

A microscopic image showing numerous green, spiky microorganisms, possibly ciliates or similar single-celled organisms, scattered across a textured, brownish-green surface. The organisms have a central body with many fine, radiating spines or cilia. Some have a distinct yellowish-green circular feature on their surface.

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AG/ENVIRONMENTAL

Community Science

PD 3: Stakeholders and Inclusion

Developed in partnership with:
Discovery Education and Ignited

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Technologist in white suit checking production in industrial factory.

Cover Image

Bacteria in a water sample is a potential source of environmental DNA (eDNA).

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

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AG/ENVIRONMENTAL / COMMUNITY SCIENCE

Proposal Development (PD) Lesson 3: Stakeholders and Inclusion

DRIVING QUESTION

How should the needs and concerns of stakeholders be taken into consideration during product development?

OVERVIEW

The relevance of stakeholders is universal. Stakeholder identification and inclusion help to ensure that the goals of the project are met while validating those directly and indirectly involved. Identifying and including stakeholders requires students to consider perspectives that may differ from their own, which in turn promotes empathy. The community focus of the unit provides an authentic experience for students to understand the value of stakeholders.

In this lesson, students will identify and analyze stakeholders for their project. To accomplish this, they will first complete a brainstorming session where they list possible stakeholders and then as a group explain their decisions. Students are then introduced to empathy and its role in stakeholder analysis. Next, they will complete an activity where they take a position about statements that will facilitate a discussion about stakeholders and their understanding of science and DNA. Each group will have time to think about how these statements pertain to their specific project. Finally they will complete a summative assessment for their final artifact.

ACTIVITY DURATION

Three class sessions
(45 minutes each)

ESSENTIAL QUESTIONS

What is a stakeholder and who are the essential stakeholders for our project?

What is a target market and how is it different from a stakeholder?

OBJECTIVES

Students will be able to:

Define “stakeholder” and explain why identifying stakeholders is important in project planning.

Analyze the needs of their stakeholders.

Identify the target market for their project.

Materials

Agree Signs

**Stakeholder Analysis Preparation
Capture Sheet**

**Stakeholder Analysis Inclusion
Grid Capture Sheet**

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 must use self-discipline and self-motivation to stay on task. In the lesson, students will use compassion and empathy when examining different perspectives. In reflecting on stakeholders and inclusion, they will need to show concern for the feelings of others and consider social norms used by different communities. Students will continue to reflect on their role in different communities and will begin to look at broader societal issues surrounding their proposal. They will also reflect on how past uses of DNA identification technologies have and have not been equitable. By reflecting on community needs, they will recognize how critical thinking skills are useful both inside and outside of school and reflect on their roles in promoting community well-being.

CULTURALLY AND LINGUISTICALLY RESPONSIVE INSTRUCTION

Throughout the lesson, students are encouraged to reflect on different perspectives within their community and how to include all stakeholders in decision making. Students will have the opportunity to recognize and redress possible bias in stakeholders' perspectives and share personal cultural perceptions from their own communities. In these varying perspectives, respect for differences will be stressed and incorporated.

ADVANCING INCLUSIVE RESEARCH

In this lesson, students are asked to identify various stakeholders to understand their perspectives and empathize with their needs. This will help ensure that the goals of their project are met while validating the values of those directly and indirectly involved. This lesson also invites students to investigate disparities in existing DNA databases. Students will be asked to consider how they can address this lack of inclusion in their project to begin to repair relationships that have been harmed in the past.

COMPUTATIONAL THINKING PRACTICES

Students collect data on stakeholders and identify relevant data and trends from the information collected. Students use that data to make decisions about their initial topic proposal and how to include more voices in their proposal.

CONNECTIONS TO THE PRODUCT LIFE CYCLE

In this lesson, students determine stakeholders who might be in favor of, opposed to, or somehow impacted by the development of their product. This connects to the **development** phase of the product life cycle because students are understanding the community and the potential impacts of their product.

Have you ever wondered...

Who gets to make decisions about when and where new technologies are used?

Not all technology is equally available. Issues of cost, access, awareness, and historical interactions with science and technology make new technologies, including DNA identification technology, more accessible to some communities than others. By reflecting on how different groups may be impacted by a technology, we can take steps to include more voices in decisions regarding the technology to assure that the risks and benefits of employing that technology are equitably distributed.



MAKE CONNECTIONS!

How does this connect to the larger unit storyline?

In this lesson, students identify stakeholders related to their overall proposal topic. They will identify their target audience and will reflect on how to make their final proposals more inclusive. The stakeholders and inclusion grid will be used to develop their final artifact addressing a community problem.

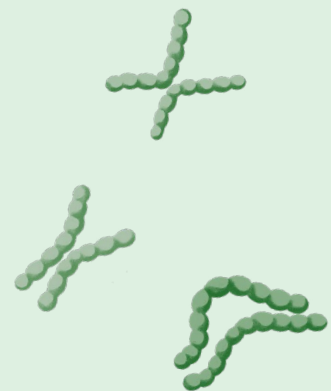
How does this connect to careers?

