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BRING THE REAL WORLD INTO YOUR CLASSROOM

Vincent Lunetta, University of Iowa, Iowa City, Iowa

Do your students enjoy working with practical problems that are "real" in their world? Have you been searching for resource materials which will encourage students to deal with practical problems in their own community? Fortunately, such materials are currently under development by the USMES project (Unified Science and Mathematics for Elementary Schools). USMES is producing interdisciplinary materials designed to stimulate students to explore relevant issues in the social as well as the natural sciences.

USMES materials are not designed to replace existing curricula; they are designed to supplement and support them by providing exciting "real life" problems which students may analyze and even begin to resolve. Once a "Practical Challenge" has been selected, students carefully investigate the problems for an extended period of time. The "challenges" have been constructed around real, even exciting problems through which students may attain some competent understanding utilizing a variety of problem-solving activities. Although materials for teachers and students do provide background information, children are encouraged to try out their own ideas and problem-solving strategies. Their ideas and hypotheses are to be tested on the rocks of experimental evidence. In addition to develop-

ing problem-solving skills, students will normally acquire an array of facts and concepts through their interactions with a "Practical Challenge" problem.

Twelve units have been developed and used in classrooms in recent years, and their titles provide some indication of the scope of unit activity. The units are: Traffic Flow, Pedestrian Crossings, Lunch Lines, Burglar Alarm Design, Electromagnetic Device Design, Consumer Research-Product Testing, Soft Drink Design, Play Area Design and Use, Describing People, Designing for Human Proportions, Dice Design, and Weather Predictions.

Units currently undergoing classroom development during 1973-74 include: Bicycle Transportation, Music Production, Consumer Research-Advertising, Small Group Dynamics, Learning Processes, Classroom Design, Manufacturing, Communications, Community Services, Sports Equipment and Game Area Design, Eco-Systems, and Animal Behavior.

For illustrative purposes we'll examine "Pedestrian Crossings" and "Consumer Research-Product Testing" more carefully. In "Pedestrian Crossings" the Long Range Challenge is: "Recommend and try to have a change made which would improve the safety and convenience of a pedestrian crossing near your school." After selecting the challenge, the children discuss issues related to the problem and methods of dealing with it. Then, individually or in groups, they collect data, evaluate it, and make recommendations. In "Pedestrian Crossings" data collection might include traffic flow patterns, vehicle speeds, vehicle gap times, pedestrian crossing times, determination of lines of sight and obstruction, and interviews with drivers, pedestrians, and police. Careful analysis of data may lead to other investigations such as stopping distances at various speeds, effects of daylight on visibility and so forth. Data will be displayed with mathematical detail where possible and these displays will include graphs, tables, and histograms. Students are also encouraged to develop and use scale models. USMES urges thorough documentation of data and suggests that an activity like "Pedestrian Crossings" may well culminate with interviews and reports to community authorities.

The Long Range Challenge in "Consumer Research-Product Testing" is: "Determine which brand of a product is the best buy for a certain purpose." After discussion, the class or group of children determine objectives for a particular product and evaluative procedures. These procedures may well include the design and development of relevant test apparatus. The investigations lead students to consider a wide array of variables for the product under study. They begin to deal with economic and values-laden issues related to cost versus equality.

At the center of USMES activities in a school is a "Design Lab." The Design Lab includes tools, materials, and other resources for construction measuring instruments, models, and test devices. Included in the lab are "How To" cards which provide information about specific skills the student needs for the solution of a particular problem.

USMES units have been designed for use primarily in elementary grades, but USMES strategies and materials are a very valuable resource for teachers at a variety of curriculum levels. The "practical" orientation of USMES problems does excite the interest of older as well as younger students. The possibility of new solutions to real community problems has obvious motivational value, and the USMES program has real educational merit.

A school desiring to implement a USMES program can do so, with an initial expenditure of about \$900 for materials, and, of course, teacher commitment. Approximately \$250 will be the annual cost of expendable supplies in an average elementary school. When money or commitment of this magnitude is not available, individual teachers can make some progress in their own classrooms without major outside help. Many of the materials can be "found" within the community when interest is generated.

Iowans may be interested to know that Dr. Clyde Kohn, Chairman of the Geography Department of the University of Iowa, has been involved in the writing of some USMES units; and that one of the major USMES contributors has been David Ost. David is well known to many Iowa science teachers and is currently serving with the USMES

staff in Massachusetts.

For more information of USMES activities and materials contact:
USMES-EDC, 55 Chapel Street, Newton, Massachusetts 02160.

WHAT MAKES GOOD SCIENCE EDUCATION DEPARTMENTS BETTER

James Hungerford, Marshalltown, Iowa

What makes a good science department? Instructors that see the whole community and the role they play in it. Second, instructors with a strong sense of loyalty to better education. Third, a basically stable environment to work in and to work on improvement. Instructors that can see ways to, and do, solve problems.

The departments that really get things done are concerned with the welfare of the student. They know that progress must be made departmental and school-wide and not at the expense of other departments, students, or instructors, for that is not really responsible progress. Good departments and instructors have problems: in fact, they may appear to have more problems than apathetic departments, because they tend to be creative and recognize and face up to problems more and attack them with possible solutions in mind.

In a school system one may note considerable school-wide pride that goes from the community level right down to the individual student. Pride is basic for any good institution.

What really counts and is often hidden, or made fun of, is a strong sense of loyalty which can be seen in the routine of everyday living in a community that supports its school, department, instructors and students. School loyalty is strong in the schools that are democratically operated and where the instructors and students understand what is going on and feel a sense of consistency and reliability. This attitude of loyalty goes from student to instructor to administration to the public. The class with high morale knows that it can trust the instructor in such a way that strengthens rather than weakens each of them.