FUTURELAB+

LIVING EARTH

*Community Empowerment:
Eradicating Disease*

Community Empowerment

In this Lesson Plan:

Print the **Teacher Section** → 🖨

Print the **Student Section** → 🖨

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.

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LIVING EARTH / COMMUNITY EMPOWERMENT—ERADICATING DISEASE

Community Empowerment

DRIVING QUESTION

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

ESSENTIAL QUESTIONS

How can the disease be eradicated from the community you are focused on helping?

How can you deliver a speech that helps convince people to follow a certain course of action?

OVERVIEW

To understand and eradicate disease are important goals of the scientific community. All living organisms are impacted by pathogenic bacteria, viruses, and fungi. These pathogens infect healthy cells and can ultimately lead to the death of the organism. Humans are impacted by many different types of diseases. However, recent scientific advancements and medical technologies have provided ways for people to protect themselves from dangerous diseases. Antibiotics and vaccines have been used to help eliminate infections and reduce the spread of pathogens.

In this lesson, students prepare for and participate in the unit's culminating presentation. For the presentations, students will use their Disease Education Reports and Disease Education Communication Posts to create a pitch presentation for how to eliminate the infectious disease in the community that has been the target of their social awareness campaign.

OBJECTIVES

Students will be able to:

Deliver a pitch that persuades people to follow a certain course of action to eliminate the disease from a specific community.

Collaborate with their group to develop, revise, and deliver a pitch presentation.

Celebrate and reflect on their learning and collaboration throughout the unit.

STUDENT TASKS

Day 1	Day 2	Day 3	Day 4	Day 5
Consider how to develop an effective pitch. Work within groups to develop their pitch presentation by reviewing their work and posts from the previous lessons.	Present their pitch plan to a student in another group during a feedback routine. Use the feedback to revise and improve their pitch plan.	Observe a fishbowl presentation of another group delivering their pitch. Use this fishbowl demonstration to improve and finalize their own pitch presentations.	Deliver their pitch presentations In this culminating moment of the unit.	Celebrate and reflect on their learning and collaboration with their group members.

MAKE CONNECTIONS!

How does this connect to the larger unit storyline?

Over the past few decades, some diseases that impact human populations. Students will create and deliver the unit's culminating presentation where they pitch a certain course of action for how to eliminate the disease from the community they have been focused on helping with their Community Outreach campaigns.

How does this connect to careers?

Epidemiologists study the patterns, causes, and effects of diseases—particularly epidemic diseases.

Research assistants and Lab technicians help scientists identify pathogens affecting different populations to determine appropriate treatment and mitigation of disease transmission.

Physicians, Nurses, and Medical assistants can help provide appropriate diagnoses and treatments for individuals who are suffering from an illness or disease.

How does this connect to our world?

This lesson touches upon several universal themes, such as our connection to the larger biological world. Students are encouraged to consider how viruses, bacteria, and other disease-causing organisms may affect individuals. Inequities in healthcare are also covered—not all individuals have access to quality healthcare, including antibiotics and vaccines.ncluding antibiotics and vaccines.

Students reflect on their learning and their collaboration with group members throughout the lesson, including during an activity that examines how they engage in social media.ge in social media in their own lives.

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

In their community outreach campaign groups, students create a final pitch recommending the best treatment to eradicate a disease from the community. This allows for use of empathy, a self-awareness skill for those infected with the disease, as well as having the social awareness of recognizing the perspective of the target audience. Students must also practice self-management skills, such as giving and receiving appropriate peer feedback, and social awareness skills, such as overcoming frustrations while collaborating with peers. The Community Communication and pitch must relate to their target audience which includes people of various ethnicities and socioeconomic backgrounds.

CULTURALLY AND LINGUISTICALLY RESPONSIVE INSTRUCTION

This lesson applies culturally and linguistically responsive instruction to facilitate the development of the students' pitch presentation and to aid in their reflection of learning on the final day. Disease affects communities all over the world. However, these impacts are more likely to be detrimental in communities with limited financial resources and stressed healthcare systems. The lesson highlights how we can raise awareness of disease and promote plans to eradicate or reduce transmission of certain pathogens. Students use selfies that they often post to their own social media as a way to reflect on their learning and collaboration throughout the unit.

ADVANCING INCLUSIVE RESEARCH

This lesson culminates in students' community outreach campaigns. As students developed these campaigns, they had to keep in mind that different communities have different levels of health literacy and established trust in the medical community. Students' campaigns should be inclusive and encourage participation from patients of all backgrounds.

