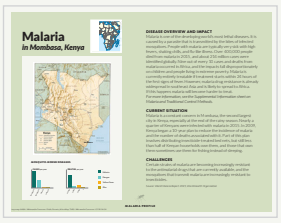
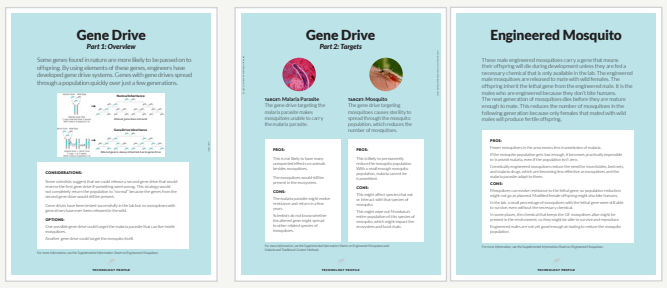
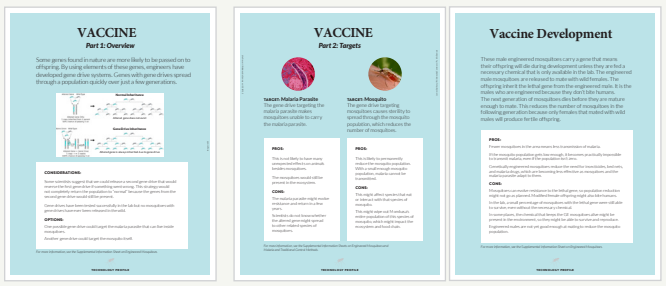
SHOULD WE ENGINEER THE MOSQUITO?

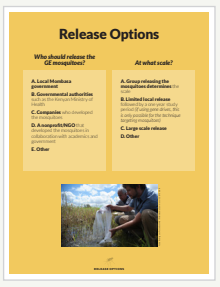
Adapted from Building with Bio

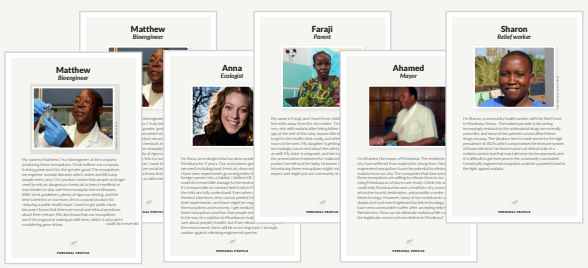
Your group is going to decide whether to release genetically engineered (GE) mosquitoes or Zika vaccines in São Paulo, Brazil, and how to go about it. Follow the steps below to learn about options, then draft your proposal on the back of this sheet. You can find more in-depth information about the mosquito life cycle, Zika and traditional control methods, and engineered mosquitoes in the Supplemental Information Sheets.











STEP 1: INTRODUCTIONS AND ZIKA PROFILE

1 card, 5 minutes

Introduce yourselves. Share your name and your connection to the topic. **Then read the Zika profile card aloud to the group.**

STEP 2: MOSQUITO & GENE DRIVE PROFILE

3 cards, 15 minutes

The technology card provides information on one genetic engineering method that could be used to engineer mosquitoes so they would not transmit Zika. Engineers are working on other methods but this is one of the more promising options. The gene drive cards provide information about a technology that can be added to GE mosquitoes. Gene drives raise ethical considerations, but can improve the success of the GE mosquito strategy. **Take turns reading the gene drive profile cards and the technology card aloud.**

STEP 3: VACCINE DEVELOPMENT PROFILE

3 cards, 15 minutes

The technology card provides information on how vaccine development works. Engineers are working on other methods but this is another of the more promising options. The vaccine cards provide information about the different types of vaccines that could be developed. Take turns reading the gene drive profile cards.

STEP 4: RELEASE OPTIONS

1 card, 2 minutes

The release options card provides some possible options for how your group can choose to release genetically engineered mosquitoes and/or the vaccine. As part of your conversation, you can choose one of these options or make up your own. **Read the release options card aloud to the group.**

STEP 5: PERSONAL PROFILES

6 cards, 12 minutes

Take turns reading the personal profile cards. You don't need to play the roles of these people, but rather, consider their perspectives as you make decisions.

STEP 6: DISCUSS AND MAKE A PLAN

30 minutes

Discuss whether your group would like to release the GE mosquitoes and/or vaccine in São Paulo. As you discuss, consider the personal profiles. How might each of these people feel about introducing GE mosquitoes and/or the vaccine to help control Zika?
For more background information on mosquitoes, refer to the Supplemental Information Sheets.
Flip to the other side of this paper to write your plan as a group. **Your group will need to decide:**

1. Will you release GE mosquitoes and/or the vaccine in São Paulo? Why or why not?
2. If you choose to release GE mosquitoes, will you use a gene drive? If you choose to test the vaccine, will you use live virus or protein vaccines? If so, which type?
3. If you choose to release GE mosquitoes and/or vaccine, who should handle the release? At what scale?
4. What were the reasons behind your group's decision?
5. If the community in São Paulo cannot agree about whether to release the GE mosquitoes and/or vaccine, who should have the power to decide?

STEP 7: REPORT OUT

10 minutes

Each group presents their plan in 2 minutes or less. Then participants can comment on each other's plans.

SHOULD WE ENGINEER THE MOSQUITO?

Adapted from Building with Bio

YOUR PLAN

Write down your group's proposal for managing mosquitoes that transmit Zika.

If your group chooses to invest in Zika in São Paulo, decide:

Will you develop a **gene drive** or a vaccine ? , and

A **method for release** from the options below, or make your own:

Who should release the GE mosquitoes?

A. **Local São Paulo government**

B. **Governmental authorities** such as the Brazillian Ministry of Health

C. **Companies** who developed the mosquitoes/vaccine

D. **A nonprofit/NGO** that developed the mosquitoes/ vaccine in collaboration with academics and government.

E. **Other**

At what scale?

A. **Group releasing the mosquitoes determines** the scale

B. **Limited local release** followed by a one year study period

C. **Large scale release**

D. **Other**

1. Will you release GE mosquitos in São Paulo and/or test a vaccine? Why or why not?

2. If you choose to release GE mosquitoes, will you use a gene drive? If you choose to test the vaccine, will you use live virus or protein vaccines?If so, which type?

3. If you choose to release GE mosquitoes or vaccine, who should handle the release? At what scale?

4. What were the reasons behind your group's decision?

5. If the community in Sao Paulo cannot agree about whether to release the GE mosquitoes or vaccine, who should have the power to decide?

If you have time, consider this: How would your answers change if this were in your own city?

Be ready to present your plan in a 2-minute summary!