Market analysts employ a variety of strategies to collect data used to guide decision making at all stages of the product cycle. Market analysts may evaluate the overall market for a product, collect information on the success of a marketing campaign, analyze the success of competitors, and identify potential areas for expansion.

Community liaisons connect organizations and their clientele to improve communication and inform program direction. They might be involved with connecting families and students with services in a school system, completing customer followup to gauge satisfaction, product development, or engaging stakeholders in potentially controversial decisions.

How does this connect to our world?

Stakeholder identification is critical to any project and is central to project management. Students continue to apply their learning to develop a proposal directly connected to their own communities.



Day 1

Procedure

LEARNING OUTCOMES

Students will be able to:

Define “stakeholder” and **explain** why identifying stakeholders is important in project planning.

Identify stakeholders for their proposed project.

Analyze the needs of their stakeholders.



INDUSTRY AND CAREER CONNECTION

Remind students that community liaisons connect organizations and their clientele to improve communication and inform program direction. It is especially important for community liaisons to consider all stakeholder perspectives and engage them in conversations around potentially controversial decisions.

Whole Class (5 minutes)

- 1 Read a blanket definition of stakeholders like the one provided below. The Plants to Pharmaceuticals Unit also focused on stakeholders, so students may have some background in this. The goal is to keep this brief and just give enough background information to get students started. As they work through the lesson, they will continue to add and modify their group of stakeholders.

Individual, group, or organization who may affect, be affected by, or perceive itself to be affected by a decision, activity, or outcome of a project.

- 2 Write these questions on the board for students to refer to:
 - Who has interest in the project?
 - Who can benefit from the project?
 - Who can be adversely impacted by the project?
 - Who can impact the project?
 - Who has power or influence over key stakeholders?
 - Who controls the resources needed for the project?

Small Group (Project Group) (5 minutes)

- 1 Task students with identifying as many stakeholders in their project as possible. Each group member will need their own list. Remind them that stakeholders may be those who benefit from the project as well as those who are skeptical or may think the project is not necessary. Stakeholders can also be those who may not want the project at all.
- 2 Start the timer for four minutes and have students write down as many stakeholders as possible as quickly as possible. Remind them to be specific so others can know exactly to whom they're referring.

Small Group (12 minutes)

- 1 Next, have students find a partner who is not in their project group. Each pair will have five minutes per partner. For the first two minutes, one partner should briefly explain the purpose of their project. They will then have three minutes to work together to add or modify their list.
- 2 Repeat the process above with the other partner's project.

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Day 1

Continued

Procedure

Small Group (15 minutes)

- 1 Project group members will use their brainstormed lists from above to compile a main list on the [Stakeholder Analysis Preparation Capture Sheet](#). Each stakeholder should get a line on the grid. Remind students that this list is still a draft and they will continue to modify it. While students are working, walk around the room and encourage students to be as specific as possible about their stakeholders. Ask: *Who exactly may be interested in your project?* Also encourage students to look at those who may be skeptical of the project.
- 2 While compiling the list, students will need to discuss *why* that individual (or group) is a stakeholder. Students can modify the list as they compile their ideas.
- 3 Stress that students should include stakeholders who may be adversely impacted by their project.

Whole Group (8 minutes)

Teacher Note > *If students created physical maps of their communities in Project Development (PD) Lesson 2, the maps could be referred to here as a way to build empathy with the spaces and people around us.*

- 1 Ask students if they know what the word *empathy* means. This was a discussion in Lesson 9 of the Solution Seeking Microbes Unit, so students may have familiarity. As a class, devise a definition that could be explained to a second grader. Write that simple definition on the board. This will be important to refer to during the next day's learning.
- 2 Say to students, *During Day 3, when we begin to analyze our stakeholders, it will be important to have empathy.* Discuss why empathy is important for analyzing stakeholders.

Teacher Note > *Look at the stakeholder lists to ensure students are on the right track before Day 3.*

Day 2

Procedure

LEARNING OUTCOMES

Students will be able to:

Analyze the needs of their stakeholders by reflecting on general perspectives on DNA technologies.



Whole Group and Small Group (alternating) (45 minutes)

- 1 Place the *Agree Signs* in the four corners of the classroom: *Strongly Agree, Agree, Disagree, Strongly Disagree*.
- 2 Tell students to walk to the sign that represents their feelings or beliefs about each statement below. Then give students one or two minutes to talk to other students in their corner and discuss their position. Ask each group to share their position, if appropriate. Complete this process for the following statements:
 - *I think every adult knows what DNA is.*
 - *I think DNA identification technology is always beneficial.*
 - *I think people trust science and scientists.*
 - *I think people can change their mind if educated about a controversial topic.*
 - *I think DNA research is controversial.*
 - *I think people do not need to be educated on DNA identification.*
 - *I think I understand DNA completely.*
- 3 After each statement, have students find their groups and give them one minute to discuss how this statement should be considered for their project.

