Inside a Square Meter

Objectives
Students Will...
1. Make 70 observations and measurements of the organic and inorganic items found in their Sq Meter. (This can be adjusted for younger students.)
2. The observations will be recorded on a data sheet.
3. These measurements and observations will consist of, but not be limited to: length, width, height, color, shape, organic, inorganic, living, dead, number of individuals of the same type, texture, moisture content, and any other physical, qualitative, or quantitative qualities of things found in the square meter.
4. Analyze data collected.
5. Make conclusions based on data analysis.

Method
Make 70 observations and measurements of the organic and inorganic items found. Record and analyze data.

Materials
1. Twine or rope 4 M in length, tied together so it can be made into a square. (Hula hoops for younger students)
2. One meter stick per group to determine the length of the sides of the square.
3. 4 stakes to hold the shape of the square meter or PVC pipe fit together to make a Sq meter.

4. 2 magnifying glasses (or more if group is larger that 3)
5. 2 metric rulers (30cm size)
6. Clipboard with paper
7. Pencils (2 in case one lead breaks)

Grade Level: Adaptable for grades PreK, K-8.

Subject Areas: Science, Math, Environmental Education

Duration: Adjustable according to grade level

Group Size: 3 to 4 students

Setting: To be determined by instructor, can be anywhere on school grounds or at a field location determined by curriculum requirements.

Ohio State Standards: GRADE BAND THEME: OBSERVATIONS OF THE ENVIRONMENT
This theme focuses on helping students develop the skills for systematic discovery to understand the science of the physical world around them in greater depth by using scientific inquiry.

Background
Before students are given materials have them brainstorm about what kind of things they might look for or find in their square meter. Ask them how they might measure what they find (Guide student thinking with suggestions as needed.)
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Suggest how they might estimate a large quantity of an organism, like grass or clover. (Divide the area into quadrants and count the number in one quadrant and multiply by 4.) This can be adapted to the age group you are working with. Younger students can view a smaller area and make physical observations without measurements and the instructor/aide can record the organisms and observations found in the area viewed. Give clear expectations on student behavior in assigned groups when making observations and measurements in their assigned sector.

Procedure
1. Arrange students into groups of 3-4 students.
2. Distribute equipment to groups.
3. Have students determine their roles before you leave the room. (2 or 3 observer/measurers and one recorder, students can change roles part way through if that is agreeable)
4. Bring students to designated survey area.
5. Depending on the age and demeanor of your students either assign or let students determine where to set up their square meter. (hula hop)
6. Students will measure and record organisms found in their square meter.
7. Students will describe and record texture, dimensions, smell and any other physical characteristics they find. Goal is to reach 70. (number adjusted to age group, pre-k and lower elementary may want to do 10-20.)
8. Upon returning to the classroom have students organize the data collected. This will depend on the age group being taught. This can be guided by the instructor.
9. Have students draw conclusions about the data they have collected.
10. Have students share data and conclusions with class, this data can be combined and class data can be collected, analyzed, and new conclusions can be drawn.

SCIENCE INQUIRY AND APPLICATION
During the years of PreK-8, all students must become proficient in the use of the following scientific processes, with appropriate laboratory safety techniques, to construct their knowledge and understanding in all science content areas:
• Observe and ask questions about the natural environment;
• Plan and conduct simple investigations;
• Employ simple equipment and tools to gather data and extend the senses;
Use appropriate mathematics with data to construct reasonable explanations;
Communicate about observations, investigations and explanations; and review and ask questions about the observations and explanations of others.

MATHEMATICAL PRACTICES
1. Make sense of problems and persevere in
solving them.
2. Reason abstractly and quantitatively.
3. Construct viable arguments and critique the reasoning of others.
4. Model with mathematics.
5. Use appropriate tools strategically.
6. Attend to precision.
7. Look for and make use of structure.
8. Look for and express regularity in repeated reasoning.