



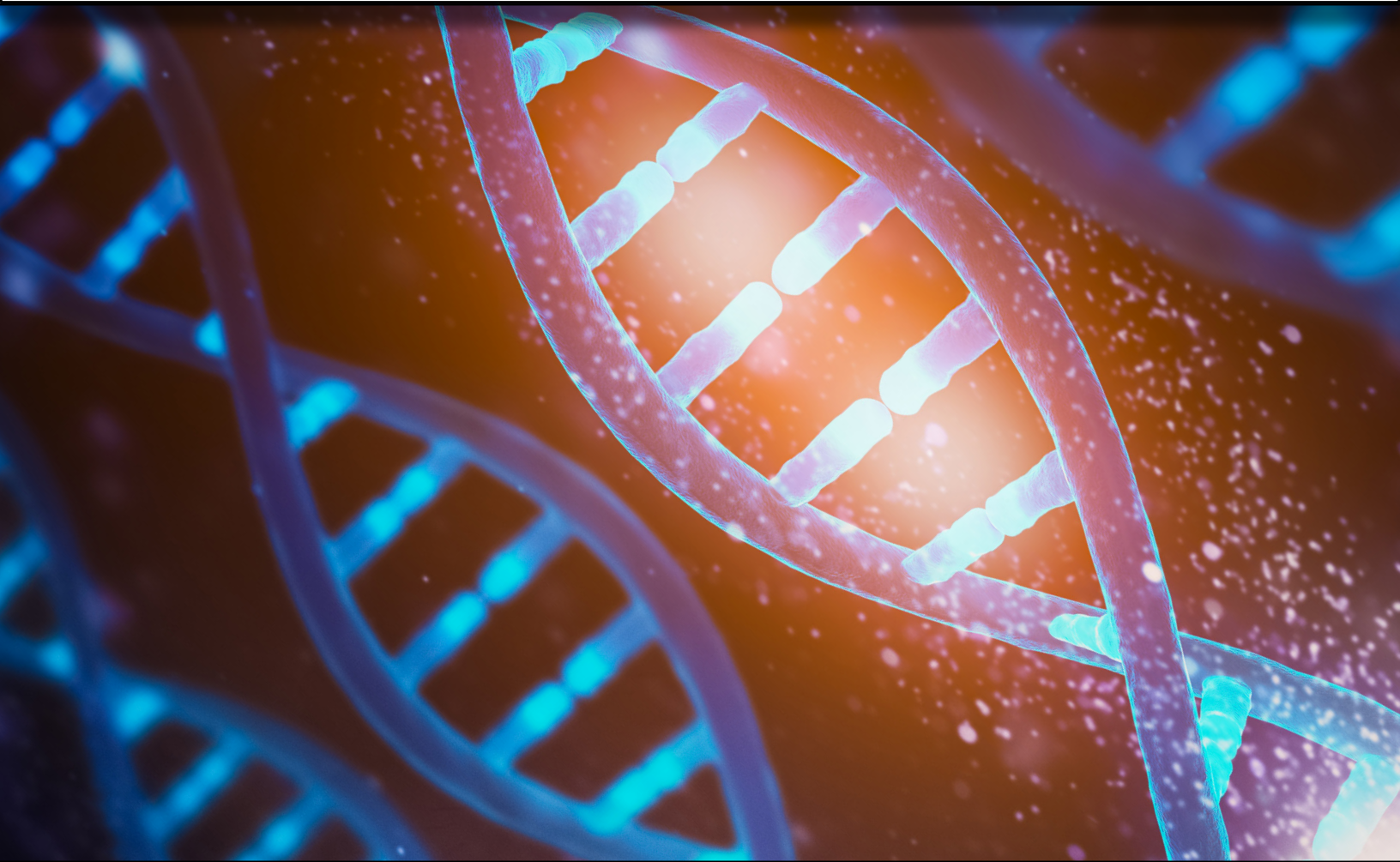
Smithsonian

**SCIENCE**

*for Global Goals*

# **BIOTECHNOLOGY!**

**Part 8: Taking Action**



**SUSTAINABLE DEVELOPMENT GOALS**

developed by



**Smithsonian**  
*Science Education Center*

in collaboration with

**iap** **SCIENCE**  
**HEALTH**  
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## PART 8: TAKING ACTION

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### **Find out More!**

For additional resources and activities, please visit the *Biotechnology!* StoryMap at <https://bit.ly/3pQUDpc>.



