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BIOMED

Crowdsourcing Innovations in Biotechnology

Infectious Diseases

Developed in partnership with:

Discovery Education and Ignited

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

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Cover Image
The image shows a cell that has been divided by mitosis.

BIOTECHNOLOGY / CROWDSOURCING INNOVATIONS IN BIOTECHNOLOGY

Infectious Diseases

DRIVING QUESTION

How does the body know the difference between an infectious and a chronic disease?

ACTIVITY DURATION

Four class sessions
(45 minutes each)

OVERVIEW

In the United States alone, 60 percent of adults have at least one chronic disease. Infectious diseases are often caused by microorganisms, such as bacteria or parasites. Viruses are also a main cause of infectious diseases, such as the flu and HIV. Chronic diseases can sometimes be due to lifestyle choices or personal wellness, such as poor nutrition, smoking, alcohol use, or lack of exercise. Some chronic diseases, such as Alzheimer's and cardiovascular disease, can be caused by genetics. The occupation of a Medical device engineer or Biomedical engineer, Science communicator, and an Epidemiologist will be featured in a few lessons. Biomedical engineers play a significant role in healthcare, helping build devices that assist doctors in diagnosing and treating certain diseases. Epidemiologists and Science communicators help inform the public about any health issues of which they should be made aware.

In this lesson, students will play the role of an Infectious disease scientist and create an infographic including information about a new imaginary infectious disease. Students will be assessed on whether or not the information in their infographic is relevant to healthcare workers' needs.

ESSENTIAL QUESTIONS

How are chronic or infectious diseases different—which causes more severe symptoms, which affects more people, and which causes sickness for longer periods of time?

What type of biomarkers are produced in the body when the body has been infected with viruses or bacteria?

What type of biomarkers are produced when the body has a chronic disease?

OBJECTIVES

Students will be able to:

Identify the causes of infectious diseases and list examples.

Identify the causes of chronic diseases and list examples.

Differentiate between infectious and chronic diseases, including identification of related biomarkers.

Apply knowledge of the differences between infectious and chronic diseases to determine the cause of illness.

BACKGROUND INFORMATION

Students will need to know about basic cell biology, such as the functions of certain organelles. This will assist them with understanding the various biomarkers used by scientists and doctors to help diagnose an illness. They will also need to discern cell hierarchy in order to understand the causes of certain illnesses. Students should be aware of common microorganisms, such as fungi, bacteria, parasites, and viruses to be able to better understand when an infectious disease occurs. Lastly, students should be somewhat familiar with the immune system and its responsibility for protecting the body from foreign invaders. More specifically, students should understand that the existence of certain white blood cells is an indication that the body has been infected by a certain type of microorganism, such as a virus versus a parasite. For example, eosinophils can attack parasites while neutrophils help destroy bacteria. Knowledge of the aforementioned topics will help students understand the connection between a certain disease and an identifying biomarker. Students should also know the difference between innate and adaptive immunity as well as the differences between antibodies and antigens.

Materials

- **Chart Paper**
- **Computers with internet access**
- **"Fight Germs: Wash Your Hands!" Video Questions**
- **Learn an Infectious Disease Capture Sheet**
- **Case Study Library**
- **Infectious Disease Infographic Assignment**
- **Infographic Rubric**
- **Markers**
- **Rulers**
- **Design Journal**

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

Students practice self-management by facilitating discussion on such topics as the lack of access to healthcare and certain treatments for groups disproportionately affected by chronic disease. Students may have had experiences involving family members or friends with certain diseases, so they must demonstrate empathy and respect for others in their interactions.

CULTURALLY AND LINGUISTICALLY RESPONSIVE INSTRUCTION

Culturally and linguistically responsive instruction provides space for students to participate in a language other than English. In this lesson, students create an infectious disease infographic in a language of their choice. This lesson also utilizes the random calling strategy "Pick A Stick" to ensure that all students are prepared to respond to a question.

ADVANCING INCLUSIVE RESEARCH

Certain infectious diseases are more common in specific locations around the world, which also relate to specific ethnicities. In this lesson, students examine how including more representative patient populations will enable us to evolve the promise of personalized healthcare.

COMPUTATIONAL THINKING PRACTICES

Computational thinking provides medical professionals with a series of strategies to use to solve problems. In this lesson, students learn how Epidemiologists use the computational thinking strategy of finding patterns to trace the spread of diseases. They also learn about how Bioengineers use abstraction to search for SNP sequences in DNA in order to identify genetic variations.

