

Lesson Title: Measure this, Measure that!

Lesson# 1

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Subject: Math

Grade: 1

Main Concepts and Skills

- 1 (This Lesson Plan) – Understand basic measurement vocab and concepts. Explore length, eventually leading to other measurements, such as volume, time, weight. Students compare, order, and sort items based on length.
- 2 (Subsequent Lessons in unit) – Building on basic skills. This includes building vocabulary, teaching standard units of measurement, opportunities for comparisons, ordering, sorting; extending to *estimating* length and height.
- 3 (Subsequent Lessons in unit) – *Further* extending on above skills, with an introduction to metric *and* imperial measurements. As students learn different units, inches and centimeters will be extended to distance via feet and meters.



Rationale:

An exploratory introduction for young students to grasp and understand basic measurement vocabulary and concepts. Students investigate length and height starting with fun and familiar objects serving as non-standard units. Students will be able to compare, order, and sort items based on length.

Core Competencies:

Critical Thinking and Reflective Thinking	Communicating
<p>Facets <u>Questioning and investigating:</u> Students learn to engage inquiry when they identify/ investigate questions, challenges, key issues, problematic situations in studies, lives, communities, in the media. They develop/refine questions; create and carry out plans; gather, interpret, synthesize information and evidence; reflect to draw reasoned conclusions. Critical thinking activities may focus on part of the process, such as questioning, and reach a simple conclusion. Others may involve complex inquiry requiring extensive thought/ reflection.</p> <p>Profile 3 I can ask questions and consider options. I use my observations, experience, and imagination to draw conclusions and make judgments.</p>	<p>Facets <u>Acquiring and presenting information:</u> Students communicate by receiving/ presenting info. They inquire into topics of interest, topics related to their studies. They acquire info from a variety of sources, people, print materials, media; this involves listening, viewing, or reading, and requires understanding of how to interpret information. They present information for many purposes and audiences, and their presentations often feature media and technology.</p> <p>Profile 3 I communicate purposefully, using forms and strategies I have practiced.</p>

Big Ideas (Understand)

Objects have attributes that can be described, measured, and compared. Concrete graphs help us compare and interpret data and show one-to-one correspondence.

Learning Standards

Curricular Competencies (DO)	Content (KNOW)
<ul style="list-style-type: none"> ❖ Estimate reasonably ❖ Represent mathematical ideas in concrete, pictorial, and symbolic forms ❖ Develop, demonstrate, and apply mathematical understanding through play, inquiry, and problem solving 	<ul style="list-style-type: none"> ❖ Direct measurement with non-standard units; non-uniform and uniform ❖ Concrete graphs, using one-to-one correspondence ❖ (Grade 2) Direct linear measurement, introducing standard metric units

FPPL:

Learning is holistic, reflexive, reflective, experiential, and relational (focused on connectedness, on reciprocal relationships, and a sense of place). This activity epitomizes exploration through experience and relationship, while connecting measurement to what's what's most familiar in our everyday lives as we first investigate non-standard units before anything else.

Instructional Objectives & Assessment

Instructional Objectives (will be able to...)	Assessment
Understand basic measurement vocabulary and concepts. Exploring length and height, students recognize measurement by aligning and counting recognizable non-standard units.	Assess completed "Exit Tickets" products (the completed workbooks), and that they include visual evidence of counting lengths using units, recording findings, and foot measurements in oranges.
Compare, order, sort, and <i>reasonably</i> estimate length and height using both standard and non-standard units	Circle amongst the groups observing discussion around their quest, ideas generated, estimates of what non-standard units are most appropriate, what lengths might be, and how they compare.
Relate, compare, and convert metric units to non- standard units as they record findings in workbook, and realistically estimate between various units	During group talk and direct communication with students, gauge the ability to answer prompting questions. I.e., how many Centimeters might a banana be, how many bananas tall are you, and ultimately; how many Centimeters tall are you?

Organizational Strategies:

This activity should garner respectful listening and personal reflection, and is an important break from the typical grind of reading, writing, arithmetic. To gather attention and quiet as needed, a wind-blowing type whisper of "5-4-3-2-1" is recommended to settle class.

If there is a student with problem behavior, or even sitting still quietly unengaged, he/she could be the helper, perhaps the first volunteer to share their guesses and select non-standard units.

