

Target Performances for *Animals* Activities

All *Carbon TIME* units are organized around a common purpose: *assessing and scaffolding students' three-dimensional engagement with phenomena*. Every *Carbon TIME* activity has its specific expectation for students' three-dimensional engagement with phenomena, what we call its **target performance**. Each activity also includes tools and strategies that teachers can use to assess and scaffold the target performance in rigorous and responsive ways.

The target performances for each activity in the *Animals* unit are listed in the table below.

Activity	Target Performance
<i>Lesson 1 – Pretest and Expressing Ideas (students as questioners)</i>	
Activity 1.1: <i>Animals</i> Unit Pretest	Students show their initial proficiencies for the overall unit goal: Questioning, investigating, and explaining how animals move and change matter and energy as they live, move, and grow.
Activity 1.2: Expressing Ideas about How Animals Grow	Students ask and record specific questions about changes in matter and energy in response to the unit driving question: What happens when ethanol burns?
<i>Lesson 2 – Foundations: Zooming into Organisms (students developing foundational knowledge and practice)</i>	
Activity 2.1: Zooming into Plants, Animals, and Decomposers	Students “zoom in” to animals, plants, and decomposers, describing how all of these organisms are made of cells with special structures and functions.
Activity 2.2: Molecules Cells Are Made of	Students use food labels to describe molecules in animal, plant, and decomposer cells: large organic molecules (carbohydrates, proteins, and fats), as well as water, vitamins, and minerals.
Activity 2.3: Molecules in Cells Quiz	Students complete a quiz to assess their understanding of the molecules in cells and how to identify which molecules store chemical energy.
Activity 2.4: Questions about Animals	Students describe structures and functions that all animals share and pose questions about mealworms to prepare for their upcoming investigation.

Activity	Target Performance
<i>Lesson 3 – Investigating Mealworms Eating (students as investigators and questioners)</i>	
Activity 3.1: Predictions about Mealworms Eating	Students develop hypotheses about how matter moves and changes and how energy changes when mealworms eat, move, and grow and make predictions about how they can use their investigation tools—digital balances and BTB—to detect movements and changes in matter.
Activity 3.2: Observing Mealworms Eating	Students record data about changes in mass and BTB when mealworms eat, move, and grow and reach consensus about patterns in their data.
Activity 3.3: Evidence-Based Arguments about Mealworms Eating	Students (a) use data from their investigations to develop evidence-based arguments about how matter moves and changes and how energy changes when mealworms eat, move, and grow, and (b) identify unanswered questions about matter movement and matter change that the data are insufficient to address.
<i>Lesson 4 –Explaining How Animals Move and Function</i>	
Activity 4.1: Molecular Models for Cows Moving and Functioning: Cellular Respiration	Students use molecular models to explain how carbon, oxygen, and hydrogen atoms are rearranged into new molecules in a cow’s cells.
Activity 4.2: Explaining How Cows Move and Function: Cellular Respiration	Students explain how matter moves and changes and how energy changes during cellular respiration in a cow’s cells (connecting macroscopic observations with atomic-molecular models and using the principles of conservation of matter and energy).
<i>Lesson 5 – Explaining How Animals Grow (students as explainers)</i>	
Activity 5.1: Tracing the Processes of Cows Growing: Digestion and Biosynthesis	Students “zoom in” to the structure and function of a cow’s organ systems and cells, tracing atoms and energy.
Optional Activity 5.2: Molecular Models for Cows Growing: Digestion and Biosynthesis	Students use molecular models to explain how polymers are broken into monomers during the process of digestion and monomers are linked into polymers during biosynthesis.
Activity 5.3: Explaining How Cows Grow: Digestion	Students explain how matter moves and changes and how energy changes during digestion in a cow (connecting macroscopic observations with atomic-molecular models and using the principles of conservation of matter and energy).

Activity	Target Performance
Activity 5.4: Explaining How Cows Grow: Biosynthesis	Students explain how matter moves and changes and how energy changes during biosynthesis in a cow's cells (connecting macroscopic observations with atomic-molecular models and using the principles of conservation of matter and energy).
<i>Lesson 6 – Explaining Other Examples of Animals Growing, Moving, and Functioning (students as explainers)</i>	
Activity 6.1: Explaining Other Examples of Animals Growing, Moving, and Functioning	Students develop integrated accounts of how other animals (salmon, mealworms, dolphins) grow, move and function through the processes of digestion, cellular respiration, and biosynthesis.
Activity 6.2 Comparing Animals and Flames	Students compare how matter moves and changes and how energy changes in ethanol burning vs. a child growing, moving and functioning (connecting macroscopic observations with atomic-molecular models and using the principles of conservation of matter and energy).
Activity 6.3: Functions of All Animals	Students develop integrated accounts of how all animals grow, move and function through the processes of digestion, cellular respiration, and biosynthesis.
Activity 6.4: Animals Unit Posttest	Students show their end-of unit proficiencies for the overall unit goal: Questioning, investigating, and explaining how animals move and change matter and energy as they live, move, and grow.