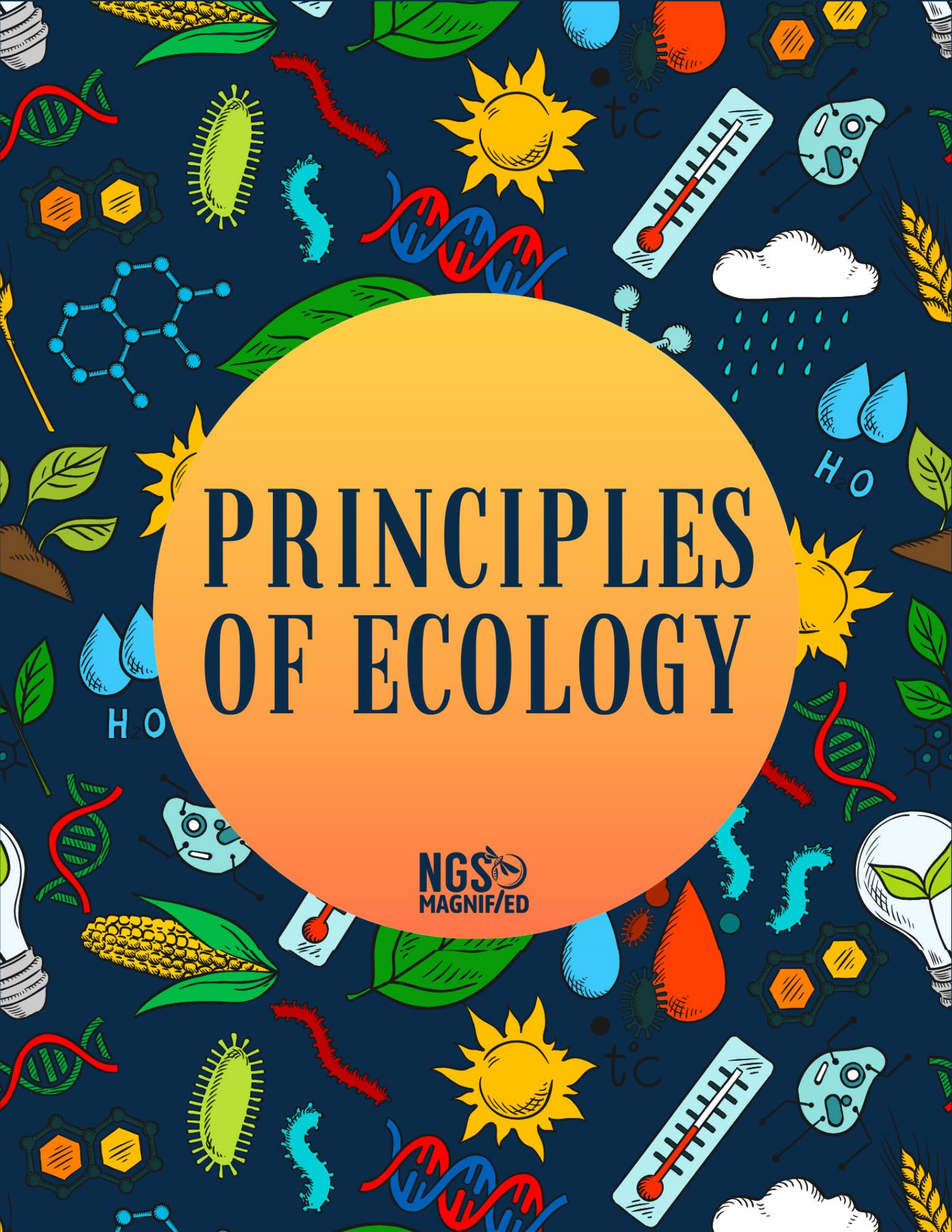




PRINCIPLES OF ECOLOGY

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Introduction

If you are new to the idea of using a Science Interactive Notebook in your classroom, stop by my Nitty Gritty Science shop and download my Intro to Science Interactive Notebooks tutorial for FREE! In there you will find tips on how to begin with your students, what materials to have on hand and, most importantly, how it will enhance your students learning through reflection and creativity.

