## How Much is a Million?

## Summary

This activity allows students to explore the relationship among customary and/or metric units of measurement.

## Materials

- How Much is a Million?
- If You Made a Million

Ruler with customary and metric measures
Measuring cups: customary and metric
Scale(s): customary and metric
Paper
Pencils
Roll of pennies
Dollar bill for each cooperative group
Miscellaneous materials, e.g., paper clips, gum eraser, unsharpened pencil, straight pin, etc.
Colored construction paper
$81 / 2^{\prime \prime} \times 11$ " white paper (4 sheets per student)
Scissors
Glue stick

- CRT Conversion Chart
- How Much is a Million?
worksheet
- If I had a Million?
worksheet
Additional Resources
Books
- How Much is a Million?
, by David M. Schwartz; ISBN 0-590-43614-7
- If You Made a Million
, by David M. Schwartz; ISBN 0590-43608-2
- The Magic of a Million
, by David M. Schwartz \& David J. Whitin; ISBN 0-590-70133-9


## Background for Teachers

This activity allows students to explore the relationship among customary and/or metric units of measurement. There is a strong reading and writing component to the activity. Students will measure ordinary, readily available materials. They will then have to use their knowledge of conversion to answer any or all of the following questions in book form: How much? How many? or How far? Students should be encouraged to use examples of length, volume, weight, and area using both customary and metric units. The project should provide a valuable tool for determining the students' understanding of measurable attributes as well as conversions to appropriate units of measure.

Intended Learning Outcomes
4. Communicate mathematically.
5. Make mathematical connections.
6. Represent mathematical situations.

Instructional Procedures
Invitation to Learn
Materials should be distributed and ready for use. Have students brainstorm different tools of measurement and list them on the board--both customary and metric. Read How Much is a Million? Ask the students to journal their thoughts on "how much a million is."
Instructional Procedures
In cooperative groups, have students measure the length of a dollar bill. Ask, "How far would a million bills reach?" Students should use customary and metric units of measure to calculate the answer.
Repeat the above procedure using other items (e.g., pennies, pencils, paper clips, etc.). Ask the same question "How far would a million $\qquad$ reach?" Students should have at least six different items that they measured, calculated, and recorded their findings on the How Much is a Million ? worksheet.
Students write about the activity in their journals.
Make a Millions Book. (Teacher models this procedure as the students work.)
Using one sheet of white paper, have the students find the mid-point of the two opposite long sides. (This is done by folding the paper in half.)
Tell students to make a mark on the fold one inch down from the top and one inch up from the bottom.
Using their scissors, the students make a $1 / 8$ inch cut into the fold at the marks. They will be removing the center part of the page between the two marks, leaving the one inch sections intact to keep the paper together.
Using the other three pieces of paper, students fold at the midpoint of the long sides (best if all three are folded together at same time).
Students make a mark on one of the sheets, along the fold one inch down and one inch up (as done in step b).
Tell the students to cut on the fold from the top down (making sure all three pieces are together) to the mark (may go a little beyond it).
Cut on the fold from the bottom up to mark (may go a little beyond it).
Open the pages and roll the three pieces of paper lengthwise, inserting in the cutout section of first piece of paper. Once the cuts in the three pieces line up with the fold of the first piece of paper, move the cuts to slip over the parts of the first paper that were not cut on the fold. This will keep the papers from separating, forming a booklet.
Once the above is completed, tell the students to fold the colored construction paper in half at the mid-point of the two long sides.
Apply glue to one side of the outermost piece of the four white sheets joined together. Insert the four pieces into the construction paper, matching fold-to-fold.
Once the sheet is glued on one side, apply glue to remaining back page of the white paper. Close the booklet, letting the back page adhere to the construction paper.
With the book created, students brainstorm, using their journals, different measurements of a million they could write about and illustrate on each of the 12 pages (exclude the pages glued to the front and back covers). They should be thinking about using the measurements and calculations completed in steps 1-3.
Students complete their Millions Book by writing and illustrating at least six of the items measured earlier. There should be two pages for each item measured--one page for customary and one page for metric. Each page should include the words: "If I had a million ..., I would ..." or "how far would a million ... reach?"

## Extensions

Read If You Made a Million. Have the students use the If I Had A Million? worksheet to create and replace the last two pages in the Millions Book. This worksheet may also be used to create a separate book.
Use volume measuring tools to measure and include volume in the books, replacing some of the linear measurement pages (e.g., If I have a million cups, or liters, or gallons, etc.). This could be extended to weight also.
Family Connections
Students take home a copy of the If I Had A Million? worksheet and discuss with family and/or friends.
Create a measurement booklet to explore and record ideas and items families have measured.

## Assessment Plan

Observe students while they are working in groups and individually. Did they work well in cooperative groups? Were the materials used properly and accurately? Could the students present and discuss their opinions and feelings.
Students complete the How Much is a Million? worksheet based on their observations and turn it in. Students must journal their procedures, questions, and results. The students will create and turn in a finished Millions Book.

## Bibliography

Research Basis
Taylor, P.M., Simms, K., Kim, O. \& Reys, R.E. (2001) Do your students measure up metrically?
Teaching Children Mathematics. 7(5). 282-287.
Various attempts have been made to adopt the metric system in the United States. Thomas Jefferson was the first to introduce the concept. Today the U.S. is one of only three countries not using the metric system. The Third International Mathematics and Science Study (TIMSS) showed that students in the U.S. are behind in their understanding and use of the metric system. Teachers are encouraged to use metrics in their curriculum to develop a broader sense of measurement.
Principles and Standards for School Mathematics. (2000). Reston, VA: The National Council of Teachers of Mathematics.
In learning measurement, students should be actively involved, drawing on familiar and accessible contexts. The first step is to understand measurable attributes of objects and the units of measurement--both customary and metric. Connection(s) must be made to real-world applications. Students should investigate a wide variety of applications.

## Authors

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