

BIOMIMICRY IN-CLASS ACTIVITY #3

Animal Inspiration

Instructor Notes on Lesson

Expected Time: 30 minutes

When to Implement: Biomimicry, being an ideation methodology, should be introduced as a way to come up with possible design solutions (after painstorming is covered, if it is). This method lends itself especially well to design challenges that may benefit from a nature-inspired design or relate to environment or sustainability (however, it can be used for design challenges of any topic). The Biomimicry video should be shown first and this would be an appropriate in-class activity to follow. If other prepared activities are being used, this should be follow Biomimicry In-Class Activity #1.

Class Set-Up: Teams of approximately 4.

Materials Needed:

- Scrap paper for students
- White board or chart paper for tracking class ideas
- Students should have access to the internet via computers or phones

Learning Outcomes:

At the completion of this activity, students will be able to:

- Identify features, function, and skills of animals and apply them to complex nature-inspired, human-driven design challenges

Instructor Guide:

After watching the Biomimicry video, put the class in teams of 4 asking students to get out their own note sheet:

INTRODUCTORY DIALOGUE:

Explain to the class that you are going to continue to practice the technique of biomimicry, this time focusing on animals and the features, functions, and skills that they possess, making them well suited for certain tasks. Drawing inspiration from animals is a relatively easy way for individuals wishing to use biomimicry to get started.

Part 1. Become a zoo! [10 minutes]

- Tell each team that they need to assign one person on the team to represent a: Koala bear, Fox, Angel Fish, Giraffe, and/or Hippo.
- Each person should then become an expert on their animal. They should do individual research on their computers or phones to read about and watch videos to learn about how their animal acts and moves, the unique features their animal has, and the characteristics and skills their animal possesses.
- The team should then share together so they all understand the background of all of the animals they represent, so that they can later draw on this. If the instructor wishes, there could also be a class discussion or jigsaw activity so that all of the “koala bears” in the class learn from each other.

Part 2. Design Challenge! [15 minutes]

- Now pose one or more design challenges to the class. These can be quick discussion-based activities where numerous are presented, or one or two that are focused on in-depth.

For example, you might use a more in-depth design challenge that “Your neighbor is a single father of two young boys and he is trying to build a treehouse for them. He recently broke his arm and is having trouble carrying supplies, climbing the tree, and building the house but needs to finish he hopes that the treehouse he is building is spacious, dry, and safe/protected place for the boys to play with. He is hoping that his young boys are able to use the treehouse independently, getting up and down into the treehouse easily, safely, and on their own.

- Instruct the students to first break down all of the sub-problems contained within the design challenge problem statement (e.g. carrying large, heavy objects with one hand; lifting materials into the tree; ensuring a dry space, getting children up in the air safely, etc.). They should do this as a team, recording their responses on their scrap paper.
- Then, working in their teams, instruct each person to contribute at least one solution to at least one sub-problem that is directly inspired by something their animal is capable of

doing. As this is done the teams should discuss how to practically design some solution that is comparable to that inspired by the animal.

Part 3. Share Out and [5 minutes]

- As a class, have each team share their solutions and what animals these solutions were inspired by. Look for commonalities and differences across the class groups. If differences in approaches arise, the instructor may want to initiate a class discussion on which the “better” solution between two or three proposed might be. The instructor may also need to emphasize practicality and how easy/difficult it might be to mimic certain animal feature/functions.

Part 4. (Optional) Wrap Up [5 minutes]

To wrap up this activity, instructors may wish to have students individually or in pairs or teams complete the attached wrap-up assignment.

Name: _____

BIOMIMICRY IN-CLASS ACTIVITY #3

Animal Inspiration

WRAP-UP

1. Which animals were easiest to draw inspiration from? Which were most difficult? What made a particular animal more or less suited to serving as inspiration? How much did this have to do with the specific task proposed?

2. How easy was it to imagine how to practically mimic (build) the feature, function, or skill that your animal utilized? How could you make this process easier?

3. If in our next class you were told that you were tasked with coming up with a new product, service, or process that would make family car travel more enjoyable:

a. How likely would you be to (without receiving any additional instruction or practice) use biomimicry?

1. Extremely unlikely
2. Unlikely
3. Neutral
4. Likely
5. Extremely likely

b. If you were told you had to use bisociation, how confident would you be that you could do so effectively (without receiving any additional instruction or practice) use biomimicry?

1. Not at all confident
2. Not very confident

3. Somewhat confident
4. Confident
5. Extremely confident

4. If in our next class you were told that you were tasked with coming up with a new product, service, or process that would benefit your local sustainable agricultural farm:

a. How likely would you be to (without receiving any additional instruction or practice) use biomimicry?

1. Extremely unlikely
2. Unlikely
3. Neutral
4. Likely
5. Extremely likely

b. If you were told you had to use bisociation, how confident would you be that you could do so effectively (without receiving any additional instruction or practice) use biomimicry?

1. Not at all confident
2. Not very confident
3. Somewhat confident
4. Confident
5. Extremely confident