I. **Title: The Water Cycle Project Based Learning**

- **Big Idea:** Earth's water is everywhere and constantly in motion. It moves in rivers, lakes, streams, and the ocean, it even moves around in your own home and environment. How can we demonstrate the movement of water on the Earth?

II. **Grade Level and Subject Area: 5th Grade English Language Arts, Math, Art, and Science**

III. **Standards:**

- **English Language Arts:**
  - **Reading Informational Texts**

    CCSS – ELA.RI.5.7: Draw on information from multiple print or digital sources, demonstrating the ability to locate an answer to a question quickly or to solve a problem efficiently
  - **Writing**

    CCSS – ELA.W.5.2: Write informative/explanatory texts to examine a topic and convey ideas and information clearly

    CCSS – ELA.W.5.8: Recall relevant information from experiences or gather relevant information from print and digital sources; summarize or paraphrase information in notes and finished work, and provide a list of sources

    CCSS – ELA.W.5.9: Draw evidence from literary or informational texts to support analysis, reflection, and research
  - **Speaking and Listening**

    CCSS – ELA.SL.5.1: Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher led) with diverse partners on grade 5 topics and texts, building on others' ideas and expressing their own clearly.

    CCSS – ELA.SL.5.4: Report on a topic or text or present an opinion, sequencing ideas logically and using appropriate facts and relevant, descriptive details to support main ideas or themes; speak clearly at an understandable pace.

    CCSS – ELA.SL.5.5: Include multimedia components (e.g., graphics, sound) and visual displays in presentations when appropriate to enhance the development of main ideas or themes.
- **Math:**
  - Mathematical Practices: 2 – Reason abstractly and quantitatively.
  - **Geometry**

    CCSS – MATH.5.G.2: Represent real-world and mathematical problems by graphing points in the first quadrant of the coordinate plane, and interpret coordinate values of points in the context of the situation

- **Arts:**
    - **Visual Arts**
      2.0 CREATIVE EXPRESSION: Creating, Performing, and Participating in the Visual Arts – 2.7 Communicate values, opinions, or personal insights through an original work of art.
      4.0 AESTHETIC VALUING: Responding to, Analyzing, and Making Judgments About Works in the Visual Arts – 4.4 Assess their own works of art, using specific criteria, and describe what changes they would make for improvement.
      5.0 CONNECTIONS, RELATIONSHIPS, APPLICATIONS: Connecting and Applying What Is Learned in the Visual Arts to Other Art Forms and Subject Areas and to Careers – 5.2 Identify and design icons, logos, and other graphic devices as symbols for ideas and information.
- **Next Generation Science Standards (NGSS):**
    - **Earth's Systems**
      5-ESS2-1: Develop a model using an example to describe ways the geosphere, biosphere, hydrosphere, and/or atmosphere interact.
      What about the Cross-cutting Standards?

IV. Engaging Context:

- Lesson Overview: This lesson combines English Language Arts, Math, Arts and Science together to create a learning activity where students explore the different stages of the Water Cycle. Students learn to make connections to their own experiences where they have seen an aspect of the Water Cycle in their daily lives. Many students believe that the Water Cycle only happens to large bodies of water, when in reality, it happens all around. For example, precipitation can be seen on rainy days, snowy days, days of hail; evaporation can be seen when a glass of lemonade spills onto the hot cement and begins to disappear; transpiration can be seen on the plants all around us in the early hours of the day; condensation can be seen on the outside of an ice, cold, glass of lemonade on a hot, sunny day. The Water Cycle is happening all around us, and having the students see its relationship to their daily lives will help them learn the topic more easily, and become able to explore in what other ways they can experience the water cycle.
- Students will be asked to imagine themselves as a droplet of water moving through the Earth's system.
    - Where are they going?
    - How are they getting there?
- Students will then ask themselves "How does water travel through the Earth's system?""Does water change as it moves through the Earth? How?"
- In groups, students will explore and learn how water moves through the Earth's system by becoming water droplets. As water droplets, students will refer to their prior knowledge of water and the waters movement through Earth to create connections between the water cycle in the environment to the water cycle they may experience within their own homes or have experienced in their daily lives.
- After the groups have discussed and thought about how water moves through the Earth's system, I will show them a video that explains the Water Cycle to them. This will support all learners by giving them a visual representation and a kinesthetic way to internalize the stages

of the water cycle. This can also spark some ideas for their demonstrations/models/art/etc. https://www.youtube.com/watch?v=KM-59ljA4Bs

- Students will then begin to brainstorm ideas for their presentation of the Water Cycle
- Teacher's Instruction: Basic information will be given about the activity and how the groups can tackle the task at hand.
    - Every individual is a water droplet, but as a group they are a small body of water or a larger water droplet.
    - Each group will refer to their prior knowledge to answer the question "How can we demonstrate the movement of water on the Earth?".
    - Each group can research the movement of water on the Earth.
    - Each group will create a demonstration/model of what they learned and write a 3 paragraph explanation of what they learned and were surprised about.

V. Measurable Objectives:

- Students will be able to
    - Engage and collaborate in a group activity to represent their understanding of the Water Cycle.
    - Identify, learn, and use vocabulary related to the Water Cycle as they refer to prior knowledge or explore the internet.
    - Explain how water moves through the Earth's system using academic language.
    - Construct a model that demonstrates a stage or all stages of the Water Cycle (can be a model, demonstration, performance, etc.)
    - Make connections between the Water Cycle and their everyday lives.
    - Demonstrate their learning by writing at least 3 paragraphs reflecting on what they learned, found interesting, and how they think they did as a group member.

