



# ***LIVING PROOF: FACES OF RESEARCH***

**Teacher Resources**

**Funded by**



**Produced by**



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## ***Living Proof: Faces of Research***

# Introduction

This teacher resource kit is designed to provide suggestions for classroom use of the ***Living Proof: Faces of Research*** DVD. Lesson suggestions are provided and should be adapted to fit the specific course in which the DVD is used, the age of the students and the amount of time allocated for this instructional strategy.

Learning objectives may include:

- 1) Explore the medical research process, which includes animal research.
- 2) List four medical advances that were made by using animals in research.
- 3) Discuss “quality of life” issues in medical treatment.

## **Activities**

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### **Discussion Guide**

The discussion guide includes a set of questions to be used to discuss the DVD after it is shown to a group. Discussion questions are recommended for middle and high school students. The teacher should carefully review the questions and use only those questions he/she feels are audience appropriate.

### **Student Viewing Guide**

Option #1 – Provide students with a copy of the viewing guide prior to showing the DVD. Have them answer the first question and then find the answers to the remaining questions while watching the DVD.

Possible answers are provided in the teacher key.

Option #2 – Provide students with a copy of the viewing guide. Have students answer the first question and then read the rest of the questions to provide an idea of what they will be looking for during the DVD. Allow students to jot down notes during the DVD.

Once the DVD is completed, have students work in small groups to discuss and collaborate in answering the questions on the viewing guide.

Modification for Middle Grades – Select the first five questions only. Use Option #1, but pause the DVD and help students formulate an answer to the questions, giving them time to write down their responses.

### **Group Discussion – Teacher Notes**

This activity is designed to help students learn how to analyze new information that is presented to them. It is important for the teacher to keep the atmosphere of the discussion logical and based on factual information.

If students are honest, an interesting side discussion can be about how peers influence our beliefs. How did it feel to be in the group with the fewest students? How many went with their friends rather than examine and act on their own personal beliefs?

This activity is appropriate for middle grades and high school students.

### **Medical Research Essay**

This assignment can be used for extended learning or to challenge advanced students.

This assignment is designed to develop analytical thinking skills, writing skills and the use of technology.

If Internet access is not available, the teacher may want to delete that step and remove the resource requirements from the instructions and rubric.

### ***Living Proof* Web site**

This page provides suggestions for instructional activities that can supplement the ***Living Proof: Faces of Research*** DVD using the companion *Living Proof* Web site at [www.living-proof.us](http://www.living-proof.us).



## ***Living Proof: Faces of Research***

# **Discussion Guide**

***Discussion questions are recommended as follows:***

MS = Middle school

HS = High school

### **Introduction to the DVD**

The purpose of the DVD is to provide insights into the benefits of medical research. In the DVD, you will be introduced to four people who have benefited from advances in medical care made possible by animal research. You will also meet some of the scientists who are helping make these medical miracles happen.

### **Show the DVD**



### **Discussion Questions for after the DVD**

1. What did Ervin, Dennis, Ted and Daisy have in common? (HS and MS)

**Possible responses might include:**

- Their illnesses were sudden
- They all benefited from animal-based research
- They all are survivors

2. What did you learn about kidney transplants from the DVD? (HS and MS)

**Possible responses might include:**

- First transplant in 1954 between identical twins
- Came from years of transplanting organs in animal models
- Scientists are looking to create a herd of pigs whose organs can be transplanted in humans
- Most animal models used in transplant research are small animals such as rats and mice

3. Why do you think rats and mice are used in medical research? (MS)

**Answers will be all over the place and imaginative. Accept all answers, but reinforce those answers that are most accurate. If students say animals should not be used, ask them to explain their reasoning. Encourage them to be logically consistent – i.e., if they were gravely ill and needed a kidney transplant, would they agree to the transplant knowing the surgery was developed using animals?**

4. Dennis Rickman had acute leukemia that was diagnosed with a bone marrow biopsy. What is leukemia, and what is a bone marrow biopsy? (HS)

Some students will have prior learning that will help educate the rest of the students. What you are looking for is:

- LEUKEMIA – A “blood cancer” in which bone marrow makes too many immature white blood cells that don’t do the job of fighting infection like normal white blood cells.
- BONE MARROW BIOPSY – Using a needle to withdraw a sample of bone marrow and examine it under a microscope

Students should be able to reason out how leukemia is diagnosed, and that the problem stems from the bone marrow’s inability to create functioning white blood cells.

5. Dennis Rickman needed a bone marrow transplant to treat his leukemia. After a long search, a donor was found in Germany. What do you know about bone marrow transplants and becoming a registered donor? (HS)

The first place physicians look for a match is within the patient's immediate family. Regardless of race or ethnicity, each person has a unique tissue type inherited from his or her parents, which is why the chances of finding a match are best among family members. The chances of two siblings matching each other are one in four.

