3rd-5th Grade (upper elementary)

Lesson 1: Water cycle

(a) What is a water cycle and how does it function?
(b) Why are rainforest water cycles important and how do they compare with water cycles in regions across the USA?

Purpose: The purpose of this lesson is two-fold: (a) for teachers and students to co-construct meaning together in understanding what the water cycle is and how it works, and (b) to bring awareness to the importance of water cycles and appreciate the vast differences between water cycles in rainforest regions compared with water cycles in areas around the USA.

Key concepts: evaporation, transpiration, sublimation, condensation, precipitation, and collection.

Research based: Sociocultural theory with an emphasis on co-constructing knowledge and negotiating meaning using **Wells (1999, 2002, 2010) model, 'Spiral of learning and teaching through inquiry'**.

Materials: Internet access, dictionary, pencil, markers, crayons, colored pencils, scissors, and tape.

Common Core Standards:

English Language Arts Standards:

Reading: Informational Text:

Craft and Structure:
CCSS.ELA-Literacy.RI.3.4 (third), 4.4 (fourth), and 5.4 (fifth) Determine the meaning of general academic and domain-specific words and phrases in a text relevant to a grade 3-5 topic or subject area.
CCSS.ELA-Literacy.RI.3.5 (third) Use text features and search tools (e.g., key words, sidebars, hyperlinks) to locate information relevant to a given topic efficiently.

Integration of Knowledge and Ideas:
CCSS.ELA-Literacy.RI3.8 (third) Describe the logical connection between particular sentences and paragraphs in a text (e.g., comparison, cause/effect, first/second/third in a sequence).
CCSS.ELA-Literacy.RI.4.9 (fourth) and 5.9 (fifth) Integrated information from two texts on the same topic in order to write or speak about the sub knowledgeably.

Reading: Foundational Skills:

Phonics and Word Recognition:
CCSS.ELA-Literacy.RF.3.3c (third) Decode multisyllable words.
CCSS.ELA-Literacy.RF.4.3a (fourth) and 5.3 a (fifth) Use combined knowledge of all letter-sound correspondences, syllabication patterns, and morphology (e.g., roots and affixes) to read accurately unfamiliar multisyllabic words in context and out of context.

Writing:

Text Types and Purposes:
CCSS.ELA-Literacy.W.3.2a (third) Introduce a topic and group related information together, include illustrations when useful to aiding comprehension.
CCSS.ELA-Literacy.W.4.2a (fourth) Introduce a topic clearly and group related information in paragraphs and sections; include formatting (e.g., headings), illustrations, and multimedia when useful to aiding comprehension.
CCSS.ELA-Literacy.W.5.2a (fifth) Introduce a topic clearly, provide a general observation and focus, and group related information logically; include formatting (e.g., headings), illustrations, and multimedia when useful to aiding comprehension.

Speaking & Listening:

Comprehension and Collaboration:
CCSS.ELA-Literacy.SL.3.1 (third), 4.1 (fourth), and 5.1 (fifth) Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 3,4, and 5 topics and texts, building on others' ideas and expressing their own clearly.

Language:

Vocabulary Acquisition and Use:
CCSS.ELA-Literacy.L.3.4c (third) Use a known root word as a clue to the meaning of an unknown word with the same root (e.g., company, companion).
CCSS.ELA-Literacy.L.4.4b (fourth) Use common, grade-appropriate Greek and Latin affixes and roots as clues to the meaning of a word (e.g., telegraph, photograph, autograph).
CCSS.ELA-Literacy.L.5.4b (fifth) Use common, grade-appropriate Greek and Latin affixes as clues to the meaning of a word (e.g., photograph, photosynthesis).

<u>Next Generation Science Standards (NGSS):</u>

Disciplinary Core Idea Progression:

Earth Space Science Progression (ESS2.C): Most of Earth's water is in the ocean and much of Earth's fresh water is in glaciers or underground.

Procedure:
Wells' model, "Spiral of learning and teaching through inquiry," in action:

I. Tapping into students' prior knowledge and experiences:

Pre-assessment: (Use pdf)
1. What is a water cycle?
2. How does water get into Earth's atmosphere? Can you name and describe 3 ways?
3. How is water temporarily stored in Earth's atmosphere? What is this process called?
4. How does water fall from Earth's atmosphere? What is this process called?
5. In what ways is water stored or collected on Earth? Why is this important?

Use the pre-assessment questions to tap into students' prior knowledge and experience about the water cycle. Allow students time to share their knowledge and experiences in pairs, small groups, and whole class. Both you and the students can even draw diagrams using the symbols on the **Student Water Cycle Worksheet** (pdf) on the board to co-construct and demonstrate the meaning of each stage in the water cycle.

II. Gathering information:

Students can seek information from the teacher, Internet, books, dictionaries, articles, consulting experts, etc., on water cycles. Allow students time to gather information to answer the questions in the **Student Water Cycle Worksheet** (pdf).

III: Co-constructing knowledge together:

Allow students time to (1) share their information from their **Students Water Cycle Worksheet** with you, and (2) cut all four water cycle stages (*on the dotted lines*) and place them in a circle which represents a logical sequence. Note: 3rd graders may need more scaffolding with this so you may want to pair the 3rd graders with the 4th graders. Go around the room and ask each pair of students to explain their sequence to you. Once you have done this preliminary assessment, you can add to what they have using the information in your **Teacher Information Sheet** (pdf)

IV. Understanding

Demonstrating understanding through post-assessment and activities (see activities**):**

Post-assessment: (Use pdf)
1. What is a water cycle?
2. How does water get into Earth's atmosphere? Can you name and describe three ways?
3. How is water temporarily stored in Earth's atmosphere? What is this process called?
4. How does water fall from Earth's atmosphere? What is this process called?
5. In what ways is water stored or collected on Earth? Why is this important?

Note: Use the Student Water Cycle Worksheet and the Teacher Information Sheet for Lesson 1.