## Planner

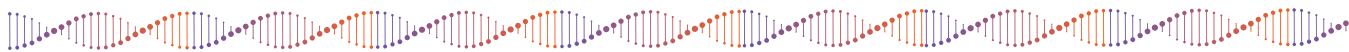
Activity	Description	Materials and Technology	Additional Materials	Approximate Timing	Page Number
<b>Task 1: How will I help create a sustainable world using biotechnology?</b>					
<b>Discover</b>	Use your <i>Futures Mood Board</i> to decide what future you want to take action to support.	<ul style="list-style-type: none"> <li>• Paper</li> <li>• Pens or pencils</li> </ul>	<i>Futures Mood Board</i> (Part 1)	20 minutes	289
<b>Understand</b>	Come to consensus and plan your action.	<ul style="list-style-type: none"> <li>• Paper</li> <li>• Pens or pencils</li> </ul>	<i>Identity Map</i> (Part 1)	45 minutes	291
<b>Act</b>	Implement your action plan and reflect on your action.		<i>Futures Mood Board</i> (Part 1)	15 minutes + action time	293



## Task 1: How will I help create a sustainable world using biotechnology?

As **action researchers** you now have a lot of information. You discovered what is important to you and your team. You understand more about the science of **biotechnology**. You understand the values of people in your **community**. Now you will put those ideas together. In this part you will decide how your team will act to create the future you want. Then you will put those plans into action.

In this task you will **discover** more about your and your community's hopes for the future. Then you will **understand** more about your role in working toward those goals. Finally, you will **act** on your ideas and work toward a **sustainable** and positive future.



### **Discover:** *How do I want biotechnology to be used in the future?*

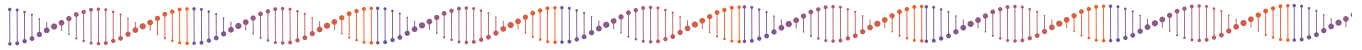
Before you decide what you want to do, you need to think about what you want to accomplish. Many different futures are possible. Which one do you want to work toward?

1. Take out your *Futures Mood Board* from Task 1.
2. With your team, think about everything you have learned in this guide. Is there anything you would like to add to your *Futures Mood Board*? If so, add it now.
3. By yourself, examine the *Futures Mood Board*. Pick one part of the future that relates to biotechnology that you would like to work toward. It could be a concern you have about the future that you want to avoid, or it could be a hope about the future that you want to encourage.
4. Share your ideas with your team.
5. As a team, come to **consensus** on one part of the future you want to take action on. A consensus is a balanced decision that works for everyone in the group. There are many ways to come to consensus. Here are some ideas. You can choose whatever works best for your team.
  - a. List the good things and bad things about taking action for each future. Discuss as a team.
  - b. Try to find the same values. Are there some ideas about the future that are similar? Try to combine them.



