

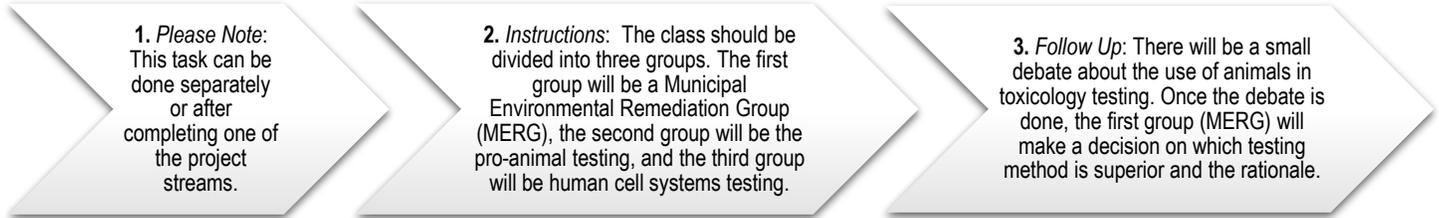


Purpose: To introduce to students some of the moral and ethical issues surrounding the use of animals in Toxicology research.

Timeline:
2 to 3 Days

Learning Goal 1 &
Learning Goal 5

Educator Instructions:



Debate Preparation (Day 1):

1. The class will be divided into 3 groups and be given information on their roles, assignment, and expectations. See below for further information. See the next page for the articles' bibliographical information.

Group 1: Municipal Environmental Remediation Group	Group 2 (Company A): Animal Testing Method	Group 3 (Company B): Human Cell Systems Testing Method
<p>Number of Students: 3 to 4</p> <p>Role: The municipal group was assigned to complete a toxicity levels study in a brownfield. One company conducts animal toxicity testing and the other conducts toxicity testing using human cell systems. The role of this group is to decide which method is the best to use.</p> <p>Assignment: Students will have two articles to read. They can divide into 2 smaller groups to read the articles.</p> <p>Students should make notes individually about the procedure, benefits, and disadvantages of the testing method. They should also think of questions they may want to ask.</p> <p>For students in Group 1, ensure that as a group, they have no personal bias, they are impartial as well as objective towards their decision on which testing method to use.</p>	<p>Number of Students: 7 to 10 Students</p> <p>Role: This is the group that will present the animal testing method to Group 1. The goal is to convince Group 1 that their testing method is the best to use.</p> <p>The group is free to choose any presentation method.</p> <p>Assignment: Students will present the specific testing method. Divide yourselves into 3 or 4 smaller groups to work on specific parts of the assignment. Here is a breakdown:</p> <ul style="list-style-type: none"> ❖ 2-3 People: Introduce testing method and have 3-5 key facts. ❖ 2-3 People: Explain the procedures and benefits of the testing method. Describe how this method is superior. ❖ 2-3 People: Read the other article and make notes. Explain how your method would be better. ❖ 1 Person: Conclude with a small proposal of what will be done 	<p>Number of Students: 7 to 10 Students</p> <p>Role: This is the group that will present the in human cell systems testing method to Group 1. The goal is to convince Group 1 that their testing method is the best to use.</p> <p>The group is free to choose any presentation method.</p> <p>Assignment: Students will present the specific testing method. Divide yourselves into 3 or 4 smaller groups to work on specific parts of the assignment. Here is a breakdown:</p> <ul style="list-style-type: none"> ❖ 2-3 People: Introduce testing method and have 3-5 key facts. ❖ 2-3 People: Explain the procedures and benefits of the testing method. Describe how this method is superior. ❖ 2-3 People: Read the other article and make notes. Explain how your method would be better. ❖ 1 Person: Conclude with a small proposal of what will be done

Please note: Let students know that they cannot simply copy the content that they see. Ensure students base their notes on how they would interpret the information and only include what is required (see the lists in **bold** for each group above under the assignment section). If students are having trouble with notetaking or unsure how to proceed, provide further details.

To Read:

Animal Testing Method	Society of Toxicology. Animals in Research, The Importance of Animals in the Science of Toxicology. 1999.
Human Cell Systems Testing Method	Zurlo, Joanne. "No Animals Harmed: Toward a Paradigm Shift in Toxicity Testing." In Susan Gilbert, Gregory E. Kaebnick, and Thomas H. Murray, eds., Animal Research Ethics: Evolving Views and Practices, Hastings Center Special Report 42, no. 6 (2012).

