

Setting Up for the Book Fair

Adapted from the Pumpkins, Pumpkins! Foundations of Measure Unit

by Rich Lehrer

K.MD.1, K.MD.2

This unit addresses the same mathematical concepts as Lehrer's unit, but expands on the idea of the object being measured, providing less complicated attributes to define and measure.

- Objects are described and can be compared by their attributes of measure- height, length, weight
- Attributes must be defined if used for comparison
- Direct comparisons can be made with measurable attributes
- When compared, objects can be ordered according to measurable attributes
- Objects must have agreed upon methods of comparison to have accurate results

Lesson One

(APK) Setting the Scene:

Show students 4 books of varying lengths, heights, and weights. Be selective in your book choices so that students must grapple with which book is longer/shorter, taller/shorter, and heavier/lighter. Label the 4 books: A, B, C, and D. Our school librarian is setting up a book shelf for the Book Fair. She wants to display the books, so that they look nice on the shelves. She wants to put the books in order from biggest to smallest. What order should she put them in?

Ask students, "What is big?" and "What is small?" Have students share their ideas out with the class. You can create an anchor chart and list their thoughts as they share.

Ask students, "If we look at these books, how could we measure what is biggest?" "What would we be measuring?" Have students come up and point to the different attributes of the book that could be measured.

Tell students that they are going to use streamers/yarn (you will need 4 different colors) and work in small groups to find out which book is biggest. Give students streamers or yarn to measure the books. *Each book measured should have a different color of streamer/yarn.* Have students rotate in small groups around the room to measure each book. Do not tell them how you want them to measure. They must decide as a group and then measure accordingly with the string/yarn. After they measure each book, students will need to tape their strings to a piece of paper.

After students have measured all of the books, ask their group to decide which book is biggest and circle that letter on their piece of paper.

When students are finished, come back together as a class to discuss their findings. Questions to ask during discussion: “Did every group find the same book to be the biggest? Why or why not?” Ask each group to share how they measured the books and ask questions that facilitate their understanding of the need for a consistent method of comparison. Ask, “Were we able to all agree on which book is the biggest? Is that okay if we disagree?” “What will we need to do to be able to find the biggest book?”

Lesson Two

Come back together and discuss the previous day’s lesson. Tell students that the librarian has decided that she wants to display the books by standing them up and ordering them by how tall they are. Ask students, “Does that help us figure out which part of the book we need to look at as biggest?” “Were we able to agree on the biggest book?” “What would we need to do to be able to find the biggest book to start our display?” Help lead students to the idea that we need to all measure the same attribute. Work together as a group to measure the same attribute of all 4 books... Height. Discuss how height can be a form of “big.”

Work with students to come to agreement about the tallest (biggest by height) book. *The words taller(est), shorter(est) will need to be addressed in the discussion.* Then, ask them, “How would we order the other books, so that they are displayed from tallest (biggest) to shortest (smallest)?” Work together as a class to order them.

Extension Activities to Reinforce Height

[Size Shuffle](#)

Lesson Three

Come back together and discuss the previous day’s lesson. Tell students that the librarian didn’t like the way the display looked by ordering the books by how tall they were. She has changed her mind to have them lying down on the shelf, so that kids can flip through the pages easier. She wants to order them by how long they are. “What would we need to do to be able to find the biggest (longest) book to start our display?” Help lead students to the idea that we need to all measure the same attribute. Explain to students that length could be the same as height on the books, and reinforce the idea that the display would look the same as the previous lesson, but with the books lying down. Ask them, “Would there be another way we could measure how long the books are to see which one is the longest?” Work together as a group to measure the same attribute of all 4 books... Length. Discuss how length can be a form of “big.”

Work with students to come to agreement about the longest (biggest by length) book. *The words longer(est), shorter(est) will need to be addressed in the discussion.* Then, ask them, “How would we order the other books, so that they are displayed from longest (biggest) to shortest (smallest)?” Work together as a class to order them.

Extension Activities to Reinforce Length

[Longer and Shorter](#) [Which is Longer?](#)

Lesson Four

Review the different ways the books could be measured and displayed for the Book Fair. Tell students that the Book Fair was a big success and that now the librarian is packing up the books that didn't sell into boxes, so that she can send those back to the company. The packing instructions tell her that the heaviest book needs to go on the bottom of the box. Ask students, "What is heavy?" "Is heavy a form of big?" "What would we be measuring to find the heaviest book?" If no student knows the word, tell them we would be measuring weight.

Pass the 4 books around and ask students to decide which one feels heaviest. If there is disagreement, tell students that there is a tool that can be used to tell how heavy something is. If everyone agrees that one book is the heaviest, ask students, "Are we sure?" "Is there a way we should check to make sure we are right?" Then, introduce the pan balance. Explain how the pan balance works, with the heavier object falling lower on one side than the lighter one.

Work with students to come to agreement about the heaviest (biggest by weight) book. *The words heavier(est), lighter(est) will need to be addressed in the discussion.* Then, ask them, "How would we order the other books, so that they are go from heaviest (biggest) to lightest (smallest) in the box?" Work together as a class to order them.

Extension Activities to Reinforce Weight

[Which is Heavier?](#)

You can connect this activity directly to standards involving comparing numbers (K.CC.6 and K.CC.7) by using the different numbers of the same objects (example: counting bears) to show which number is bigger/smaller, greater than/less than

Lesson Five

Wrapping Up the Book Fair:

Tell students that the librarian just finished packing up the Book Fair and sent the books that were not bought back to the company. Then, ask students, "So, did the biggest book change depending on the part of the book we measured? Explain how you know." List their ideas on the chart paper about "What is Big?" and compare their understanding at the beginning of this unit to the end of the unit.