

FUTURELAB+

LIVING EARTH

*Community Empowerment:
Eradicating Disease*

Disease Impact

Developed in partnership with:
Discovery Education

In this Lesson Plan:

Print the **Teacher Section** → 

01 For Teachers	Page
Lesson Overview	1
Make Connections!	3
Pedagogical Framing	4
Slides	
Day 1	5-6
Day 2	7-8
Day 3	9-10
Day 4	11
Day 5	12-13
Day 6	14-15
National Standards	16

Print the **Student Section** → 

02 Student Resources	Page
Lab Report	
Part 1 Introduction	1-2
Part 2 Experimental Design	3
Part 3 Experimental Design	4-7
Part 4 Results	8
Part 5 Conclusion	9-11
Stages of Mitosis Capture Sheet	12-13
Connect, Extend, Challenge	14
Fighting Disease Research	15

Cover Image

Tuberculosis bacteria,
(illustration).

This document is separated into two sections, For Teachers [T] and Student Resources [S], which can be printed independently.

Select the appropriate printer icon above to print either section in its entirety.

Follow the tips below in the Range field of your Print panel to print single pages or page ranges:

Single Pages (use a comma): T3, T6

Page Range (use a hyphen): T3-T6

LIVING EARTH / COMMUNITY EMPOWERMENT—ERADICATING DISEASE

Disease Impact

DRIVING QUESTION

How can an effective outreach campaign educate and empower a community to help eradicate an infectious disease?

OVERVIEW

Disease has been the constant companion of human existence. While advances in sanitation, water filtration, and modern medicine have worked to relieve previously endemic illnesses, some are not so easily eradicated while other new bacteria and mutated viruses continue to spread. Advances toward a global society has allowed for improved trade, cultural expansion, and easy travel. However, it has also allowed pathogens to travel borders more easily as well. As the world works to combat these new contagions, one form of management is reducing transmission. By limiting the movement of these organisms, pandemic-type diseases can be prevented by keeping infection numbers low and localized. However, pathogens are a diverse subset of life, and with that comes a wide variety of potential sources of infection. Combatting their spread requires a wide range of biotechnology applications and healthcare professionals versed in the best forms of transmission prevention.

In this lesson, students create their second social media post or community outreach communication to help eradicate the

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ACTIVITY DURATION

Six days

ESSENTIAL QUESTIONS

How do you design an experiment around an experimental question?

How does the body maintain homeostasis?

How does the process of mitosis help maintain homeostasis in the body?

How does infectious disease disrupt the homeostasis of an infected person's body?

OBJECTIVES

Students will be able to:

Design and conduct an experiment in order to develop an understanding of homeostasis.

Learn about the process of mitosis and how it helps maintain homeostasis in the body.

Discover how their infectious disease disrupts the homeostasis of the body.

OVERVIEW *Continued*

disease from their focus community. The groups will create a post or content that communicates information about how the infectious disease affects an infected person's body and gives rise to the symptoms. Additionally, students will write the detailed scientific information regarding how the disease disrupts the homeostasis of an infected person's body in their Disease Education Report. In order to do this work, students will learn about homeostasis through designing and conducting a lab, and mitosis.

Through this reflection of our shared experience with COVID-19, students will launch their own Community Outreach Campaign. The purpose of their outreach is to help combat a specific infectious disease that impacts a defined community. To do



this, students will learn about different types of infectious diseases (viral, bacterial, and parasitic), identify a specific disease they want to focus on for their Community Outreach Program and identify a community impacted by their disease to focus on for their research.

STUDENT TASKS

<i>Day 1</i>	<i>Day 2</i>	<i>Day 3</i>	<i>Day 4</i>	<i>Day 5</i>	<i>Day 6</i>
Design and run a lab that is used to introduce the concept of homeostasis.	Explore the process of mitosis and how it helps the body maintain homeostasis.	Research how the cause of their disease disrupts the homeostasis of someone who has the disease and what the immune response is to fight the disease.	Continue to develop their Disease Education Report by completing the "Disease Impact on the Body" section.	Begin to develop the second post of their community outreach campaign. Work together in their Community Outreach Campaign role to develop a post to raise awareness around how the disease disrupts the homeostasis of an infected person's body.	Participate in a Gallery Walk and provide feedback on posts. Use feedback from the other students to revise and finalize their posts. Students add their post to their Disease Education Communication Posts.

MAKE CONNECTIONS!

How does this connect to the larger unit storyline?

This lesson focuses on eradicating diseases that impact human populations. In this lesson, students create their second post of their Community Outreach Campaign to help eradicate the infectious disease in their community.

How does this connect to careers?

Phlebotomists are responsible for drawing blood and collecting other samples for laboratory testing.

Medical technicians help nurses and physicians treat patients.

Nurses and **doctors** help run diagnostic tests and treat patients.

Research assistants help scientists discover new information and analyze scientific information.



How does this connect to our world?

Emerging infectious diseases are increasing, causing loss of life in animal and human populations. There are many factors that contribute to disease emergence, such as population growth, urbanization, hunting and pasture practices, deforestation, global warming, and global travel. These emerging diseases disrupt and impact our bodies and populations. In this lesson, students will reflect on their own experiences with COVID-19 in order to consider how infectious diseases can disrupt homeostasis and impact the body.

Pedagogical Framing

Instructional materials are designed to meet national education and industry standards to focus on in-demand skills needed across the full product development life cycle—from molecule to medicine—which will also expose students and educators to the breadth of education and career pathways across biotechnology.

