

CHAPTER 5	Thought Lab 5.1: Modelling the Source of Oxygen in the Light-Dependant Reactions	BLM 5.2.6
HANDOUT		
Purpose: Predict and trace the source of oxygen atoms in photosynthesis.		

Procedure

1. Examine the following general equation that resulted from the van Niel experiment:

$$\text{CO}_2(\text{g}) + 2\text{H}_2\text{O}^*(\ell) \rightarrow \text{CH}_2\text{O}(\text{s}) + \text{H}_2\text{O}(\ell) + \text{O}_2^*(\text{g})$$
2. Radioactive water tagged with an isotope of oxygen as a tracer (shown by the *) was used. Note where the tagged oxygen ends up on the right side of the equation.
3. Assume that the experiment was repeated, but this time a radioactive tag was put on the oxygen in CO_2 .
4. Using materials provided by your teacher, model what you predict the appearance of the results would be. Your model must include a “tag” to indicate the oxygen isotope on the left side of the arrow as well as where it ends up on the right side of the arrow.
5. Use labels or different colours in your model to indicate what happens to the carbon and hydrogen in this reaction.

Analysis

1. Explain how an isotope can be used as a tracer.
2. Using your model, predict what happens to:
 - a) all oxygen molecules that originated from carbon dioxide

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b) all carbon molecules that originated from carbon dioxide

c) all hydrogen molecules that originated from water