



# The Gift of Life

## Biology



Brittany Bowens, Teresa Lansford  
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<b>Grade Level</b>	9th – 10th Grade	<b>Time Frame</b>	215
<b>Subject</b>	Science	<b>Duration</b>	4-5 Periods
<b>Course</b>	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

- Common Cartridge (attached)
- Justified True or False Handout (attached; 1 per student)
- The Blood Connection Questionnaire Slides (attached; 1 per student)
- Organ Donation PSA (attached; 1 per student)
- A Match Made in DNA Questionnaire (Online) (attached; 1 per student)
- Internet-enabled student devices

30 minutes

## Engage

Introduce the lesson by having students review the essential question: *What are the benefits and risks to organ donations? How does one determine if two people are a match?*

In your learning management systems (LMS), direct students to the discussion board and invite students to participate using the [Preflections](#) strategy. Instruct students to write a paragraph on everything they know about organ donations. Have students then respond to two of their classmates' posted paragraphs.

### Teacher's Note: Timing

For the above activity, give students a day to create their initial posts. You can wait until the following day to enable responses. If possible in your LMS, require students to create an initial post before they see their peer's posts. Monitor the discussion board and feel free to add encouraging comments to students' posts.

### Optional Facilitation: Conversation Support

Consider providing comments like the following to support students as they converse:

- "I like the connection you made with organ donations being connected to our genetics."
- "Interesting point! We certainly will be addressing your comment/question in this lesson."
- "Interesting point of view! Do you mind elaborating on what you mean by \_\_\_\_\_?"
- "Great thoughts! Why do you believe this to be true?"
- "Good post! Do you think it may be connected to our last unit? If so, how?"

Next, create a quiz for students in your LMS. During the quiz, have students watch the video ["The Gift of Life — My Little Kidney."](#) Have students pause at the 4:17 mark to answer the following open-ended quiz question:

- *What traits do you think the donor should have that would make them a match?*

Students should then finish the video and answer a second open-ended question:

- *After viewing the video, was your initial hypothesis about the donor correct? How do you know? What is the term for the physical characteristics you listed called?*

### Optional Modification: Quiz

[EdPuzzle](#) is an alternate platform for this activity. With EdPuzzle, you can embed the questions above into the video for students to answer. To use EdPuzzle, remove the quiz page and replace it with a standard page that includes instructions and a link to the EdPuzzle activity.

For instructions on how to prepare an activity, see the K20 Center's [EdPuzzle app tutorial](#).

30 minutes

## Explore

Using your LMS's discussion board format, invite students to participate in 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 Donation & Transplant Quiz](#) website. What myths discussed in the Justified True or False activity do you believe affected most people's decisions? Did you see 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

### Teacher's Note: Preparation

Before assigning this activity, view the attached **A Match Made in DNA Questionnaire (Online)**. Create an online quiz in your LMS and copy the questions and answers from the questionnaire into the quiz.

Create an additional page and upload a copy of the attached **The Blood Connection Questionnaire Slides**. Enable students to download these slides for editing. Alternatively, upload a "force copy" Google Drive link to the page.

Consider setting up the above sequence activity so that students complete the **A Match Made in DNA Questionnaire** before moving on to The Blood Connection. This can be done by setting a future date or leaving it unpublished until the following day. Provide students with due dates for each section.

Introduce students to the video "[A Match Made in DNA](#)." As students watch the video, have them answer the "A Match Made in DNA Questionnaire" quiz questions.

Next, invite learners to play [The Blood Connection](#). Distribute the link to the game (<https://bit.ly/k20bloodconnection>) in your LMS. As students complete the activity, have them complete the activities on the uploaded or linked **The Blood Connection Questionnaire Slides**.

40 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.

Direct students to review the following context provided within the Career Exploration Videos discussion thread in your LMS:

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 your chosen 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 one of the following career exploration videos over a profession they would like to learn about:

- [Community Outreach Coordinator](#) - Robin Morris
- [Organ recovery Coordinator](#) - Brittany Wineland
- [Surgery Recovery Coordinator](#) - Meagan Lenhart
- [Tissue Recovery Coordinator](#) - Tashira Bass

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

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

Attach the **Organ Donation Flyer Instructions and Rubric** in your LMS. Have students complete their [Preflections](#) by researching information on organ donation and creating a flyer to share with others through social media. Have students use [PosterMyWall](#) to create their flyer.

### 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 finish, have them display their flyers in your LMS's discussion board. Instruct students to complete a virtual [Gallery Walk](#) of their peers' flyers by responding to their peers' discussion posts with at least two questions or comments about their flyers.

### Possible Student Responses in Discussion Board

- The visual representation was eye-catching and drew readers to the statistics.
- The poster did a great job explaining the impact of not having enough organ donations.
- I like that you gave resources for others to learn more about this topic.

## 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](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](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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