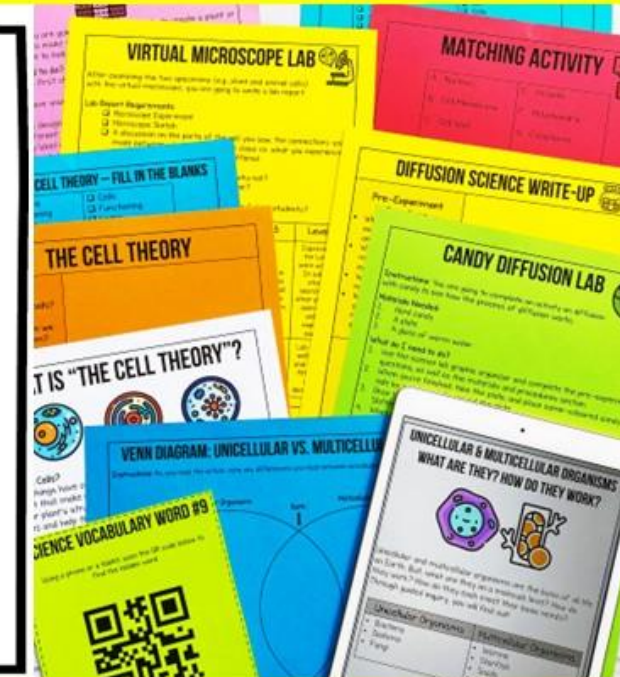


GRADE 8 SCIENCE BUNDLE

PDF & DIGITAL FORMATS

Bundle

- ✓ 4 Units
- ✓ 82 Lessons
- ✓ MP3 Audio Files
- ✓ Hands-On Labs
- ✓ Inquiry Activities
- ✓ Print & Digital



**2022 ONTARIO
CURRICULUM**

RESOURCE INCLUDES

1. Aligned to the 2022 Ontario Science Curriculum
2. 82 Differentiated Lessons
3. 4 Units
4. MP3 Audio Files
5. Detailed Unit Plans
6. Answer Keys & Assessment Rubrics
7. Quizzes & Unit Tests
8. Hands On Science Labs
9. Inquiry Activities
10. 4 Digital Escape Rooms
11. Sub Plans
12. Print & Digital Formats

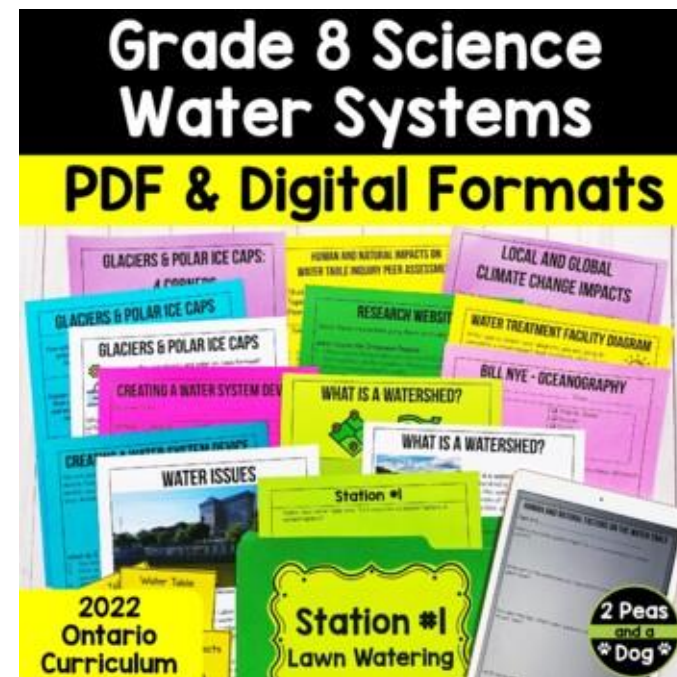
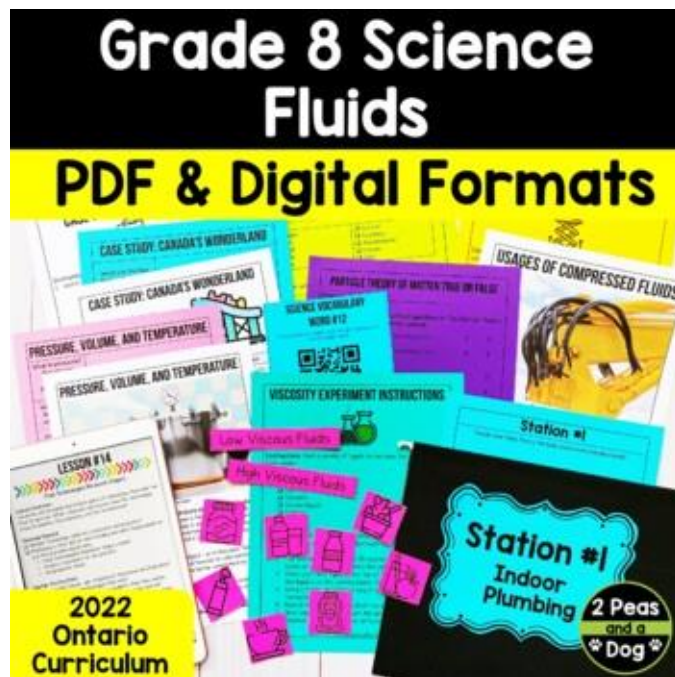
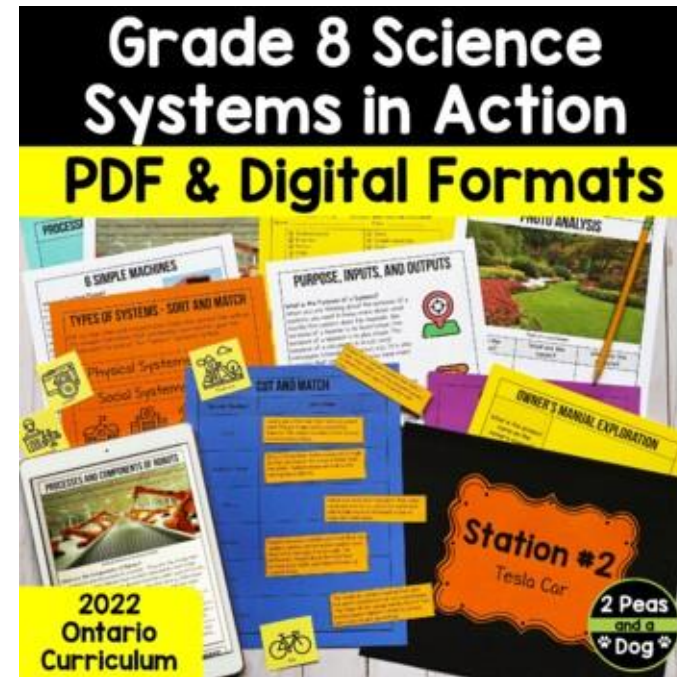
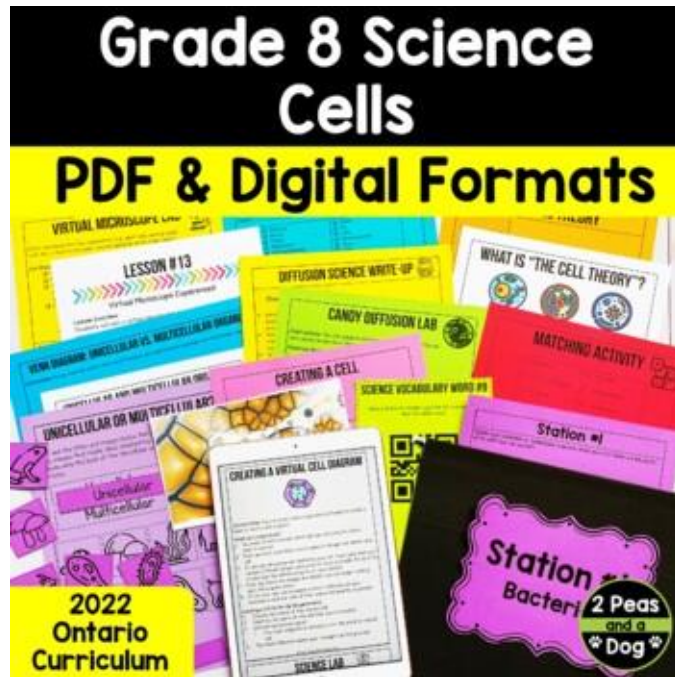


