**Student Name:**

# Biodiversity Counts!
# A Jigsaw Activity

**INSTRUCTIONS**

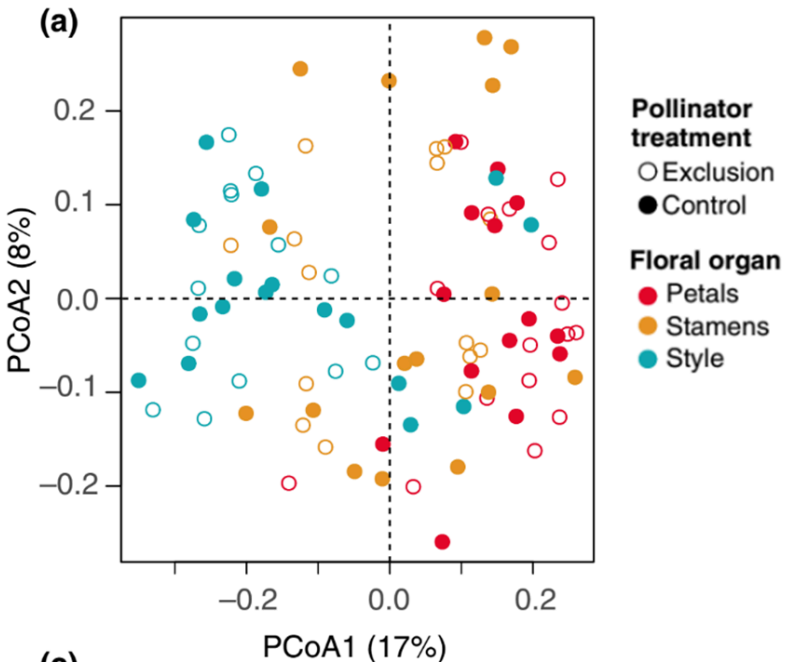
1. Brief introductions
2. Be aware of the space you are taking up in your group
    a. listen - don't interrupt
    b. speak up when it's your turn, elaborate if you're shy!
3. Parts 1 - 3 will be completed within "expert groups". Make sure you understand everything about the figure you've been assigned before you move on to new groups for Part 4. As the figure "expert", you'll be asked to explain the research behind the figure to new group members during Part 4 😊. Finally, Part 5 will be completed individually after class.
4. Raise your hand if you have any questions and someone from the instructional team will come as soon as possible.
5. Submit your completed worksheet (individually) to the assignment tab on Canvas

**INTRODUCTION**

In order to study biodiversity, we first need to know how to quantify it. We need a way to compare how biodiversity changes through time, or how it differs from place to place. In today's activity, you will explore a few ways in which scientists quantify diversity and visualize various diversity metrics. We will focus on species diversity (but remember that biodiversity can refer to diversity at any biological scale from genetic diversity to ecosystem diversity).

**PART I (8 min)**

The figure below was taken from a research article that we'll introduce later in class. With your group, try to answer as many of the questions below as you can before we provide more information about the study system and experimental design. Don't worry if you leave some questions unanswered or incomplete, you'll be able to come back to the questions during Part 2.




**Beta Diversity:** Fig 2a in Rebolleda Gómez & Ashman (2019). *Molecular Ecology* https://doi.org/10.1111/mec.15280

- What is a PCoA (Principal Coordinates Analysis) plot? How can one interpret this kind of graphs (in simple terms)? Feel free to look this up.
- What do the different colors indicate?
- What do the open vs. closed circles indicate?
- What question is being addressed by this figure?
- What controls (if any) were used in the experiment?
- Summarize the main finding of this experiment

**PART 2 (5 min)**
You've now met Dr. María Rebolleda Gómez, the first author of the paper that contains your figure. In the video, Dr. Rebolleda Gómez gave us an introduction to the yellow monkeyflower (*Mimulus guttatus*), their study system. Dr. Rebolleda Gómez also discussed their overarching questions and the experimental design they created to address these questions. With this new information, go back to the figure and questions in PART 1. Complete and correct your answers as needed.

**PART 3 (12 min)**
Let's hear what Dr. Rebolleda Gómez has to say about the research findings they summarized in your assigned figure! Have one person in your team play the video that corresponds to your figure (see links below). As you watch Dr. Rebolleda Gómez explain the figure, reflect on how your answers compare to theirs. It's ok if your answers differ! What is similar? What is different? Please use a **different color font** when you annotate your answers above with your reflections.

Alpha diversity
Beta diversity
Venn diagram
Percent stacked bar plot

**PART 4 (15 min)**
Now that you know your figure inside out, it is time to 1) share your knowledge with others, 2) learn about other ways to measure and visualize diversity patterns, and 3) reflect how the research ties together.
You should now be in new groups (with at least 1 expert on each of the 4 figures).
First, give a 1 min summary of your assigned figure. What question is being addressed? What are the main findings? How do you interpret those findings from the figure?

Once everyone has shared, answer the questions below with your new groups.

- Which of the figures examine the microbiome?
- Which of the figures focus on the pollinators only?
- Does alpha diversity change a lot across organs?
- Is there evidence that the communities in each organ are distinct?
- Do you think the pollinator exclusion treatment affected diversity?

Finally, watch Dr. Rebolleda Gómez as they summarize the overarching findings of their study, As before, reflect on how your answers compare to theirs. It's ok if your answers differ! What is similar? What is different? Please use a different color font for your reflections.
Overarching findings

**PART V (on your own)**
You have now met Dr. María Rebolleda Gómez and heard about one of their research projects. If you could ask Dr. Rebolleda Gómez 3 questions, what would you like to know? It can be about their research, their career path, tips for success, etc.

1.
2.
3.

Dr. María Rebolleda Gómez has answered some of these questions! Please watch at least 3 of their responses to questions below.

- What kinds of scientific questions interest you the most?
- What do you do if you have questions about how to analyze your data?
- When and how did you know you wanted to be a scientist?
- Tell us about the path that led you to your current job.
- Tell me about a moment when you felt like you really belonged in the field of science.
- What is it like being a scientist who identifies as queer and Mexican?

Finally, take a few minutes to reflect on your own identity and career path. Please share a few of your thoughts in the space below.

**Your reflection:**