THOMPSON RIVERS UNIVERSITY | Education & Social Work

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

Lesson Title: Fractions through Seasonal Rounds | Lesson #: 3 | Date: December 10th 2024

Name: Ethan Greenwood | Subject: Mathematics | Grade(s): 3

Rationale:

This lesson is designed to deepen students' understanding of fractions through a culturally specific lens via Indigenous seasonal rounds. This lesson would be the 3rd lesson in the unit, and would aim to move students' knowledge of fractions from the abstract to a more real-world application through Indigenous ways of knowing.

Core Competencies:

Communication	Thinking	Personal & Social
	Critical and Reflective Thinking: **Analyzing and critiquing:** When students analyze the seasonal rounds chart, they can connect it to their understanding of fractions. This deepens their ability to think critically, and identify fractions in multiple contexts. **Profile 6:** **I can examine evidence from various perspectives to analyze and make well-supported judgments about and interpretations of complex issues.** Using fractional knowledge from various perspectives (seasonal rounds) allows students to analyze mathematics in multiple contexts and interpret data in increasingly complex ways.	**Positive Personal and Cultural Identity:** **Understanding relationships and cultural contexts:** By exploring mathematics through an Indigenized lens, students can explore their own personal/cultural identity and how that relates to broader cultural identities in their immediate world and beyond. **Profile 2: I am aware of different aspects of myself. I can identify people, places, and things that are important to me.** By linking the seasonal rounds chart to students' own personal identity and lived experience, students will develop a deeper understanding of the different aspects of their identity.

Big Ideas (Understand)

Fractions are a type of number that can represent quantities.

Learning Standards

(DO)	(KNOW)
Learning Standards - Curricular Competencies	Learning Standards - Content
• Incorporate First Peoples worldviews and perspectives to make connections to mathematical concepts. • Engage in problem-solving experiences that are connected to place, story, cultural practices, and perspectives relevant to local First Peoples communities, the local community, and other cultures	• Fraction concepts. • Time concepts.

Instructional Objectives & Assessment

Instructional Objectives (students will be able to…)	Assessment
• Students will be able to remember that fractions represent a part of a whole number. • Students will be able to describe how the year can be divided into equal/fractional parts using the seasonal round chart. • Students will be able to represent fractions visually by dividing the seasonal rounds chart and labelling them with the appropriate fraction. • Students will be able to reflect on the importance of seasonal rounds in Indigenous cultures and its importance in managing time and resources.	• Observation (formative assessment/assessment *for* learning): observe students during the "number talk" portion of the lesson, as well as during the student work portion. • Use a checklist to document understanding of concepts, participation and application of skills/knowledge. • Ex: are students correctly identifying fractions within the seasonal rounds chart? Are students labelling fractions correctly? • Student work/product (summative assessment/assessment *of* learning): • Assess students labelled representation of seasonal rounds charts. • Assess for: correct labelling of fractions, accuracy in dividing the chart into equal parts, explanation of how their fractions represent seasons and seasonal rounds.

Prerequisite Concepts and Skills:

Basic understanding of fractions (this will be covered in previous lessons in the unit).
Ability to equally subdivide a circle.
Understanding of time/able to connect chart to seasons.

Indigenous Connections/ First Peoples Principles of Learning:

Learning is holistic, reflexive, reflective, experiential, and relational (focused on connectedness, on reciprocal relationships, and a sense of place).
This lesson aims to demonstrate how mathematics is interdisciplinary and connected to all aspects of the natural world. By connecting mathematical concepts to seasonal rounds, this lesson demonstrates how fractions can relate to seasonal changes, time, life cycles and Indigenous worldviews.

Naziel, J. (2022). *Circle-D sharing: Seasonal rounds*. University of British Columbia. https://educ-indig-mathnet-2024.sites.olt.ubc.ca/files/2022/10/Circle-D-Sharing-Jessica-Naziel-Seasonal-rounds.pptx.pdf

Universal Design for Learning (UDL):

Inclusive Instructional Practice and Learning:
Student choice and autonomy – during the student work portion of the lesson, students will have the ability to fill in their own seasonal round chart with things that are meaningful for them and their own lived experience.