2 Peas
and a
Dog


2 Peas and a Dog

Middle School Teaching Resources

4 FULL SCIENCE UNITS



- ✓ Detailed Lesson Plans
- ✓ MP3 Audio Files
- ✓ Answer Keys & Assessment Rubrics
- ✓ Quizzes & Unit Tests
- ✓ Hands On Science Labs
- ✓ Inquiry Activities
- ✓ Digital Escape Rooms
- ✓ Sub Plans

TEACHER FEEDBACK

“Wonderful resource that made learning fun and planning easy! Students were engaged and enjoyed the learning activities!” – Melissa G.



“Thank you for this resource! My students were engaged throughout the units, which makes me happy! This cut down on my prep in a huge way leaving me valuable time to make observations and complete assessments. Thank you!”
– Pavandeep S.

WHAT'S INSIDE?



DETAILED LESSON PLANS

82
LESSONS

LESSON #1



Unit Vocabulary

Lesson Overview:

Students will work on reviewing vocabulary for this unit.

Materials Needed:

1. Photocopy a class set or use the provided Google Slides version of the:
 - Vocabulary sheets (QR Code or Non-QR Code option)
 - Vocabulary graphic organizer
 - Definitions (For IEP and ESL students)
 - Definitions Google Slides

Teacher Instructions:

1. Hang the vocabulary words up around the classroom or hallway using the QR code or non-QR code format.
2. Divide the class up into groups of 4.
3. Have students walk around the classroom or hallway and find the vocabulary sheets. Students need to scan the QR code with their phones to uncover the mystery word. Once they have uncovered the mystery word, have them write it on the vocabulary graphic organizer.
4. Once students have completed this activity, take up the definitions as a class using the provided slideshow or definitions sheets.

LESSON #3A



Mass, Volume, and Density

Lesson Overview:

Students will learn about the relationship between mass, volume, and density.

Materials Needed:

- Reliable Technology (internet, computer and projector)
- Photocopy a class set of each reading and note-taking sheet:
 - Mass, Volume, and Density readings
 - Mass, Volume, and Density graphic organizer
 - Video: [Evaluate: Mass, Volume, and Density](#)
- Teachers can also use the provided digital version of this lesson to reduce photocopying.

Additional Teacher Resources:

- To further students' understanding of density, have them try a [Density Stimulator](#).

Teacher Instructions:

1. Have students watch the video: [Evaluate: Mass, Volume, and Density](#).
2. Then, read aloud as a class the "Mass, Volume, and Density" sheet.
3. After the video and article, have students complete the graphic organizer note-taking. Incomplete work can be assigned for homework.

LESSON #9



Mechanical Advantage

Lesson Overview:

Students will learn how to calculate the mechanical advantage with simple machines for several mechanical systems.

