## April Curriculum Planning Kindergarten

Encouraging student to defend their answers often yields valuable insight into their thinking. Reys et al.

## Bunk Beds and Apple Boxes

Contexts for Learning Mathematics K - 3, Fosnot
Children learn about compensation and equivalence within the context of a pajama party during which eight excitable girls confound their babysitter by continually changing places on their bunk bed and also in a grocery store where a grocer arranges apples in different-sized trays. The arithmetic rack (rekenrek) is introduced as a model for exploring part-whole relations. (N1 - N4) See Portal for SmartBoard
 Rekenrek .notebook


## Curriculum Outcomes for April

N5: Compare quantities, 1 to 10, using one-to-one correspondence. Focus on numbers to 10. [C, CN, V]

SS1: Use direct comparison to compare two objects based on a single attribute, such as length (height), mass (weight) and volume (capacity). [C, CN, PS, R, V]

N4 (cont'd): Represent and describe numbers 2 to 10 concretely and pictorially. [C, CN, ME, R, V]

Revisit N1: Say the number sequence by 1 s starting anywhere from 1 to 10 and from 10 to 1 . [C, CN, V]

Revisit N3: Relate a numeral, 1 to 10 , to its respective quantity. [CN, R, V]

## Mathematical Processes

Communication (C): Students need to communicate their learning using mathematical vocabulary. To do so they must have a true understanding of mathematical terms. For example: more, less, the same as, shorter, longer, taller, heavier, lighter, full, empty, smaller, bigger are words students should be using when exploring measurement.

Connections (CN): Measurement can be easily integrated into other subject areas in the kindergarten curriculum, such as art, language arts and You and Your World. It also reinforces learning in other areas of the mathematics curriculum. See Portal for Measurement Centre Ideas.

Reasoning (R): When students are comparing quantities encourage them to use relational thinking. For example, students should see that 5 is less than 7 or 8 is more than 6 . When comparing numbers, students should recognize that because 5 is greater than 4 then 4 must be less than 5 .

Mental Mathematics and Estimation (ME): In Kindergarten, students are using direct comparison to measure, but they are also estimating in order to make predictions. Students should have conversations about finding objects in the class that are shorter than a given object, about the same length as that object and longer than that object. They should be encouraged to experiment with the concept of volume as they first predict and then count how many scoops or cups it takes to fill various containers. Similarly, when using a balance, students might predict which of two objects is heavier and then compare. Estimation is important as it is an application of number sense. It contributes to students' development of spatial sense.

Problem Solving (PS): As students move through the problem solving process, it should be an experience that "stretches" the students' thinking. Support and challenge the students' thinking before giving the correct answer. Make sure the students understand the problem. You may need to adjust the mathematics in the problem to fit the students' understanding or you may remind them of other strategies that may be tried.

Technology ( $\mathbf{T}$ ): The pan balance scale is a tool that can be used to explore mass, i.e. is one object heavier than another? Sites such as the following allow students to explore mass using a computer simulation:
http://www.peepandthebigwideworld.com/games/bunnybalance.html
Visualization (V): In order to mathematize, children learn to see, organize and interpret the world through and with mathematical models such as the rekenrek. Using the rekenrek allows kindergarteners to use 5 as a unit. When the 5 -structure is used it can support learning of 6 as 5 and 1,8 as 5 and 3 , or 4 as one less than 5 .


## April - Kindergarten

## Exploring Measurement

Measurement activities provide opportunities for students to link their understandings of number and geometry. Students have intuitive understandings that should be built upon as they continue to recognize attributes common to objects and use these attributes to make direct comparisons. Students should make direct comparisons by looking at or handling the objects. For example, they can compare heights by standing back to back. Given two objects, they can predict which is heavier and then check by picking them up. Given two containers, students can predict which one holds more and then check by filling them with a material, such as rice or water.
Students need to identify which attributes they can use to describe objects and make comparisons. These attributes are best recognized in students' everyday conversations, e.g. when they say, "That person is very tall." or "We need a large container for this."

## Investigation Ideas

Scavenger Hunt: Do a scavenger hunt where students have to find pairs of items where one is taller than them and one is shorter than them. Have them look for something heavier than their shoe and lighter than their shoe. Have them find something that holds more than their juice box and less than their juice box. (SSI)

Classroom Balances: Using small classroom balances, have small groups of students balance a variety of small items by comparing the weights. What happens to the balance? Why does one side go down further than the other side? What is happening when both sides of the balance stay the same? (SS1)

Teddy Bear Size-up! Have students bring a stuffed toy to school. Working in pairs or small groups, have them directly compare their toys for height and mass. Have a selection of different-sized boxes on hand. Have students test the boxes to find the best fit as packaging for their toy. Then have students compare their toys' heights, masses, and best fit packaging sizes (volume) as a whole class.
Arrange all of the toys in order according to their height. Photograph the arrangement for discussion purposes later. Rearrange and photograph the toys in order of mass, and finally volume. Discuss the arrangements
(photographs). Was the tallest toy the heaviest? Did the lightest toy need the smallest package? etc.
On chart paper, record what students say they've learned about measurement as a result of their investigation. (SS1)

## Journal Ideas

Choose a number from 6 to 9 . Write the number you chose. Write the number that comes before and the number that comes after. Write the three numbers in order. (N1)
Pick a number card $(6-10)$ and draw a set of objects to show the number. Write the number next to your drawing. (N3)
Using flyers or magazines cut out 6 red objects and glue them into your journal. Record the number. (N3)

Make a 2-colour train using snap cubes that shows the number 8 . Tell about your number by drawing your train and recording the number of each colour. Repeat this activity with as many combinations as possible. (N4)

Using two sets of objects of differing sizes (e.g., 7 large objects in one set and 8 small objects in the other set) ask: Which has more? How do you know? (N5)

Draw something that is very heavy and something that is very light. (SS1)
Draw 3 apples - small, medium and large. Label them S, M, L. (SS1)

## Interesting Websites

http://www.k-
5mathteachingresources.com/kindergarten-mathactivities.html
http://www.abc.net.au/countusin/default.htm

## Literature Connections

Mighty Maddie by Stuart Murphy
Mighty Maddie compares the mass of objects as she cleans up.

## I Can Measure Weight at Any Rate

 by Tracy Kompelien

Mass is explored by direct comparison.

## Game/Activity Ideas

Length, Mass and Volume: Create a small group activity where you place five items (e.g. pieces of rope or ribbon) on a table and have students tell which is the longest, which is the shortest and which are almost the same. Ask them to explain how they know this. Have similar stations for mass (full cans of different sizes) and volume (empty containers of different sizes). (SSI)

Possible or Impossible? For each of the following statements, have the students tell you if it is possible or impossible:

- A cat is heavier than my mom.
- When I'm thirsty, I could drink a whole swimming pool.
- A dog and a small child could weigh the same amount.
- A tall man could touch the ceiling.
- A bird is lighter than an eraser.
- A bathtub holds less than a jug of milk.
- My arm is longer than my foot.
- My leg is shorter than my arm. (SSI)

High Ten: Have students sit in a circle. Ask students to give a "high five" to the student sitting next to him or her. Ask students: How could you give a "high ten"? Can you think of another way to show a "high ten"? Throughout the day, repeat the activity calling "high ten" and have students give each other "high tens". (N3)

Shake and Spill: Have students shake and spill a handful of two-sided counters (for numbers 3-10). Have the students record (with pictures or
Humerals) how many counters there ar numerals) how many counters there
altogether and how many of each colour there are. (N3)