CONNECTION TO THE PRODUCT LIFE CYCLE

This lesson focuses on the **discovery** phase as students identify infectious and chronic diseases and identify important related biomarkers. As a result, students will be introduced to the overall product life cycle. They will be able to draw a connection between the biomarkers and possible products that could be developed to help diagnose or treat certain diseases. In addition, the **commercialization** of the product is included in the product life cycle. Communicating the use and efficacy of the product to the public plays an important role in whether or not the product will be successful.

Have you ever wondered…

How does the body know when it is not well?

The body is constantly trying to maintain homeostasis. The responsibility of the immune system is to protect the body from anything that does not naturally belong. Certain cells in the immune system produce specific proteins to help the body rid itself from the invader and get the body back to its normal levels.

How do doctors know if a person has been infected with a pathogen?

Various devices can be used and tests can be performed to determine the cause of sickness. Such devices include an EKG., which measures heart rate and rhythm, and a sphygmomanometer, which measures blood pressure. Additionally, tests such as urinalysis or blood tests can be used to compare present levels with normal levels to determine if there is an issue. Doctors also directly look for the pathogen by determining the presence of the pathogen's genetic material. This can be done by sequencing blood or sputum samples. Devices and tests such as these compare the levels currently present in a person's body with normal levels at homeostasis homeostasis.

MAKE CONNECTIONS!

How does this connect to the larger unit storyline?

A biomarker can be used to determine the health of an individual. If proper biomarkers could be established, a wearable device might be able to tell what type of illness one has.

How does this connect to careers?

Epidemiologists find the cause of a certain disease. They also determine individuals who would be at risk for the disease. In addition, they identify methods to control the spread of the disease and to prevent the disease from occurring.

Biological and Medical informatics workers interpret large sets of data to better inform scientists about aspects of the human body or disease. This data can be a result of computational models created by the informer, who ultimately helps collect and analyze data.

Science communicators help the public understand difficult science concepts. They are able to relate concepts in layman terms and help educate citizens on a certain area of science. As a result, people not directly involved in the particular science topic are able to make more informed decisions.

How does this connect to our world?

Utilizing digital devices in healthcare has many benefits, including efficiency. Time is a significant factor in healthcare; how soon a person is diagnosed often determines that person's trajectory to wellness. The creation and use of wearable digital devices require expertise from both scientists and engineers. Scientists will use their knowledge of biomarkers to help engineers create effective medical devices. Optimally, these devices will be used to detect infectious or chronic diseases at various stages. Ultimately, the increased use of devices could give clues to other aspects of healthcare, such as prevention that could lower the overall rate of these diseases.

Days 1–2

Procedure

LEARNING OUTCOMES

Students will be able to:

Explain how germs spread.

Identify the causes and provide examples of infectious diseases.

Whole Group (20 minutes)

1 Let students know that today they will be discussing infectious diseases. Use the participation protocol *Raise a Righteous Hand* to ask students if they can define what an infectious disease is. After two to three answers, let students know that an infectious disease is defined as "disease that is caused by organisms, such as bacteria, viruses, parasites, etc."

2 Place students into groups of three to four and provide each group with a large sheet of bulletin board or chart paper. Give students two minutes to brainstorm all of the types of diseases caused by organisms they know. The goal is for them to list at least ten. Invite students to also list diseases in their native or bilingual languages.

Teacher Note > *They may need to be given one to two examples of diseases caused by organisms. Some examples include the common cold, flu, STDs, or athlete's foot. Walk around the room and note the most common and uncommon diseases that are listed.*

3 Allow students to volunteer to read some of the examples that they brainstormed. Make a class list on the board. Have students add the diseases suggested by other groups that were not included on their lists.

4 Tell the students that they will now find patterns among each of the diseases listed on the board. On the same sheet of bulletin board or chart paper, instruct them to make boxes titled:

- Type of Microbe—Bacteria
- Type of Microbe—Virus
- Type of Microbe—Fungi
- Type of Microbe—Parasite
- Severity of Illness—Major
- Severity of Illness—Minor
- Most Common
- Rare
- How They Are Transmitted/Spread

5 After the activity, remind students that in today's lesson they will discuss infectious diseases. They will do this by first taking notes while watching a brief video, and then researching examples of infectious diseases in order to complete a chart.