Materials Needed:

- Reliable Technology (internet, computer and projector)
- Video: [Mechanical Advantage Explained \(lever, block and tackle, inclined plane\)](#)
- Photocopy a class set or use the provided Google Slides version:
 - Mechanical Advantage reading
 - Mechanical Advantage graphic organizer
 - Practice with Mechanical Advantage Calculations

Teacher Instructions:

1. Watch the video [Mechanical Advantage Explained \(lever, block and tackle, inclined plane\)](#).
2. Hand out the mechanical advantage reading and read it aloud as a class.
3. After students read the article, go through some of the major concepts through the use of the Mechanical Advantage graphic organizer.
4. When students understand this, hand out the Mechanical Advantage practice questions to let students try to figure it out on their own.
5. You may have to circulate and respond to questions, or go through an example together to make sure students understand.
6. You can take it up together as a class or collect it.

WHAT'S INSIDE?



READINGS

STUDENT READINGS COME WITH MP3 AUDIO FILES

82 LESSONS

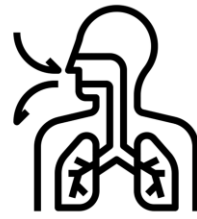
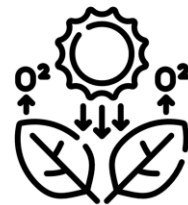
WHAT IS "THE CELL THEORY"?



UNICELLULAR AND MULTICELLULAR ORGANISMS

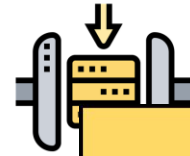
How Do Multicellular Organisms Meet Their Basic Needs?

As for getting nutrients, multicellular organisms are able to get their food from other living things (e.g., plants, animals). Their digestive system breaks these components into smaller parts that provide energy for the body. After the food is consumed and the energy is stored or used, the rest becomes waste. It is a little bit different when plants need to get food, though. Since they don't have mouths and a digestive system to get energy, they use photosynthesis - in other words, the sun's light - to produce energy and get nutrients.



Almost all living things need to breathe or participate in a gas exchange. Humans and animals do so through the use of the respiratory system. Here, the organs and tissues found within the respiratory system infuse oxygen in the body, while pushing out carbon dioxide. Since plants do not have a respiratory system, they rely on diffusion to breathe. Plants do the opposite of animals to breathe. For example, they take in the carbon dioxide and let out oxygen.

WHAT IS COMPRESSIBILITY?



What is compressibility?

When you compress something, you are applying an external force on a substance, like squeezing a ball. The more force or pressure, the more the substance is compressed.

Which states of matter can be compressed?

Solids are the most difficult to compress because their particles are packed closely together. Gases are the easiest to compress because their particles are far apart.

Liquids are in between. They can be compressed a little, but not as much as gases.

Plasma is a state of matter that is very hot and ionized. It is difficult to compress.

Compressibility is a property of matter that describes how much the volume of a substance changes under pressure.

The compressibility of a substance is related to its density and the strength of the forces between its particles.

Compressibility is an important property of matter that is used in many scientific and engineering applications.

SELF-DRIVING CARS

What is a Self-Driving Car?

A self-driving car is a vehicle that can drive itself without any human assistance.

Self-driving technology is already used in many vehicles, but full driverless cars are not widespread.

Currently, some cars already have partial self-driving features. There are cars that can park themselves, keep you driving at one speed without your foot on the gas (cruise control) or brake automatically.

These cars have a level of self-driving, but driverless cars, where the car operates itself for you, are still being developed.

Today's models of driverless cars are not fully autonomous. Some require the driver's hands to be on the wheel to ensure they are ready to take over in case of emergency.

Level Up

Vehicles have different levels of self-driving, ranging from 0 to 5. For a Level 0, all major systems in a car are controlled by humans. For a Level 5, none are controlled by humans.

WHAT IS A WATERSHED?

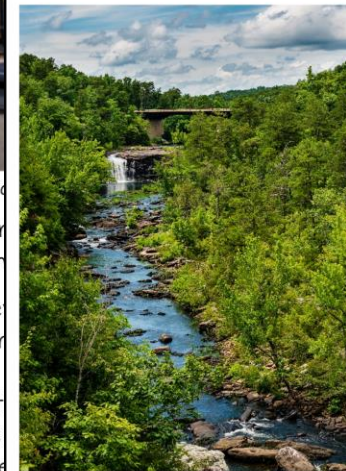


Photo of a watershed in Little River Canyon in Alabama.

What is a watershed?

A watershed is a piece of land that drains the water from the land to a main body of water nearby (e.g., a river, a lake, an ocean, a stream, etc.).

Remember, the water drains downward, so think of land as being on top, and the body of water as being on the bottom.

How I

Why are watersheds important?

Watersheds are important because if we couldn't drain the water, our land would be consistently flooded with water. The water that goes into the land also helps to keep the soil fresh and helps plants and animals thrive.

How many watersheds exist in Canada?

In Canada, rivers flow and drain into five continental watersheds:

1. The Pacific
2. The Arctic
3. The Atlantic
4. Hudson Bay
5. The Gulf of Mexico

WHAT'S INSIDE?



ASSIGNMENTS, LABS & GRAPHIC ORGANIZERS

82 LESSONS

PLANT CELL DIAGRAM

Work Bank

<input type="checkbox"/> Nucleus	<input type="checkbox"/> Vacuole
<input type="checkbox"/> Mitochondria	<input type="checkbox"/> Cell Wall
<input type="checkbox"/> Cytoplasm	<input type="checkbox"/> Chloroplast
<input type="checkbox"/> Cell Membrane	

1.	
2.	
3.	
4.	
5.	
6.	
7.	

CELLULAR ORGANISMS INQUIRY TOPICS

- Group 1: Bacteria
- Group 2: Diatoms
- Group 3: Fungi
- Group 4: Worms
- Group 5: Starfish
- Group 6: Snails
- Group 7: Frogs

MASS-TO-VOLUME RATIO

Instructions: To reinforce your understanding of density, you are going to calculate the mass-to-volume ratios of different amounts of the same substance.