Teacher Note > *You can add statements that are relevant to the local community to help students connect with community issues.*

Day 3

Procedure

LEARNING OUTCOMES

Students will be able to:

Analyze the needs of their stakeholders.

Identify the target market for their project.



Whole Group (7 minutes)

- 1 Start the day with writing the term “target market” on the board. As students come into class, give them a sticky note. Have them write what they think of when they hear the term “target market” on their sticky note. Other lessons refer to the target audience, which would be appropriate too.
- 2 Use student ideas to write the following definition on the board: “A group of people identified as the focus of a marketing campaign.” You can read parts or whole notes that lead you to this definition.
- 3 Explain to students that there are whole careers that focus on marketing and determining a target market or target audience. This would be a good opportunity to do some exploration of the role of a [Market Research Analyst](#) from the United States Bureau of Labor Statistics if time allows.
- 4 Ask students to relate the terms *target market* and *stakeholder*. Make sure students understand the difference between a stakeholder and a target market. To clarify, a stakeholder is: “An individual, group, or organization who may affect, be affected by, or perceive itself to be affected by a decision, activity, or outcome of a project.” Based on this definition, the target market would likely include some stakeholders, but not all stakeholders are part of the target market.

Small Group (38 minutes)

- 1 Students will complete and turn in the [Stakeholder Analysis Inclusion Grid Capture Sheet](#). Tell students to use what they learned in the previous two days to integrate their understanding of stakeholders and empathy into their grid. This will be used to make decisions on how to implement and pitch their final plan.
- 2 After completing the grid, students should answer the summary questions at the end of the capture sheet. Explain that these questions will help students to plan the “tone” of their final project. The questions will guide them to meet the needs of their stakeholders to ensure the success of their project.
- 3 Collect the capture sheets to provide feedback. Students will include the finalized [Stakeholder Analysis Inclusion Grid Capture Sheet](#) in the Lesson 11 Final Artifact Portfolio of Supporting Evidence.

National Standards

Next Generation Science Standards

HS-ETS1-2 Engineering Design

Design a solution to a complex real-world problem by breaking it down into smaller, more manageable problems that can be solved through engineering.

Science and Engineering Practices

Obtaining, evaluating, and communicating information

Compare, integrate and evaluate sources of information presented in different media or formats (e.g., visually, quantitatively) as well as in words in order to address a scientific question or solve a problem.

Career and Technical Education (CTE)

A1.1

Use data to explain how biotechnology fields such as pharmaceuticals, agriculture, diagnostics, industrial products, instrumentation, and research and development are impacting human life.

A1.6

Explore and outline the various science and non-science fields and careers associated with biotechnology.

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.

Educator Resources

Agree Signs



Strongly
Agree

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Educator Resources

Agree Signs

Continued



Agree

Continues next page >

Educator Resources

Agree Signs

Continued



Disagree

Continues next page >

Educator Resources

Agree Signs

Continued



Strongly
Disagree

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Stakeholder Analysis Preparation Capture Sheet

Directions

Based on your brainstorming session, list the stakeholders in the grid below, then fill out why they are stakeholders. Try to be as descriptive as possible; knowing your audience is important to the success of your plan.

What is your proposal topic?

Who is a stakeholder for your project?	Why would this stakeholder be interested in (or skeptical of!) your project?

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Stakeholder Analysis Inclusion Grid Capture Sheet

Directions

Complete the tables to show your understanding of stakeholders that should and could be interested in your project. Take time to evaluate their point of view in developing a plan for inclusion. Complete the summary questions that follow.

A Stakeholder Name

1	Interest What are their concerns?	
2	Influence Do they have power over the project?	
3	Inclusion Opportunities How can you include the stakeholder in the project?	
4	Special Considerations	

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Stakeholder Analysis Inclusion Grid Capture Sheet

Continued

B Stakeholder Name

1	Interest What are their concerns?	
2	Influence Do they have power over the project?	
3	Inclusion Opportunities How can you include the stakeholder in the project?	
4	Special Considerations	

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Stakeholder Analysis Inclusion Grid Capture Sheet

Continued

C Stakeholder Name	
1	<div>Interest</div> <div>What are their concerns?</div>
2	<div>Influence</div> <div>Do they have power over the project?</div>
3	<div>Inclusion Opportunities</div> <div>How can you include the stakeholder in the project?</div>
4	<div>Special Considerations</div>

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Stakeholder Analysis Inclusion Grid Capture Sheet

Continued

D Stakeholder Name	
1	<div>Interest</div> <div>What are their concerns?</div>
2	<div>Influence</div> <div>Do they have power over the project?</div>
3	<div>Inclusion Opportunities</div> <div>How can you include the stakeholder in the project?</div>
4	<div>Special Considerations</div>

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Continued

- [illegible]

6

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4. What topics or concepts do you need to include in your project presentation to educate potential stakeholders? (Example: DNA collection from the site will not disrupt the habitat.)