Agriculture Education
Cycle Theme: Meaning & Purpose
Academic Content Lesson

Montessori Lesson Plan

School: James N. Gamble Montessori High School	Teacher: Mary Dudley
Subject/Topic(s): Agriculture Education / Levels of Biological Organization	
Grade Levels: 9-12	Theme: Meaning & Purpose

Standards/Objectives

Outcome 7.1 The Science of Food: Differentiate the structures, functions and sources of basic functional ingredients and the roles they play in the development and manufacturing of food products for human nutrition.

Competency:
7.1.1. Classify the matter in foods by elements, compounds, mixtures, chemical bonds, organic and inorganic properties and physical and chemical changes.

Materials: Teacher	Materials: Student	Time/Dates
• Clipboard • STWW • Weekly record sheet • Status of the class sheet • ALC forms • Witness statements • Hall pass • Sign-out sheet • Current student checklist • Levels of biological organization chart control	• STWW • Current student checklist • Laptop • Focus • Blank levels of biological organization chart • Levels of biological organization cards	• November 18, 2019

Facts/Skills (Prior Knowledge)	Concepts/Big Ideas
• How to listen to directions • Respect for others & materials • Basic understanding of biological elements	• Biological structures • Internal structures of organisms • Our place in the universe

Lesson Relates to Theme (Note: Every content lesson will not directly relate to the theme)

- As students begin to study the microscopic elements of food and apply techniques to study food science it can be easy to forget how these tiny elements connect to the full organism. This lesson brings the students back to basics, allowing them to "zoom out" as they connect the atomic level to the macro. Awareness of this continuum will allow students to find personal meaning and purpose as they relate their own biology to the organisms we are working with.

Correlating lessons

- Food chemistry
- Biotechnology

Applicable FFA events

- Food Science CDE
- Biotechnology CDE

Connection to Elementary Material or Lesson

- Tree of Life
- Kingdoms (botany cards & animal cards)

Curriculum Components Included: ❑ Project ❑ Mini-Whole Group ✔ Lesson-Small Group ❑ Student engagement during lesson ✔ Shelf work ❑ Rubric ✔ Self-Assessment ❑ Seminar/Qs ❑ Interdisciplinary ❑ Outside Opportunity

Seven Gateways for Adolescence addressed in this lesson: ✔ Deep Connection ❑ Silence & Solitude ✔ Meaning & Purpose ❑ Joy & Delight ❑ Creativity ✔ Transcendence ❑ Initiation

Step-by-Step Procedures	
1st Period Lesson – 20 minutes (Include steps and materials) • Small groups of students (less than 8) are invited to join in the lesson to learn the levels of biological organization. Opening discussion begins with the students sharing their prior knowledge on the subject including the smallest particles that are currently known. • Distribute a common organism to all of the students and have them move through the levels of biological organization together as a group • Next have the students pair up with their elbow partner and collaborate to place the cards provided on each level • When the groups have finished allow them to check their work with the control and discuss any questions or final thoughts • Describe where the forms and cards will be placed in the classroom for students to continue their practice	
2nd Period – Recognition (Shelfwork) • Placing the cards provided on the form in the correct levels and checking work against a control	2nd Period – Recall Practice •
3rd Period – Student Application • Drawing representations of each biological level for an organism of choice on a blank form for assessment	

Plan for Differentiation		
Teaching	Work	Assessment
• Small group lesson • Partner collaboration • Individual reteaches	• Student organism choice for application of lesson when illustrating levels	• Level of detail provided on illustrated forms will range depending on student ability
Outside Support: Who, What, How N/A		

Formal Assessments
Formative Assessments: teacher observation, student use of vocabulary during practice
Summative Assessment: student illustrated levels of biological organization