COMPUTATIONAL THINKING PRACTICES

In this lesson, students put three computational thinking strategies into practice: collecting data, analyzing data, and finding patterns. Students collect data in the form of feedback from their peers on how to revise their pitch presentation. Students then analyze their feedback and find patterns in the feedback when each person in the group shares their sticky feedback notes.
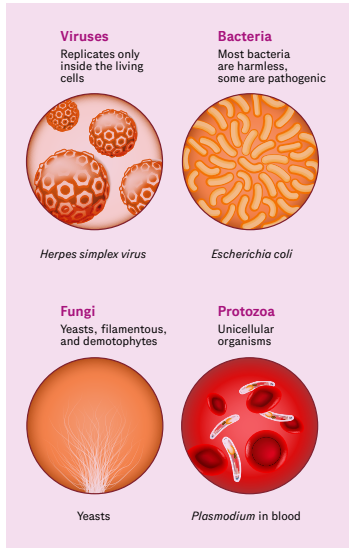
CONNECTION TO THE PRODUCT LIFE CYCLE

This lesson focuses on the Commercialize phase of the product life cycle. As students develop their pitch presentations, they simulate the role of marketers, public health professionals, and health educators who work to spread awareness of available therapies to the public.

Day 1

Slides 1–14

Viruses
Replicates only inside the living cells

Herpes simplex virus

Bacteria
Most bacteria are harmless, some are pathogenic

Escherichia coli

Fungi
Yeasts, filamentous, and demotophytes

Yeasts

Protozoa
Unicellular organisms

Plasmodium in blood

Types of Pathogens
Illustration showing four types of pathogens: viruses, bacteria, fungi, and protozoa.

Slides 1–7

What motivates people to change their intent or take action? Students consider their "pitch" in order to use messaging to give community members a call to action.

1   Students watch a pitch video: *Simon Sinek: Golden Circle*.

2   Tell students: In your presentation, you will need to convince community leaders to follow a course of action to eliminate the disease from the community. These types of presentations are called a pitch. When you deliver a pitch to someone, you have to be very strategic in what you say and do. Let's take a moment to think about how you will deliver your pitch.

3   In a turn and talk conversation, have students discuss with their partner the following prompt:

- What is the "golden circle?"
- How does flipping the narrative to why, how, and what convince people to listen to you? (You may give students the example Simon Sinek used with Apple, and how they convince people to buy their products).
- What will be the purpose of our pitch to community leaders?

4   Use this conversation to transition into the next section.

Slides 8–14

Students review their posts and individual develop their pitch with a goal of eliminating the disease from the community.

1   Tell groups they are now going to develop their pitch with their group aimed to eliminate the disease from the community.

2   Pass out the *Our Disease Education Recommendation Pitch* capture sheet to students. Have students review the document and share out anything they notice. Ask students to share out their responses to the following prompts:

- How will the structure of the template help you to deliver an effective pitch?
- What process will you go through to develop the pitch with your group?
- What is the benefit of developing the pitch individually before you decide as a group?
- How will your work in the Disease Education Report and the Community Communication help you to develop your pitch?

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Day 1
Continued
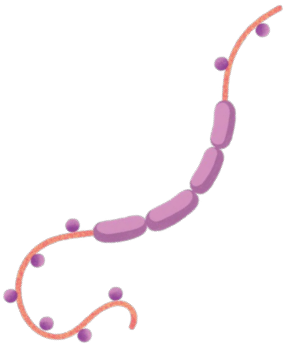
Slides 8–14

3	Now, have students individually review their Disease Education Report and their Community Communication to complete Part 1 of *Our Disease Education Recommendation Pitch* capture sheet.
4	Then have students present their pitch ideas to their group members. Tell students they will need to come to a consensus on what to include in the different sections of their pitch. Have students write in their official group's recommendations to eliminate the disease in Section 2 of the document.
5	Next, students will work as a group to decide and develop their official pitch to eradicate the disease from the community. To do this, each group member will pitch their ideas for what to include in each section of *Our Disease Education Recommendation Pitch, Part 3*. They will use the right column to identify how the Community Communication connects to each recommendation. Then as a group, they will have to come to a consensus on what to discuss during each part of the pitch.
6	Now, with their whole group, have students create their script or outline of what they will say for each section of their pitch.
7	When students have completed Part 3, have groups identify who will be responsible for presenting the different parts of the pitch. Have groups use this information to complete *Our Disease Education Recommendation Pitch, Part 4*. For groups of 4, let students know they can share responsibility for one of the sections or figure out another way to divide the work evenly.

