

SCIENCE & TECHNOLOGY

METRIC EDUCATION

■ "Metric skills are absolutely essential to scientific research," says Marsha Lakes Matyas, director of the American Association for the Advancement of Science (AAAS) project on women and science.

Nevertheless, says Gerald Kulm, a project director in the AAAS directorate on education and human resources, "the attention to the metric system has been up and down."

The metric system was in vogue in the "mid- to late 1970s," says Dr. Kulm. Organizations published educational materials to help teachers incorporate the metric system into their classes, and some textbooks shifted "almost exclusively" into metrics.

"Since then, it has just about completely moved back or reverted [the other way] . . . You hardly ever see workshops or attention to helping teachers teach the metric system."

One reason for the decrease in emphasis, says Kulm, is that the importance of teaching the metric system "has paled in comparison to the more fundamental problems of just teaching kids to think and apply mathematics."

For example, Kulm says, it isn't that school children don't understand how to measure something using the metric system, but that they don't understand fundamental concepts about measurement itself.

Thomas Romberg, director of the National Center for Research in Mathematical Sciences Education and a professor at the University of Wisconsin, agrees. "Measurement is a process of doing something, and that doesn't lend itself to a standardized tests," says Dr. Romberg. "If you want to know if a kid can measure something, hand him a ruler and tell him to go measure it." Since the skill is not tested, he surmises, it is often glossed over in textbooks and by teachers.

-S. L. G.

America Moves to Metric Measures

Attempts to convert to the metric measuring system failed in the 1970s, but now the US is renewing the effort by requiring metric units for all government procurements by 1992

By **Simson L. Garfinkel**

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BETTER get ready, America: The metric system is coming . . . again.

US companies are losing overseas markets because they don't make metric products, say advocates of the International System of Units (SI), the measuring system's formal name.

Two years ago, Congress took up the cause of the meter. Congress couldn't require US firms to use the metric system, so it did the next best thing: It inserted a clause in the Omnibus Trade and Competitiveness Act of 1988, mandating that every federal agency make its purchases in metric units, starting Sept. 30, 1992. The only exceptions are cases where the change is impractical, severely inefficient, or likely to cause loss of market for US firms.

"World trade is increasingly geared towards metric measurement, and US industries will lose out in the international marketplace unless they can deliver goods measured in metric terms," says Sen. Claiborne Pell (D) of Rhode Island, who sponsored that provision of the bill.

The last time the United States tried to convert to the metric system, after Congress passed the US Metric Conversion Act of 1975, a lot of Americans suddenly felt as if they were living in a foreign country.

"The logicians behind the metric conversion effort of the 1970s oversimplified the case," says G. T. Underwood, director of the US Department of Commerce Office of Metric Programs. "They didn't realize that elderly people, getting up in the morning and hearing the weather on the radio wouldn't know how to dress if the temperature was given in metric. People who drove into a gas station and bought their gas by the liter didn't know . . . if they were being cheated."

Some people even thought that the metric system was a communist conspiracy: "They would say that 'Russia just wants us to go metric: After we go metric they will be able to take us over more easily,'" remembers Valerie Antoine, director of the US Metric Association in California.

"It was a housewives rebellion," says Seaver W. Leslie, whose organization, Americans for Customary Weight and Measure, encouraged its members to write letters to their representa-

tives in Washington, calling for an end to the metric system in the US. "Good old Yankee common sense beat down the effort of these people trying to make a buck from simply changing over from one measurement system to another."

So while Canada, England, and the other manufacturing countries that were using the inch-pound system converted to metric, the official conversion ef-

fort in the US stalled, then died in the midst of Reagan budget cuts.

point during the 1970s, he laments: "Arguments for lost export markets got mixed up with the need for metric road signs." The federal government, Underwood explains, is the largest consumer in the country. By specifying that all procurements be in metric units, it will be giving US firms that manufacture in metric a ready place to sell their wares. The year 1992 is important, he adds, because that is the year of

They want it in even metric sizes," she says. "We are going to be shut out of all the European markets if we don't go metric."

