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TEACHER GUIDE

STRUCTURE AND FUNCTION OF LIVING THINGS GRADES 3-5

COMMON MISCONCEPTIONS

- **Students do not recognize animal and plant structures as having specific functions.**
All animals and plants have developed structures that help them survive in their particular environment.

STRUCTURE AND FUNCTION

The concept that structure and function are tied together is important, especially because it has not typically been approached this way in the past. Just as an arch serves a specific function in engineering and architecture, plants and animals have structures - both internal and external - that serve specific purposes to help them survive. In the Next Generation Science Standards, structure and function are present both as a topic (Disciplinary Core Idea), and as one of the seven Crosscutting Concepts. The DCI associated with this 4th Grade Performance Expectation is “systems and system models,” encouraging focus on the importance of the structures in the context of the larger body or plant system.

EVOLUTION AND STRUCTURE AND FUNCTION

Although it is not the focus at this level, student foundation in the concept of structure and function will help their understanding of other concepts - such as adaptation and natural selection - as they progress through the grade levels. Structures with specific functions are the result of generations and generations of animals or plants which were better adapted to a particular function. Darwin’s study of bird beaks in the Galapagos is a prime example of this.

INTERNAL STRUCTURES

At this level, students still think about body systems broadly. They can differentiate between bones and organs, or leaves and seeds, but are not yet thinking about these structures at the cellular level. Students at this level may not be able to envision internal structures, and it is important to share visuals when referencing them.

EXTERNAL STRUCTURES

External structures are easier to see and therefore their function is often easier to understand. These can include animals with exoskeletons, but also the external structures of other animals and plants.

BIOMIMICRY

The concept of humans mimicking nature to solve problems is introduced at the first grade level through the NGSS. Biomimicry is an important concept in engineering. The term biomimicry is not used in the video, but many examples are shown such as glow sticks inspired by fireflies, adhesive inspired by gecko's feet, and swimwear inspired by shark skin.