6 Ensure that each student has a copy of the "*Fight Germs: Wash Your Hands!" Video Questions* to answer as they watch the CDC video: *Fight Germs. Wash Your Hands*!

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Days 1–2

Continued

Procedure

Individual (25 minutes)

1	Students will each research a different infectious disease and complete the *Learn an Infectious Disease* capture sheet including—the "who" an infectious disease can affect, the "what" particular part of the body the disease affects, the "why" the disease affects that person (written as prevention methods), the "how" the disease affects that person (including symptoms), the "when" or the age group the disease affects the most (if applicable), and the "where" the disease is most prominent.

COMPUTATIONAL THINKING IN ACTION

Here, students are using the computational thinking strategy of decomposition to explore patterns in infectious diseases.

Whole Group (10 minutes)

1	Share with students that a local hospital is enlisting their help in supporting new residents (doctors). They want to build a library of practice caseloads to help the residents determine diseases that are affecting some of their patients. Ultimately, this will assist doctors with being able to quickly identify a certain disease, which will improve the treatment outcomes. They want you to use your research and create a case study that scientists and doctors can use
2	Notify students that they will be playing the roles of both a scientist and a doctor to create a case study for a specific disease. All information will be included in a case study. Emphasize to students that doctors will utilize tests to determine the issue. Accordingly, biomarkers will be important to input into the case study.
3	Review the details of the *Case Study Library* assignment and rubric.

COMPUTATIONAL THINKING IN ACTION

In this activity, students are drawing connections between the computational thinking strategies of collecting data and analyzing data to improve treatment outcomes.

INDUSTRY AND CAREER CONNECTION

Emphasize to students that major soft skills needed for research are being detail-oriented, being organized, and having a good attention span. There will be a lot of reading involved while researching, so maintaining clear records is another important technical skill.

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Days 1–2

Continued

Procedure

Small Group (30 minutes)	
1	Divide students into groups of five in order to complete their research and write a case study.
2	Students will use the following two resources as examples of case study templates. Let them know that their case studies should include components similar to those in these case studies. Review examples of case studies: *TB Splenic Abscess Case Study* *A Case Study of Persistent Bloody Diarroeah*
3	After they have finished their research, have students write their case study into a collaborative software, such as Google Slides or Padlet. This will allow students to give feedback on the work of their peers and allow reflection on their work.
4	Students will need to be prepared to present their case studies at the end of class. They will have 1 minute to present each patient.
5	To complete this task, each team member should assume specific roles and responsibilities:

a. **Project Manager:** ensures everyone is completing his or her task within the allotted time frame and completes elements outlined in the rubric.

b. **Recorder:** records all information provided by the researcher

c. **Researcher:** researches the disease and shares information with the recorder

d. **Scientist:** creates the case study based on the results from the researcher

e. **Doctor:** presents information, gathered by the team, to the whole class

Teacher Note > *If computers are not available, in order to create a digital case study file, have students record each case study on a poster. After all groups are finished, they may conduct a gallery walk and provide feedback to their peers using sticky notes or a simple feedback form attached to each poster.*

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Days 1–2

Continued

Procedure

Whole Group (10 minutes)

1 Have the "doctor" of each group present the case study in one minute or less. As other groups are presenting, students will provide feedback on the case study being presented. Students will use the feedback protocol "TAG" to give written feedback to each group. Students can record their "TAG" using the notes (if Google Slides was the platform used) or comments (if the Padlet was used).

Students will share their feedback with their peers by—
T: Telling them something they liked
A: Ask a question
G: Give a suggestion

This will allow students to reflect on their work and improve based on peer feedback.

Teacher Note > *Having students participate in authentic role plays and scenarios is essential to inclusivity and empowerment. Remind students that they will be creating a wearable device at the end of the unit. Pose a question to consider: would their device be used to treat or diagnose an infectious disease?*

Days 3–4

LEARNING OUTCOMES

Students will be able to:

Discuss the responsibilities of an Epidemiologist.

Explain symptoms and modes of transmission for a new imaginary infectious disease.

Describe possible treatments and/or vaccinations for a new imaginary infectious disease.

Describe creative solutions for barriers or lack of access that individuals may face in the treatment of the new imaginary infectious disease.

