**Biomimicry Brainstorm**

**Estimated Time**

1 class

**Materials**

Per group:
- Large piece of paper (e.g., flip chart paper or butcher paper)
- Index cards (4 x 6 in. or larger)
- Sticky notes
- Colored markers

**Background Information**

This activity provides a framework for students to consider what they’ve learned from their biological strategies and how they can be applied to a solution for their problem. It is best done after students have developed ‘design strategies’ from their biological strategies by evaluating the working principles that make them function.

**Getting Ready**

Prepare students for this activity by having them first generate ‘design strategies’ from the biological strategies they are considering as models for their design. They will do so by applying the same process they learned in the Design-ifying Biological Strategies activity. See the YDC Instructional Storyline (Lesson 15) for suggestions on how to do this.

**Facilitation**

1. Have students sit in design teams with their bio-inspired design strategies. Give each team a large sheet of paper, markers, sticky notes, and index cards.

2. Direct students to write their original design question (“How might we…”) across the top of the large paper. Have them select several of their most interesting bio-inspired design strategies and write them on the index cards (one strategy per card). Have students place the completed index cards in a pile in the center of the table.

   *Tip: When selecting design strategies for this activity, students may be tempted to focus on strategies that fit a design solution they already have in mind. To encourage more innovative thinking, have students focus on strategies that best match the function they need their design to perform, and the variables (context/conditions) that will affect it.*

3. Tell students that in this activity they will be brainstorming ways to apply their design strategies to their design problem/question. Remind them that the point of brainstorming is to generate a large number of diverse and innovative ideas that could be considered for solutions to a problem. It is important to keep an open mind and
encourage all ideas. Remind them that all ideas are valid, whether or not they seem realistic. This is not a time for critiquing, only idea generating.

4. Instruct students to take turns reading the design strategies aloud to their team. After each strategy is read, the team should spend a few minutes brainstorming an answer to the question “How can this strategy help solve our design problem?” Have them record all of their ideas on sticky notes and attach them to the large paper. Encourage students to capture their ideas as doodles, sketches, or short statements. It’s OK if ideas are incomplete or in the form of questions; each note may represent only a single component or elements of a larger possible solution.

5. Assist teams as they work. After about 20 minutes or when students have explored all of the design strategy cards, instruct design teams to study the collection of ideas they captured and cluster them by moving the sticky notes around. Have them identify and label idea patterns and relationships in each cluster. Ask students: Do any of the ideas seem to fit together? Can you recombine or mix them to arrive at new ideas? Draw lines, arrows, and add notes as needed to capture your observations and additional ideas. Give students approximately 15 minutes for this part of the activity. Check in with teams as they work to monitor their progress and answer questions.

6. Organize a gallery walk for students to review each other’s brainstorming papers by setting papers on tables or posting them on walls. As a peer feedback option, students could add thoughts about the patterns and connections on sticky notes or separate pieces of paper. Possible feedback prompts include: “I like __________.” Another might be_________”

7. Hang the papers on the wall or store them in the classroom, as they will be needed for more of the design process. Students may want to save a copy as a photo on a smartphone.

Reflection Questions
- What was the purpose of your team going through this brainstorm process?
- What did you figure out?
- What part of this process was challenging?
- How could identifying patterns or other connections among the ideas be beneficial in the design process?

Modification
Sometimes individual brainstorming can be as fruitful as group brainstorming. Depending on your class, consider giving students individual time to brainstorm how the design strategies could be applied to their design problem before having them share their ideas with their group.