Day 2

Slides 15–21

Slides 15–21

Students present their pitch presentation plan to a partner to get feedback for revisions. (10 minutes)

1	Tell students they will present their pitch plan to a partner in class today to get feedback on how to strengthen their pitch presentation.
2	Tell students they will present individually to a partner who is in another group. Then they will rejoin their group and plan how to use the feedback to strengthen the presentation.
3	Ask students the following prompts: • Why do we want to get feedback in general? • What is the benefit of getting feedback on your plan while you are still working on developing the pitch? • What is the benefit of splitting up your group so each person gets feedback from someone else?
4	Review the steps of the *Rose-Bud-Thorn* feedback protocol with students.
5	Pass out blue, green, and red sticky notes to each student.
6	Tell students that red sticky notes are for the Rose feedback. Green sticky notes are for the Bud feedback. And the Blue sticky notes are for the Thorn feedback.
7	Review the three categories of feedback with students: • Rose—Something that is working well; something positive • Bud—Something that has not been developed or explored • Thorn—Something that is not working and needs fixing
8	Review the timing and structure of the feedback protocol with students: • Presentation (two minutes each)—Both students present their script plan to each other. • Feedback (five minutes)—Students write their feedback on the sticky notes. • Share (three minutes)—Students share the feedback sticky notes with their partner.

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Day 2
Continued

Slides 20–22

9	Make sure students know to write one feedback comment per sticky note. Each comment should be on a separate sticky note. Stress that they should write their feedback on the correct color note.
10	Partner students and have them begin the *Rose-Bud-Thorn* feedback protocol.

Slide 22

Students review feedback sticky notes with their group.

1	When ready, have students rejoin their group. Make sure students bring their sticky notes with them.
2	Now, have students share their feedback. Tell students to look for trends in the feedback by grouping the sticky notes into different categories.
3	Tell students to identify: • What is good about our presentation pitch so far? • What do we need to change or develop more? • How are we going to make those changes?
4	Tell groups they need to share their plan with you before they can start working.
5	Let groups revise their presentation pitch for the remainder of the class.

Day 3

Slides 23–25

Slide 23–24

Fishbowl presentation. (15 minutes)

1	**Prepare in advance:** Think about your classroom environment and how to set-up the *fishbowl* presentation. For example, students can bring their chairs to the center of the room to form an inner and outer circle; students can sit in the center of the room, etc.
2	In advance, invite a group to present during the fishbowl. Select a group that is the furthest along in their pitch presentation development.
3	Tell students they will be participating in a fishbowl presentation. Students will be separated into two groups: inner circle (presenters) and outer circle (observers).
4	Tell students in the outer circle to be actively listening so they can provide feedback.
5	Have the group present their pitch.
6	Once the group is done, facilitate a discussion about the presentation and elicit feedback from the observers.
7	Tell students to use the fishbowl presentation experience to think about their group pitch and how they can improve their work.

Slide 25

Revise and finalize (30 minutes)

1	Encourage group members to use the fishbowl experience to have a collaborative conversation about revisions to improve their pitch.
2	Work in groups to make final revisions using *Our Disease Education Recommendation Pitch* capture sheet.
3	Once revisions have been made, groups can rehearse their pitch. All group members have a part in the presentation.
4	Groups should make final preparations for presentation day.

Day 4

Slides 26–31

Slides 26–31

Students present. (40 minutes)

1. **Prepare ahead of time:** Number each group in your class. Half of the groups will prepare to present, while the remaining groups will be split up and regrouped. For example, if there are eight groups in your class, have groups 1 through 4 present first. Split up groups 5 through 8, then regroup so that students are listening to the presentations with students who were not part of their original group. Number the new groups 5 through 8.

2. As the first groups (1–4) are setting up their community outreach campaigns and practicing their pitches, distribute *Feedback for Disease Education Presentation* capture sheets to the remaining students (groups 5 through 8).

   • Give groups 5–8 roles to complete for the first round of presentations. For example, group 5 can complete the presentation rubric, group 6 can ask the presenting group questions, group 7 can give positive feedback, and group 8 can give constructive feedback (See *Round 1 Presentation Diagram*).

3. During the first round of presentations, groups 5–8 should complete only their section of the capture sheet. Once the presentation is complete, allow the designated group to ask questions and receive answers. Then have the designated groups provide positive feedback and constructive feedback. Finally, have the designated group present the rubric. Students should share their feedback with the presentation group, then move in a clockwise manner to the next presentation.