Focused Lessons with Differentiated Instruction

The lessons shared on the following pages cover National Science Standards and meet students' needs. I have given you the notes that I would give my students (Right Side - Input Side of Notebook) so you can understand what I'm having the students focus on when working on their creative assignments (Left Side - Output Side of Notebook). Each lesson focuses on a Question of the Day (QOD) represented in red in the top margin of each "Input" page with the student giving an answer in red on "Output" page.

Left Side - Output

Instructions for each Output Side are included. This includes cut-outs, foldables or master copies where applicable. You may find that students work slowly at first, but once groups are organized and students know what is expected from them, not only will you see more energy focused on the final product, but also you will be shocked at the level of creativity certain students have in certain areas.

Mini-Assessments

Mini quizzes will be given for each section so you may monitor student's level of understanding. For reproduction purposes, there are two quizzes to a page so you can cut in half and save on paper.

Section 1: Nutrition and Energy

Answer: Sun

TEETH COMPARISON OF HETEROTROPHS

Mammal Skull	Canine	Incisor	Molars/Premolars	Type of Heterotroph	Animal
	Long, sharp for tearing	Sharp for cutting	Sharp ridges for grinding	Omnivore	Bear
	Short and small	Protruding and sharp for nipping	Flat for grinding	Herbivore	Horse
	Absent	Elongated for digging	Flat for grinding	Herbivore	Gopher
	Absent	Sharp for nipping	Flat for grinding	Herbivore	Rabbit
	Pointed for tearing	Blade-like for cutting	Flat for grinding	Omnivore	Human
	Sharp, pointed	Small, sharp	Sharp ridges for grinding	Carnivore (insect)	Bat
	Absent	Elongated incisors called tusks	Flat for grinding	Herbivore	Elephant

NUTRITION AND ENERGY

Ecology - study of the interactions among organisms and between organisms and their environment

Ecologists study the flow of energy through communities to discover nutritional relationships between organisms.

SUNLIGHT is the main energy source for life on Earth.

Autotrophs - organisms that use sunlight or energy stored in chemical compounds to make food
↳ because they make their own food - called **producers**

Photosynthesis
process used by autotrophs to make food energy from sun
• plants • algae • cyanobacteria

Chemosynthesis
autotrophs that capture chemical energy since they live in places without sunlight
• bacteria found in volcano vents, hot springs, tidal marshes

Heterotrophs - organisms that rely on other organisms for their energy and food supply; also called **consumers**

Heterotroph	Description	Examples
Herbivore	eat only plants	cows, caterpillars, deer
Carnivore	eat only animals	snakes, owls, sharks
Omnivore	eat both plant and animals	humans, bears, crows
Detritivore	eat plant and animal remains	worms, crabs, vultures

Decomposers - break down organic matter Ex. bacteria, fungi

Instructions:

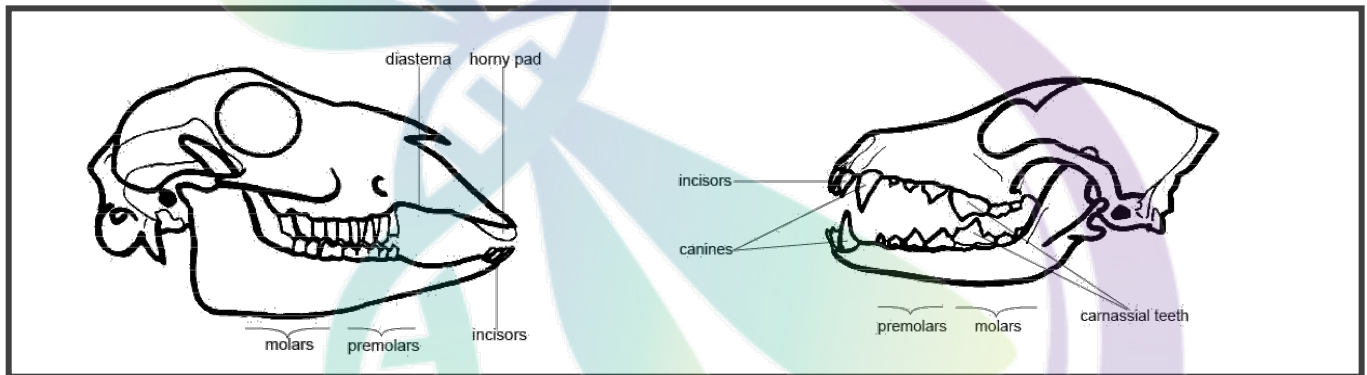
Students will compare teeth of seven mammal skulls and use the characteristics to determine if the mammal is an herbivore, carnivore or omnivore. They will be asked to identify and describe the different types of teeth (incisors, canines, molars and premolars) and then use that qualitative data to make their decision.

For this concept I have included a background page on teeth and heterotrophs for students to read, a printable for teeth comparison activity and a mini-quiz.

MULTIPLE LEARNING STYLES ADDRESSED WITH ORIGINAL ACTIVITIES – NO REPEATS!

Herbivores, Carnivores and Omnivores – Teeth Comparison

Introduction: When comparing mammals' feeding habits, you can determine the type of food they eat based on the shape and adaptations of their teeth. Teeth are structures of the skull that function in an organism's growth and survival. Most mammals have four main types of teeth: canines, incisors, premolars and molars. *Canines* are used for stabbing and tearing, *incisors* gnaw or cut, *premolars* crush and shear, and *molars* grind food.



Carnivores, or animals that only eat meat, tend to have long canines, shearing premolars, and crushing molars. These teeth enable them to catch and kill their prey.

Herbivores, or plant-eaters, have incisors adapted to nipping off grasses and shrubs. Canines are generally absent, and molars and premolars are well-developed with sharp ridges on top for grinding food.

Omnivores, which eat both meat and plants, have a variety of teeth. They need canines for tearing, as well as molars for grinding.

Directions:

1. Examine the following chart of mammals' teeth. Record if the animal has canines, incisors, and/or molars and premolars. Then write a brief description of each in the column.
2. Use the qualitative data to determine if the mammal skull belongs to a carnivore, herbivore or omnivore.
3. Identify the animal represented by each skull. The choices are: sheep, boar, tiger, human, wolf, rat, and horse.

Name _____ Date _____

Quiz: Nutrition and Energy

Circle the word that makes each statement true.

1. (Omnivores, Decomposers) break down organic matter.
2. The process used by autotrophs to make food energy from the sun is called (photosynthesis, chemosynthesis).
3. Organisms that rely on other organisms for their energy are called (autotrophs, heterotrophs).
4. Animals that eat both plants and meat are called (omnivores, detritivores).
5. Organisms that make their own food are called (consumers, producers).
6. A cow is an example of a(n) (herbivore, carnivore).
7. Chemosynthesis is a way for organisms to produce energy in a place without (water, sunlight).