Lesson Activities:

Teacher Activities	Student Activities	Time
<p>Introduction (the "HOOK"):</p> <ul style="list-style-type: none"> ❖ Students gather seated at the carpet where a bowl of fruit is peculiarly displayed adding intrigue, but also a carrot as an explanation will be provided once everyone settles quietly ❖ Teacher asks, "Does anyone know why I have a fruit bowl", and then takes guesses ❖ Teacher then answers "Today, we're going to see how many bananas tall we are, and how many oranges long our feet are. Who can guess just how many Bananas tall I am?" ❖ Teacher explains that in groups of three, whichever group guesses closest wins the bowl <p style="text-align: center;">The hook is set!</p>		
<p>Body:</p> <ul style="list-style-type: none"> ❖ Model measuring – Demonstrate how to make measuring fun by using fruit to measure body parts by marking start/end lines, and lining up fruit to then count. ❖ Group formation – direct students line up by height to then join up in groups of three ❖ Hand out worksheets that list what groups need to measure, with a list of possible units. The worksheet includes a page to have group members trace their feet, not only measuring but also graphing their feet in oranges while offering a visual comparison 	<ul style="list-style-type: none"> ❖ Students observe teacher demonstrations and are encouraged to ask questions and make observations and estimates ❖ Form groups. Per teacher's direction, join with who's beside you and closest in height ❖ Guided by the sheets, students graph feet then pick fruits to explore how tall they are, wing and hand spans, finger length, etc. They're then prompted to measure items of choice (i.e. length of teacher's desk) choosing non-standard units such as candy, cubes, or even hotwheel cars. 	<p>10 min</p> <p>8 -</p> <p>7 -</p> <p>6 -</p> <p>5 -</p>
<p>Closure:</p> <ul style="list-style-type: none"> ❖ Compare Demonstrate that comparing objects is a useful to visualizing measurement. If we can estimate and measure oranges we can estimate and measure in Centimeters, and ultimately measure, compare, and estimate anything with practice ❖ Ask questions, focus on "why" not the answer. I.e. Why do you think Sam is 12 bananas tall? If Sam is 12 bananas, how many oranges do you think he is, and why? Etc. 	<ul style="list-style-type: none"> ❖ Return to a class setting for recap, actively listen and relay observations to the class as everyone compares findings and lessons learned ❖ Discuss and share responses to leading and "why" questions? 	<p>10 min</p> <p>4 -</p> <p>3 -</p> <p>2 -</p>

Materials and Resources

<p>Rulers and yardsticks Fruit, hotwheel cars, and other non-standard units Paper and pencils Workbooks</p>	<p>1 -</p>
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Universal Design for Learning (UDL):

Given the physical nature of the lesson, it's important to accommodate all learners, specifically visual and auditory learners. While I do love this exploratory hands-on lesson, we can't ignore the need to visually demonstrate and speak to the process as a whole new skill for some. This must be carried out by explicitly modeling the measuring process in an exploratory and practical way.

Correspondingly, when posing questions to the class, and groups during their activity, certain students might better express understanding outside the workbook as a product, but rather speaking to the process of measuring and comparing various units which is why assessment needs to be carefully considered as part of designing the activity.

Differentiate Instruction (DI):

Similarly, there may be an ELL student who struggles to comprehend the English language, or a lower level communicator. He/she could be grouped with a strategically selected stronger, kind, peer who could assist him/her with the measuring, tracing, and counting. Just like UDL above, the "leader of the group or pairing would model the process and serve as a leader.

Materials and Resources

Rulers and yardsticks
Fruit, hotwheel cars, and other non-standard units
Paper and pencils
Workbooks

Prerequisite Concepts and Skills:

- Ability to sit quietly and respectfully during instruction
- Ability to express ideas and estimates with groupmates, share the group pencil and ruler
- Ability to respectfully listen to others connections, and engage in discussion

Proactive, Positive Classroom Learning Environment Strategies:

- Perpetually encourage participation by posing silly comparisons - I.e. How many kiwis high do you think your knees are? What if the kiwis are stacked sideways and not standing up?

Extensions:

- ❖ **Challenge Tasks** – One great way to get kids exploring their skills is with challenging tasks.
Example: Try it "backwards" by encouraging students to find an object that is "two hands" tall.
- ❖ **Finally, standard units!** Bring the groups back to the seated area, and exemplify how Length, Width, and Height can be measured with Standard units with a ruler, and do the math on seemingly impossible questions to answer, proving them possible.
Ask: Without a ladder, how many oranges and Metres tall are the gym walls? Hopefully, a group might consider measuring a brick from the outside, and then count the bricks

Reflections (if necessary, continue on separate sheet):

To be completed with findings after delivering activity.

Assessment

I can demonstrate how the mathematical concepts build and connect.	I understand how mathematical concepts build and connect using a variety of strategies, resources and manipulatives. I can anticipate and identify misconceptions students may have.
I can create intentional learning sequences.	I can create an intentional learning sequence that takes into account required background knowledge and entry points for diverse students.
I can determine tasks for student learning.	I can create intentional tasks for students that incorporate all of the following elements: • First People Principles of Learning • Universal Design for Learning • Positive mathematical mindset