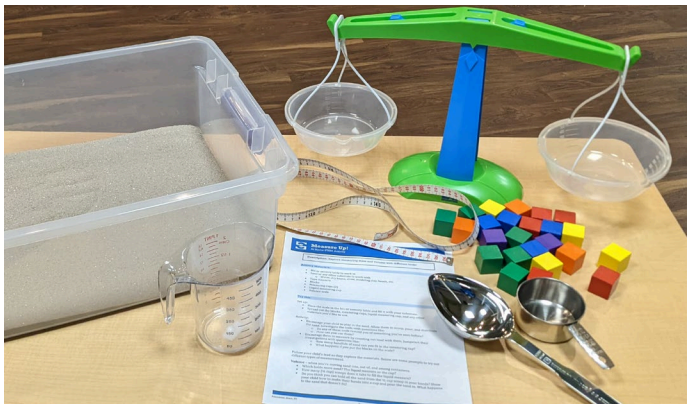
Sciencenter At-Home: Measure Up!

Explore measuring mass and volume with different tools!

In this activity, learners will use a scale, measuring cups, and chosen substrate to explore weight and volume.

Activity Materials:

- Bin or sensory table
- Sand or any other substrate
  - Water, dry beans, beads, etc.
- Tape measure
- Blocks
- 2 measuring cups
- Liquid measuring cup
- Balance scale



Try this:

Set up:
Place the scale in the bin or sensory table and fill it with your substrate.

Spread out the blocks, measuring cups, liquid measuring cup, and any other materials you'd like to use.

Activity:
Encourage your child to play in the sand. Allow them to scoop, pour, and distribute the sand.
Investigate the tools with questions like:

- Do any of these tools remind you of something you've seen before?
- How can you use them?

Encourage them to measure by counting out loud with them. Jumpstart their investigations with questions like:

- How many handfuls of sand can you fit in the measuring cup?
- What happens if you put the blocks on the scale?

Follow your child's lead as they explore the materials. Below are some prompts to try out different types of measurement.

Volume – when you're moving sand into, out of, and among containers:

- Which holds more sand? The liquid measure or the cup?
- How many [½ cup] scoops does it take to fill the liquid measure?
- Do you think you can hold all the sand from the ½ cup scoop in your hands? Show your child how to make their hands into a cup and pour the sand in. What happens to the sand that doesn't fit?
- Can you find two containers or scoops that look different but hold the same amount (volume) of sand?

Mass – when you're putting objects into the balance scale:

- Put a handful of sand into one side of the scale. What happens? How many blocks does it take to balance out?
- Which feels harder (heavier) to lift: a ½ cup of sand or the liquid measure full of sand?
- Fill the liquid measure with sand and dump it into one side of the scale. What happens? Now, fill the liquid measure with blocks and dump those into the other side of the scale. Which side is heavier?
- Fill both ½ cup measures with sand, and empty one onto each side of the scale. What happens?

Distance/Length – when you're placing items in a line or stack:

- Draw a line in the sand. How many blocks can you line up next to it from end to end?
- How many blocks long is your shoe? Compare with other family members!
- What other distances can you measure? Try using different units like blocks, inches, foot lengths, etc.
- Measure your height with the tape measure, and lock the tape measure at that length. Can you find something else in the room that is the same length as you?

Change it up!

Depending on the age and need of your child, this activity may look different. This is an open-ended and exploratory activity. There is no wrong way to do it!

Here are some activity extensions and adaptations:

- Try using alternative materials to sand. You could replace sand with pony beads, water, water beads, slime, modeling clay, dry rice, dry beans, or other similar sensory substrates if desired.
- Add in more abstract measurement tools like timers and thermometers.
    - Try taking the temperature of the sand and your hand and comparing.
    - How tall a block tower can you build in thirty seconds?
- Narrate your child's actions. Try highlighting their use of tools, introducing vocabulary around measurement, or posing new challenges.

- Ex. “You’re filling the liquid measure with scoops of sand to see how much it can hold. That’s an interesting investigation. Do you think all of that sand can fit on one side of the scale?”

Science process skills

This activity focuses on building the skills to participate in science over the science content itself. Whether or not your child masters the measurement concepts in this activity, practicing the skills and mechanics will help strengthen their understanding.

Measuring, counting, and using tools are all science skills that will help children investigate basic science concepts. Measuring allows us to make quantitative observations. We can use tools that have specific units like tape measures and scales to observe and compare amounts. Combining measuring and observation skills allows learners to get a bigger picture of the items they’re working with. To continue practicing measuring skills throughout the day, try counting out loud with your child, counting the number of stairs you’re walking down, or counting the number of legs on a chair.