Activity Name:

The Mystery Box - Making observations and collecting data

Purpose: To differentiate between qualitative and quantitative observations and to practice data collection.

Background Information: Students often have a difficult time differentiating between the types of data or observations asked for in a question. Quantitative data is expressed in numbers and comes from measuring or counting. The data is recorded using scientific measuring units such as grams, centimeters, millimeters, or degrees Celsius. In this activity the two types of quantitative data collected are mass and length or dimensions.

Qualitative data is descriptive and involves data that usually cannot be counted or quantified. Qualitative data is observed using the senses. With practice students with limited vision can make valuable observations using their tactile, kinesthetic, auditory, and olfactory senses. See the list of descriptive adjectives below. Students with low vision can be encouraged to use these senses more, as in science it is frequently unsafe to get very close to an item to make observations. Magnifiers and Closed circuit televisions (CCTV) can enhance visual observations.

If working with a group of students some with vision and some without vision, giving the sighted students the items in a closed box with access only for their hands to enter, encourages those students to use their other senses.

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**Preparation:**
Collect 10 everyday items such as spoons, gloves, pencils, soda cans, etc. If working with a group, have the same items for each student. A dish pan works well to hold the items. If low vision students would benefit from practice using their vision to collect data, put their objects in an open tub, otherwise use a box with only access for the hands.

**Materials:**
- Variety of items with varying sizes and textures, including a couple that make sounds
- Boxes or dish pans
- Talking scale
- Talking or tactile tape measures or rulers
- Pens, and paper

**Procedure:**
1. Describe item in your box to another person using one word descriptors, such as soft, bumpy, smooth, etc
2. The person hearing the description checks the items in his or her own box, comparing these to the description.
3. When the person hearing the description thinks he or she knows which item is being described, hand it to the describer for verification.
4. Record the qualitative information.

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5. Create a chart for the quantitative including mass, length, and possibly width, depth, and circumference.
6. Make the quantitative measurements and record the data.
7. Discuss the types of data for irregularly shaped objects.
8. Compare masses of various objects.

Some descriptive adjectives:

**Size:**
- Depth: deep, full, shallow, empty, endless, infinite, steep
- Height: tall, short, small, vast, spacious, big, large, gigantic, tiny, huge, little, enormous, petite, miniature, massive, mammoth, mighty, microscopic, medium, colossal
- Width: wide, thick, broad, narrow, thin, slender, skinny, slim, bulky, baggy, bulging
- Weight: heavy, light, strong, feathery, fat, stocky, stout, lean, skinny, slim, slender, crowded, trim, lithe, plump, chunky

**Shape:** circular, curved, crooked, curly, diamond-shaped, flat, jagged, oval, pointed, round, rectangular, spiral, square, triangular, angular, arched, bell-shaped, bent, coiled, cone-shaped, conical, cylindrical, dome-shaped, egg-shaped, elliptical, erect, flat, flat, forked, geodesic, heart-shaped, hexagon-shaped, hollow, level, molded, oblong, obtuse, octagonal, pentagon-shaped, pyramidal, rambling, scalloped, straight, symmetrical, tunnel-shaped, upright, amoeba-like

**Sounds:** barking, crackling, crying, dripping, echoing, fluttering, giggling, hissing, howling, jingling, knocking, laughing, moaning, neighing, popping, quarrelling, ringing, roaring, sizzling, swishing, tapping, thumping, whistling
**Textures:** blunt, brittle, coarse, crumbly, dense, flexible, fluffy, glossy, gritty, jagged, mushy, pebbly, prickly, tough, wrinkly, rocky, rough, scaly, shaggy, sharp, silky, slimy, smooth, soggy, spongy, springy, squishy, thorny, velvety