Social and Emotional Learning and Well-Being:
Valuing diversity – awareness of the strengths and challenges of others – valuing of diverse contributions to communities.

Differentiate Instruction (DI):

Adaptive Assessment:
Varied level of complexity for diverse learners – this could look like having some students divide their seasonal rounds chart into simpler fractions (½ or ¼) and other students may challenge themselves with more complex fractions (1/12 and so on). High ceiling/low floor.

Materials and Resources

Hands-on Materials
Seasonal rounds chart (can be blank for students to create their own, or have pre-made charts for learners who may need extra assistance in creating equal fractions)
Coloured pencils/pencils/rulers
Fraction manipulatives

Instructional Tools:
Smartboard or projector for displaying the UBC Indigenous math resource seasonal round chart

Naziel, J. (2022). *Circle-D sharing: Seasonal rounds*. University of British Columbia. https://educ-indig-mathnet-2024.sites.olt.ubc.ca/files/2022/10/Circle-D-Sharing-Jessica-Naziel-Seasonal-rounds.pptx.pdf

Lesson Activities:

Teacher Activities	Student Activities	Time
Hook: Spark curiosity by linking the concept of seasonal rounds to time/calendars ● Hold up a calendar or wall clock and ask *"how do we keep track of time in a day? a year?" "Do you notice any patterns in the clock/calendar?" "How many seasons are there?" "Remember our last lesson on fractions? What would that be as a fraction?"* ● Show the Coast Salish seasonal rounds chart without much explanation: "this is another way of keeping track of time. What do you notice right away?" pause for discussion/thinking. ● Transition: "Let's look more closely at this chart."	**Observe:** ● Students will examine the calendar/wall clock and note any patterns between the two/concept of seasons. **Engage:** ● Student's will respond to teacher questions, make predictions about the seasonal round chart when it is briefly introduced.	5 Minutes

Number Talk/Class Discussion: **Set-Up** ● Gather students around a circle/carpet. ● Display the Coast Salish seasonal rounds chart (printed copy or smartboard). ● Discuss norms for culturally respectful conversations/discuss the cultural importance of this chart. **Guided Inquiry:** ● Begin with observation/guided questions: "What do you notice about this chart? Is it similar to anything else? Different? How many sections are there in total?" (12). ● Transition to fraction based questions: "if the WHOLE circle represents one year, what fraction is each segment?" ● "How many months/segments are dedicated to fishing? Gathering? Hunting? How could we represent that as a fraction?" "If there are 4 seasons, what fraction of the year is one season?" ● Connect this to students' experiences: "How is this similar to something you use in your life? A calendar/clock? How is it different?" ● Incorporate seasonal awareness: "Why do you think some activities/food can only be done during certain times of year?"	**Observe and Analyze:** ● Students will observe the projected/printed seasonal round chart, count the total number of segments, identify patterns/fractions. **Discuss/Respond:** ● Students will respond/discuss guiding questions about the chart, such as how many segments there are, the fractions contained within the chart etc. ● Students will offer reasoning for their answers/defend their answers. ● This will build a back and forth discussion with peers and teachers (number talk) **Reflect:** ● Students will be prompted to begin to make connections between seasons/seasonal rounds and their own lives (activities/food/events tied to specific times of year).	15 Minutes
Main Activity - Create a Personal Seasonal Rounds Chart: **Instructions/Introduce the Task:** ● "Now it is your turn to create your own seasonal chart – think about the seasonal activities, foods or traditions that are important to you!" ● Inform students they will need to subdivide the circle into equal fractions that represent the seasons (4), they may also choose to further divide those segments into months (12). They must also label the fractions correctly (¼ ¾ etc). **Steps:** ● Distribute blank charts or premade charts, depending on student abilities and needs.	**Observe:** ● Students will listen to instructions and observe the modelling of how to create/fill in their seasonal rounds chart. **Plan**: ● Students will need to plan, incubate and brainstorm ideas for their chart, how to divide it and what to put in each segment. **Create:** ● Students will work independently to: draw and fill in their chart, illustrate each segment with personal/seasonal activities, and label the fractions for each segment. **Adapt**:	30 Minutes

