

# A Vignette of Science Instruction

## **Unit 1: Matter Cycling**

Mr. Lang's class recently started a new science unit. In Lesson 1, Mr. Lang introduced the unit by telling his class they were starting a unit on - Matter cycling. He said that they would be learning about how matter cycles within ecosystems. He asked the class - Where have you heard the word matter before? One student said - "Like what's the matter." Another student said "Matter has another meaning too that we learned in 5th grade science. It is like what all stuff is made of." Mr. Lang built off of that idea and wrote a definition on the class word wall - Matter is everything around you. Matter has mass and takes up space (volume). He then had the class watch a video about matter with examples. During Lesson 2, Mr. Lang said now that we know what matter is, how does it cycle in an ecosystem? He explained that matter cycles between living and nonliving parts as he drew on the board a model of carbon cycling in a forest ecosystem. He then had students play a carbon cycle board game where they saw carbon moving through an ecosystem.

In Lesson 3, the topic for the day on the board is photosynthesis. Mr. Lang tells the class that photosynthesis is an essential part of matter cycling. Mr. Lang explains that during photosynthesis a plant makes its own food, called glucose, through a chemical reaction that uses sunlight to turn water and carbon dioxide into glucose and oxygen. As he explains he writes the formula for photosynthesis on the board and students copy it. Mr. Lang then tells the class that they can see for themselves how this works through a lab he has set-up with a small plant, a baggie, and a carbon dioxide and water detector. Mr. Lang explains that they will put the plant in the baggie and then record the carbon dioxide and water levels. Then, they will graph the results and answer questions about how the data relate to the photosynthesis formula.

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## **Unit 2: Where does food come from and where does it go next?**

The students in Ms. Snow's class recently started a new science unit. In Lesson 1, the students brainstormed food they eat and tasted maple syrup and maple sap. Then they explored nutrition labels for the different foods and realized they all have some food molecules in them (e.g. sugar). But the students wondered - How do plants get the food? Ms. Snow asked them how they thought those food molecules got into plants. Students said that plants do not really eat like animals, but they do need things to grow like - sunlight, soil, water and air. Students had lots of questions about these - Why do plants need sunlight? How do they use soil, water, and air? What exactly is in air and soil? In Lesson 2, Ms. Snow brought in models of food molecules and data on air composition for students to examine and they noticed that some of the elements that make up food (e.g. Carbon and Hydrogen) can be seen in the gases in the air.

Ms. Snow starts today's lesson (Lesson 3) by asking students to summarize what they noticed when they compared air to food molecules and what they want to investigate next. Students offer ideas such as "we could measure the gases in the air with a plant" and "we could use a detector to see if the amounts of carbon dioxide and water in the air around the plant change." The class works together to plan an investigation using the detector and the plants they have been growing in class sealed in a ziploc baggie. Students make predictions about whether they think the water and carbon dioxide around the plant will each decrease, stay the same or increase. Ms. Snow explains that they will now collect their data and then analyze the data. They will then discuss the data to see which of their questions they have answered and what data they still need to collect to explore their questions about how plants get food.