Organize research and present technical content on an imaginary infectious disease.

Procedure

Whole Group (15 minutes)

1 Use the instructional strategy *Can You Guess My 2-1-4?* to introduce the career of Epidemiologist to students.

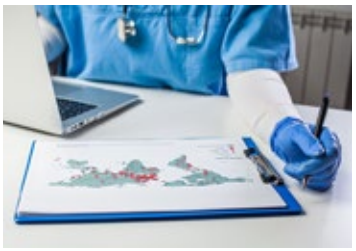
2 Tell students that they are going to make predictions about what they will be learning about next. Present the facts to students one at a time, allowing time between each fact for collaborative discussion about what they think the topic of study is. Have students cite evidence from the facts to support their predictions about the topic. Present the clue and ask students to refine their thinking based on new information. Allow additional time for discussion and evidence.

a. Example of *Can You Guess My 2-1-4*:

2 Facts:
1. This career field uses data to help save lives around our world every single day.
2. People in this career work in many settings, such as health departments, government, hospitals, and so much more.

1 Clue:
These scientists are often referred to as the “disease detectives.”

4 images:



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Days 3–4

Continued

Procedure

COMPUTATIONAL THINKING IN ACTION

Students learn about the career of epidemiology, which relies on the computational thinking strategy of finding patterns to identify, control, and prevent diseases. They also see how epidemiologists use the computational thinking strategies of collecting and analyzing data in order to give guidance to the medical community and to the public.

3	Share responses and reveal the topic to students.
4	Ask students if they know what an Epidemiologist does. Use the participation protocol *Pick-a-Stick* to choose a student to share his or her thoughts.

Teacher Note > *There are digital options for "Pick-a-Stick." Wheel-of-Names is an example of a digital tool that allows you to randomly choose a student and also ensure that all students have an opportunity to be chosen.*

5	Let students know a formal definition of an Epidemiologist: a scientist who is responsible for figuring out the causes of certain diseases and who would be at risk of getting the disease. In addition, Epidemiologists also figure out the best method to control the disease and/or prevent the occurrence of the disease.
6	Provide examples of how Epidemiologists help the public, doctors, and scientists. One example is providing information about infection rates, which helps inform hospitals concerning necessary resources to assist with patients. Epidemiologists also inform the public about ways in which they can stay safe and avoid getting sick. Information provided by Epidemiologists can help inform scientists on various research studies and lab experiments that should be performed.

COMPUTATIONAL THINKING IN ACTION

The computational thinking strategy of abstraction is demonstrated in the use of SNPs to identify genetic variations. Students use a tool called an infographic to share information. Infographics use the computational thinking strategy of abstraction to highlight the most essential data about a topic. This allows a viewer to easily analyze the data and draw conclusions.

Individual (15 minutes)

1	Share with students that they will play the role of an Epidemiologist or Science communicator and create an infographic to present information collected for a new imaginary infectious disease. Infographics are visual representations of information. These displays present information in quick and clear ways. Infographics include both text and images.
2	Let students know that this information should be relevant to healthcare worker needs. Remind them of the product life cycle and that this particular activity would involve communicating about the medical device used or created to diagnose the disease and the product used as treatment.

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Days 3–4

Continued

Procedure

COMPUTATIONAL THINKING IN ACTION

Magnetic Resonance Imaging (MRI) technology uses magnetic force and radio waves to build a visual model of the body. Positron Emission Tomographies (PETs) are scans that model how well organs and tissues are functioning. These are examples of how doctors use the computational thinking strategy of building models in their work.

3. Provide examples of tools or devices used to diagnose disease: genome-wide scanning (scanning an individual's entire genome to look for SNP, or single nucleotide polymorphisms which is when a single nucleotide is changed in a genetic sequence). This technique has been applied in Alzheimer's disease. SNPs are the most common genetic variation and are very useful in locating genes that correlate to certain diseases. Also make students aware of more structural biomarkers, such as a change in the volume of certain parts of a tissue or organ. Medical devices, such as MRIs and PET scans, help scientists identify these differences. This has been particularly important in identifying the differences between the brain of an aging individual and one of an Alzheimer's patient.

