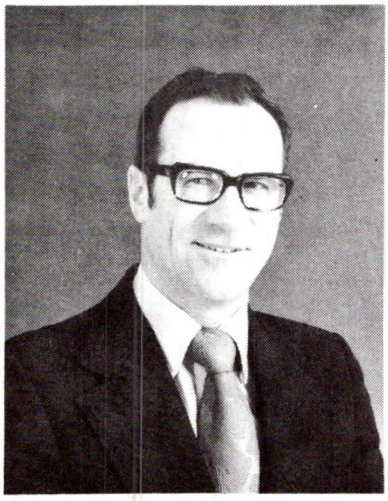
Ala Metric Conversion



This article is a reprint from the November/December 1974 issue of *Metric News*. Permission was granted by the editor, David Mathieu.

W. George Cathcart
University of Alberta

The results of this little pilot study were so encouraging that we decided to experiment with a large class of students in their first year in the Education Faculty at the University of Alberta. Seventy-nine students participated. As they entered the large lecture hall, the first was sent to the right (blue side), the second to the left (red side) and so on. The two sides were identified by large pieces of colored cardboard. In addition to weighing on the bathroom scales, the students were asked to find their height in metric units. On the side with the dual-dial bathroom scales, we had placed two metre sticks, one on top of the other against the wall. On the side of the metric only bathroom scales, we had two more metre sticks plus two yard sticks alongside them and similarly arranged.

No explanation was offered. The students were asked to find their *metric* height and weight. When the students had weighed in and checked their height, they sat down and listened to an hour-long panel discussion on educational administration.

Following this, they were provided with paper and asked two main questions. The questions (and number of persons answering each) were as follows -

Question	Red (N=37)		Blue (N=42)	
	Yes	No	Yes	No
1. Do you honestly remember your weight in kilograms?	16 (43%)	21 (57%)C	35 (83%)C	7 (17%)
2. Do you honestly remember your height in centimetres?	35 (95%)	2 (5%)	19 (45%)	23 (55%)

After each question, students were also asked to tell whether or not they knew their metric weight and height prior to today. In the red group, only two said they had known their weight prior to the experiment and only one person in the blue group knew it in advance. One person said he knew his height in centimetres in advance. He was in the red group. These few individuals do not appreciably affect the proportions indicated above.

If we apply the statistical test of a difference between two independent proportions to the responses to question one, we find that the difference is highly significant ($Z=3.7$; $p>0.001$). The proportion of the subjects who could recall their weight (mass) in kilograms was significantly greater in the group who weighed on the metric only scales (83%) than in the group who weighed on the dual dial scales (43%).

Similarly, the proportion of students who could recall their height in centimetres was significantly greater in the group that measured themselves only in centimetres (95%) than in the group that took their height in both British and metric units (45%), ($Z=4.7$; $p>0.001$).

While this experiment was not as well controlled as it might have been, the results are so one-sided as to suggest that the cold turkey hypothesis is

valid. The most efficient way for us to help our students to "think metric" is to immerse them in the metric system and avoid, as far as possible, any reference to the British system of measurement. This little experiment indicates that when people are faced with both systems they concentrate on the one they are familiar with and ignore the other. Conversely, when forced to measure themselves in the metric system only, they think in terms of the metric units.

Here are a few suggestions for activities which should help your pupils to "think metric." Ask them to estimate how many centimetres long their longest finger, hand span, height, pace, etc. is. Measure. Compare the estimate with the measured length. You might give your pupils exercises in the following form -

I think this (object) is _____ centimetres long.

The (object) is _____ centimetres long.

For measurement of mass (weight), ask your pupils to hold metric weights in their hand. The 200 g, 500 g, and one kilogram (kg) masses are helpful. Then ask your pupils to estimate and then find the mass of a variety of objects.

In measuring capacity, pupils should study a litre (1 000 ml) to get some idea of its capacity. Using water and various containers, have the pupils estimate and then measure the capacity of the containers.

The estimation process is important because it forces children to think about the different units and the number of units involved. Estimating measurements is one of the best processes for getting people to the point where they can, in fact, think in metric terms.

The most important principle in teaching the metric system to children - and this is supported by the experiments reported here - is to teach it independently of any other system of measurement.