Background Information
In Grade 1, children will learn how to measure length and height. Measurement activities will include the use of non-standard units (that is, everyday objects rather than standard units such as centimetres) for measuring. Children will learn how to use an object as a unit of measurement; for example, they might measure the length of their book using paper clips. Through exploration, children will come to understand that the number of non-standard units required to describe a measurement increases as the size of the unit decreases (e.g., when using paper clips versus pencils to measure the length of a table). Investigating measurement helps children develop spatial sense as well as estimating and predicting skills.

Purpose
In these activities, children will measure an object’s length using a variety of non-standard units in the form of relatively small everyday objects. They will learn to use identical units to measure the length of an object. Children will also learn important rules about measuring: they must not leave gaps between the units, they must not overlap the units, and they must begin to measure an object’s length by starting at one end of the object. They will also understand that it is important to include the name of the unit and the number of units in their measurement (e.g., My book is 20 paper clips long). Through their investigations, they will begin to understand the relationship between the size of the unit and the number of units needed to measure the length of an object. For example, it will require more paper clips than craft sticks to measure the length of their book.
Materials

- One object to be measured, such as a skipping rope, an umbrella, a long stick, a toy snake, a placemat, a wrapping paper tube, a belt
- Multiples of identical small objects to serve as non-standard units of measurement, such as LEGO® cubes, paper clips, crayons, pencils, pens, craft sticks, toothpicks, spoons
- Pencil and paper to record measurements

Activities

Get Ready
1. Select an object that children can measure. It should be a relatively long object, such as a wrapping paper tube, an umbrella, or a belt.
2. Provide containers filled with identical small objects that children can use as non-standard units for measuring the length of the chosen object. The photo and the materials list above will give you with some ideas. It is important to have enough identical objects to serve as non-standard units so that children can successfully measure the length of the object, e.g., a wrapping paper tube.

Measure an Object
1. Show children the object to be measured and ask, How can you figure out how long the [walking stick/wrapping paper tube] is? How could you measure it? Have children choose one of the small objects provided to serve as a non-standard unit for measuring the length of the object.
2. Before children start measuring, ask, Where should we start measuring? (at one end of the object) Where should we stop measuring? (at the other end of the object)
3. Then have children measure their object by placing the smaller objects serving as non-standard units along the length of the object. Ask, Why is it important that you use identical units for measuring? (so that I end up with the same length each time I make the measurement rather than a bunch of different lengths)
4. Some children may measure the object’s length but leave gaps between the non-standard units. Model how to measure the length of the object while leaving a space between each unit. Ask, How long is the walking stick? (30 paper clips long) Then measure the object again, but this time leave no spaces between the units. Ask, How long is the walking stick? (27 paper clips long) Ask, Why did we get two different measurements? (because you left spaces between the paper clips the first time, but the second time you made the paper clips touch each other, with no gaps between them) Why is it important to leave no spaces between units when we measure? (We want our measurements to be accurate and the same every time, not different every time.)
5. Some children may measure the length of the object but overlap the units. Model how to measure the same object both with and without the units overlapping. Ask, **Why did we get two different measurements? Why is it important not to overlap the units?** (We need to make sure that the units line up, just touching each other, because that is the only way that we can be accurate. If we let the units overlap when we make a measurement, then everyone will get a different measurement.)

6. Help children to describe the object’s length when there is a partial unit left over at the end of the object. Ask, **How many [paper clips] did you use to measure the walking stick?** (27) **Does the last paper clip line up exactly with the end of the walking stick?** (No.) Tell children, **The walking stick isn’t exactly 27 paper clips long. So how long might we say it is?** Model how to describe the partial unit: **The walking stick is almost 26 paper clips long. The walking stick is nearly 26 paper clips long. The walking stick is about 26 paper clips long.**

7. Children now choose another object to serve as a non-standard unit to measure the object. Ask, for example, **Do you think you will need more craft sticks than paper clips to measure the walking stick, or do you estimate that you will need fewer craft sticks?** (fewer) **Why?** (because the craft sticks are longer than the paper clips) Children can then measure the length of the walking stick (or other long object) using craft sticks to check their prediction. Have them record their measurement on a sheet of paper, e.g.: **The walking stick is 13 craft sticks long.**

**Extend the Learning**

1. Talk about appropriate non-standard units for measuring length. Ask, **If you want to measure the length of your room, would paper clips be a good unit to use?** (No, that would take way too many paper clips. No, it would take a really long time to measure the length of a room using paper clips.) **What would be a good unit to use instead?** (long sheets of paper, wrapping paper tubes, belts) **What might be a good unit to use to measure the length of your backpack?** (craft sticks, crayons) **Why?** (I would not need a big number of craft sticks or crayons to measure how long my backpack is. It would not take me too long to lay out the craft sticks or the crayons in a line touching each other to measure the length of my backpack.)