4. Review the information that will be included:

   a. Name of disease

   b. Cause (name of microorganism)

   c. Symptoms

   d. Mode of transmission

   e. Biomarkers

   f. Medical device or tool used to diagnosis the disease—can be a device or tool used or one created based on the disease

   g. One possible treatment

   h. At least one barrier or issue with a lack of access individuals may face in order to obtain treatment for disease

   i. Two creative solutions that would prevent the above barrier or lack of access

INDUSTRY AND CAREER CONNECTION

Students will have to demonstrate the soft skills of time management and motivating learning while creating their new imaginary infectious disease. Much like an academic researcher, this assignment will require good use of their time as well as being detail-oriented like a Medical science liaison. Students will need to make sure that their newly created infectious disease is unique, which may require attention to detail when conducting research.

5. Provide students with an example: *Infographic: Chagas Disease*. This infographic is available in English, Spanish, and Portuguese. Have students consider what other languages their infographic would need to be translated into, if they were creating it for community use.

Teacher Note > *Consider allowing students to create an infographic in another language. When students are allowed to validate and affirm their own language heritage, they continue to bridge the learning with their community and build shared connections to friends and family. Students should consider factors such as format, language, images, and how it is published and promoted to maximize accessibility and usage.*

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Days 3–4

Continued

Procedure

6	Students can use *Canva*, *Adobe Spark*, *PIKTOCHART*, or *Google Drawing*.
7	Invite students to use their **Design Journal** to capture how content learned in this lesson connects to the overarching problem we are investigating. Students should summarize how biomarkers can help identify or rule out infectious diseases. They can also help distinguish bacterial from non bacterial infections.

Teacher Note > *Let students know that because of the responsibilities and knowledge of an Epidemiologist, they are often placed in the role of being a Science communicator. In this unit, students have created products that could be shared in a virtual newsletter, discussed at a family night event, or displayed within the school building. The daily partnership and connection with the community is a huge part of Culturally and Linguistically Responsive Teaching.*

National Standards

Next Generation Science Standards	**LS3.B: Variation of Traits** Science and Engineering Practices Obtaining, evaluating, and communicating information Communicate scientific and/or technical information or ideas (e.g. about phenomena and/or the process of development and the design and performance of a proposed process or system) in multiple formats (i.e., orally, graphically, textually, mathematically).
Career and Technical Education (CTE)	**A5.2** Use a variety of methods, including literature searches in libraries, computer databases, and online for gathering background information, making observations, and collecting and organizing data.

"Fight Germs: Wash Your Hands!" Video Questions

ANSWER KEY **Do not share with students**

Directions
Watch the video "Fight Germs. Wash Your Hands!" from the CDC. Answer the following questions:

1. What does the "Glo-Gel" show?

The germs and chemicals that we get when we touch things throughout the day (toys, pets, etc)

2. How can the germs and chemicals get into our bodies and make us sick?

By rubbing eyes, nose, or mouth or picking up or touching to eat

3. How often do people touch their eyes, nose, or mouth (face)?

About 25 times per day

4. What are the five steps the CDC recommends to get rid of germs and chemicals?

Wet, Lather, Scrub, Rinse and Dry

5. How long should you scrub your hands (time and song)?

20 seconds or sing the *Happy Birthday* song twice

6. Why is washing hands so important?

Germs and chemicals from unwashed hands can get into foods and drinks when they are being prepared or when we eat or drink, which can make us sick. They can also be transferred to other objects (tabletops, toys, cell phones) and then can be transferred to other people's hands.

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Fight Germs: Wash Your Hands! **Video Questions**

Directions
Watch the video **Fight Germs. Wash Your Hands!** *from the CDC. Answer the following questions:*

1. What does the "Glo-Gel" show?

2. How can the germs and chemicals get into our bodies and make us sick?

3. How often do people touch their eyes, nose, or mouth (face)?

4. What are the five steps the CDC recommends to get rid of germs and chemicals?

5. How long should you scrub your hands (time and song)?

6. Why is washing hands so important?

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Learn an Infectious Disease Capture Sheet

Directions
Choose a disease from the list below, and then, complete the chart with the information you find. Be sure the sites are reputable. Here are a few examples:

California Department of Public Health
Mayo Clinic
National Foundation for Infectious Diseases

List of Diseases			
Malaria	Lyme Disease	West Nile Virus	Shingles
Giardiasis	Typhoid Fever	Salmonellosis	Tetanus
Plague	Rabies	Ringworm	Polio
Toxoplasmosis	Anthrax	Listeriosis	Measles
Coccidioidomycosis	Amebiasis	Meningitis	Hepatitis