Through this collection, educators are equipped with strategies to engage students from diverse racial, ethnic, and cultural groups, providing them with quality, equitable, and liberating educational experiences that validate and affirm student identity.

Units are designed to be problem-based and focus on workforce skill development to empower students with the knowledge and tools to be the change in reducing health disparities in communities.

SOCIAL-EMOTIONAL LEARNING

This lesson encourages students to practice self-management skills, while pursuing research into how disease disrupts homeostasis. They will practice social awareness and management skills to successfully understand how the infectious disease infects a person's body and gives rise to the symptoms, while appreciating and interacting positively with their diverse groups during the lesson. All students have been impacted by COVID-19, some students may have personal experiences with the infectious disease or community and will carry those experiences with them into sensitive discussions. They will be able to work together if they are able to cooperate, resist inappropriate social pressure, negotiate solutions to conflict, and seek help when needed.

CULTURALLY AND LINGUISTICALLY RESPONSIVE INSTRUCTION

Students reflect on their experiences with COVID-19 in their community in order to learn about homeostasis, the body's immune system, and mitosis. Students learn this content collaboratively through a variety of student-centered learning activities. Equitable practices allow students to safely discuss sensitive topics such as health disparities and questions involving specific communities, while centering students' learning in their personal experience.

ADVANCING INCLUSIVE RESEARCH

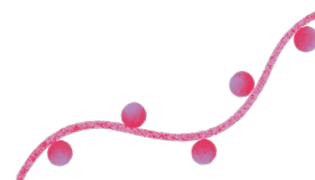
In this lesson, students learn that bodies react to diseases in different ways. For instance, COVID-19 affected people with pre-existing conditions such as asthma and diabetes more than individuals without those conditions. As treatments and therapies are created, it is important to test them on as diverse a group as possible in order to understand how they might interact with a patient's other pre-existing health conditions.

COMPUTATIONAL THINKING PRACTICES

Homeostasis is the tendency toward a relatively stable equilibrium between interdependent elements. A disease disrupts the homeostasis of an infected person's body. In this lesson, students will practice the computational thinking strategies of collecting and analyzing data, finding patterns, and making predictions by conducting an experiment in which they learn about homeostasis. They will use decomposition to learn about the strategies of mitosis and how it helps to maintain homeostasis in the body.

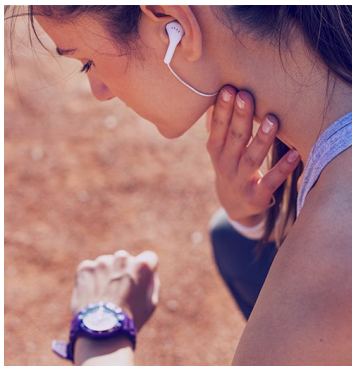
CONNECTION TO THE PRODUCT LIFE CYCLE

This lesson focuses on the Discover phase of the product life cycle, during which scientists conduct research in order to learn about a disease.



Day 1

Slides 1–6



As students design and perform the experiment, they are utilizing the computational thinking strategy of collecting data.

Slides 1–6

Introduce the concept of homeostasis through the lab. (35 minutes)

Teacher Note > *Do not use the term homeostasis during the lab. You will introduce that term after students have completed the lab. This lab is designed to help students develop their own meaning of the term prior to you introducing the vocabulary word and definition.*

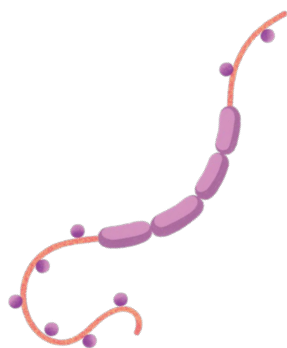
- 1 Have students record their resting heart rates.
- 2 Ask students to brainstorm a list of things that change in the body during exercise. As students share, make a list on the board. Make sure the list includes:
 - Body temperature
 - Breathing rate
 - Heart rate
- 3 Tell students to split these variables up in their group so that each person will focus on one for the lab.
- 4 Pass out all parts of the *Lab Report* capture sheet, one per group, and have students write their names “under the Main Investigator heading” next to the variable each student selected in Section 1a.
- 5 Now, tell the students they will design and perform an experiment to see how exercising affects each of those variables and to learn how changes in each of those variables connect to each other.
- 6 Have students write their experiment question in Section 1a.
- 7 Now, have students identify their experimental variables and write their hypothesis in Section 1b and 1c.
- 8 Now as a group, have students identify their controls and their procedure. To facilitate this conversation, have groups discuss the following prompt; In this experiment, you will each exercise over a period of time to see how it will affect the variable that you selected. Since you are each focusing on a different variable, you are going to compare your results with the results from the other students in your group to understand how your body reacts to exercise and how your variables are related to one another. In order to compare each other’s data, you will need to make sure you collect your data in a similar way. With your group, come up with a list of what you will need to do the same when you collect your data while you exercise.

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Day 1

Continued

Slides 1–8



-
- 9 When students are ready, have them share their lists. Make a list of these controls on the board as students share their ideas. Make sure these two controls are included:
- Exercise time
 - Type of exercise
-
- 10 Now have students Complete Sections 2a and 2b. When filling out Section 2b, tell students they need to make sure they include the items from their Materials list in the description as well as the control variables.
-
- 11 Inform students that they can begin to conduct their experiment as soon as they have shown you their Procedure in Section 2b.
-
- 12 When you confirm each group's Procedure, tell students they can begin to collect their data in Section 3a following the Procedural Steps they wrote. Have students each use a different color pencil or pen to record their data. Tell students they will use the same color to fill out their sections in the rest of the lab report.
-
- 13 Inform students they will need to complete the rest of their Lab Report capture sheet for homework.