- c. Build a sense of the group opinion. Are there some ideas about the future that many people would be interested in working toward?
  - d. Find a slow consensus. Find a partner and as a pair find consensus on which future idea is most important. Then in a group of two pairs (four team members) you can build consensus among the four of you. Then in a group of four pairs (eight team members) you can discuss further to build consensus. Keep adding groups together until you have found a team consensus.
  - e. Consider your **impact**. Think about who would benefit from your team working toward a specific idea about the future. Which group are you most interested in helping?
6. Once you have chosen a future you want to work toward, you need to think of an action to take that might help create that future. Get out a piece of paper and write or draw any actions you can think of. If you are having trouble thinking of actions you can take, here are some ideas you may want to consider.
- a. Personal: Could you personally become involved in discovering and using biotechnologies? You have learned about many types of STEM careers from your research mentors. Choose the one that interests you the most and figure out how you could follow that career path.
  - b. Educate others: Other people you know may not know much about biotechnology. Could you choose a group to educate to help them learn more?
  - c. Communicate with your community: Help your community understand a part of biotechnology or a concern you have by designing posters, composing songs, recording podcasts, making public service announcements, setting up a social media campaign, or using other ways to communicate.
  - d. Government change: Try to change the rules your local or national government has about biotechnology. For example, you could write letters to officials or speak at local government meetings to share the actions you think are necessary to create the future you want.
  - e. Global change: Collaborate with others around the world who are worried about the same problem. For example, join a group that is using biotechnology for sustainability or a group that represents any concerns you have.
  - f. Come up with your own ideas!





### **Understand:** *What will my role be?*

Now it is time to plan your action. As you have learned, variations among people's perspectives and abilities can make the whole team stronger. Think about what role you will take to help with the team action.

1. Take out your *Identity Map* from Part 1 and examine it closely. Make a note of things about your identity that might help you decide how you would like to act. For example:
  - a. Are you part of any groups that you could communicate with?
  - b. Do you have any special talents, such as art or music, that might be useful to capture people's attention?
  - c. Are you interested in science and engineering or other ways to try to find innovative solutions?
  - d. Do you have good planning or organizational skills?
  - e. Are there other things about your identity that might help you work toward the future you want?
2. Gather with your team. Write "Team Strengths" on a sheet of paper or on the board.
3. Under *Team Strengths*, write down all the ideas each person had about things from their identity that might help you all act.



#### **Emotional Safety Tip**

Everyone has strengths and weaknesses. As a team member, sharing your unique strengths is important, even if it feels uncomfortable. It is important to respect your own strengths and to respect what others identify as their strengths.

4. As a team, discuss the actions you thought of in the Discover activity. Remove any actions that would not be helpful or that you cannot do.

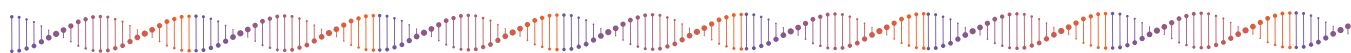


5. Share your ideas and listen to others. Come to a consensus about which action you will take, using your *Team Strengths* list to help you decide the best action for your team. You can use some of the consensus-building ideas from the Discover activity, if you want.
6. Think quietly to yourself about the steps that could be part of planning the action your team picked.
7. Write, draw, or use another way to record your ideas on small pieces of paper. Each piece of paper should have one step.
8. Have each team member share their steps by placing their pieces of paper on a table or by using a digital tool for collaboration.
9. Read through the steps from your teammates.
  - a. Did you notice any steps that were similar to yours?
  - b. Do you think your team is missing any steps?
10. Start to organize your team's steps. You can move the pieces of paper around as you do this. Thinking about your team's steps will help you decide how you will take action.
  - a. Group any similar steps together.
  - b. Remove any steps you don't think are needed to help your team take action.
  - c. Think about how each team member will help. Put their names with the steps they would like to help with.
  - d. Think about what steps might be missing. Add those steps.
11. Put the steps in order. For example, what do you think the team needs to do first? Place that piece of paper before all the others.
12. Title a sheet of paper "Action Plan" and record the following:
  - a. The steps your team would like to take
  - b. The order of those steps
  - c. Who will help with each step (it might be more than one person)
  - d. When and where you will take these steps
  - e. Partners or other people you will involve
  - f. How you will communicate your action plan to the community





13. Think about what you will do if your plan doesn't work or you run into another problem. For example, what will you do if an adult in your community says you need permission to do something in your plan. Record these ideas as part of your action plan.
14. Remember to create an **inclusive** action plan. Being inclusive means everyone on your team can participate in some way. You may need to make changes to the plan so that everyone feels safe, comfortable, and able to help. Those changes are okay! They are part of being a good teammate.