VI. Total Time: 45 - 60 minutes a day for 5 days

- Day One: Learn and Explore
- Day Two: Draft
- Day Three: Construction of model/demonstration/art/etc.
- Day Four: Construction of model/demonstration/art/etc. continues
- Day Five: Reflection, group assessment, and submission

VII. Materials List:

- **Research**
    - Computers
    - Vocabulary Worksheet
    - Water Cycle Riddles Activity
- **Model/ Demonstration/ Art/ Etc.**
    - Paper – regular, poster, construction
    - Markers
    - Color pencils
    - Water
    - Bowls
    - Aluminum
    - Plastic wrap

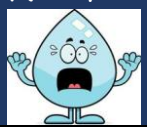
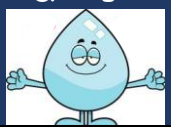
Students will be able to request materials that may be available or bring their own material throughout the project sessions.

VIII. Social Skills and/or Habits of Mind to Engage/ Assess:

- The students will be introduced to the social skills rubric before the activity. This will keep them accountable for what is expected of them throughout the activity.

Checklist of Social Skills

As a droplet, did I contribute?

	Not Yet 	Almost 	Got It! 
Stayed in your group			
Used a Level 3 voice			
Helped group complete the tasks on time			
Encouraged group members			
Disagreed with the idea not the person			
Gave input			

IX. Level of Voice Appropriate for Activity:

- During instructions/directions: Level 0
- During group discussions: Level 3 – normal "table talk"

X. 5-e Framework

- **Engage:** Students will form groups based on a human graph (How much do you know about water and the Earth's systems?"). Then, once they are in their groups, students will assign the materials manager. From their they will go counter-clockwise to assign the next roles.
    - **Materials Manager/ Spy Tasks:** This student will gather, manage, collect and distribute all materials to their group. Students will decide what materials they will need for their model/demonstration and the materials manager will get them. This student will also be in charge of requesting materials that the teacher may have but are not at hand for students. **Also define what the Spy will do**
    - **Checker's Task:** This student is responsible for keeping all group members on task and reminding them what their tasks are. To make the checkers' job more organized, they will write down each student's name and the task (research, drafting a model/demonstration, etc.) that was assigned to them, this is not the same as their roles in the group.
    - **Recorder/ Reporter's Tasks:** This student will write down everything the group discussed. They'll record all members' predictions, ideas, opinions, or responses towards one another. This student will be held accountable to keep track of what was said

throughout the activity and what conclusion the entire group decided on. (other members can help the recorder with this important task).
    - **Encourager/ Observer's Task:** This student will spread positivity throughout their group. They will show team spirit throughout activity and lead cheers or energizers to keep group members motivated. They will help the team choose or create a team energizer at the close of the PBL.
    - **All students** will be responsible to clean up their area after collaboration
- **Explore:** Students will explore the water cycle in their groups by imaging themselves as water droplets. They will think about all of the different ways water moves through the Earth's systems. As a group they will decide how they want to demonstrate a stage of the water cycle to the class.
- **Extend/ Explain:** As the project comes to an end, those who finish will want to share what they learned or explain what they did. Each group will be presenting their discoveries and how they connected the water cycle to their day-to-day life.
- **Evaluate/ Assess:**
    - Vocabulary worksheet must be completed, including pictures, term, and definition.
    - Model/Demonstration/etc.
        - Does it state the topic?
        - Does it include vocabulary?
        - Does it show evidence that the group members learned about the Water Cycle and could demonstrate it?

	Student 1	Student 2	Student 3	Student 4
Listened to the team!				
Solved conflicts reasonably				
Respected everyone's ideas				
Did their best work!				
Completed all tasks!				

    - Group Assessment

- Self-Assessment
  - Each student will write at least 3 paragraphs, explaining what they learned, what they found interesting, and how they think they did as a group member
    - Did they explain what they learned?
    - Did they state and explain what they found interesting?
    - Did they state their stance on their participation with the group?
    - Does the student have at least 3 paragraphs?
- Water Cycle Riddle Quiz

1. I am the movement of water from the ground to the air and then back to the air and then back to the ground. What am I? _____

2. I am a liquid. I am sitting on a leaf. As the sun heats me up, I change forms. What part of the water cycle am I? _____

3. I could be sleet, rain, snow or hail. I am water that falls to the Earth in liquid or solid form. What am I? _____

4. I am the collecting of water in streams, lakes and oceans. What am I?
   _____

5. I am floating up into the atmosphere. As I go higher, it gets colder. I begin to join with other water drops to form a cloud. What am I? _____

6. I am a liquid. If the temperature is hot enough, I change and start floating into the atmosphere. What am I? _____

7. Most people call me the Water Cycle but sometimes I am also called the
   _____

8. I am a finally a liquid again and I made it back to Earth. I think I will stay a while and make my way down towards a lake, a river, or the ocean. What am I?
   _____

Have you seen any part of the Water Cycle in your daily lives? Draw a picture and explain why your picture represents a stage of the Water Cycle.