Note > *You can also choose any other disease that is not listed. Be sure to get it approved by the teacher.*

Name of Disease	
Demographic/Age Group affected the most.	
Causes (specific name of microorganism)	
How is the person infected (mechanisms of entry into the body)?	
Common Symptoms	
How is it diagnosed (type of test and/or medical device used)?	
Biomarkers (specific proteins or enzymes that are expressed)	

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Case Study Library

A local hospital has enlisted help for their new residents. They want to build a library of caseloads to help the doctors practice determining diseases that are affecting some of their patients. Ultimately, this will assist the doctors with being able to quickly identify a certain disease, which will improve the treatment outcomes. They have provided case studies to assist with identifying the specific disease along with possible treatments. Additionally, they need help in identifying biomarkers that can possibly be used by a wearable device to help diagnose individuals and/or for prevention.

Directions
The hospital has called in a team of professionals to address the problem. Each student team must create a case study for a specific disease. The case studies will include the following:

1. Symptoms e.g (fever)
2. Brief medical history: a description of past medical state prior to this disease
3. Vitals: blood pressure, heart rate, and temperature
4. At least two biomarkers that would be presented specific to the disease
    a. could include a certain level or number of white blood cells
    b. could include an increase in the level of certain protein or enzymes (usually at normal levels)
5. Any other important information that may be necessary

Use the following examples:

Case Study: 10 year old male
Case Study: 22 year old female

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Case Study Library Rubric

Score	4	3	2	1
Components	The case study includes all of the components.	The case study includes most (75%) of the components.	The case study includes half of the components.	The case study includes less than half of the components.
Identification of biomarkers	The case study mentions at least two specific biomarkers associated with the disease.	The case study mentions at least two possible biomarkers associated with the disease, but they are not very specific.	The case study only mentions one possible biomarker associated with the disease.	The case study only mentions one possible biomarker, but it is not specific to the disease.
Engaging and Unique	The case study is interesting, including details and not a repeated example.	The case study is interesting, but does not provide many details and is not a repeated example.	The case study is not interesting and does not provide many details.	The case study is a repeated example.
Final Score				

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Infectious Disease Infographic Assignment

Infographics are visual representations of information. These displays present information in quick and clear ways. Infographics include both text and images. You will create an infographic to present information on a new imaginary infectious disease. A portion of the product lifecycle involves communicating information about the medical device used or created to diagnose the disease or the product used as treatment. In this case, the information you will be communicating should be relevant to healthcare worker needs.

Directions
The information should include:

1. Name of disease
2. Cause (name of microorganism)
3. Symptoms
4. Biomarkers
5. A model of the medical device or tool used to diagnose the disease—can be a device actually used or one created based on the disease that would gather important biomarker data. Include how the device would be used as a diagnostic tool and the rationale behind its use.
6. Possible treatments
7. Possible treatments
8. Prevention measures

An example of an infographic:
Infographic: Chagas Disease (EN, ES, PT)

A program such as Canva, Adobe Spark, PIKTOCHART, or Google Drawings

Reflection is an important part of student work. Include the following in the final project:

1. Two things you would have done differently.
2. What did you learn?
3. Which part of the project did you do your best work on and why?

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Infographic Rubric

Score	4	3	2	1
Components	All requirements are included in the infographic.	Infographic is missing one requirement.	Infographic is missing two requirements.	Infographic is missing more than two requirements.
Relevant to Healthcare Worker Needs	The information will help inform decisions made by healthcare workers.	Most of the information will help inform decisions made by healthcare workers.	A little of the information will help inform decisions made by healthcare workers.	None of the information will help inform decision made by healthcare workers.
Accuracy of infectious disease information	All of the information connects accurately.	Most of the information connects accurately.	Some of the information does not connect accurately.	Most of the information does not connect accurately.
Reflection	Student has included at least two things they would have done differently, something they learned, and which part of the project they did their best work on and why.	Student has included three of the following: two things they would have done differently, something they learned, which part of the project they did their best work on and why.	Student has included only two of the following: two things they would have done differently, something they learned, and which part of the project they did their best work on and why.	Student has included only one of the following: two things they would have done differently, something they learned, and which part of the project they did their best work on and why, or they did not complete the reflection.
Final Score				

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