Teacher Note > *For the second round of presentations, you may want to have students switch their feedback roles. For example, group 5 can ask questions, group 6 can give positive feedback, group 7 can give constructive feedback, and group 8 can complete the rubric (See Round 2 Presentation Diagram). Make sure all students know their roles before the second presentation begins so that all components of the capture sheet are completed.*

4. During the second round of presentations, groups 5–8 should complete only their section of the capture sheet. Once the presentation is complete, allow the designated group to ask questions and receive answers. Then have the designated groups provide positive feedback and constructive feedback. Finally, have the designated group present the rubric. Students should share their feedback with the presentation group, then move in a clockwise manner to the next presentation.

5. Students that were giving feedback will now be presenting, and students who were presenting will now be giving feedback for rounds 3 and 4.

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Day 4
Continued
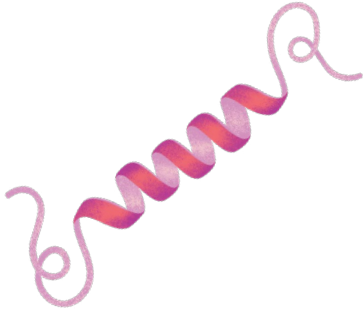
Slides 26–32

6	As the second groups (5–8) are setting up their community outreach campaigns and practicing their pitches, distribute *Feedback for Disease Education Presentation* capture sheets to the remaining students (groups 1 through 4).
7	Give groups 1–4 roles to complete for the third round of presentations. For example, group 1 can complete the presentation rubric, group 2 can ask the presenting group questions, group 3 can give positive feedback, and group 4 can give constructive feedback (See *Round 3 Presentation Diagram*).
8	During the third round of presentations, groups 1–4 should complete only their section of the capture sheet. Once the presentation is complete, allow the designated group to ask questions and receive answers. Then have the designated groups provide positive feedback and constructive feedback. Finally, have the designated group present the rubric. Students should share their feedback with the presentation group, then move in a clockwise manner to the next presentation.

Teacher Note > *For the fourth round of presentations, you may want to have students switch their feedback roles. For example, group 1 can ask questions, group 2 can give positive feedback, group 3 can give constructive feedback, and group 4 can complete the rubric (see Round 4 Presentation Diagram). Make sure all students know their roles before the fourth round begins so that all components of the capture sheet are completed.*

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9	During the fourth round of presentations, groups 1–4 should complete only their section of the capture sheet. Once the presentation is complete, allow the designated group to ask questions and receive answers. Then have the designated groups provide positive feedback and constructive feedback. Finally, have the designated group present the rubric. Students should share their feedback with the presentation group, then move in a clockwise manner to the next presentation.
10	Once all of the presentations are done and feedback is given, have students go back to their disease groups to reflect on the process.

Slides 32

Reflect on process (5 minutes)

1	Have students write in an exit ticket using a quick *Plus/Delta*: what they liked about the presentation process and what they would change about it.
2	If time, have a quick class discussion around their thoughts.

Day 5

Slides 33–36
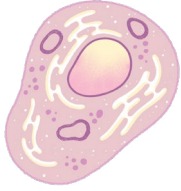
Slides 33–35

Celebration of learning (15 minutes)

1   **Prepare in advance:** The celebration can be created on chart paper or as a digital poster. See template suggestions. If you are using chart paper, either cut out hearts or provide paper to students to cut their own hearts.

2   Take a moment to celebrate the end of the project with your students. It mirrors life in the workplace, celebrating the completion of good work.

3   Tell students you want to celebrate their success and completion of the project. To do this, all students will contribute to the **Social Media Care Poster**. Tell students this is a way for them to share their gratitude to one another as they reflect on their project journey.

4   If you are using chart paper to post in the classroom, pass out a pre-cut heart or have students cut their own heart and respond to the prompt on the chart paper/digital poster. Respond to the following prompt:
This project was…

5   In addition to hearts, you can also post pictures and other project artifacts. This is a great way to commemorate the journey. You can refer back to the celebration throughout the year, and share it with parents, visitors, administrators, and colleagues.

Slide 36

Reflection (30 minutes)

1   Share with students that it is important to celebrate success and at the same time it is also important at the end of every project for students to reflect on their learning.