Materials Needed:

- Beaker or measuring cup
- Granulated Cylinder
- 3 different types of fluids (e.g., water, oil, syrup)
- Mass-to-Volume graphic organizer

Instructions:

- Once you have your materials gathered, write a hypothesis about which of the substances is most to least dense.
- Then, measure the mass of the granulated cylinder.
- Next, pour 25mL of the first liquid into the cylinder and record the mass.
- Then, measure the mass of the granulated cylinder with the liquid.
- When you have the mass and volume, calculate the mass-to-volume ratio.
- Once you've done this once, repeat with the second liquid, and then add 7.5mL of the liquid, and then add 7.5mL of the liquid, and then add 7.5mL of the liquid.
- After you've completed one substance, repeat with the other two substances with the same procedure.
- Be sure to complete the Mass-to-Volume graphic organizer.
- Once the sheets have been completed, present your results to your teacher to be assessed.

CELL PHONE EVOLUTION

Assessment	Below Expectations	Meets Expectations	Above Expectations
	✓		

Instructions: In paragraph form, write how the cell phone has evolved based on the article and your own thoughts. Consider other social factors that influence technology and think they will further evolve?

Task: You are going to conduct an experiment to determine what happens when the number of pulleys that support a load is changed.

Materials Needed:

- Pulleys
- String (or rope)
- A weight (e.g., a bucket)
- A bar (in case there are no pulleys)
- Chairs

Instructions:

- You need to first complete the graphic organizer.
- When you are finished, set up the pulley system, you will need to use the bar.
- Place two chairs close to each other, and place the bar in the middle of two chairs so that the bar is resting on the chairs.
- After, you need to get a weight and wrap the string(s) around the pulley and see how it feels.
- Once your load is supported, add more weight and see how it feels.
- When you finish, you will record your observations in the Observation section of the POG.
- After, you will try the experiment with a different number of pulleys.

PULLEY EXPERIMENT

CREATING A WATER SYSTEM DEVICE

You are going to be designing, building, and testing a water system device that performs a function or meets a need. Alongside the device, you will complete a write up and a presentation to showcase your device.

What do I need to do?

- You need to think about the system you are going to create.
- Once you have your ideas, you will complete the graphic organizer, where you will design and think through the building process.
- After, you will begin to create the device.
- As you create the device, you will record observations about your device (e.g., how it works, what needs improvements, etc.).
- Once you test it a few times and it performs the function/meets the goal, you will present your device to the class.
- At the end, you will complete a short reflection on your experience.

Water Device Write-Up Requirements:

- Include the name of the water systems device.
- Identify how the device performs a function or meets a need.
- Detailed explanations about:
 - How you designed the device
 - What materials you used to build the device
 - How you tested the device
- Presentation that shows the device, the building and testing process, and the final water product.
- The final reflection about your thoughts on the process.

LESSONS INCLUDE

- ★ Articles & MP3s
- ★ Graphic Organizers
- ★ Student Choice

WHAT'S INSIDE?



ANSWER KEY

What is a water table?	The water table is an underground body of water near the upper surface of the water. The water that remains in the pockets of water in the aquifer is often there for time.
------------------------	---

Where is the water table located? Draw or describe the water table.	The water table is located in the saturated and unsaturated zone of underground water.
---	--

Explain to humans in a table.	<p>What is diffusion?</p> <p>Diffusion works in such a way that particles of a liquid or gas move from a highly concentrated area (where there is a lot of particles in a specific place), to a less concentrated area (one where there are fewer particles in the same spot).</p> <p>When people add crystals to water and notice how they settle up at the top before it even starts to sink throughout the drink. Or, when you open a can or a bottle of pop and noticed that it has gone flat. Both of these scenarios are examples of diffusion.</p>
-------------------------------	--

Explain to humans in a table.	<p>How does it work?</p> <p>Provide an example of when diffusion occurs.</p>
-------------------------------	---

Explain to humans in a table.	<p>What is the process of osmosis?</p> <p>Osmosis works by having water move from one area to another where there is a high concentration of water to a low concentration of water. The water moves to a low concentration area to even itself out - called osmosis.</p> <p>An example of osmosis is when your fingers and toes get wrinkly because of the water.</p>
-------------------------------	--

Explain to humans in a table.	<p>What is the goal of osmosis?</p> <p>Provide an example of when osmosis occurs.</p>
-------------------------------	--

ANSWER KEY

Hypothesis	<p>Disclaimer: These are sample answers – your students may choose a different approach to building their object, but these answers act as a guide.</p> <p>I think my object will float because it is going to be shaped like a boat. I will make my boat like a canoe with curved, but round edges so it can stay afloat.</p>
-------------------	--

Materials	<p>For this experiment, I will need:</p> <ul style="list-style-type: none"> Aluminum foil
------------------	--

Procedure	<p>List all of the steps you will take to complete this lab.</p> <p>*Needs to be approved by teacher</p>
------------------	--

Procedure	<p>List all of the steps you will take to complete this lab.</p> <p>*Needs to be approved by teacher</p>
------------------	--

Procedure	<p>List all of the steps you will take to complete this lab.</p> <p>*Needs to be approved by teacher</p>
------------------	--

SCIENCE LAB RUBRIC



Criteria	Level 1	Level 2	Level 3
Will it Float or Sink Lab	Student was unprepared during experiment. Student did not participate in the lab.	Student had some of the materials required for the experiment. Student participated in the lab, but did not take on an active role.	Student had the required materials for the experiment. Student participated in the experiment and lab, and took on an active role.
Will it Float or Sink Lab Report	Lab report is incomplete. Several required elements are missing.	Lab report is mostly complete. Some required elements are missing.	Lab report is complete. All required elements are present.

CREATING A WATER SYSTEM DEVICE

Student Name: _____

Criteria	Level 1	Level 2	Level 3	Level 4
Information on the device	Student did not complete all aspects of the device.	Students device was partially complete.	Student completed a water device. The water device works properly.	Student thoroughly completed the water device. The device is complex and performs a function or meets a need.