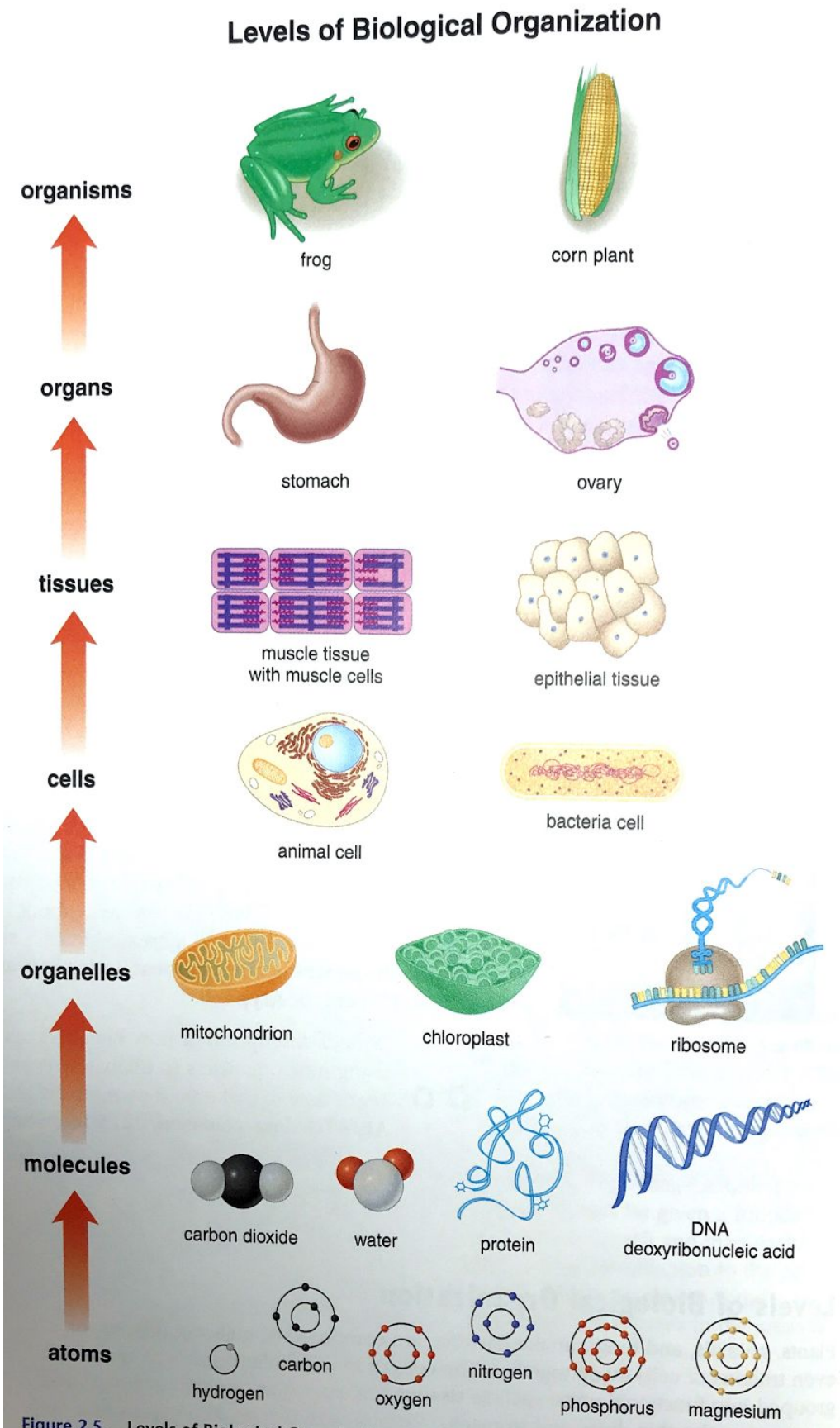

Figure 2.5. Levels of Biological Organization. Atoms are the smallest units of matter that are easily manipulated in cells and in laboratories. Atoms make up molecules, such as carbohydrates, proteins, and nucleic acids. Molecules are the building blocks of cells. Cells function in groups called tissues, and tissues function together in organs. Organs make up organ systems that work together in the multicellular organism.