Debate Preparation-Optional (Day 2):

If you need to, give students in their groups extra time to complete reading over the articles (Group 1) or extra time to prepare their presentations (Groups 2 and 3).

The Debate and Testing Method Selection (Day 2 or 3):

Group 1: Municipal Environmental Remediation Group	Group 2 (Company A): Animal Testing Method	Group 3 (Company B): Human Cell Systems Testing Method
<p><u>Assignment Instructions (Continued):</u></p> <p>a) Groups 2 and 3 will present their information. Each group should be given five to ten minutes. Ensure the students in that group make notes and think of questions to ask those groups.</p> <p>b) Once each presentation concludes, Group 1 should ask questions for clarification or further information.</p> <p>c) Once both presentations are done, Group 1 will review the findings and select which testing method should be used. They should be given 5 minutes to decide.</p> <p>d) A spokesperson will be chosen and present their findings along with the rationale.</p>	<p><u>Assignment Instructions (Continued):</u></p> <p>a) On the day of the debate, the group will be given five to ten minutes to present their findings.</p> <p>b) When the group is done presenting, Group 1 will ask further questions. Students should be ready to answer any further inquiries.</p>	<p><u>Assignment Instructions (Continued):</u></p> <p>a) On the day of the debate, the group will be given five to ten minutes to present their findings.</p> <p>b) When the group is done presenting, Group 1 will ask further questions. Students should be ready to answer any further inquiries.</p>

Once the decision is made, have Group 1 complete their notes and the final recommendation report.

Assessment and Evaluation: At the end, students will submit the following content below.

Group 1: Municipal Environmental Remediation Group	Group 2 (Company A): Animal Testing Method	Group 3 (Company B): Human Cell Systems Testing Method
<p><u>Individual/Group:</u></p> <ul style="list-style-type: none"> ❖ Notes on the specific Article including information on the procedure, benefits, and disadvantages of the test method ❖ Questions to ask about that Article ❖ Notes on each Presentation ❖ Questions to ask about the Presentation <p><u>Group:</u></p> <ul style="list-style-type: none"> ❖ Recommendation Report (up to 250 words) 	<p><u>Individual/Group:</u></p> <ul style="list-style-type: none"> ❖ Notes on the specific section and contributing content for the presentation ❖ Ability to answer questions about the procedure and process <p><u>Group:</u></p> <ul style="list-style-type: none"> ❖ Presentation of the Testing Method 	<p><u>Individual/Group:</u></p> <ul style="list-style-type: none"> ❖ Notes on the specific section and contributing content for the presentation ❖ Ability to answer questions about the procedure and process <p><u>Group:</u></p> <ul style="list-style-type: none"> ❖ Presentation of the Testing Method



Environmental Toxicology is a profession where testing and monitoring are essential to understand the effects of various substances in the environment as well as to our health. Despite many advances in the way we test substances such as the development of 'in vitro' and computational models, these efforts have not changed the predominant role that animals have in Toxicology research. The class will be divided into groups to undertake a debate about toxicity testing in animals and human cells. Each group will present their findings to a Municipal Environmental Remediation Group that will decide which testing method should be used.

Instructions:

The class will be split into three groups noted below. Once you know which group you are assigned to, read the corresponding instructions, goals, expectations, and how you will be evaluated. Your educator will also explain any further instructions.

