04/16 Photosynthesis & Energy in Food #6

Plan

-Controled producer investigation
-Photosynthesis
-Conclusion and Discussion

Exit goal

I understand how plants use energy from the sun to make food.

Entry Task:

~We eat food to get the energy and building materials we need to grow, change, and do the things we do. Plants don't eat food. How to plants get the energy and building materials they need to grow, change, and do the things they do?

~What do plants make food out of? What materials do they need to produce food?

Learning target: I can explain what plants need to make food and the photosynthesis equation. I can write a conclusion and discussion for an investigation.

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	Conditions					Data		
	Water	Light	O_2	CO_2	N_2	Starting mass	Ending mass	Mass change
Environment A	Yes	Yes	Yes	Yes	Yes	500 g	551 g	
Environment B	Yes	Yes	Yes	Yes	No	500 g	552 g	
Environment C	Yes	Yes	Yes	No	Yes	500 g	500 g	
Environment D	Yes	Yes	No	Yes	Yes	500 g	549 g	
Environment E	Yes	No	Yes	Yes	Yes	500 g	500 g	
Environment F	No	Yes	Yes	Yes	Yes	500 g	500 g	

This investigation was highly controlled.
What can you learn about this investigation and the one you did about what plants need to make food.
How do we read this data...

Learning target: I can explain what plants need to make food and the photosynthesis equation. I can write a conclusion and discussion for an investigation.

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- **Describe the role of the 5 environmental factors on plant growth.**
- **What did you learn about this and your experiment about what plants need to make food.**

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Photosynthesis

$6\,CO_2 + 6\,H_2O + \text{Light Energy} \rightarrow C_6H_{12}O_6 + 6O_2$

carbon dioxide — water — glucose (sugar) — oxygen

Learning target: I can explain what plants need to make food and the photosynthesis equation. I can write a conclusion and discussion for an investigation.

Remember this activity...