2   Tell students they will take a selfie with their group and add it to the class copy of the **Disease Education Communication Posts.**

3   Tell students to revisit **Our Group Collaboration Contract** one last time to help them reflect on their journey. Ask students to think about how they would caption the group selfie around their growth as a learner and working as a group member. Encourage students to include an emoji(s) that captures the group selfie. Student captions can be added directly to the selfie slide on the **Disease Education Communication Posts.**

National Standards

Next Generation Science Standards

Science and Engineering Practices (SEP)	Disciplinary Core Ideas (DCI)	Crosscutting Concepts (CC)

Practice 6

Constructing Explanations and Designing Solutions

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

ETS1.B

Developing Possible Solutions

When evaluating solutions, it is important to take into account a range of constraints, including cost, safety, reliability, and aesthetics, and to consider social, cultural, and environmental impacts.

Connections to Engineering, Technology, and Applications of Science

Influence of Science, Engineering, and Technology on Society and the Natural World

New technologies can have deep impacts on society and the environment, including some that were not anticipated. Analysis of costs and benefits is a critical aspect of decisions about technology.

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Our Disease Education Recommendation Pitch, Part 1
My Recommendations to Eliminate the Disease

Directions
Individually, identify the steps leaders in your community should take to eradicate the disease from their community. To do this, review your Disease Education Report and your Community Communication content. List the steps you came up with below. You will use the work you do here to pitch your recommendations to your group in the next section.

Individual Pitch Sections	Why is it important for your leaders in your community to follow this recommendation? Why will it help eradicate the disease from their community?
Why is this disease an issue in the community? Why is it important to address this issue with your community outreach campaign?	
How does the disease impact people in the community? How does the disease continue to spread in the community?	
What are the recommended treatments?	

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Our Disease Education Recommendation Pitch, Part 2
Our Group's Recommendations to Eliminate the Disease

Directions

Work as a group to decide and develop your official pitch to eradicate the disease from the community. To do this, each group member will pitch their ideas for what to include in each section. Use the right column to identify how the Community Communication connects to each recommendation. Then as a group, come to a consensus on what to discuss during each part of your pitch.

Group Pitch Sections	Why is it important for your leaders in your community to follow this recommendation? Why will it help eradicate the disease from their community?	Which Community Outreach Communication is connected to this section?
Why is this disease an issue in the community? Why is it important to address this issue with your community outreach campaign?		
How does the disease impact people in the community? How does the disease continue to spread in the community?		
What are the recommended treatments?		

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Our Disease Education Recommendation Pitch, Part 3
Our Pitch Outline

Directions
*With your group, create an outline or script that you will use
to present your pitch.*

Group Script Questions	
Why is this disease an issue in the community? Why is it important to address this issue with your community outreach campaign?	
What community outreach communication will you use to help communicate this recommendation to leaders in your community?	
What will you say?	

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Our Disease Education Recommendation Pitch, Part 3
Our Pitch Outline
Continued

Group Script Questions	
How does the disease impact people in the community? How does the disease continue to spread in the community?	
What community outreach communication will you use to help communicate this recommendation to leaders in your community?	
What will you say?	

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Our Disease Education Recommendation Pitch, Part 3
Our Pitch Outline

Continued

Group Script Questions	
What are the recommended treatments?	
What community outreach communication will you use to help communicate this recommendation to leaders in your community?	
What will you say?	

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Our Disease Education Recommendation Pitch, Part 4
Who Will Present?

Directions
*As a group, decide who will be responsible for presenting
the different sections of your pitch.*

Presentor	Who will be responsible for pitching this recommendation during the presentation?
Why	
How	
What	

Documents
Day 2
Day 3
Day 4

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Feedback for Disease Education Presentation

Directions
Use the center columns to evaluate whether the product meets the standard or is still developing. Provide specific suggestions for improvement in the far left column. Note elements that exhibit deeper understanding in the far right column.

