THOMPSON RIVERS UNIVERSITY | Education & Social Work

Bachelor of Education (Elementary) & Bachelor of Education (Secondary) STEM Lesson Plan

Lesson Title: My daily Water Usage | Lesson # 2 | Date: Feb 14

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Rationale:

This lesson comes after learning about the water shed on earth. After seeing how much water there is available on earth, students will predict and track their usage in the hope they will be more aware of the former.

Core Competencies:

Communication	Thinking	Personal & Social
Students communicate with intent and purpose, by receiving and presenting information	Students will learn to engage in inquiry and reflect, to consider purpose and perspective, pinpoint evidence, use criteria, make judgements or assessments and draw conclusions.	Students who are personally aware and responsible have a sense of self-worth and a growing confidence in a variety of situations. They will also take ownership of their choices and actions

Big Ideas (Understand)

Computational fluency and flexibility with numbers extend to operation with larger (multi-digit) numbers.

Learning Standards

(DO)	(KNOW)
Learning Standards - Curricular Competencies	Learning Standards - Content
• Use reasoning to explore and make connections • Connect mathematical concepts to each other and to other areas and personal interests.	• number concepts to 1 000 000 • multiplication and division to three digits • duration, using time measurement

Instructional Objectives & Assessment

Instructional Objectives (students will be able to…)	Assessment
• Students will be able to estimate their water usage and create a chart to record their daily water usage. • Students will be able to apply appropriate and manipulate measurements to measure the different ways they use water directly in a day.	• Formative observation and product of estimation and personal daily water chart. • For learning/as learning: teachers will provide common direct water usages and students will monitor their own learning by asking questions and figuring out other usage quantities: conversation.

Prerequisite Concepts and Skills:

Multiplication and addition, unit conversions, unit sizes

Indigenous Connections/ First Peoples Principles of Learning:

Indigenous people have been standing up to protect water for decades. To them, water is more than just hydration: Water is sacred. Water is life, nourishment, and has been used for transportation since time immemorial.

Learning ultimately supports the well-being of the self, the family, the community, the land, the spirits, and the ancestors.

Universal Design for Learning (UDL):

Students will have opportunities to engage as prior knowledge is activated and connected to personal real-life examples. Recording provides learners with autonomy.
Information will be presented in multiple media sources.
Students will create their own charts using word descriptions or pictures or a handout chart will be available with common direct water usage and an example will be up on the board.
Students can work in groups to design charts.
A review of measurements and conversion will be discussed and a conversion chart available:
Access to the internet will be available to search out usage details.

Differentiate Instruction (DI):

Students can partner up.
Handouts will be available and information up to the board.
Desks are arranged in groups for a supportive environment
Students take home for family connection and support.
Students make a take home chart and record data for two weeks and will try to reduce by putting what they learned to work.

Materials and Resources

conversion factors: 1 L= 4.2 cups; 1 gallon = 3.8 L; 1 L = 1,000 milliliters (ml)
Example consumption chart and template to hand out to log daily water consumption (paper copy and on copy white board)
10-gallon clear water jug
Hose to get water from tap to jug
Toothbrush and paste
Whiteboard and marker
Paper for charts

Lesson Activities:

Teacher Activities	Student Activities	Time
Brain break: students will do a multiplication activity: 5X MULTIPLICATION GAME! BRAIN BREAK EXERCISE, MOVEMENT ACTIVITY. MATH GAME. TIMES TABLES	Students will engage in brain brake	5 mins
Introduction (anticipatory set – "HOOK"): "Hey guys, sorry. Will you excuse me so I can brush my teeth?" The teacher goes to brush teeth for 1 minute and leaves the tap running.	Students will observe the water collected when the teacher is brushing their teeth.	5mins

Water is collected into a clear 10-gallon jug so students can see the water collected. "Thanks for that. I cheated and only brushed for 1 minute. With hands raised how long do you brush for? And put your hand up if you leave the water running. Ok thanks for that"	Students will say the time they brush their teeth for and if they leave the tap running.	
Body: As we seen last week, there is not a lot of drinking water available on our planet. Today we are going to talk about water usage and design our own charts, to monitor our own personal daily water usage. Ask students how they use water and write up on board. (Flushing toilet 5 G or 18L/per flush, dishwasher 64 L or 17G, dishes by hand 56 L or 15G, take a shower 5G/min, bath 189L or 50G, small load of wash 170 L or 45G, brush teeth or washing hands 7.5 L or 2 G/minute, car wash 170L, 2L to drink/day, 26L to cook/day, cut grass 35L/ minute). Review of conversion factors: 1 L= 4.2 cups; 1 gallon = 3.8 L; 1 L = 1,000 milliliters (ml) Set expectations and show rubric: All final answers should be written in Liters. Please share your work with me on how you found your solutions. The goal is to estimate and then record, as close to your actual water usage as possible, and calculate your total weekly water usage. Now students can break into groups or individuals, reminding students to show good behavior and group work, to build charts and enter data as an estimation. The chart will then be taken home and back to school daily to record personal water usage. Students can make own charts or use template provided. Students who finish early can calculate their total weekly estimation and find ways to represent it. Example: when leaving the tap running when brushing your teeth how much water are you using, a kitchen sink, a 5g pail, a bathtub etc.	Listening attentively After class discussion break into groups or individual, to start own personal water usage chart. Students will do conversions and estimate their own personal water per day and weekly usage. A class helper will go around and hand out paper to do own chart of use template provided	10 mins 20mins

Water from the hook will be conserved for washing hands, filling water bottles, etc., and not to be dumped down the drain.		
Closure: the teacher will use the hand clapping attention-grabbing technique and instruct students to clean up and return to their desk with chart. Talk to students reiterating with the charts we will record our water usage for a week to determine our individual and classes water usage to use for our next lesson where we will again measure our weekly usage to she if we are able to reduce the latter. The teacher will ask students to share some of their water usage and estimations and how they determined/ converted the measurements.	Students return to their desk and put their materials away and keep charts to record water usage at school and take their chart home or paper to record data and become more aware of their water usage. Students will listen actively and raise their hands to talk about what they put on their charts.	5mins

Organizational Strategies:

Engage students with the hook that grabs their interest as it connects to their personal lives.
Students' desks will be in groups and students may select partners to help develop their chart.
Charts will go home to fill out and come back to school for multiple opportunities for support.

Proactive, Positive Classroom Learning Environment Strategies:

Students will sit at desks arranged in groups for hook and instruction before choosing to independently work on chart or move to work in other groups.

A student helper will hand out paper for students to do their charts.

An attention-grabbing hand clap will be used to get students' attention when needed and to signal them to return to their desks.

Extensions:

After learning about watersheds and drinkable water on earth, after students determine their water usage, they can find a way to represent it to have a better understanding ex: a bathtub is 300L

Students will record their water usage the following week, trying to find ways to reduce usage to promote water conservation, which will be a fallow up lesson. The class will find ways to conserve water to become better keepers of the earth.

Reflections (if necessary, continue on separate sheet):

I think this lesson is important to teach the future generation as I often see people wasting water, which is a limited resource on our planet. This lesson will help children to be more aware of their water usage to apply this knowledge in a future lesson on strategies to conserve water.

When planning, I tried to find an engaging activity to foster independence and connection, thus I chose to make your own personal chart to record your water usage. I also struggled to find more ways to

include all students through UDL and DI. I feel the option of working in groups will foster connections and learning for the students.