

ALTERNATIVE LESSON PLANS FOR DISTANCE LEARNING

These alternative lesson plans condense what is taught and suggest ways to support students learning at home. We acknowledge that every situation is unique and strive to provide plans that can be used online or as printed packets. Focus on fewer scientific principles. Use print and audio readings. Share the videos that you can. Discuss if you can.

UNIT TITLE	ES3
DRIVING QUESTION	How does food provide my body with energy?

Lesson 1 (2 days)	
Activity 1.1	<p>What Happens in My Body When I Run around the School?</p> <p>Although you are unable to perform activity, you could have a discussion with students about what happens when they exercise. They might suggest: lose weight, burn calories, sweat, increase heart rate and breathing. Use discussion to start them thinking about the use of energy in their bodies.</p>
Activity 1.2	<p>How Can I Learn More about How Food Provides Energy to My Body? Share setup video and images, and PI: Tortilla Chips Nutrition Facts. Perhaps share the data table below and discuss rather than having students attempt to complete activity.</p> <p>https://d16dnhlej6sizh.cloudfront.net/assets/portal/Teacher-Portal-Resources/IC3_se_v2_0_5_video-activity_1-539.mp4</p> <p>https://d16dnhlej6sizh.cloudfront.net/assets/images/san-ic3foodv3/L1_Be%20Jar%20Probe.jpg</p>  <p>https://d16dnhlej6sizh.cloudfront.net/assets/images/san-ic3foodv3/L1_Burning%20Tortilla%20Chip.jpg</p> 

		Concentration in the room air (the air you inhale)	Concentration in the air you exhale	Change
	Oxygen concentration (%)	Oxygen levels ~21%	Oxygen levels ~15%	
	Carbon dioxide concentration (ppm)	Carbon dioxide levels 350–1,000ppm or 0.04%	Carbon dioxide levels 3,500–10,000ppm or 4%	
		Before burning	After burning	Change
	Oxygen concentration (%)	Oxygen levels ~21%	~significantly less than 21%, but not 0%	
	Carbon dioxide concentration (ppm)	Carbon dioxide levels 350–1,000ppm or 0.04%	significantly higher than before burning or in exhaled air	
	Type of Energy Observed		Evidence	
	Light		light is emitted from the flame	
	Thermal		the flame is hot and the surrounding air is getting warmer	
	Sound		the fire crackles	
	Kinetic		the flame moves, smoke rises	
Reading 1	<i>What Happens in My Body When I Run around the School?</i>			
Reading 2	<i>How Can I Learn More about How Food Provides Energy to My Body?</i>			

Lesson 2 (1-2 days)	<i>What Do Plants Need to Grow?</i>
Activity 2.1	What Should I Consider When Designing Scientific Investigations?
Reading 1	<i>What Do Plants Need to Grow?</i>

Lesson 3 (2-3 days)	Do Different Foods Provide Different Amounts of Energy?
Reading 1	<i>Do Different Food Molecules Provide Different Amounts of Energy?</i>
Reading 2	<i>Why Do Different Food Molecules Provide Different Amounts of Energy? (99)</i>

Reading 3	<i>How Much Do I Need to Exercise?</i>
Lesson 4 (1 day)	How Do Food Molecules Provide Organisms with Building Materials?
Reading 1	<i>How Does My Mouth Change Carbohydrates?</i>
Lesson 5 (2-3 days)	How Are Food Molecules Built Up and Stored?
Activity 5.1	Where Do Proteins Go When They Are Eaten? You may choose to have students watch the movie “Super Size Me” (100 minutes) to demonstrate that weight gain is evidence that the body can store energy for food. Provide discussion prompts for student response or for discussion after viewing the video.
Reading 1	<i>What Allows Organisms to Grow?</i>
Reading 2 A	<i>Do Animals and Plants Store Food for Later?</i>
Reading 2 B	<i>Plants Also Store Food Molecules for Long Periods of Time</i>
Lesson 6 (1 day)	What Do Plants Need to Grow?
Reading 1	<i>What Do Plants Need to Grow?</i>
Lesson 7 (2 days)	How Do Plants Make Their Own Food?
Reading 1	<i>What Do Plants Produce in the Light?</i>
Reading 2	<i>How Do I Know that Plants Use Carbon Dioxide?</i>
Lesson 8 (day)	What Can Burning Food Teach Me about Food Providing Energy to My Body?
Reading 1	<i>What Can Burning Food Teach Me about Food Providing Energy to My Body?</i>
Lesson 9 (3-4 days)	
Activity 9.2	How Do Food Molecules Provide Plants with Energy? Show BTB color change video: https://youtu.be/V8wBChybVh4 . Share PI: <i>Comparing Photosynthesis and Cellular respiration.</i> Setup videos may also be helpful https://d16dnhlej6sizh.cloudfront.net/assets/media/Elodea_Demo_1.mp4 https://d16dnhlej6sizh.cloudfront.net/assets/media/Elodea_Demo_3.mp4 https://d16dnhlej6sizh.cloudfront.net/assets/media/Elodea_Demo_2.mp4
Reading 1	<i>Does a Reaction Similar to Burning Happen in My Cells?</i>
Reading 2A	<i>How Do Food Molecules Provide Plants with Energy?</i>
Reading 2B	<i>Do Plants Give Off Carbon Dioxide?</i>
Reading 3	<i>How Can I Tell that Food Molecules Provide My Cells with Energy?</i>
Lesson 10 (day)	How Do Matter and Energy Move between Organisms?
Activity 10.1	<i>How Does Matter Transfer between Organisms?</i> We suggest providing students with a completed table and Making Sense questions, then discussing responses rather than having students working independently to complete the table and questions.
Reading 1	<i>How Does Matter Transfer between Organisms?</i>

Reading 2	<i>How Does Energy Flow through the Environment?</i>
Reading 3	<i>What Else Is There to Learn about Energy?</i>

SUMMATIVE ASSESSMENT: Students now have all the information they need to write a scientific explanation to the Driving Question: How Do Food Molecules Provide My Body with Energy? Ask students to draw on what they have learned, and any artifacts that they have created (Driving Question Board, models, and so on), to write a complete, detailed explanation. Alternatively, you may have them create and explain a concept map or a flow chart in order to answer the Driving Question.

Students should use the following terms and concepts in their explanation.

- CO₂
- water
- O₂
- C₂ H₁₂O₆ (glucose)
- photosynthesis (in plants)
- cellular respiration (in plants and animals)
- light energy
- energy provided by food molecules
- kinetic energy
- thermal energy
- food molecule breakdown
- food molecule buildup and storage

Sample student response:

Food molecules provide my body with energy when they react with oxygen in my cells in a chemical reaction called cellular respiration. Food molecules are first created by plants when they use light energy to make food molecules and oxygen from water and carbon dioxide in a chemical reaction called photosynthesis. Plants can either use these food molecules right away or store them for later. When I eat a plant, or an animal that has eaten a plant, I consume these food molecules. These food molecules are then broken down in the digestive system and go to my cells through the circulatory system. My cells can use these food molecules for energy or building materials right away or store them for later use. When my cells need energy, the food molecules react with oxygen and produce carbon dioxide and water. During this process, the cells of the body are provided with energy

You might choose to emphasize only a portion of this as a final assessment, given what you are able to teach and what students are actually able to do during this remotely taught unit.