Group 1: Municipal Environmental Remediation Group	Group 2 (Company A): Animal Testing Method	Group 3 (Company): Human Cell Systems Testing Method
<p><u>Role:</u> Your group was assigned to complete a toxicity levels study in a brownfield. Two companies were contacted that specialize in toxicity testing (one performs animal toxicity testing, the other performs human cell systems testing). The role of your group is to decide which method would be the best to use.</p>	<p><u>Role:</u> As Company A, you are the group that will present the animal testing method to Group 1. Your goal is to convince Group 1 that your testing method is the best to use.</p>	<p><u>Role:</u> As Company B, you are the group that will present the in human cell systems testing method to Group 1. Your goal is to convince Group 1 that your testing method is the best to use.</p>
<p><u>Assignment:</u></p> <ol style="list-style-type: none"> There are two articles to read. Divide into 2 smaller groups. Each group reads one of the articles and make notes individually about the procedure, benefits, and disadvantages of the testing method. Think of questions you may want to ask. The other two groups will make presentations about their testing methods. Each group will be given five to ten minutes. Individually make notes on each presentation. Think of questions to may want to ask. Once each presentation concludes, your group will have the opportunity to ask questions for clarification or further information. Once both presentations are done, review the findings as a group and select which testing method should be used. A spokesperson will be chosen and present their findings along with the rationale. 	<p><u>Assignment:</u></p> <ol style="list-style-type: none"> Your group will present the specific testing method. Divide yourselves into 3 or 4 smaller groups to work on specific parts of the assignment. Decide on which sections to work on. Here is a breakdown: <ul style="list-style-type: none"> ❖ 2-3 People: Introduce testing method and have 3-5 key facts. ❖ 2-3 People: Explain the procedures and benefits of the testing method. Describe how this method is superior ❖ 2-3 People: Read the other article and make notes. Explain how your method would be better. ❖ 1 Person: Conclude with a small proposal of what will be done When you are ready to present (your teacher will provide you with further information), your group will be given five to ten minutes to present your findings. When you are done presenting, Group 1 will ask further questions. Be ready to answer these questions. 	<p><u>Assignment:</u></p> <ol style="list-style-type: none"> Your group will present the specific testing method. Divide yourselves into 3 or 4 smaller groups to work on specific parts of the assignment. Decide on which sections to work on. Here is a breakdown: <ul style="list-style-type: none"> ❖ 2-3 People: Introduce testing method and have 3-5 key facts. ❖ 2-3 People: Explain the procedures and benefits of the testing method. Describe how this method is superior ❖ 2-3 People: Read the other article and make notes. Explain how your method would be better. ❖ 1 Person: Conclude with a small proposal of what will be done When you are ready to present (your teacher will provide you with further information), your group will be given five to ten minutes to present your findings. When you are done presenting, Group 1 will ask further questions. Be ready to answer these questions.

To Read (provided by your Educator):

Animal Testing Method	Society of Toxicology. Animals in Research, The Importance of Animals in the Science of Toxicology. 1999.
Human Cell Systems Testing Method	Zurlo, Joanne. "No Animals Harmed: Toward a Paradigm Shift in Toxicity Testing." In Susan Gilbert, Gregory E. Kaebnick, and Thomas H. Murray, eds., Animal Research Ethics: Evolving Views and Practices, Hastings Center Special Report 42, no. 6 (2012).

Assessment and Evaluation:

The following chart explains what you need to submit individually and as a group:

Group 1: Municipal Environmental Remediation Group	Group 2 (Company A): Animal Testing Method	Group 3 (Company): Human Cell Systems Testing Method
<u>Individual/Group:</u> <ul style="list-style-type: none"> ❖ Notes on the specific Article including information on the procedure, benefits, and disadvantages of the testing method ❖ Possible questions to ask about that Article ❖ Notes on each Presentation ❖ Possible questions to ask about the Presentation <u>Group:</u> <ul style="list-style-type: none"> ❖ Recommendation Report (up to 250 words) 	<u>Individual/Group:</u> <ul style="list-style-type: none"> ❖ Notes on the specific section and contributing content for the presentation ❖ Ability to answer questions about the procedure and process <u>Group:</u> <ul style="list-style-type: none"> ❖ Presentation of the Testing Method 	<u>Individual/Group:</u> <ul style="list-style-type: none"> ❖ Notes on the specific section and contributing content for the presentation ❖ Ability to answer questions about the procedure and process <u>Group:</u> <ul style="list-style-type: none"> ❖ Presentation of the Testing Method

Further Notes:

If you are part of **Group 1**, ensure that as a group, you free yourselves from any personal bias, be impartial as well as objective towards your decision on which testing method to use. Science is a discipline where data, evidence, and facts are essential to either prove or disprove any theory, hypothesis, testing, or concept.

For **Groups 2 and 3**, you are free to choose whatever presentation method you are most comfortable with. Let your educator know what your groups intends to do.

For all groups, when you are making notes, do not simply copy what you see. Make your notes based on how you interpret the information and only include what is required (see the **lists in bold** for each group in the previous page under the assignment section). If you are having trouble with notetaking or unsure how to proceed, talk with your classmates or your educator. Notetaking is an important skill that you will be able to use once you start your post-secondary education.



Name(s):	Group 1
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Animal Testing Method	Human Cell Systems Testing Method
Notes:	Notes:
Questions/Thoughts:	Questions/Thoughts:

Presentation Notes from Group 2 – **Animal Testing Method:**

Questions:

Presentation Notes from Group 3 – **Human Cell Systems Testing Method:**

Questions:

Selection:

Rationale:



Select Group 2 or Group 3

Article Title:

Article(s) Notes:

Introduction:

Procedures & Benefits:

Other Article Notes:

- Comparative notes
- How is your method better?

Proposal:

Extra Notes: