

Title: <u>Science Tech Unit</u>	Grades: <u>8th Grade</u>
Subject/Course: <u>Applied Tech</u>	Designer: <u>Mrs. Chang</u>
Topic: <u>Carbon Cycle using Cacao</u>	

Defining Purpose / Desired Results

Established Goals:

4.1 Use electronic reference materials to gather information and produce products and services.

4.3 Use information and communication technologies to synthesize, summarize, compare, and contrast information from multiple sources.

CTE – Standards for Business and Finance

Bio-geochemical Cycles

7. Each element on Earth moves among reservoirs, which exist in the solid earth, in oceans, in the atmosphere, and within and among organisms as part of biogeochemical cycles. As a basis for understanding this concept: a. Students know the carbon cycle of photosynthesis and respiration and the nitrogen cycle. b. Students know the global carbon cycle: the different physical and chemical forms of carbon in the atmosphere, oceans, biomass, fossil fuels, and the movement of carbon among these reservoirs.

California State Earth Science Standards

1. Facilitate and Inspire Student Learning and Creativity
 - a. Promote, support, and model creative and innovative thinking and inventiveness
 - c. Promote student reflection using collaborative tools to reveal and clarify students' conceptual understanding and thinking, planning, and creative processes

2. Design and Develop Digital Age Learning Experiences and Assessments
 - a. Design or adapt relevant learning experiences that incorporate digital tools and resources to promote student learning and creativity

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3. Model Digital Age Work and Learning

a. Demonstrate fluency in technology systems and the transfer of current knowledge to new technologies and situations

NET-S Standards

Course Objective:

Students will use prior knowledge of the Carbon Oxygen Cycle they learned with their science teacher and use a diagramming program called Cacao to illustrate their knowledge.

The students will spend time online researching the best pictures to use in their diagram.

See Rubric below for more detail.

Learning Outcomes:

Students will be able to work in pairs and collaborate for the best pictures to represent *decomposition, respiration, combustion, and photosynthesis*. One picture for each science term.

Students will learn how to use a diagramming tool such as Cacao to illustrate the Carbon Oxygen Cycle. Basic diagramming tools will eventually lead to more complicated diagramming software such as Visio.

Students will work in pairs and collaborate the best way to illustrate their four pictures of *decomposition, respiration, combustion, and photosynthesis* in a visually attractive diagram with color and multiple arrows.

Students will learn to give proper reference credit to the images used in their diagram.

Essential Questions:

- How do plants and other organisms that capture carbon dioxide and release oxygen cause atmospheric changes?
- How crucial is team effort and team work on designing an online diagram?
- How does illustrating a diagram help visualize a science concept?
- Does visualizing a concept help others understand the concept easier?

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Learning Plan

Necessary Materials:

- Internet
- Computer Lab
- Cacoo and Google Chrome
- Microsoft Word

Learning Activities: (Lessons are for 45 minute periods)

Day 1: Students will go online in pairs and find pictures that represent *decomposition, respiration, combustion, and photosynthesis*. They will copy and paste these images into Microsoft Word and cite the source in the Word document.

Day 2: Students will narrow down their images to just ONE image for each of the four categories: *decomposition, respiration, combustion, and photosynthesis*. Students will also begin inserting these images into Cacoo and resize, edit, and format accordingly.

Day 3 ~ 4: Students will continue to collaborate and work together to design their Carbon Oxygen Cycle using the tools in Cacoo, adding colors and formatting wherever possible.

Day 5: Students will submit their work by sharing the link to their Cacoo diagram to the teacher's Cacoo account.