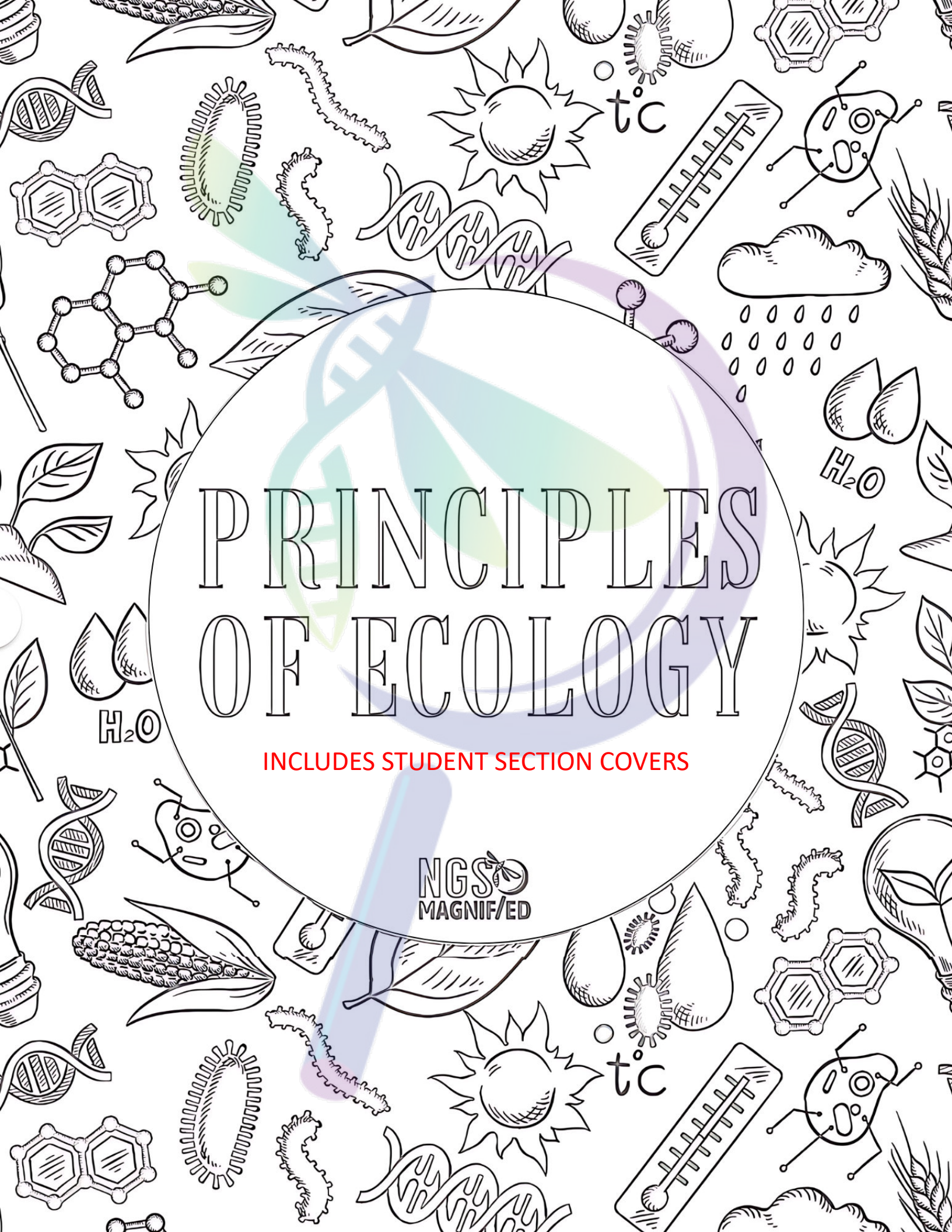
----- **MINI QUIZZES INCLUDED FOR EACH SECTION** -----

Name _____ Date _____

Quiz: Nutrition and Energy

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PRINCIPLES OF ECOLOGY

INCLUDES STUDENT SECTION COVERS

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Question: What is the main energy source for almost all ecosystems on Earth?

NUTRITION AND ENERGY

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SUNLIGHT is the main energy source for life on Earth.

Autotrophs – organisms that use sunlight or energy stored in chemical compounds to make food; because they make their own food, they are **producers**

Photosynthesis

process used by autotrophs to make food energy from sun, plants, algae, cyanobacteria

Chemosynthesis

autotrophs that capture chemical energy since they live in places without sunlight; bacteria found in volcano vents, hot springs, tidal marshes

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Decomposers – break down organic matter; Ex. bacteria & fungi



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