ROBOTIC SYSTEMS WEBQUEST ASSESSMENT



Criteria	Level 1	Level 2	Level 3	Level 4
Accuracy of content and terminology	<input type="checkbox"/> The information for the Robotic Systems WebQuest is inaccurate or incomplete.	<input type="checkbox"/> The information for the Robotic Systems WebQuest is basic and requires more details.	<input type="checkbox"/> The information for the Robotic Systems WebQuest is relevant to the topic.	<input type="checkbox"/> The information for the Robotic Systems WebQuest is detailed and demonstrates extensive understanding of the content from the articles and videos.

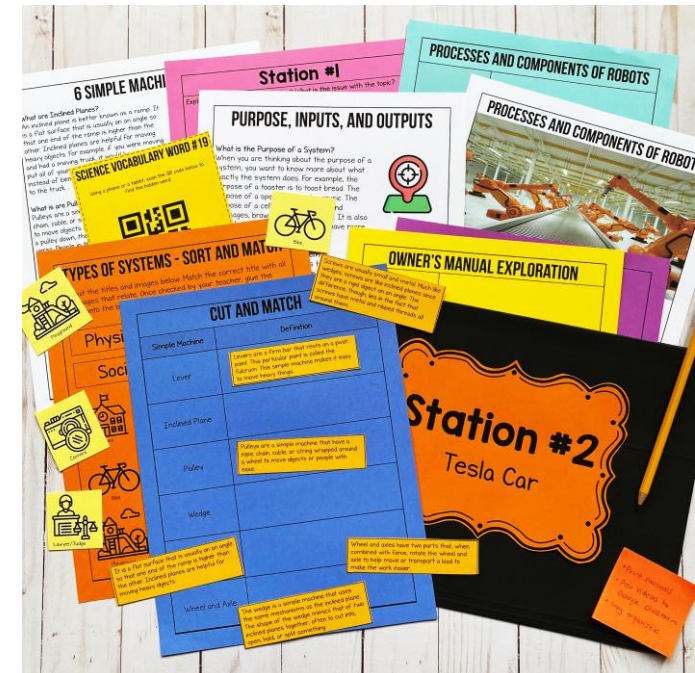
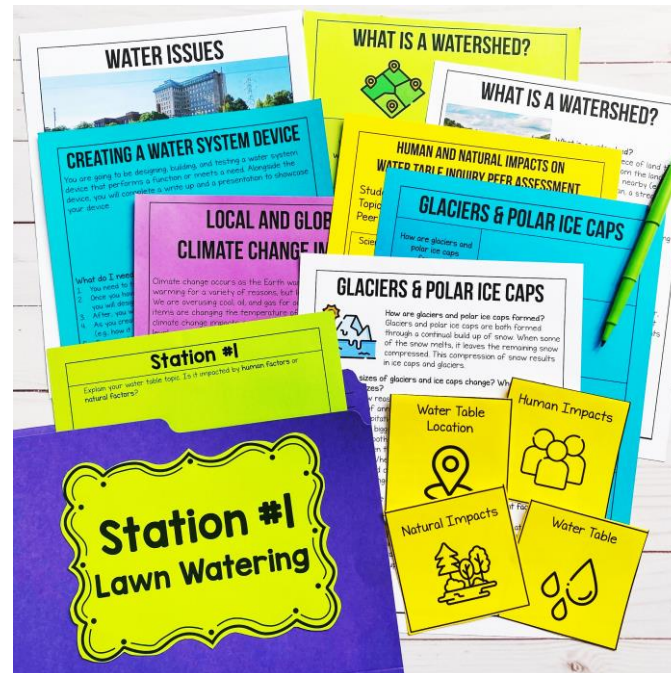
Comments:

ANSWER KEYS & RUBRICS

FREE UP YOUR WEEKENDS

THIS RESOURCE IS FOR GRADE 8 SCIENCE TEACHERS WHO

- ✓ Want their students to enjoy what they are learning
- ✓ Want their evenings and weekends free from lesson planning
- ✓ Want to ensure that they are covering the curriculum expectations in a meaningful yet engaging way