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Rubric: Applied Tech – Cacoo Rubric

	Excellent/ Proficient (A) 10 pts Proficient Knowledge	Good / Fairly Proficient (B) 8 pts Good Knowledge	Average (C) 6 pts Basic Knowledge	Below Average (D) 4 pts Not Really Understanding Course Assignment	Unsatisfactory (F) 2 pts Did not implement the required actions or elements.
Use of time & Effort	<p>Excellent/ Proficient (A)</p> <p>Student shows effort and strive for his best while working on their Carbon Oxygen Diagram using Cacoo.</p> <p>Assignment shows efficient use of classroom lab time.</p>	<p>Good / Fairly Proficient (B)</p> <p>Student shows some effort while working on their Carbon Oxygen Diagram using Cacoo.</p> <p>Assignment shows efficient use of classroom lab time.</p>	<p>Average (C)</p> <p>Student shows little effort while working on their Carbon Oxygen Diagram using Cacoo.</p> <p>Assignment was worked on during classroom lab time.</p>	<p>Below Average (D)</p> <p>Assignment shows little or no work during classroom lab.</p>	<p>Unsatisfactory (F)</p> <p>No signs of effort during class assignments.</p>
Use of New Tools & Techniques	<p>Excellent/ Proficient (A)</p> <p>Has an advanced & knowledgeable understanding of Current Tool & Can navigate the software.</p>	<p>Good / Fairly Proficient (B)</p> <p>Good Understanding of software & tools required for assignment.</p>	<p>Average (C)</p> <p>Has a basic understanding of software & tools required for assignment.</p>	<p>Below Average (D)</p> <p>Needs Better understanding of software & tools required for assignment.</p>	<p>Unsatisfactory (F)</p> <p>Did not implement the required actions or elements.</p>
Skills & Improvement	<p>Excellent/ Proficient (A)</p> <p>Student shows extensive knowledge of the Carbon Oxygen Cycle and Cacoo and/or is showing extreme improvement from previous assignments.</p>	<p>Good / Fairly Proficient (B)</p> <p>Student has updated their skills in Carbon Oxygen Cycle and Cacoo and/or is showing some improvement from previous assignments.</p>	<p>Average (C)</p> <p>Student has maintained skills in Carbon Oxygen Cycle and Cacoo and final result lacks precision.</p>	<p>Below Average (D)</p> <p>Student work demonstrates almost no precision or control of the elements in Carbon Oxygen Cycle and Cacoo .</p>	<p>Unsatisfactory (F)</p> <p>No signs of Improvement or Not applying learned skills</p>