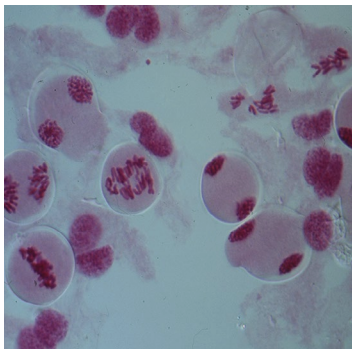
Slide 7–8

Have students share what they noticed about how the body reacted to the different variables.

-
- 1 Ask students why the rates went up from resting when they started to exercise and then went back down after exercise.
-
- 2 Tell students this is an example of homeostasis in our body. Ask students to write their own one-sentence definition of *homeostasis* based on the example in the lab. When ready, have students share with their groups and select one definition or develop one new definition using ideas from each person in the group. Have groups share their definitions with the class.
-
- 3 Now, give students the definition of homeostasis: the tendency toward a relatively stable equilibrium between interdependent elements, especially as maintained by physiological processes.
-
- 4 Discuss the following prompts with students:
- How is this similar to or different from your group's definition?
 - How is this idea of homeostasis connected to infectious diseases?

Day 2

Slides 9–12


**CULTURALLY AND LINGUISTICALLY
RESPONSIVE INSTRUCTION**

Students learn collaboratively through a variety of student-centered learning activities. Equitable practices allow students to safely discuss sensitive topics like health disparities and questions involving specific communities, while it centers students' learning in their personal experience.

Slides 9–11

Have students explore the stages of mitosis. (25 minutes)

- 1 Another way the body helps maintain homeostasis is through mitosis by creating new cells that are used for growth and repair.
- 2 Put students in groups of four. Assign a stage of mitosis to each student in the group.
- 3 Have students *watch the video of Mitosis* and use the review slides under the animation to investigate their stage of mitosis.
- 4 Each student will then meet with others who were also responsible for the same stage of mitosis. In these “same stage” groups, students compare their notes and solidify their understanding of the events of the stage.
- 5 Next, have students return to their original groups in order to explain their assigned stages of mitosis. Make sure everyone understands all the stages.
- 6 During this jigsaw presentation, students are using the *Stages of Mitosis* capture sheet to take notes about what happens at each stage based on what other group members said.
- 7 Review the Big Question at the end of the *Stages of Mitosis* capture sheet with the class.

Slide 12

Students learn about how our body fights diseases. (20 minutes)

- 1 How does our body fight diseases?
- 2 Give students this comic from the CDC: *Ask a Scientist: How Does My Body Fight Disease?*
- 3 Explain and model for students how to go through the reading protocol: *Connect, Extend, Challenge*. This protocol helps students to make connections between new ideas and prior knowledge, as well as recognize questions and reflect on learning.

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Day 2

Continued

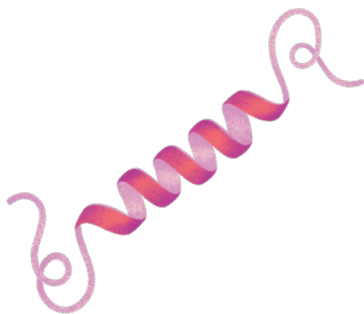
Slides 12–13

-
- 4 First, have students read the comic and complete individually in the *Connect, Extend, Challenge*, what connections they have to the article and what they have learned or knew about how the body fights disease, what in the comic has extended their thinking, something that they did not know before, and what questions, or challenges do they have about how their bodies fight disease.
-
- 5 Once you have given time for students to read and reflect individually, have students discuss in their disease groups one thing they connected with, and if anything that extended or broadened their thinking about how our bodies fight disease.
-
- 6 Then have a quick, whole-class discussion around the connections to what was previously learned, making sure to bring up how mitosis plays a role in repairing damaged cells, and proteins needed to fight disease.
-
- 7 Have students discuss what has extended their thinking, bringing up new concepts and vocabulary they learned from the reading.

Slide 13

Students reflect on questions, or things that challenge their thinking. (5 minutes)

-
- 1 As an Exit Ticket, have students write what questions or challenges they have about how their bodies fight disease. You should look this over to be able to address any themes or patterns you notice with the questions students have.



Day 3

Slides 14–19



Slides 14–17

Students learn about how our body fights COVID-19. (20 minutes)

- 1 Tell students: Since we are building on our knowledge of how our bodies try to maintain homeostasis, today we are going to look back at our entry event to see how our immune system responds to COVID-19.
- 2 Say: We will be watching a quick video on how our body battles COVID-19. The first time we watch the video, listen for:
 - What is the first response when the virus infects a person?
 - What is needed to maintain balance?
- 3 Play video: [How the Body Battles COVID-19](#)
- 4 Say: The second time we watch the video listen for:
 - What is a cytokine storm?
 - What happens if cytotoxic T cells get to organs they are not supposed to be in?“
- 5 Tell students: Read the article underneath the video. What was confirmed or clarified for you after watching the video twice and reading the article about how the body fights a COVID-19 infection? What can happen if our immune system does not stop fighting the disease?“

Slides 18–19

Students research how their disease elicits an immune response. (15 minutes)

- 1 Tell students: Disease by definition is a disruption in homeostasis, and we will now look at how the body fights your specific disease, eliciting an immune response.
- 2 Have students research how the body fights their disease, disrupting homeostasis using the [Fighting Disease Research](#) capture sheet. When students research, it may help to discuss what a reliable source looks like. Here are some sites to help students realize what is more reliable than others.
 - [Finding Reliable Sources: What is a Reliable Source?](#)
 - [Four Ways to Differentiate a Good Source from a Bad Source](#)

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COMPUTATIONAL THINKING IN ACTION

By learning how to identify reliable sources, students are practicing the computational thinking strategy of collecting data. Collecting data is a skill that involves identifying what you need to know and the best way to find it.