Photosynthesis

$6\ CO_2 + 6\ H_2O$ + Light Energy → $C_6H_{12}O_6 + 6O_2$

Jobs

Carbon Dioxide: Make 6 CO_2 molecules

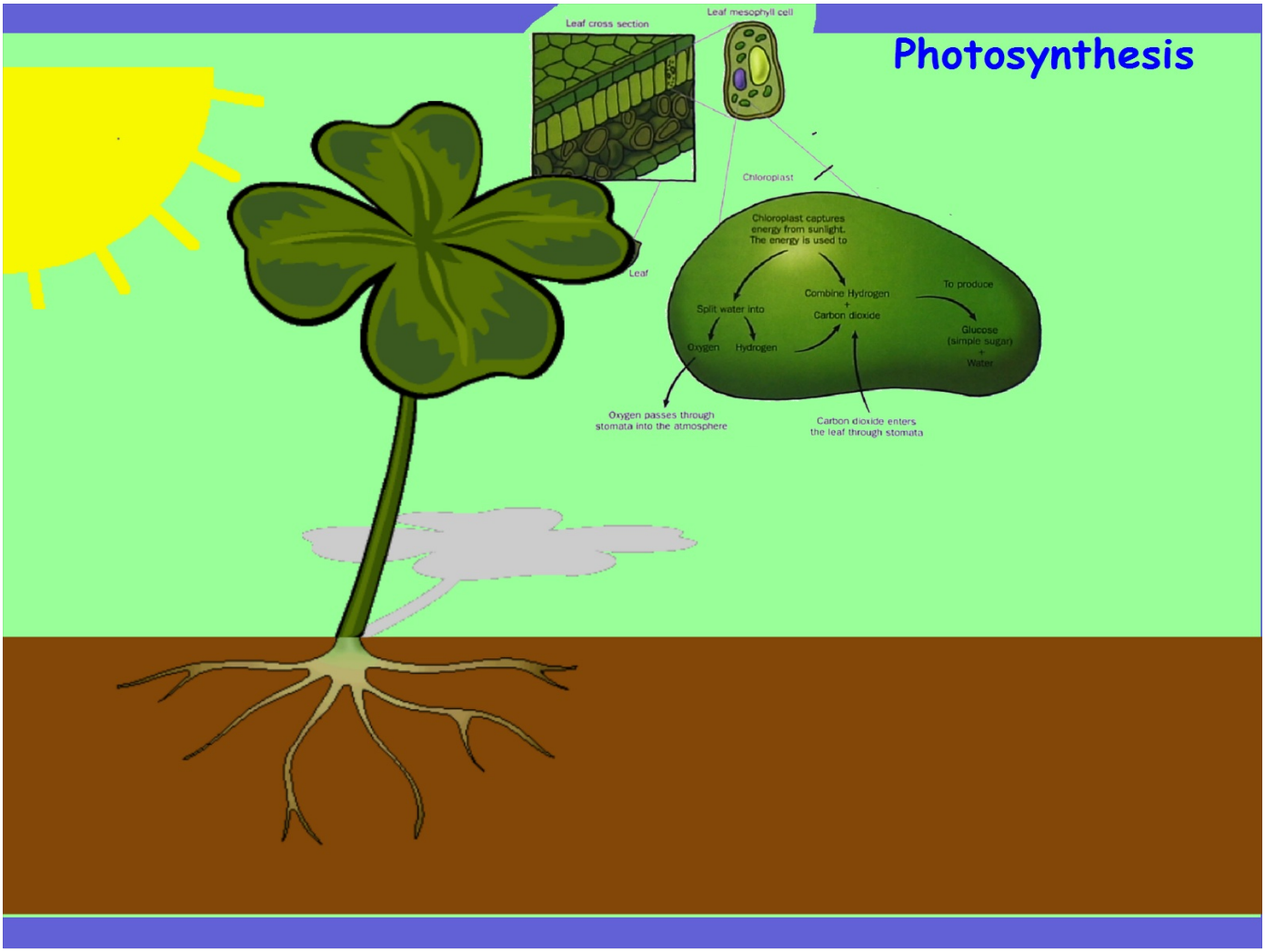
Water: Make 6 H_2O molecules

Sun: Use energy to break all bonds and form new ones

Chloroplast: Synthesize 1 glucose a 6 O_2 molecules

KEY
Carbon: White
Oxygen:Yellow/orange
Hydrogen:Blue

Learning target: I can model the photosynthesis equation.


Photosynthesis
Leaf cross section
Leaf mesophyll cell
Chloroplast
Leaf
Chloroplast captures energy from sunlight. The energy is used to
Split water into
Oxygen
Hydrogen
Combine Hydrogen + Carbon dioxide
To produce
Glucose (simple sugar) + Water
Oxygen passes through stomata into the atmosphere
Carbon dioxide enters the leaf through stomata

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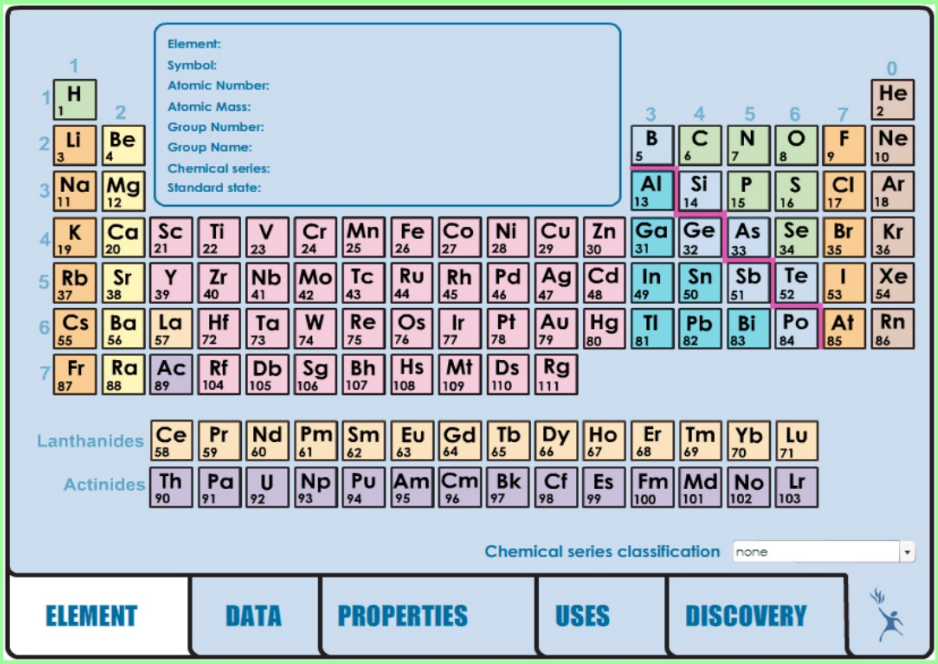
Chloroplast: Synthesizes 1 glucose a 6 O_2 molecules

Where does most of the mass of the plant come from?

Learning target: I can model the photosynthesis equation.

Hint: Look at the atomic mass of oxygen, hydrogen, and carbon.



Photosynthesis

$$6\,CO_2 + 6\,H_2O + \text{Light Energy} \rightarrow C_6H_{12}O_6 + 6O_2$$

The mass in plants comes mostly from the air! The mass comes from the carbon found in carbon dioxide! (Not from the soil)

Learning target: I can explain what plants need to make food and the photosynthesis equation. I can write a conclusion and discussion for an investigation.

Producer Investigation

Conclusion

A **Answer the investigation question and say if your hypothesis was correct/incorrect.**

P **Provide supporting high data**

P **Provide supporting low data**

S **Say how this data supports your conclusion.**

Learning target: I can explain what plants need to make food and the photosynthesis equation. I can write a conclusion and discussion for an investigation.

Producer Investigation

Discussion

- Infer why you think you got the results you did. Use your background experience and knowledge of science to explain the reason for the differences in your data.
  "The control plant grew _____ than the plant without _____ because...."
- Report any variables not controlled and how they might have affected your results.
  "In this investigation we were not able to control..., which may have affected our results by..."
- What would you do differently next time to make your investigation more valid and your data more reliable?
  "To make this investigation more valid and reliable, next time I would..."
- How might your conclusions be overgeneralized from limited data or bias?
  "Our conclusion may be overgeneralized because..."