**Act:** *How will I put my ideas into action?*

The time has come to act! You can use everything you have learned to take action to help create the future you want.

1. With your teammates, implement your Action Plan. This may take some time. There is no need to worry; take the time you need. When you are finished, come back and complete this activity.
2. Think quietly about the action you took. Consider:
  - a. What went well?
  - b. What do you think could have gone better?
  - c. How would you change your action if you had to do it again?
3. Discuss with your team:
  - a. What makes you proud of yourselves as a team?
  - b. What do you think you have learned for next time?
4. Examine your Futures Mood Board from Part 1. How are you feeling about the future now?
5. Think quietly to yourself about what you plan to do to create the changes you want to see in the future.



# Congratulations!

## You finished the *Biotechnology!* Community Research Guide!

All of us should be trying to do what we can to change ourselves and our world for the better. Maybe you took a big action. Maybe you took a small action. Maybe it had a big impact. Maybe it had a small impact. The most important thing is that you did something. When you take action to make your community better, you create the world you want to live in. You and your team are changing the world, one step at a time!



## Glossary

This glossary can help you understand words you may not know. You can add drawings, your own definitions, or anything else that will help. Add other words to the glossary if you would like.

**Action researcher:** A person who works with their community to discover, understand, and act on local and global problems they learn about

**Biotechnology:** Using living things, parts of living things, or things produced by living things to solve people's problems and meet their needs

**Community:** A group of people who share something in common, such as a space or an identity

**Consensus:** A balanced decision that works for everyone in the group

**Impact:** The effect one thing has on another

**Inclusive:** Making sure no one is left out

**Sustainable:** An approach that balances different perspectives and can keep working for a long time



## Meet Heidi Gibson, Your Biotechnology Guide Developer



Meet Heidi Gibson. Heidi (*Hi-dee*) was the main person writing this guide. She talked with lots of researchers to get information. However, like anyone, she has her own perspective. You have learned it is important to consider the perspectives of your teammates and research mentors.

Perspectives affect what we think and how we think. It is also important to think about the perspective of the writer. This can help you understand why the guide was written the way it was. Considering the source of information is always a good idea.

Heidi has degrees in biology and international education. However, she also has knowledge and perspectives that come from other parts of her identity. Since you have been reading a lot of what Heidi has written, it is important to know who she is. To help you, Heidi filled out an identity map, just like you did in Part 1. Heidi's identity map includes the following things.

- Purpose is to help young people realize their power to transform the world
- Past jobs include laboratory research, civic education, international development, and diplomacy
- Grew up and lives now in Arlington, Virginia, USA
- Husband is Scottish and they lived there as a family, so that feels like her second home
- Also lived in Germany, China, Malawi, and Fiji
- Two children, ages 15 and 12
- Six siblings
- Loves being outdoors, especially the beach
- Walks around her garden looking at what is growing every day
- Enjoys travel, reading, singing, and being with family and friends
- Likes learning new things—cultures, ideas, languages, skills



Before you finish the guide, think quietly to yourself about Heidi's identity map.

- What questions do you have about the way the guide was written?
- What perspectives does Heidi have that might have made her write the guide the way it is?
- Are there things you would include that were not included?

Do you want to tell Heidi what you would change about the guide? Email her at [scienceeducation@si.edu](mailto:scienceeducation@si.edu). She'd love to hear from you!





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Action Plans can be shared with us by using hashtag #SSfGG!

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Smithsonian Science for Global Goals (SSfGG) is a freely available curriculum developed by the Smithsonian Science Education Center in collaboration with the InterAcademy Partnership. It uses the United Nations Sustainable Development Goals (SDGs) as a framework to focus on sustainable actions that are student-defined and implemented.

Attempting to empower the next generation of decision-makers capable of making the right choices about the complex socio-scientific issues facing human society, SSfGG blends together previous practices in Inquiry-Based Science Education, Social Studies Education, Global Citizenship Education, Social Emotional Learning, and Education for Sustainable Development.

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