Day 3

Continued

Slides 19–20

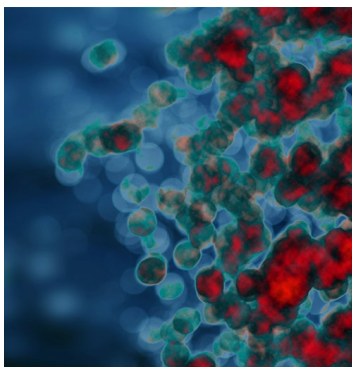
-
- 3 Possible sentence frames to help students find research:
- How does the body fight (insert disease name)?
 - What is the immune response for (insert disease name)?
 - What part of the immune system fights (insert disease name)?
 - What cells or proteins are involved in fighting (insert disease name)?
 - What are some of the symptoms that may be present as a result of the body fighting (insert disease name)?

Teacher Note > *Students may not find the answers to all of the questions, and may need assistance deciphering some of the more technical writing around this topic. Walk around as students are researching to ensure they are finding reliable information and understand the material they are researching.*

Slide 20

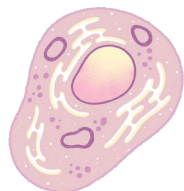
Students will reflect on what they have learned about how the body responds to infections. (10 minutes)

-
- 1 Tell students: Now that we have seen how the body fights your disease, let us take a few moments to visually capture what is happening in our bodies when we fight our infectious disease.
-
- 2 Have students draw out or diagram what they picture is happening in the body as it is fighting their disease. Have them label any specific cells or proteins that are involved in fighting the disease as well as the disease itself. Allow students to be creative with their drawings as this helps to reinforce the key concepts and connect big ideas.
-
- 3 As students are drawing, look for what they are drawing, how they are making connections, and note any misconceptions that may need to be addressed.



Day 4

Slides 21–23



Slides 21–23

Students further develop their Disease Education Report. (45 minutes)

- 1 Ask students to review the Disease Education Report and guess which section they can now fill in based on the information they have learned in this lesson.
- 2 Have students share their ideas. Make sure students understand that they are to fill out the following section:
 - **Disease Impact**
- 3 To write the Disease Impact section, tell students to use their notes to include the following information:
 - A description of homeostasis
 - An explanation of how the body maintains homeostasis
 - How our body's immune system reacts when we are infected with a disease
 - An explanation of how their specific disease impacts the body system and disrupts homeostasis
- 4 Tell students to select two of the ideas to communicate the information into this section of their report.
 - Charts and graphs
 - Infographics
 - Pictures and diagrams
 - Glossary of terms
- 5 When ready, let students use the rest of class to finish the section detailed above.

Day 5

Slides 24–27

Slides 24–26

Students review the different posts they can create for their Community Outreach Campaign. (5 minutes)

- 1 Students continue to message their community to raise awareness around the body system their disease disrupts.
- 2 Provide time for students to revisit the group copy of the **Community Communication Toolkit**.
- 3 Have students switch their group media roles and update it on the group copy of the **Community Communication Toolkit**. Provide time for students to take a look at their new roles.
- 4 Remind students that they should reference **Our Group Collaborative Contract** as they work in their groups.

Slide 27

Students have a role and as a group create their social media post or community outreach communication. (40 minutes)

- 1 Now that students have reviewed their job roles, groups will work on their second posts. The Group Manager facilitates this section. Teacher walks around the room to provide support to groups.
- 2 Encourage students to think about what they have learned about infectious diseases and social media since their last post and what improvements they can make to their first posts.
- 3 Social Media Manager says:
 - a. As we develop our next post, we need to keep in mind our community and target audience. We can refer back to our **Outreach Campaign Community Identification** capture sheet from Lesson 1.

Teacher Note > *Please remind students to continue Steps 4–6 from the capture sheet if they have not already finished all steps. These final steps are crucial to the message strategy, partnerships required, and launch of the Community Outreach Campaign.*

Day 5

Continued

Slide 27

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-
- b.** The focus for this post is to communicate to our audience, how the body system is disrupted by our disease.
-
- c.** Let us review the different social media posts or content in the group copy of the **Community Communication Template**.
-
- d.** As a group, we will determine the format for our next post.
-
- e.** We will use the information from our **Disease Education Report** to help us create our social media post or community communication.
-
- f.** We will have (insert amount of minutes) to work on our sections of the posts. Our posts should go on the slide (insert slide number) of the class copy of the **Disease Education Communication Posts**.
- Group members work on their sections of the social media post on the class copy of the **Disease Education Communication Posts**.
-
- g.** Students' second post should be completed on the class copy of the **Disease Education Communication Posts** for the *Gallery Walk* in the next lesson.

Day 6

Slides 28–31



Slides 28–31

Students conduct a *Gallery Walk* to obtain feedback of the class copy of the **Disease Education Communication Posts**.