Group Members _____

Emerging How can this product be improved?	**Developing** This product includes some, but not all required elements.	**Proficient** This product meets all performance expectations.	**Advanced** How does this product exceed expectations?
	I can develop ideas for a purpose and task, and communicate appropriate findings, arguments, and supporting evidence. My audience can follow the line of reasoning.	I can clearly develop ideas appropriate to the purpose and task, and communicate appropriate findings, arguments, and supporting evidence clearly, concisely, and logically. My audience can easily follow the line of reasoning. **Presentation— Explanation of Ideas and Information**	

Questions to ask group:

_____

_____

_____

_____

Positive feedback for group:

I like…

_____

_____

_____

Constructive feedback for group:

I wonder…

_____

_____

_____

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Presentation Diagram
Round 1

Group

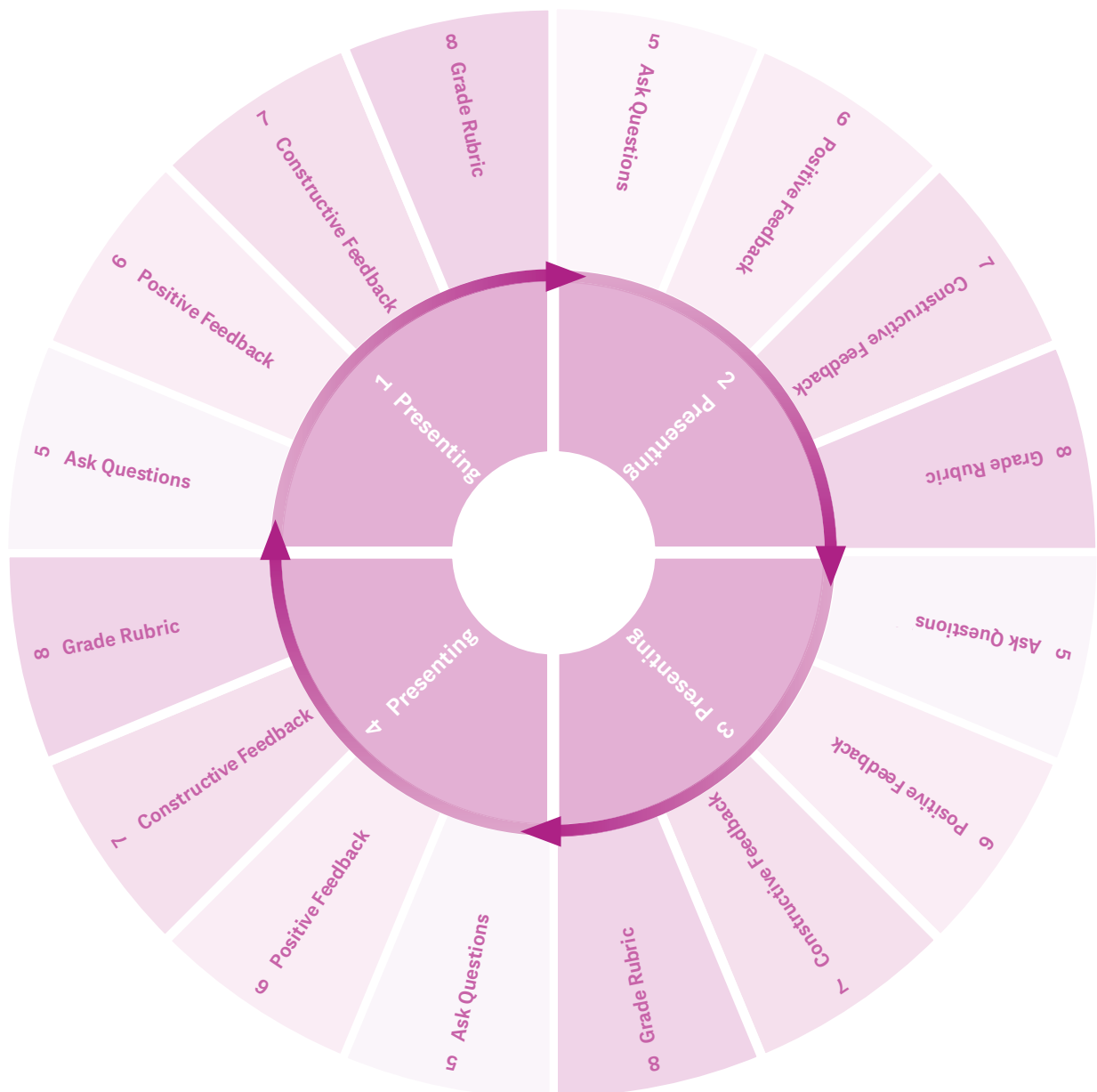|	
1–4	Presenting for the first time
5	Each member is listening to different presentations and focusing on giving feedback from the presentation rubric.
6	Each member is listening to different presentations and focusing on asking questions about the presentation.
7	Each member is listening to different presentations and focusing on giving positive feedback.
8	Each member is listening to different presentations and focusing on giving constructive feedback.
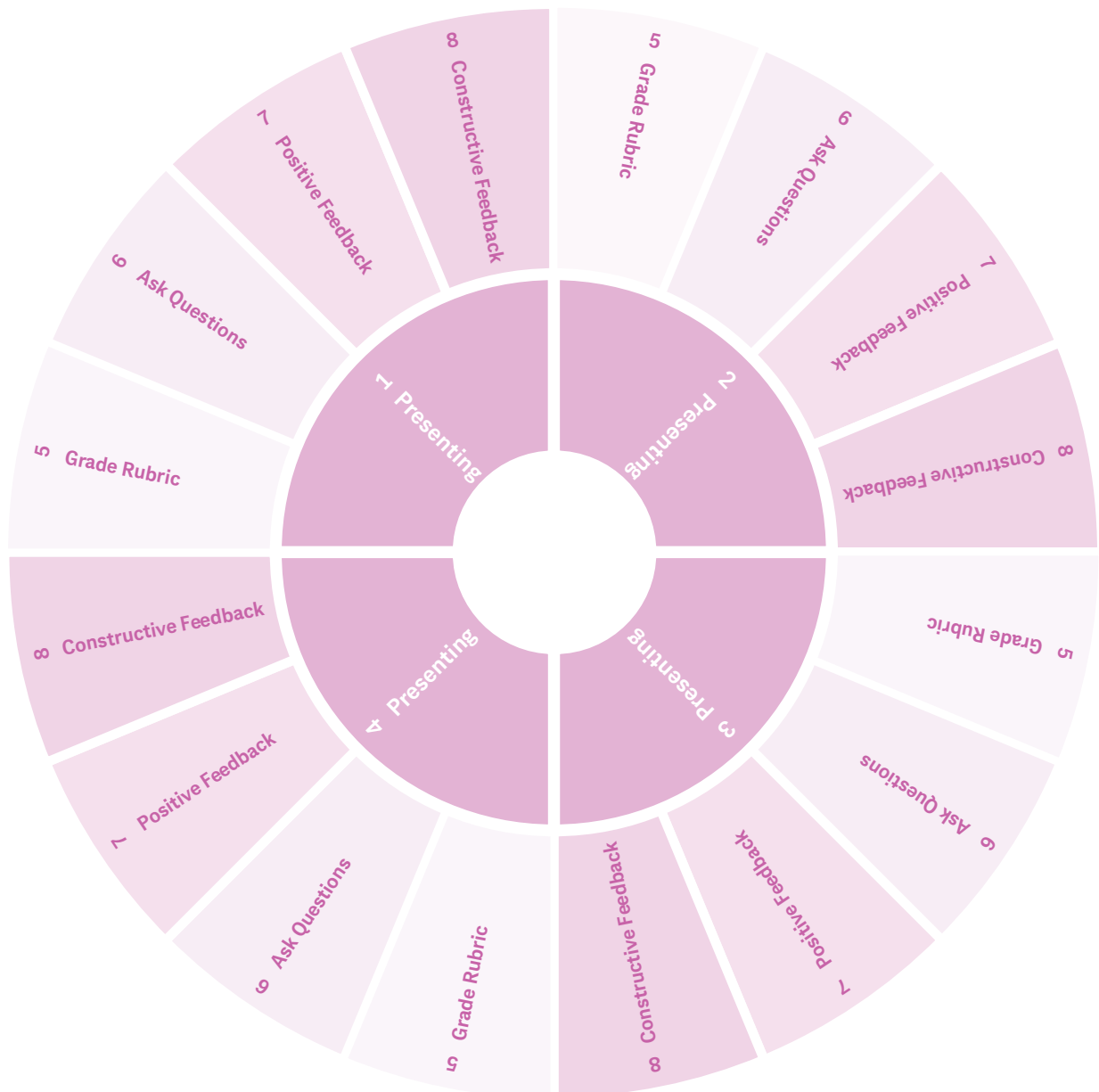
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Presentation Diagram
Round 2