LESSON FORMATS



PDF

✓ Individual & Whole Unit

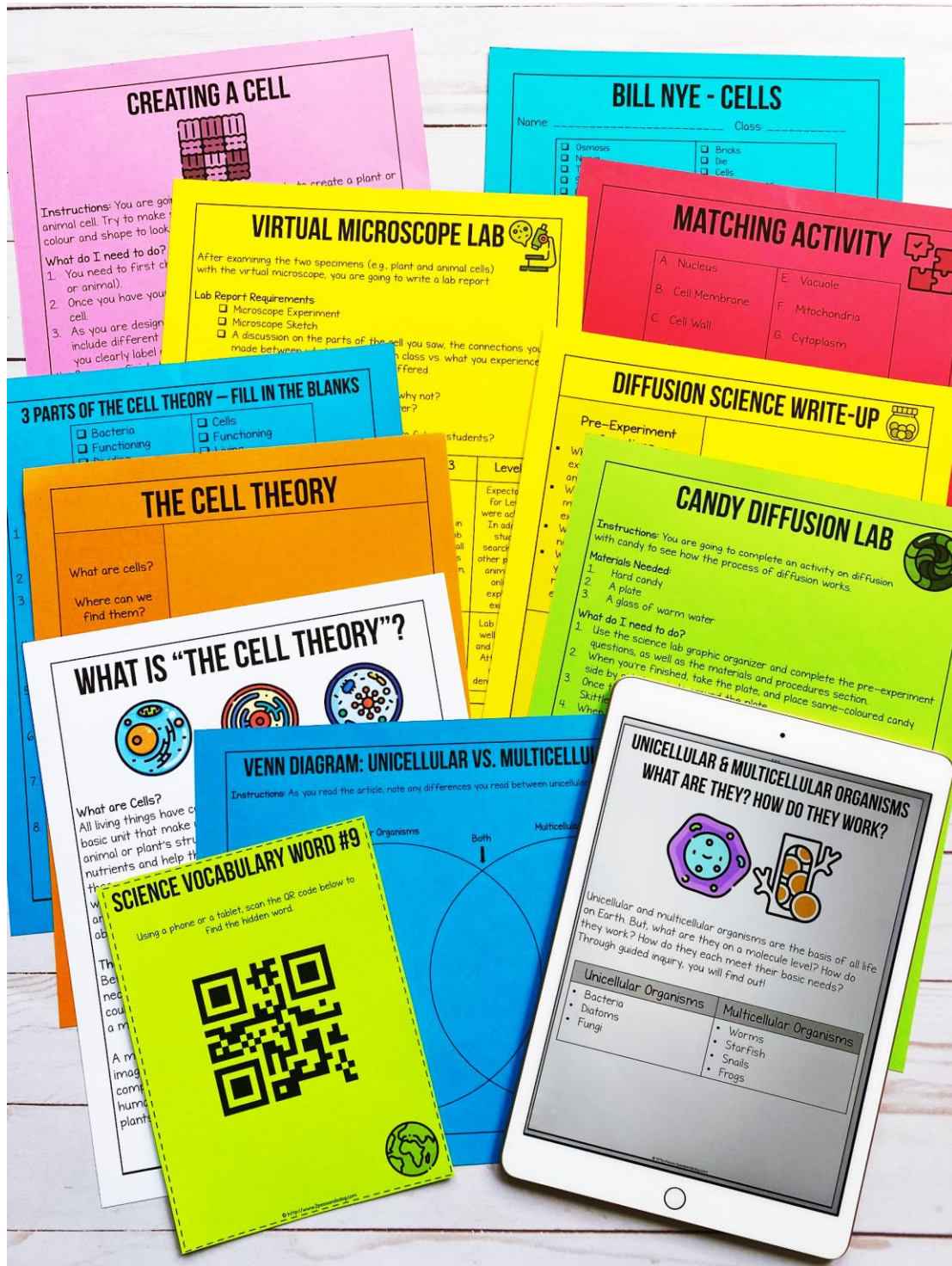


DIGITAL

✓ Google Slides

RESOURCE CAN BE USED IN-PERSON OR ONLINE

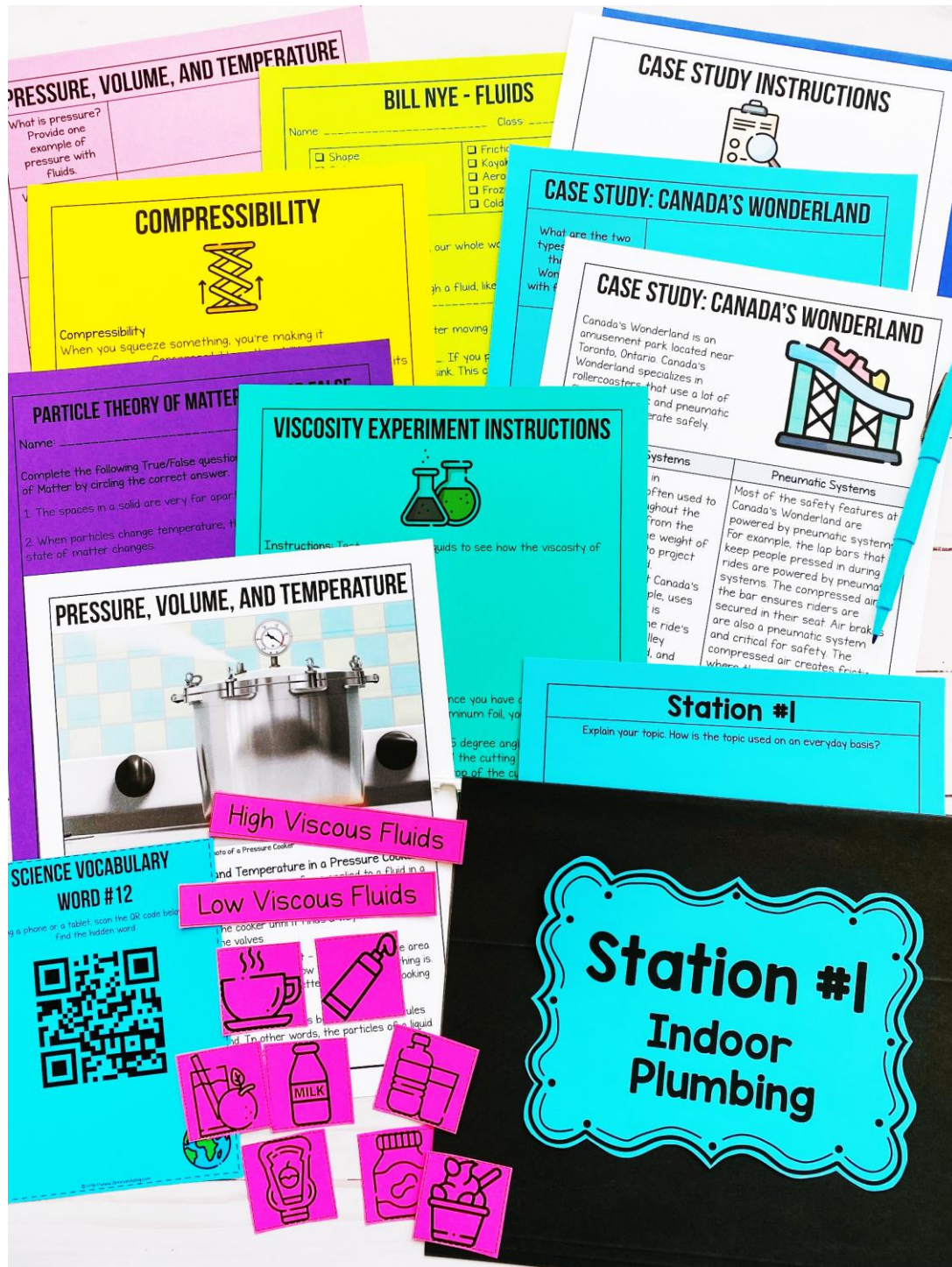
GRADE 8 - CELLS



Included Lessons

1. Introduction: Safety Rules & Cells Interview
2. Unit Vocabulary
3. The Cell Theory
4. Structures and Organelles in Cells
5. Plant vs. Animal Cells
6. Create Your Own Cell - Plant or Animal Cells
7. The Process of Diffusion and Osmosis
8. Candy Diffusion & Potato Osmosis Experiments
9. Unicellular and Multicellular Organisms
10. Cellular Organisms Inquiry
11. Organization of Cells into Tissues, Organs, and Organ Systems
12. Organ Systems Infographic & Presentation
13. Mid-Unit Quiz
14. What is a Microscope?
15. Plant and Animal Cells Microscope Lab
16. Dry and Wet-Mount Slides
17. Cell Technology and Our Understanding of Cells