Teacher Note > *This is a repeat of the previous Gallery Walk from the first post. However, there will be an additional layer to feedback. Review the Exit Ticket: Cheer, Challenge, Students conduct a Gallery Walk to gather feedback of Disease Education Communication Posts.*

- 1 **Prepare in advance:** To display posts on the wall: copies of posts, chart paper (3 sections labeled: Reactions, Feedback, Likes), markers.

Teacher Note > *The Feedback section should be separated into 3 sections and labeled T, A, G.*

A *Gallery Walk* is a critique protocol in which students get and give feedback to their peers in order to improve their work. Prior to the Gallery Walk, students should understand how to give and receive feedback. You may want to model this process by facilitating role-plays, providing sentence starters, or building in additional learning experiences to reinforce a positive culture.

- 2 Students display the content they created for their social media platform as if they are posting on the platform. These posts can be taped to the wall or displayed on a computer screen.
- 3 Students will be participating in a Gallery Walk to view social media posts. Let students know they will be posting and giving feedback as if they were commenting on social media.

Tell students there are three posts you can make:

- a. Give feedback to the group to help them revise and improve their posts.
 - There are three rules when giving feedback: Be kind, be specific, and be helpful.
 - In the first Gallery Walk students were able to provide open feedback. In this second Gallery Walk, students will be providing deeper feedback for groups to improve their work.
 - Students will use “TAG” to provide feedback.
 - T: Tell a compliment
 - A: Ask a question
 - G: Give something to work on

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Day 6

Continued

Slide 28–31

-
- b.** Provide reactions to posts for the information presented (e.g. OMG!)
-
- c.** Students can “like” a group’s post.
-
- 2 Posts taped to walls:
-
- a.** Groups visit the other groups’ posts.
-
- b.** On the chart paper, they can write feedback, provide reactions, and/or “like” a group’s post by drawing a heart.
-
- 3 Posts displayed on a computer screen:
-
- a.** Groups access the class copy of the **Disease Education Communication Posts**.
-
- b.** Students can give feedback in the notes section of the slide.
-
- c.** Using the infinite heart, drag and drop a heart on the slide to “like” a post.
-
- d.** Students can provide reactions to a group’s post.
-
- 4 In their groups, students review and discuss the feedback from their peers.
-
- 5 Students choose how to take and use the feedback provided. Groups then revise their post or communication using the feedback they received.
-
- 6 Exit Ticket: HashTAG Me Reflection

Teacher Note > *#UnderstandingTheHashtag. Hashtag is a way to connect social media content to a specific topic, event, theme, or conversation. It encourages social media users to explore content that catches their eye and can be used to reach their target audience.*

#BasicRulesofaHashtag

- Use “#” before a word or phrase.
- Do not use punctuation or spaces in a hashtag.
- Use letter and numbers, but not just numbers.
- Keep it brief.

Tell students to think about their social media target audience. How well do you think your group’s social media posts are reaching your audience? Using a sticky note, tell students to write a reflection using hashtags.

National Standards

Next Generation Science Standards

Science and Engineering Practices (SEP)

Practice 3 Planning and Carrying Out Investigations

Evaluate a solution to a complex real-world problem, based on scientific knowledge, student-generated sources of evidence, prioritized criteria, and tradeoff considerations.

Disciplinary Core Ideas (DCI)

LS1.A Structure and Function

Feedback mechanisms maintain a living system's internal conditions within certain limits and mediate behaviors, allowing it to remain alive and functional even as external conditions change within some range. Feedback mechanisms can encourage (through positive feedback) or discourage (negative feedback) what is going on inside the living system.

Crosscutting Concepts (CC)

Stability and Change

Feedback (negative or positive) can stabilize or destabilize a system. Analysis of costs and benefits is a critical aspect of decisions about technology.



FUTURELAB+

Lab Report, Part 1 Capture Sheet

Introduction

Directions

Complete each section as you design an experiment to find out how exercising affects the identified variables and how changes in each of the variables connect to each other.

1a Experiment Questions

Write the experiment question for each person in the group.

Variable	Main Investigator	Experiment Question
Body Temperature		
Breathing Rate		
Heart Rate		

1b Independent and Dependent Variable

Main Investigator	Independent Variable	Dependent Variable

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FUTURELAB+

Lab Report, Part 1 Capture Sheet

Introduction

Continued

1c Hypothesis

Main Investigator	Hypothesis

1d Constant Variables

What will each person need to do the same when they collect their data?

Constant Variables
1
2
3
4
5

FUTURELAB+

Lab Report, Part 2 Capture Sheet

Experimental Design

Directions

Complete each section as you design an experiment to find out how exercising affects the identified variables and how changes in each of the variables connect to each other.

2a Materials

Write the materials you will need for this experiment.

Materials

1

2

3

4

5

2b Procedure

Procedural Steps

1

2

3

4

5

6

7

8

FUTURELAB+

Lab Report, Part 3 Capture Sheet

Experimental Design

Directions

Complete each section as you perform an experiment to see how exercising affects the identified variables and how changes in each of the variables connect to each other.