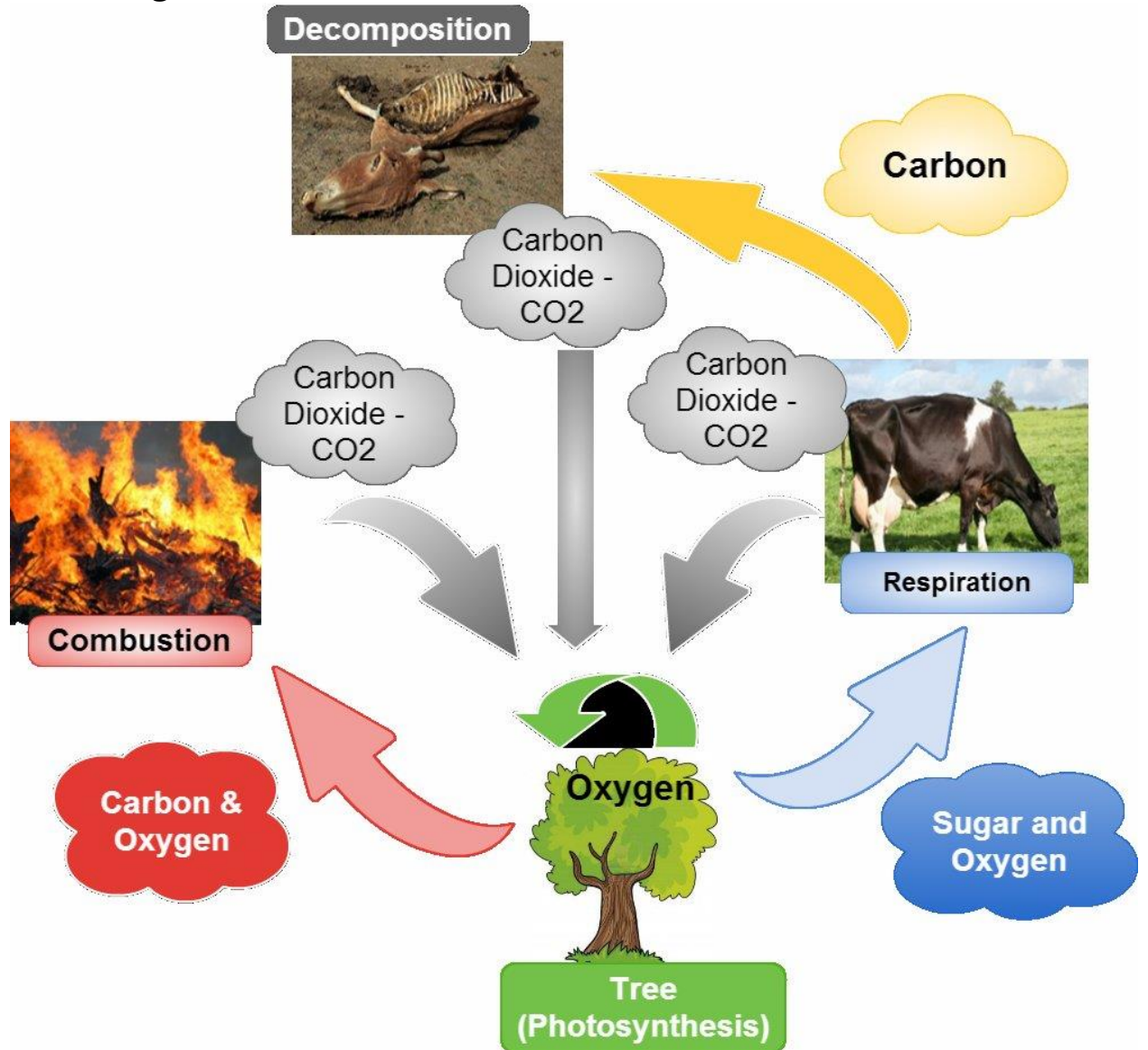
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Creativity	Excellent/ Proficient (A)	Good / Fairly Proficient (B)	Average (C)	Below Average (D)	Unsatisfactor y (F)
	Several of the graphic elements and/or images used in the Project reflect an exceptional degree of student creativity in their assignment, with 100% ACCURATE representation of the Carbon Oxygen Cycle.	One or two of the graphic elements and/or images used in the Project reflect student creativity in their assignment, with 90% ACCURATE representation of the Carbon Oxygen Cycle.	One or two graphic elements and/or images used in the Project were made or customized by the student, but the ideas were typical rather than creative, with 80% ACCURATE representation of the Carbon Oxygen Cycle.	The student did not really make or customize any of the items in the Project. Elements were too basic, with 60% ~ 70% ACCURATE representation of the Carbon Oxygen Cycle.	Did not implement the required actions or elements, with 50% ACCURATE representation of the Carbon Oxygen Cycle.

Teacher Sample

Cacao Diagram:



<https://cacao.com/diagrams/jq3y3VM8gyVu8iLN>

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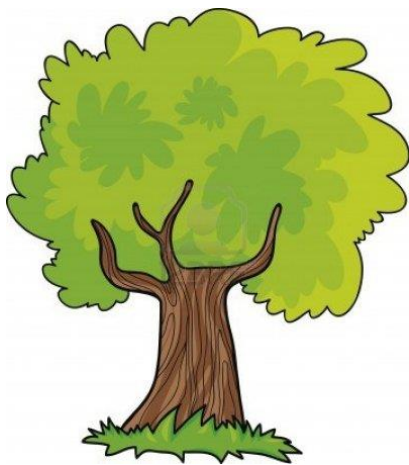
Images References:



http://commons.wikimedia.org/wiki/File:Midsummer_bonfire_closeup.jpg



<http://www.wunderground.com/news/flesh-bone-what-role-weather-plays-body-decomposition-20131031>



http://www.123rf.com/photo_10746492_green-tree-cartoon-illustration.html

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<http://www.genusbreeding.co.uk/?p=4434>