



## AG IN THE BAG: Cellular Respiration (6-8)

**-Essential Question(s):**

**What is cellular respiration?**

**Why is it important to all producers and consumers?**

Objective: Next Generation Science Standards	Materials/Resources	Essential Vocabulary
<p><b>MS-LS2-3</b> Develop a model to describe the cycling of matter and the flow of energy among living and nonliving parts of an ecosystem.</p>	<ul style="list-style-type: none"> <li>• Computer, tablet, or Chromebook</li> <li>• Circle Map</li> <li>• Respiration/Photosynthesis equation graphs</li> </ul>	<ul style="list-style-type: none"> <li>• Photosynthesis</li> <li>• Water</li> <li>• Carbon dioxide</li> <li>• Sugar(sucrose)</li> <li>• Oxygen</li> <li>• ATP</li> <li>• Sunlight</li> <li>• Soil</li> <li>• Roots</li> <li>• Flower</li> <li>• Stem</li> <li>• Chloroplast</li> <li>• Stomata</li> <li>• Chlorophyll</li> <li>• Producers</li> <li>• Consumers</li> <li>• Ecosystems</li> <li>• Respiration</li> <li>• Reactants</li> <li>• Products</li> <li>• Cells</li> <li>• Mitochondria</li> <li>• Cytoplasm</li> </ul>

## Learning Experience

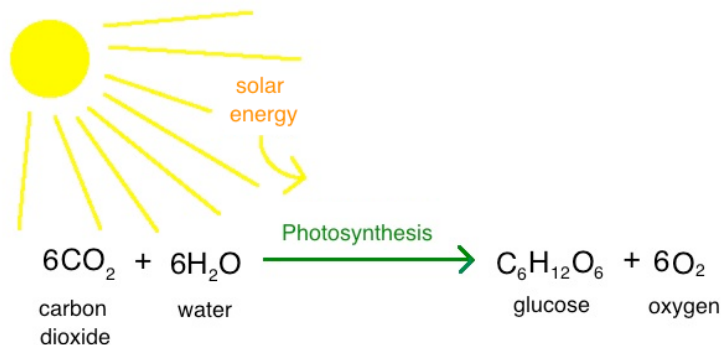
### Background Information:

Cellular respiration is a vital process that occurs in the cells of all living things. This process takes the products food (glucose) and oxygen converts it into energy (ATP), carbon dioxide, and water vapor. Respiration is important because the ATP provides energy to all the organelles in the cell to allow certain processes to occur. For example, to move your muscles the muscle cells require energy to move. If the cells lack energy, then the cell cannot function properly.

Cellular respiration is the opposite process to photosynthesis. If a living organism cannot undergo respiration it will not survive. Air and water pollution has become a major conflict in today's society, due to the limited amount of producers planted to produce oxygen. One small tree can provide enough oxygen for at least 4 to 6 people. Producers clean the air, filter ground water, and prevent soil erosion. Plants provide soil enrichment when they are living and even when they die.

### Engage: Activating Strategy:

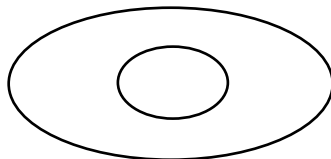
Photosynthesis Song: [https://youtu.be/8u\\_hwwztRqI](https://youtu.be/8u_hwwztRqI) from [www.learningscienceisfun.com](http://www.learningscienceisfun.com)



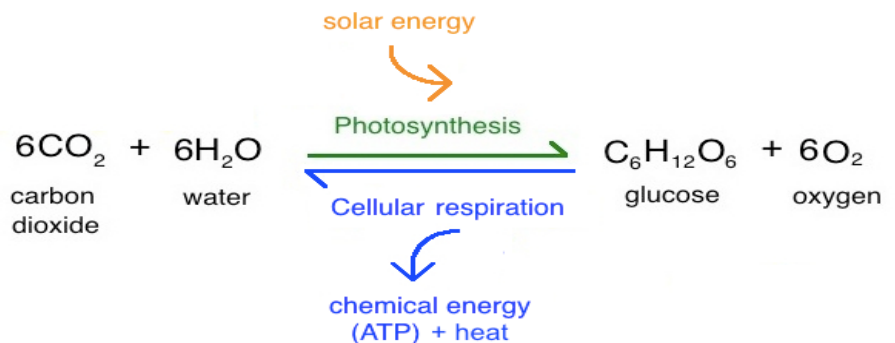
### Explore: Activities:

<https://youtu.be/ktlxlesu1U0>

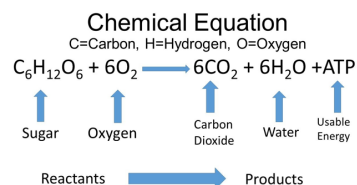
Cellular Respiration Circle Map:



Equation for Cellular Respiration



- Amoeba Sisters: Intro to Cells <https://youtu.be/8llzKri08kk>  
Have students watch the video and complete the video sheet:
- Students love playing video games! Below is a game that focuses on the cellular respiration and photosynthesis, 2 important processes to a plant cell. Put students into partner groups to allow them to compete against each other.  
<https://biomanbio.com/HTML5GamesandLabs/PhotoRespgames/photoresphtml5page.html>



### More Resources for the Ecosystem:



<https://blog.soil3.com/expert-gardener-tips-for-keeping-deer-away>

### Student

#### Misconceptions:

- Plants only do cellular respiration at night-Plants do cellular respiration night and day.

### Explain: Results:

Discuss with your partner the following question.

What is cellular respiration? Why is it important to all producers and consumers?

### Elaborate: Extending:

Acting Out-

Have students use their body movements, pictures, or dances to represent photosynthesis and cellular respiration equations. For example: photosynthesis- create a dance move for the equation or CO<sub>2</sub>-breath out and water (have a glass of water) with sunlight (point to the sun) equals food (pretend to be eating) and oxygen (breath in). Acting out can work for other vocabulary words.

### Evaluate: Summarizing Strategy:

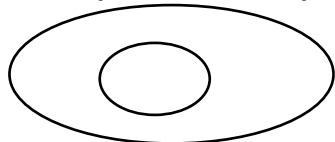
- Create a Google Doc for students to submit their responses to the following questions: **What is cellular respiration? Why is it important to all producers and consumers?**

## Differentiation Strategies

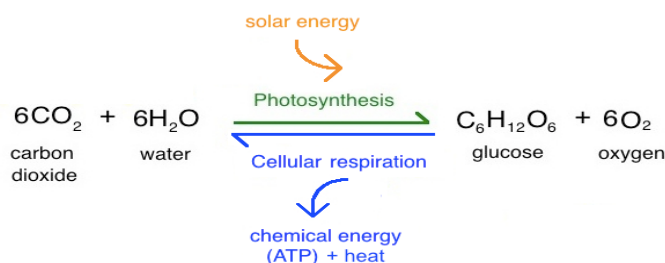
### Virtual Connections

- Photosynthesis Song: [https://youtu.be/8u\\_hwwztRqI](https://youtu.be/8u_hwwztRqI) from [www.learningscienceisfun.com](http://www.learningscienceisfun.com)
- <https://youtu.be/ktlxlesu1U0>

Cellular Respiration Circle Map:



Equation for Cellular Respiration



### STEM Opportunities

- Why are plants so important to the ecosystem? The lab below will elaborate further on photosynthesis and respiration. **Students should create their own commercial to help save their local wooded areas.**

<https://www.sciencelessonsthatrock.com/blog/carbon-cycle-lab-photosynthesis-and-respiration>

- Students love playing video games. Below is a game that focuses on the cellular respiration and photosynthesis. Put students into partner groups to allow them to compete against each other. If students are virtual they can communicate through Google Meet or Zoom to play against each other.  
<https://biomanbio.com/HTML5GamesandLabs/PhotoRespgames/photoresphtml5page.html>
- Create a Google Doc for students to submit their responses to the following questions:  
**What is cellular respiration?**  
**Why is it important to all producers and consumers?**

#### Assessment(s) Options:

Google Doc,

#### Teacher Reflection: (Teacher use Only-Next steps for the lesson

#### Resources:

Resources:

[https://www.ducksters.com/science/biology/plant\\_defenses.php](https://www.ducksters.com/science/biology/plant_defenses.php)

<https://letstalkscience.ca/educational-resources/backgrounders/needs-plants>

<https://www.dkfindout.com/us/animals-and-nature/plants/parts-flower/>

<https://www.soils4kids.org/about>

<https://www.tes.com/lessons/JRIJ0uXBc6b5FQ/science>

Thinking Map Examples: <https://1.cdn.edl.io/F0jBiCPoPKD1cf5bW14MkkIQDUyAHn05tEQMtNvYdZNS4HbJ.pdf>

Photosynthesis Picture: <https://www.sciencelessonsthatrock.com/blog/carbon-cycle-lab-photosynthesis-and-respiration>

<https://www.khanacademy.org/science/high-school-biology/hs-energy-and-transport/hs-photosynthesis/a/hs-photosynthesis-review>

<https://www.amoebasisters.com/handouts.html>

Cellular Respiration/Photosynthesis Game:

<https://biomanbio.com/HTML5GamesandLabs/PhotoRespgames/photoresphtml5page.html>