Group

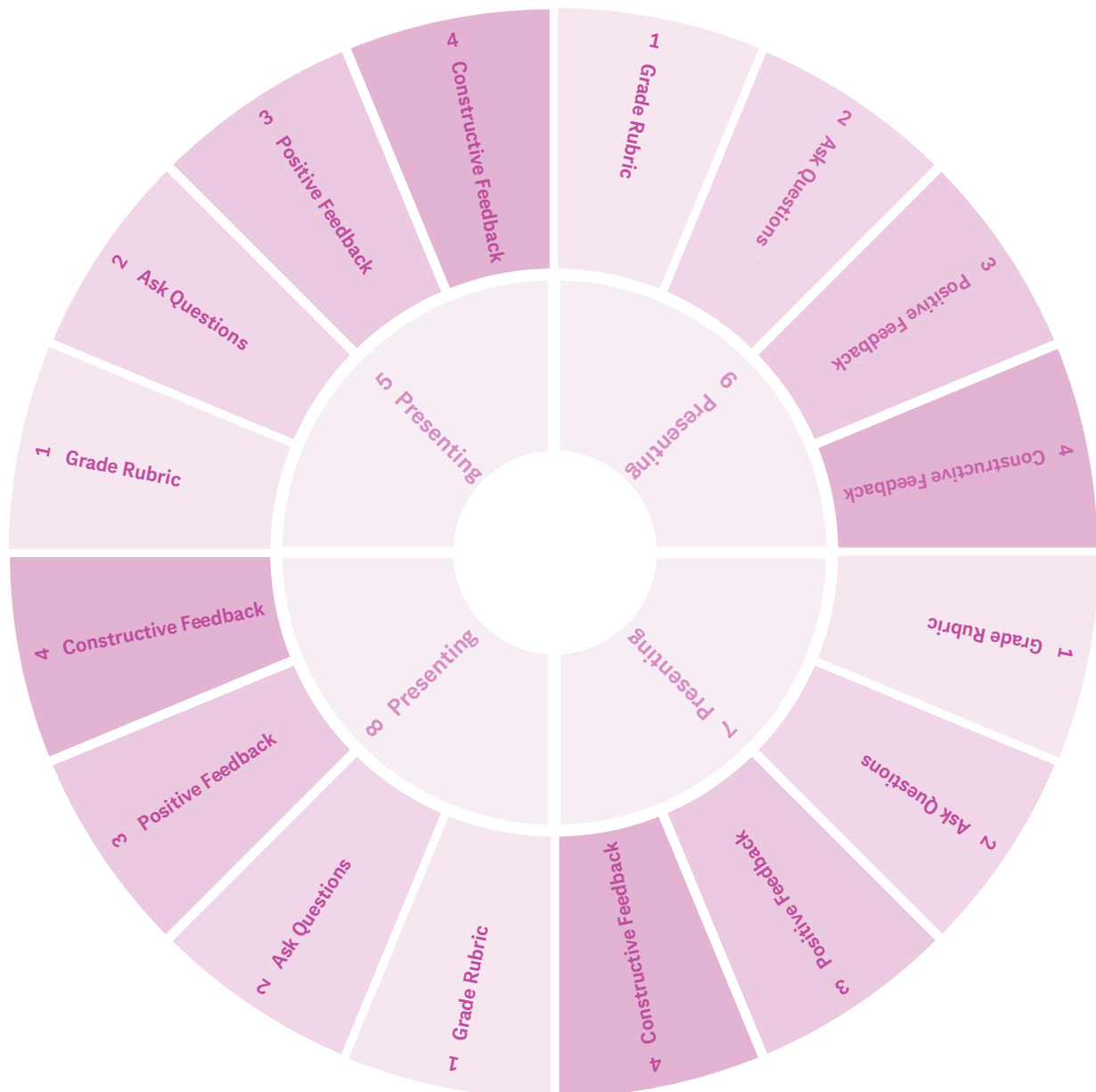|	
1–4	Presenting for the second time in same place
5	Each member is listening to different presentations and focusing on asking questions they have about the presentation
6	Each member is listening to different presentations and focusing on giving positive feedback
7	Each member is listening to different presentations and focusing on giving positive feedback
8	Each member is listening to different presentations and focusing on giving constructive feedback

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Presentation Diagram
Round 3

Group

5–8	Presenting for the first time
1	Each member is listening to different presentations and focusing on giving feedback from the presentation rubric.
2	Each member is listening to different presentations and focusing on asking questions about the presentation.

3	Each member is listening to different presentations and focusing on giving positive feedback.
4	Each member is listening to different presentations and focusing on giving constructive feedback.

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Presentation Diagram
Round 4

Group

5–8	Presenting for the second time in same place.
1	Each member is listening to different presentations and focusing on asking questions about the presentation.
2	Each member is listening to different presentations and focusing on giving positive feedback.

3	Each member is listening to different presentations and focusing on giving positive feedback.
4	Each member is listening to different presentations and focusing on giving constructive feedback.