

PRINTABLE ANATOMY & PHYSIOLOGY STANDARDS

B

From Molecules to Organisms: Structures and Processes (LS1)

B-LS1-2. Develop and use a model to illustrate the hierarchical organization of interacting systems that provide specific functions within multicellular organisms.

***Clarification Statement:** Emphasis is on functions at the organism system level such as nutrient uptake, water delivery, and organism movement in response to neural stimuli. An example of an interacting system could be an artery depending on the proper function of elastic tissue and smooth muscle to regulate and deliver the proper amount of blood within the circulatory system.*

***State Assessment Boundary:** Assessment does not include interactions and functions at the molecular or chemical reaction level.*

Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
<p>Developing and Using Models Modeling in 9-12 builds on K-8 experiences and progresses to using, synthesizing, and developing models to predict and show relationships among variables between systems and their components in the natural and designed worlds.</p> <p>Develop and use a model based on evidence to illustrate the relationships between systems or between components of a system. NRC Framework Link</p>	<p>LS1.A: Structure and Function Multicellular organisms have a hierarchical structural organization, in which any one system is made up of numerous parts and is itself a component of the next level. NRC Framework Link</p>	<p>Systems and System Models Models (e.g., physical, mathematical, computer models) can be used to simulate systems and interactions—including energy, matter, and information flows—within and between systems at different scales. NRC Framework Link</p>

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B-LS1-3. Plan and conduct an investigation to provide evidence that feedback mechanisms maintain homeostasis.

***Clarification Statement:** Examples of investigations could include heart rate response to exercise, stomata response to moisture and temperature, and root development in response to water levels.*

***State Assessment Boundary:** Assessment does not include the cellular and chemical processes involved in the feedback mechanism.*

Science and Engineering Practices	Disciplinary Core Ideas	Crosscutting Concepts
<p>Planning and Carrying Out Investigations Planning and carrying out in 9-12 builds on K-8 experiences and progresses to include investigations that provide evidence for and test conceptual, mathematical, physical, and empirical models.</p> <p>Plan and conduct an investigation individually and collaboratively to produce data to serve as the basis for evidence, and in the design: decide on types, how much, and accuracy of data needed to produce reliable measurements and consider limitations on the precision of the data (e.g., number of trials, cost, risk, time), and refine the design accordingly. NRC Framework Link</p>	<p>LS1.A: Structure and Function Feedback mechanisms maintain a living system's internal conditions within certain limits and mediate behaviors, allowing it to remain alive and functional even as external conditions change within some range.</p> <p>Feedback mechanisms can encourage (through positive feedback) or discourage (negative feedback) what is going on inside the living system. NRC Framework Link</p>	<p>Stability and Change Feedback (negative or positive) can stabilize or destabilize a system. NRC Framework Link</p>