According to a study commissioned by the now-defunct US Metric Board (set up by Congress in 1975 to oversee the metrification of the country), one-half to two-thirds of all US exports are "measurement sensitive." Even 4 to 14 percent of crude materials are measurement sensitive, mostly lumber that is cut to specific dimensions.

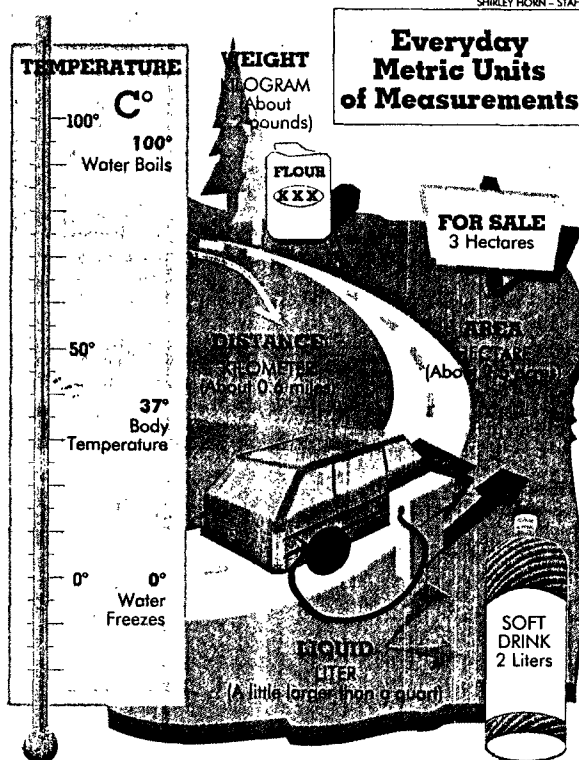
The Perfect Measuring Tape Co. of Toledo, Ohio, was forced to start printing metric measuring tapes in 1977 when Canada adopted the metric system. Today, 28 percent of the company's tapes are sent overseas, according to an article published in the September 1989 issue of Nation's Business.

The cost of retooling in metric is quickly recovered by a company, says Jim Meredith, president of the American National Metric Council, which represents industry's concerns about the metric system to the federal government. "You are going to gain [the costs] back when you have your greater sales," he explains, adding that Eastern Europe, a tremendous opportunity for American firms, is all metric. "We are not worried about the social aspects and the road signs," he adds. "If we can get industry doing things that are smart, the culture will follow in time."

Antoine, who has been fighting for the metric system for more than 30 years because she believes that it is easier to use, says that most Americans will probably shift into the metric system without realizing it. Things like film (sold in 35-millimeter frames), soft drinks (in two-liter containers), and light bulbs (measured with watts), are all commonly described with metric units. "Their cars are all metric, and they don't even know it," Antoine says.

But from his office at Old Stone Farm in Wiscasset, Maine, Mr. Leslie, an artist by training and a political activist out of necessity, sees the current push for the metric system as simply another in a long series of failed attempts.

"Commercial values have for the most part crowded the poetic out of our daily lives," says Leslie. "We have certain products that we manufacture in this country that the quality is unmatched, and they will continue to be traded and sought after," he maintains, no matter which unit system is used in their manufacture.



the European Community's economic unification. "There is every indication that the European Community will increasingly resist the importation of nonmetric goods."

"They have nearly half of the world's manufacturing trade," says Underwood. "That makes the metric argument much stronger."

Metric countries are beginning to reject US goods manufactured to inch-pound specifications. Ms. Antoine points to a Wall Street Journal article about a shipment from General Electric that was turned back from a port in Saudi Arabia because it contained electrical cords that were six feet long instead of the required two meters (6.6 feet).

"People in Europe will never buy a 2-inch-by-4-inch product.