If no related donor can be found, the search for an unrelated donor begins. To help match patients and unrelated donors, the National Marrow Donor Program maintains a computerized registry that records the tissue type of potential volunteer donors. The computer crosschecks its records to see if there is a match for the patient. In 2006, the registry contained approximately 5.5 million potential donors and 40,000 cord blood units.

A person can register to become a marrow donor by applying with the National Marrow Donor Program and providing a blood sample. For more information, contact the American Red Cross or go to [www.marrow.org](http://www.marrow.org).

6. How did the use of animal models save the life of Ted Parrish? (HS and MS)

Possible responses might include:

- Ted had cardiac bypass surgery, the technique for which was developed in animal models.
- Future treatments for heart attacks may include introducing stem cells in the damaged heart tissue that could actually restore heart tissue, and animal models could be used to see if the stem cells will transform into cardiac cells.

7. How was Daisy Thorp’s quality of life improved after she was treated for cataracts and glaucoma?

Possible responses might include:

- She is able to read and garden.
- She can make her own bed again.
- Her improved eyesight has given her back the feeling of being in control of her life.



## *Living Proof: Faces of Research*

### Student Viewing Guide

*BEFORE viewing the DVD, answer this question:*

When you think about the use of laboratory animals in medical research, what's the first thing that comes to mind?

Watch the DVD *Living Proof: Faces of Research* and answer the following questions:

1. If a person needed a kidney transplant in 1950, would that have been possible? Why or why not?
2. Before the first human kidney transplant, how did doctors learn how to do kidney transplants?
3. What is the relationship between pigs and the development of organs for human transplantation?
4. What is a bone marrow transplant and why is this done?
5. How are animals used in the development of stem cells that can transform into cardiac cells?

6. What is the most effective way of studying eye diseases?
  
7. What does Dr. Muller-Borer tell us about the regulations governing animal research?
  
8. Is there any logic to the potential use of stem cells in treating degenerative diseases of the retina? \_\_\_\_\_ Why?
  
9. People in the DVD often talk about the quality of life? What does that mean, and what would you say about Ervin, Dennis, Ted and Daisy and their quality of life today?

*AFTER viewing the DVD, answer this question:*

Now that you have seen the DVD, **Living Proof: Faces of Research**, what comes to mind now when you think about the use of laboratory animals in medical research?



*Living Proof: Faces of Research*

# Teacher Key

## Student Viewing Guide

*BEFORE viewing the DVD, answer this question:*

When you think about the use of laboratory animals in medical research, what's the first thing that comes to mind?

Accept any answer.

Watch the DVD *Living Proof: Faces of Research* and answer the following questions:

1. If a person needed a kidney transplant in 1950, would that have been possible? Why or why not? **Most likely not possible. The first successful kidney transplant was in 1954.**
2. Before the first human kidney transplant, how did doctors learn how to do kidney transplants? **They worked for years transplanting organs in animal models.**
3. What is the relationship between pigs and the development of organs for human transplantation? **Current research is directed toward creating a herd of pigs that have both human complement regulatory proteins and that don't make the sugar (galactose) that the human immune system would normally attack.**
4. What is a bone marrow transplant and why is it done? **Removal of bone marrow from a donor and transplanting the bone marrow to a recipient for the purpose of creating a new immune system. (Students might also answer "to cure cancer" or "leukemia.")**

5. How are animals used in the development of stem cells that can transform into cardiac cells? **Stem cells are injected into animal hearts to see if they can integrate with the heart tissue.**
  
6. What is the most effective way of studying eye diseases? **The most effective way of studying eye diseases is to use animal models involving gene therapy or transgenic animals that have been created to have modified genes.**
  
7. What does Dr. Muller-Borer tell us about the regulations governing animal research? **She tells us that animal research is highly regulated and that much thought and planning go into the development of animal research protocols. She tells us that animal research protocols are reviewed by boards that must approve research before any animals can be purchased for research and before a research study can begin.**
  
8. Is there any logic to the potential use of stem cells in treating degenerative diseases of the retina? **Yes Why? Stem cells can grow into new tissue; therefore, it is possible they could be used to replace unhealthy cells in the retina.**
  
9. People in the DVD often talk about the quality of life? What does that mean, and what would you say about Ervin, Dennis, Ted and Daisy and their quality of life today? **The quality of life is the ability to live freely and actively, doing the things a person wants to do. We could say that Ervin, Ted, Dennis and Daisy have a good quality of life because they are able to do things like sing in the choir, mentor youth, build houses, conduct research, garden and read.**

*AFTER viewing the DVD, answer this question:*

Now that you have seen the DVD, **Living Proof: Faces of Research**, what comes to mind now when you think about the use of laboratory animals in medical research?

