WEEK 8 Lesson 2

Science and Engineering: Biomimicry
Designing Safe Helmets

S & E **Big Ideas**	Animals have external parts that help them grow, survive, and meet their needs. Humans can copy animal structures to solve human problems. Biomimicry is when humans copy the natural world (like plants and animals) to solve human problems.
S & E **Guiding Question**	What animal structures could we copy to design safe helmets?
Content Objective	I can use what I know about animal structures to identify ways humans have mimicked animals to solve human problems. (1-LS1-1)
Language Objective	I can discuss ways humans mimic animals to solve human problems. (SL1.1)
Vocabulary	**mimic:** to copy **biomimicry:** when people use ideas from nature to solve human problems
Materials and Preparation	• hard boiled egg • clear jar filled with water Place egg in the jar. • Science for Kids video (https://www.youtube.com/watch?v=4Dcj6nYcbLI) • Biomimicry Posters • *Woodpeckers to Helmets*, by Jennifer Colby (here on Epic)
Opening 12 minutes	*In our last lesson, we learned about how humans use nature to help us solve problems. Today, we will talk about a very important problem that involves your brain! Then I'll explain how we're going to try to solve the problem using ideas from nature.* Show the video. Show children the egg in the jar. Remind them of what they learned in the

	video about how the brain moves within the skull. Simulate getting hit in the head. Hold the top of the jar with one hand and with the other, hit the side of the jar. The egg will bounce around. Explain that when this happens to your brain, it can make you dizzy, cause confusion, make it difficult to focus or pay attention, make your head hurt, and/or make your vision blurry. *If you hit your head really hard, or do it frequently, it can cause a lot of damage, which is why it's important to take care of the brain.* *Scientists and engineers have been working very hard to come up with a solution to his problem, and are looking to animals for help! That is because nature is best at solving problems! Do you remember the word for when humans use nature to solve problems?* (biomimicry) *Today you will use what you know about animal parts and how they work to design something similar to a new helmet. You will test your design by placing an egg into it and dropping it from above your head. Before we start working on designs, let's learn about a few animals that might help us with some ideas!*
Investigation 10 minutes	Show children the Biomimicry Posters of the animals (do not put up the helmets yet) and read the captions. *These are all animals that have structures that have helped humans solve the problem of protecting the brain.* ● *What do you notice about each of these animals?* ● *How are they the same? Different?* ● *What structures do you think people copied to make helmets?* ● *What do you think the helmets might look like? Why?* *We will learn a little bit more about how humans copied the woodpecker to build a safe helmet.* Read the book, Woodpeckers to Helmets. *We didn't get to see the inside of one of the helmets designed by using ideas from the woodpecker. Let's take a look at some different helmets now!*
Discussion 5 minutes	Put up the pictures of the helmets and discuss: ○ *What do you like about the designs? What would you change to improve the design?* ○ *How might you design a helmet that uses some of the structures we learned about?* ○ *What materials do you think you might need for your designs?* ○ *What questions do you have?*

Closing	*We've learned about some animal structures that could help us design safe helmets. During your Station, you will write about some of the structures you could copy to design a safe helmet. During Studios, you may start drawing some designs for what your helmet might look like and what materials you might want to use.*
Standards	**Practice 1:** Asking questions and defining problems **Practice 3:** Planning and carrying out investigations **Practice 6:** Constructing explanations and designing solutions **1-LS3-1** Make observations to construct an evidence-based account that young plants and animals are like, but not exactly like, their parents. **SL1.1** I can discuss what I learn about where animals get their traits.
Ongoing assessment	As children talk about the structures of animals and the helmets that have been designed, do they show an understanding that the structures impact the functionality? When talking about materials, do they understand that some materials are better for specific parts of designs than other materials?

Notes