● Model the activity on the board: draw a rough circle, divide it into four sections (seasons) and draw some seasonal activities (swimming, skiing etc). Label the fractions. ● Check for understanding from students: if a large number of students do not understand, try modelling the activity another way. If a few students do not understand, assist them during the activity individually. ● Call student groups up (table group or row) to collect their materials. ● Circulate the room as they work, answering any questions, encouraging student work, pose thinking questions etc.	● Students may use fraction manipulatives to assist them in determining the correct fraction for their chart.	
Closure: **Sharing and Reflection:** ● After the allotted time has passed, bring students focus/attention back. ● Ask if any students would like to share their chart with the class (if not, you could share your chart if you had an example made) ● Ask thinking questions: "What fractions did you use to divide your chart?" "What does each section represent?" ● Ask reflective questions: "what was similar in our seasonal round charts? What was different?" "How is your chart connected to the Coast Salish seasonal round chart?"	**Share and Communicate:** ● Students may share their chart and communicate their thinking and reasoning – I swim in the summer, and go skiing in the winter etc. **Reflect:** ● Students will have the opportunity to reflect on their learning, connect it to their peers' charts, and connect it to Indigenous worldviews, specifically the Coast Salish seasonal rounds.	10 Minutes

Organizational Strategies:

Material distribution:
Have materials prepared in advance (seasonal rounds chart) and sorted supplies (pencils/coloured pencils etc) to minimize time to gather materials.

Clear time limits/Transitions:
Break the lesson into manageable chunks (see lesson activities) and allow buffer time between for set-up/clean-up/questions etc. Ensure clear transitions between activities.

Visual and Verbal Instructions:
Include visual and verbal instructions for students such as posting written instructions on the board/smartboard – check for understanding before beginning activities.

Monitor:
Circulate the classroom, answer any clarifying questions, encourage student work etc.

Proactive, Positive Classroom Learning Environment Strategies:

Set Clear Expectations:
"We will treat the cultural knowledge we learn with respect." Highlight at the beginning of the lesson the importance of respecting and acknowledging diverse perspectives and worldviews and set the tone for how discussions should look.

Create Cultural Connections:
Since students will have the opportunity to create a seasonal chart that is specific to them, this creates opportunity for cross-cultural sharing which builds a positive classroom environment and relationships.

Extensions:

This lesson connects to prior learning by: reinforcing knowledge about fractions discussed in previous lessons as well as simple geometry (partitioning shapes).

This lesson could connect to future lessons by: serving as a springboard for discussing equivalent fractions via a familiar concept (2/12 = ⅙ and so on). Additionally, this lesson lays the groundwork for adding/subtracting fractions: if 2/12 of the year is spent fishing, how much of the year is left for other activities?

This lesson is also very cross-curricular: it connects to Social Studies by incorporating Indigenous perspectives. It connects to Science, by looking at seasons and life cycles. This could also extend into Language Arts, where students take their chart to write a personal narrative about their activities during the year.

Reflections (if necessary, continue on separate sheet):

An area of strength in creating this lesson plan was combining real-world experience and cultural knowledge to mathematical concepts (something that can be quite difficult to do). I did, however, find it difficult to balance the cultural contexts with the need to stay focused on mathematics – these two concepts are seemingly at odds, and it was difficult to strike a true balance between them. I would say overall that there is more focus on fractions/mathematics rather than Indigenous worldviews. However, it was made easier by accessing resources that outline ways to incorporate Indigenous perspectives into trickier parts of the curriculum, such as mathematics. For future practice, it would be beneficial to coordinate with Indigenous community members, elders or AEW's to formulate a more holistic and integrated Indigenized lesson plan.