18. Perspectives on Cell Processes
19. Cells Final Unit Test
20. Sub Plans

GRADE 8 - FLUIDS



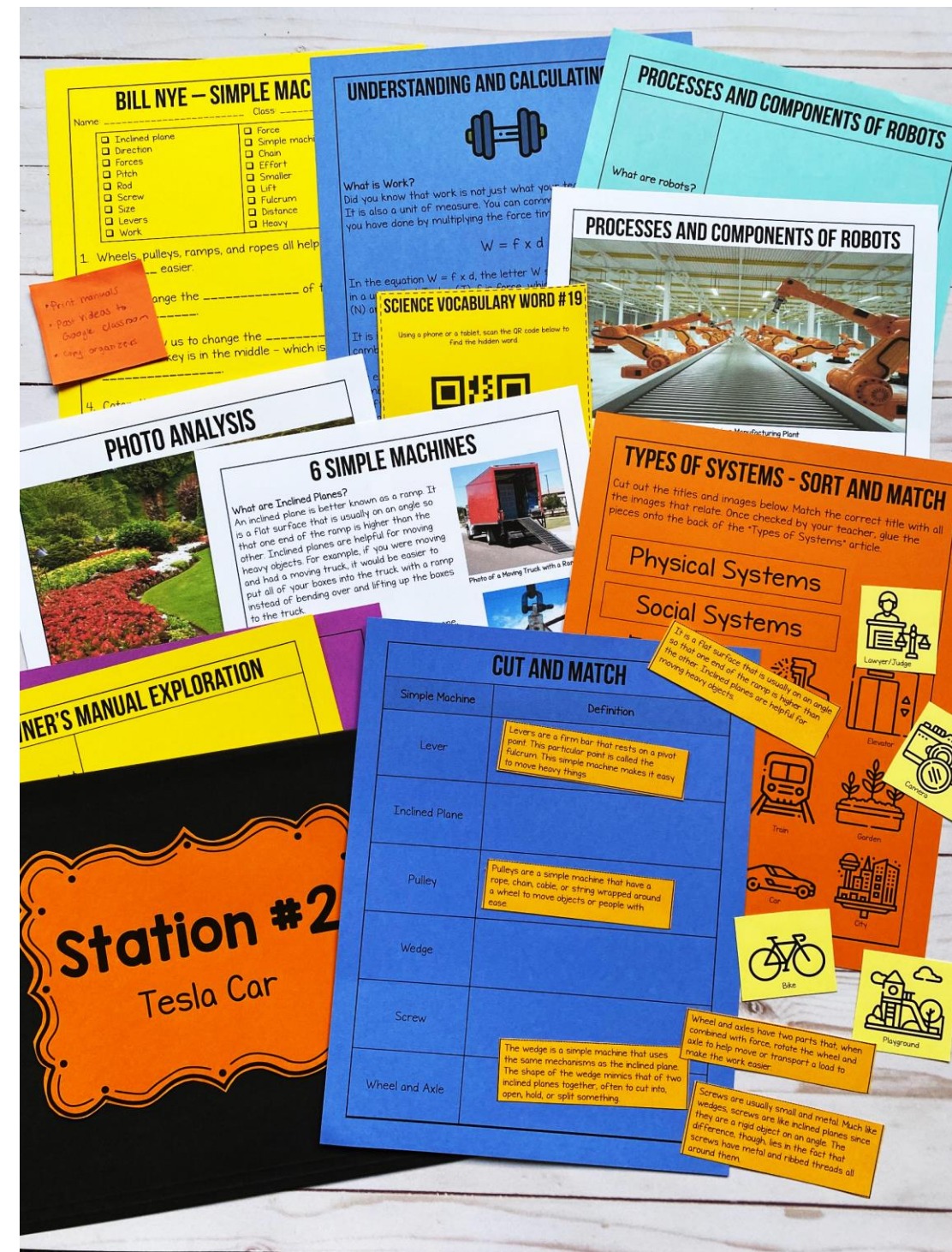
Included Lessons

1. Introduction: Safety Rules, Fluids Introduction & Unit Vocabulary
2. Particle Theory of Matter
3. What is Viscosity? and What is Flow Rate?, Experiment
4. Mass, Volume, and Density
5. Mass, Volume, and Density
6. Mass-to-Volume Ratio Experiment
7. Compressibility
8. Canada's Wonderland Case Study
9. What is Buoyancy & Float or Sink Experiment
10. Mid-Unit Quiz
11. Pressure, Volume, and Temperature & Optional Experiment
12. Pascal's Law
13. Fluids in Controlled and Manufactured Devices
14. Building a Pneumatic or Hydraulic Device (2 options)
15. Investigating Applications of Fluid Mechanics
16. Fluid Technologies Research Inquiry
17. The Impact of Fluid Spills
18. Unit Test for Fluids
19. Sub Plans