**Accept any answer. Encourage responses based on information provided in the video about the care and use of animals in research.**



## *Living Proof: Faces of Research*

### Group Discussion Activity – Teacher Notes

**Preparation:** Prior to beginning this activity, make three signs as follows:

- 1) Not important
- 2) Somewhat important
- 3) Very important

**Step #1** Tell students you are going to ask a question and they will answer by raising their hands. The question: How important is the use of animals in medical research? The three choice responses are:

- Not important
- Somewhat important
- Very important

Write down the number of students who selected each response.

**Step #2** Show the *Living Proof: Faces of Research* DVD.

**Step #3** Place the signs in three corners of the room, and ask students to go and stand under the sign that reflects their current feelings about the importance of animals in medical research.

**Step #4** Count the number of students in each group.

- Not important
- Somewhat important
- Very important

**Step #5** Give groups approximately 5-10 minutes with their groups to discuss why they identified with that response.

**Step #6** Have students return to their seats and debrief the activity as a large group by discussing responses to the following questions:

1. How many students changed their vote after seeing the DVD? Why was the DVD powerful in providing new information?
2. What is involved in medical research?
3. Would you say that animals in research help save human lives? Why?
4. Are you interested in research careers or careers working with research animals?
5. A number of students select the group their friends select rather than make an independent choice. Why is that?



## Medical Research Essay

In this assignment, you will be writing an essay that reflects your personal beliefs. The purpose of the essay is to help you learn to provide logical arguments to support your point of view on a particular issue.

**Topic:**

Would you use a medication or approve of a medical treatment to save your own life if you knew this medication or treatment had been tested on animals?

1. Begin by writing down all the arguments (reasons) you have that support your point of view.
2. Do a search on the Internet to collect factual information to support your position.
3. Write your paper.

**Resource**

**Requirements:** You may either print out the pages used from your Web search or take notes on note cards. The note cards must include the Web address of the site. You will need to turn in copies of all the printed Web pages you used, or note cards, when you turn in your essay.

**Paper**

**Requirements:** Your paper may be handwritten or word processed using a computer. Essays must be between 200 – 500 words, counting all words with three or more letters. If you use a computer, use 12 pt. font, double-spaced with 1" margins.

**Deadline:** The due date of this essay is \_\_\_\_\_.



## *Living Proof: Faces of Research*

### Medical Research Essay Rubric

Name \_\_\_\_\_ Date \_\_\_\_\_

Topic \_\_\_\_\_

Area	Points Possible	Points Awarded
<b>CONTENT</b>		
1. Introduction is attention getting.	5	
2. Introduction clearly establishes the topic and writer's position.	5	
3. Facts and data are used to support the position.	10	
4. Content of paper is interesting.	10	
5. Arguments are logical and easy to understand.	10	
6. Transitions are good with easy flow from one idea to the next.	5	
7. Conclusion summarizes the essay.	5	
<b>STRUCTURE</b>		
8. Grammar	10	
9. Spelling	10	
10. Neatness and legibility	10	
<b>FOLLOWED INSTRUCTIONS FOR:</b>		
<ul style="list-style-type: none"><li>• Resource Requirements</li><li>• Paper Requirements</li><li>• Due Date</li></ul>	20	
<b>TOTAL POINTS</b>	100	



## Instructional Strategies for Use with the *Living Proof* Web site

The following activities can be used as instructional strategies when incorporating the *Living Proof* Web site in science or health occupations instruction.

**OBJECTIVE:** Discuss medical research and give examples of how medical research contributes to advances in health care.

Activity	Instructions	Integrated Skills
<b>Web site Review</b>	<ol style="list-style-type: none"> <li>1. Have students visit the <i>Living Proof</i> Web site <a href="http://www.living-proof.us">www.living-proof.us</a> and read two (2) stories from the site.</li> <li>2. Have students write a comparison paper (one page in outline format) explaining how the stories were alike and how they were different.</li> </ol>	<ul style="list-style-type: none"> <li>• Technology</li> <li>• Reading</li> </ul>
<b>Interview</b>	<ol style="list-style-type: none"> <li>1. Have students become <i>Living Proof</i> reporters by interviewing adults age 55 and older.</li> <li>2. Teachers should help review the first draft of the interview and make suggestions for improvement/edits.</li> </ol>	<ul style="list-style-type: none"> <li>• Writing</li> <li>• Technology</li> </ul>
<b>Group Discussion</b>	<ol style="list-style-type: none"> <li>1. Divide students into work groups of 3-4 members per group.</li> <li>2. Present groups with the following questions:               <ul style="list-style-type: none"> <li>• Do the stories on the site justify the use of animals in medical research? How?</li> <li>• Did the stories you read give you a better understanding of medical research?</li> <li>• Would you consider a career in medical research? Why or why not?</li> </ul> </li> <li>3. Allow groups to share their conclusions.</li> </ol>	<ul style="list-style-type: none"> <li>• Critical Thinking</li> </ul>