3a Data Tables

	Body Temp C°	Heart Rate (beats/min) <i>Measure how many beats in 10 seconds and multiply by 6.</i>	Breathing Rate (breaths/min) <i>Measure how many breaths in 10 seconds and multiply by 6.</i>	
Rest				
2 minutes of exercise				
4 minutes of exercise				
6 minutes of exercise				
8 minutes of exercise				
1 minute AFTER stopping exercise				

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FUTURELAB+

Lab Report, Part 3 Capture Sheet

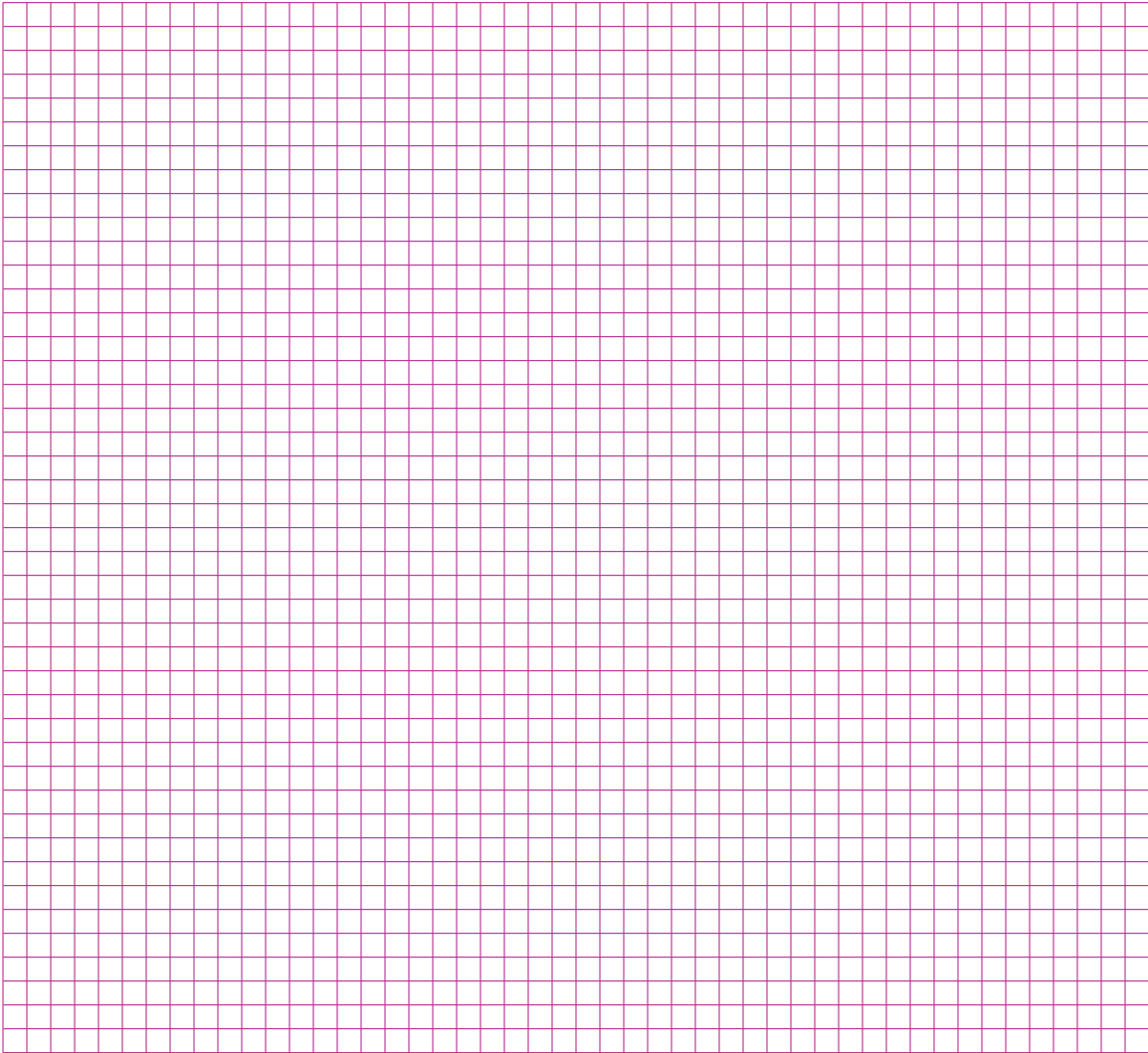
Experimental Design

Continued

3b Graphs

Graph 1: Body Temperature

Graph Title:



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FUTURELAB+

Lab Report, Part 3 Capture Sheet

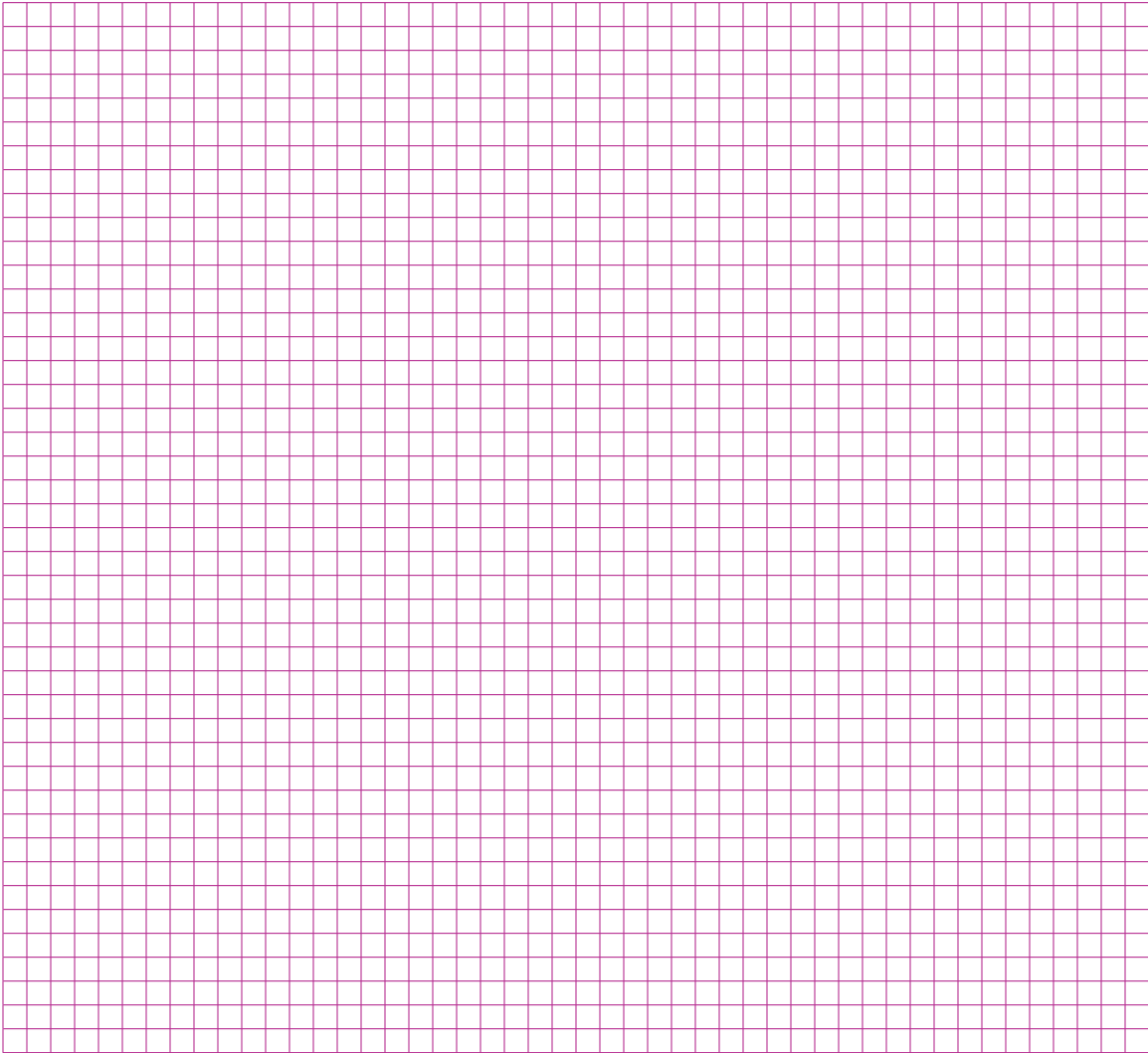
Experimental Design

Continued

3b Graphs

Graph 2: Heart Rate

Graph Title:



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Lab Report, Part 3 Capture Sheet

