overall? Why?

50 minutes

Explain (Face to Face)

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.

Embedded video

https://youtube.com/watch?v=vuUsowsM188

Optional: Stem Starters and Partner Discussion

Consider providing students with a copy of the attached **Stem Starters for Say Something** 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: 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: 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**. Share the link to the game (bit.ly/k20bloodconnection) and have students play the game on a personal device such as a Chromebook. Students should answer the questions throughout the game on their **Blood Connection Questionnaire** handout.

40 minutes

Extend (Online)

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.

In your LMS, share the following with students:

> Today, we will learn about the professionals who assist with organ donations on a daily basis. We will meet LifeShare, Oklahoma's Transplant Center Team. As you watch the next video, consider the number of individuals it takes to make an organ transplant happen, the variety of jobs involved in the transplant process, the different types of donations, and how donors and recipients are chosen.

Invite students to watch the video "K20 ICAP - LifeShare of Oklahoma." Additionally, instruct students to use the S-I-T (Surprising, Interesting, Troubling) strategy as they watch. In doing so, students should create a discussion post that includes the following:

- One surprising fact or idea from the video
- One interesting fact or idea from the video
- One troubling fact or idea from the video

Embedded video

https://youtube.com/watch?v=MGHcyBdDJTk

Direct students to choose one of the three points made by a peer and give additional input to that fact or idea from the video. Students may respond through text or with an image.

Teacher's Note: Discussion Posts

To help students develop their own opinions and to allow for student discourse, it is recommended that you allow for threaded replies in your LMS's discussion board. It is also recommended that you set the discussion board to hide previous discussion posts prior to posting.

For information about facilitating an effective online discussion and a video for students to watch on discussion board etiquette, visit the following link: the K20 Center's best practices for facilitating online discussions.

Monitor the discussion board and feel free to add encouraging comments to students' posts.

60 minutes

Evaluate (Face to Face)

Display **slide 22**. Pass out a copy of the **Organ Donation Flyer Instructions and Rubric** to each student. Have students complete their Preflections by researching information on organ donation and creating a social media flyer to share with others through a Twitter, Instagram, or Facebook post. The flyer should connect data they found with their knowledge of how organ matches are determined.

Students who would like to create the assignment digitally but do not have a computer to do so while in school can plan and/or create their flyers on paper.

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.

- Twitter: @LifeShareOK
- Facebook: @LifeShareOK
- Instagram: lifeshareok

Once students have finished their flyers, post or display each flyer around the classroom. Guide students in a Gallery Walk to observe and comment on their classmates' work.

Resources

- ISTE Standards for Students. (2016). International Society for Technology in Education. https://www.iste.org/standards/for-students
- K20 Center. (n.d.). EdPuzzle. External Apps Tutorials. https://k20center.ou.edu/externalapps/edpuzzle/
- K20 Center. (n.d.). EdPuzzle. Tech Tools. https://learn.k20center.ou.edu/tech-tool/622
- K20 Center. (n.d.). Gallery walk. *Strategy*. https://learn.k20center.ou.edu/strategy/118
- K20 Center. (n.d.). Justified true or false. Strategy. https://learn.k20center.ou.edu/strategy/174.
- K20 Center. (n.d.). Online discussions. Pedagogy. https://k20center.ou.edu/pedagogy/online-discussions/
- K20 Center. (n.d.). Preflections. Strategy. https://learn.k20center.ou.edu/strategy/191
- K20 Center. (n.d.). Say something. Strategy. https://learn.k20center.ou.edu/strategy/778
- K20 Center. (n.d.). S-I-T (Surprising, Interesting, Troubling). Strategy https://learn.k20center.ou.edu/strategy/926
- K20 Center. (2021, June). *A Match Made in DNA* [video]. YouTube. https://youtu.be/vuUsowsM188
- K20 Center. (2021, November). *My Little Kidney* [video]. YouTube. https://youtu.be/I--dFKKI9Y0
- K20 Center. (2021, November). *K20 ICAP - LifeShare of Oklahoma* [video]. YouTube. https://youtu.be/MGHcyBdDJTk
- K20 Center. (n.d.). The gift of life - The blood connection. The K20 Center. https://k20center.ou.edu/h5p/the-gift-of-life/
- Lesson Plan #1. (n.d.). LifeShare transplant donor services of Oklahoma. https://www.lifeshareoklahoma.org/educator-resources-lesson-plan-1.html
- Organ Donation Statistics. (2021, April). U.S. Department of Health and Human Services. https://www.organdonor.gov/statistics-stories/statistics.html#glance
- Who We Are. (n.d.). LifeShare transplant donor services of Oklahoma. https://www.lifeshareoklahoma.org/