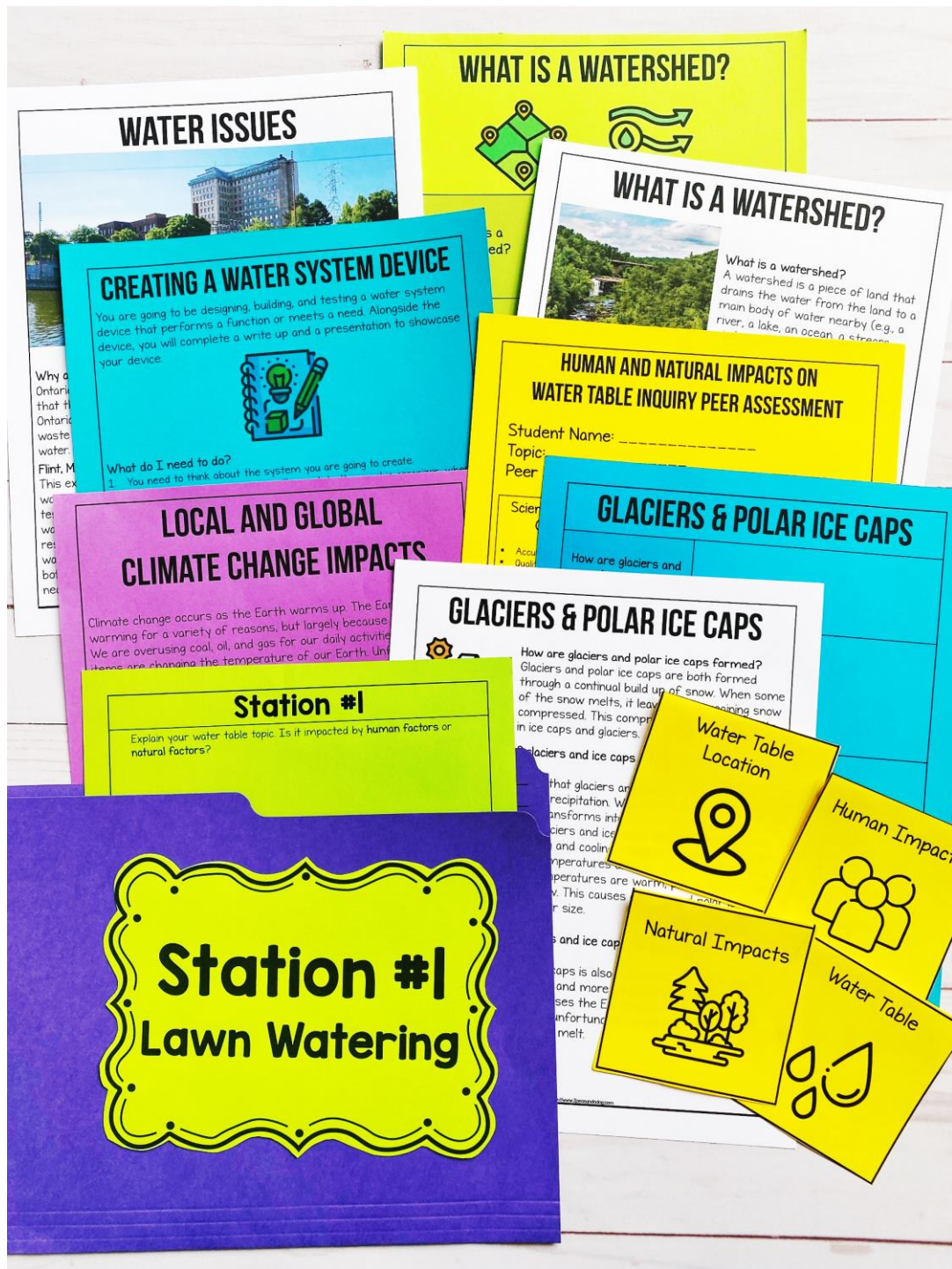
GRADE 8 – SYSTEMS IN ACTION

Included Lessons

1. Introduction - Safety Introductions & What Are Systems?
2. Vocabulary
3. Types of Systems
4. Purpose, Inputs & Outputs of Systems
5. The Processes and Components of a System
6. Quiz
7. Work, Energy, Force, and Efficiency
8. Calculating Work
9. Understanding Work
- 10.6 Simple Machines
11. Understanding Mechanical Advantage
12. Quiz
13. Energy in Mechanical Systems
14. Productivity with Systems in Various Industries
15. Evolution of the Cell Phone
16. Quiz
17. Pulley Experiment and Mechanical Advantage
18. Rube Goldberg Machine
19. Owner's Manual Exploration
20. The Impacts of New and Evolving Systems
21. Meeting Needs with Existing Systems - Different Perspectives
22. Unit Test



GRADE 8 – WATER SYSTEMS



Included Lessons

1. Introduction Lesson – Safety Lesson
2. Unit Vocabulary QR Code Scavenger Hunt
3. The Water Cycle & States of Water
4. Watersheds
5. Human & Natural Factors Cause Changes in the Water Table
6. Human & Natural Factors Cause Changes in the Water Table
7. Inquiry
8. Factors that Affect Glaciers & Polar Ice Caps
9. Atmospheric Conditions & Bodies of Water
10. Mid-Unit Water Systems Quiz
11. Virtual Water Treatment Plant
12. Testing Water Samples (3 options)
13. Investigating Local Water Issues
14. Bottled Water Case Study
15. Building a Water System Device
16. Global Water Consumption
17. Human Impact on Water Systems
18. Innovative Water Technology
19. Water Systems Unit Test
20. Sub Plans