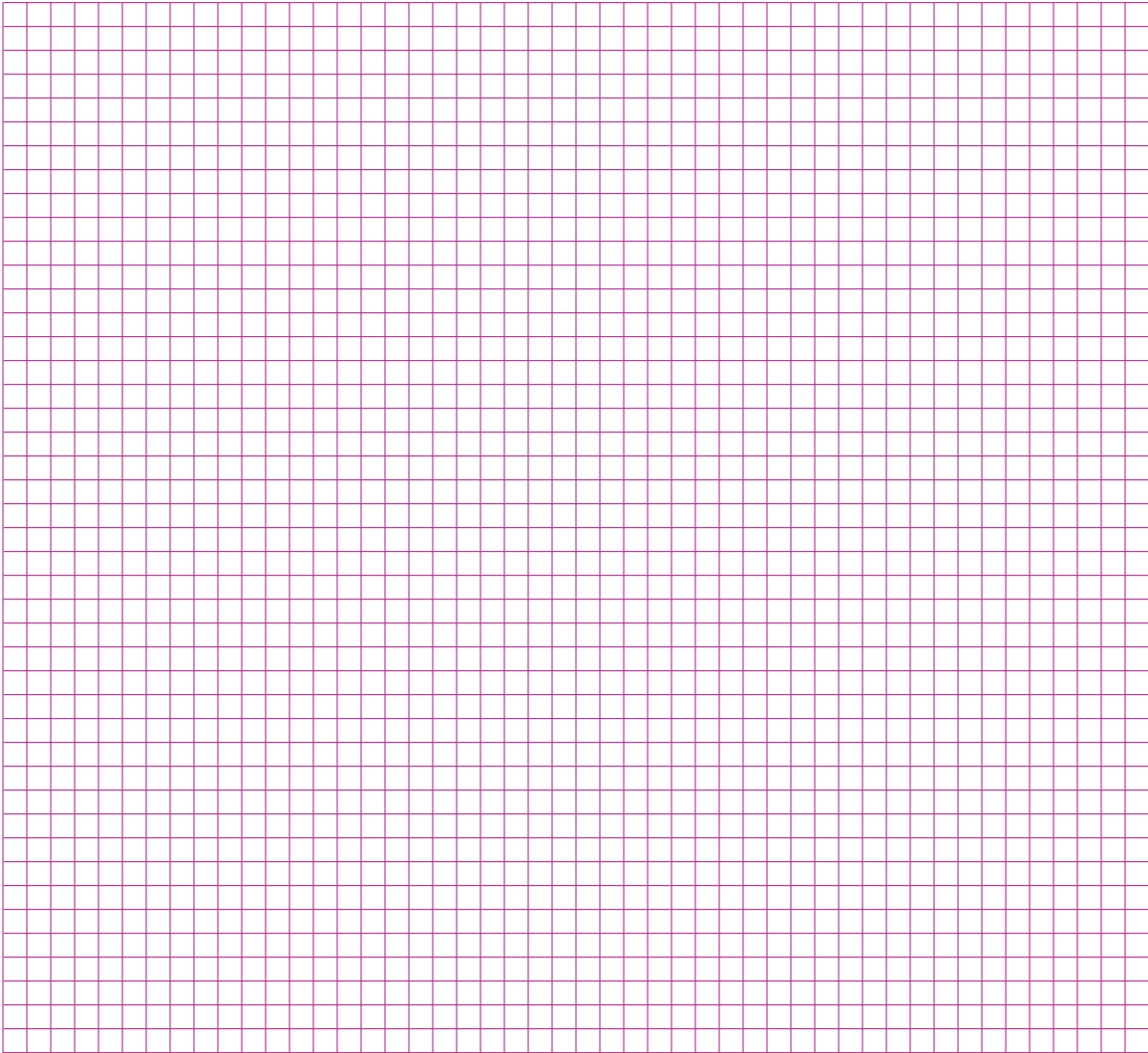
Experimental Design

Continued

3b Graphs

Graph 3: Breathing Rate

Graph Title:



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Lab Report, Part 4 Capture Sheet

Results

Directions

Complete the table to show the results of your experiment.

4a Experimental Results

Variable	Main Investigator	Explain how the various levels of exercise affect your variable.
Body Temperature		
Breathing Rate		
Heart Rate		

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FUTURELAB+

Lab Report, Part 5 Capture Sheet

Conclusion

Directions

Complete each section based on your findings, showing how exercising affects the identified variables and how changes in each of the variables connect to each other.

5a Experiment Conclusion: Body Temperature

Name of main investigator		
Explain how the data supports or does not support your hypothesis.		
How does body temperature work with heart rate and breathing rate to maintain a balance in your body?		
Now, critique your experiment. In your experiment, you controlled the amount of time you collected data and the type of experiment. What other variables did you not control that could make your data inaccurate? How did it affect your data?	Experimental Error	How did it change the data?
	1	
	2	
	3	
	4	
	5	
How would you revise the experiment so the experimental errors you listed above do not occur?		
Based on what you found out in this experiment, what is another question you could investigate by doing an experiment?		

Continues next page >

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Lab Report, Part 5 Capture Sheet

Conclusion

Continued

5b Experiment Conclusion: Breathing Rate

Name of main investigator		
Explain how the data supports or does not support your hypothesis.		
How does breathing rate work with heart rate and body temperature to maintain a balance in your body?		
Now, critique your experiment. In your experiment, you controlled the amount of time you collected data and the type of experiment. What other variables did you not control that could make your data inaccurate? How did it affect your data?	Experimental Error	How did it change the data?
	1	
	2	
	3	
	4	
5		
How would you revise the experiment so the experimental errors you listed above do not occur?		
Based on what you found out in this experiment, what is another question you could investigate by doing an experiment?		

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Lab Report, Part 5 Capture Sheet

Conclusion

Continued

5c Experiment Conclusion: Heart Rate

Name of main investigator		
Explain how the data supports or does not support your hypothesis.		
How does heart rate work with body temperature and breathing rate to maintain a balance in your body?		
Now, critique your experiment. In your experiment, you controlled the amount of time you collected data and the type of experiment. What other variables did you not control that could make your data inaccurate? How did it affect your data?	Experimental Error	How did it change the data?
	1	
	2	
	3	
	4	
5		
How would you revise the experiment so the experimental errors you listed above do not occur?		
Based on what you found out in this experiment, what is another question you could investigate by doing an experiment?		

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Stages of Mitosis Capture Sheet

Directions

Use the words in the Word Bank to describe what is happening at each stage of mitosis. Then answer the questions on the next page.

Word Bank

- Cell
- Centrioles
- Centrosomes
- Cytokinesis
- DNA
- Daughter cells
- Kinetochores
- Microtubule
- Nuclear membrane
- Nucleolus
- Nucleus
- Spindle Fiber/ apparatus
- Sister chromatids

Stage of Mitosis	Description
Prophase	
Prometaphase	
Metaphase	
Anaphase	
Telophase	

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Stages of Mitosis Capture Sheet

Continued

<p>1 What is mitosis?</p>	
<p>2 What is produced at the end of mitosis?</p>	
<p>3 Big Question Consider what you have learned about how your infectious disease impacts the body and protein synthesis. Why would the process of mitosis be helpful in maintaining the body's homeostasis?</p>	

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Connect, Extend, Challenge

Directions

Read the *CDC comic* and respond to each of the prompts.

Connect How are the ideas presented in this comic <i>connected</i> to what we have already learned or thought about how your body fights diseases?	Extend What new ideas did you get from the comic that <i>extended</i> your thinking about how your body fights diseases?	Challenge What questions or <i>challenges</i> do you have as you try to understand how our body fights disease?

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Fighting Disease Research Capture Sheet

Directions

Use the guiding questions to find out more about how the body fights your disease. Make note of where you found the information in the Sources column.

	What you discovered	Sources
What part of the immune system fights the disease?		
What is the immune response?		
What cells or proteins are involved in fighting your disease?		
What are some of the symptoms that may be present as a result of the body fighting the disease?		
How does the body fight your disease?		