

# Is a Materials Resource Center Right for *You?*



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Successfully managing  
science materials  
through a centralized  
resource center

By Tom Peters

**W**hen a commercial pilot steps into the cockpit of an airplane, it has been serviced by a host of personnel and will be supported by many more from takeoff to landing. In more and more places, when an elementary school teacher steps into inquiry-centered science instruction, his or her materials have been carefully prepared by a team of experts, too.

At a materials resource center, ready-to-use instructional materials are delivered to teachers when they are needed in a cost-effective manner. Recasting science materials management as a responsibility of the school system rather than the individual teacher can help ensure that all students are offered equitable opportunities to experience and learn science in its full richness.

As past president of the Association of Science Materials Centers (ASMC), I know that well run science materials centers are a vital part of many exemplary science instruction programs. I'd like to introduce the "Five Ss" of successful materials support—Service, Space, Staff, Stuff, and Savings—and to encourage administrators and teachers to consider the benefits of using a materials resource center approach to manage hands-on supplies.

## Service: What Will the MRC Provide?

When planning a materials resource center (MRC), it's important to first establish an overall vision for materials support. *Envisioning* is the work of teams. Teachers, administrators, key community leaders, parents, and school support staff all ought to be involved. The key question to ask is, "What materials support would we provide for science teachers if we could do *anything*?" Answering this question and then grounding it in reality requires school leaders to understand what a functioning MRC can do and what teachers need.

Typically, MRC centers have been used to help manage "kit-based" science curricula; however, each kind of curriculum offers its own challenges in materials support. Most kits arrive from the "factory" ready for teacher but not student use—some items need assembly, counting into packets, or other preparation. Some kits contain most but not quite everything a teacher needs.

At a MRC, these fixes are made before teachers even know there's a problem. With an experience base of over 30 years upon which to draw, even the newest center has access to terrific expertise in meeting challenges.

An efficient MRC must ensure that science materials arrive at a classroom ready to use. For example, within one typical electric-circuits kit there are 40 kinds of items, ranging from index cards to Fahnestock clips. Many of these items come in multiples, so some kits contain over 800 pieces. These types of kits need careful counting and restocking.

Regardless of the curriculum materials selected, it is the job of the MRC staff to ensure that every teacher who receives them has a "like new" experience no matter how many other teachers have already used the materials. This means that kits must be completely refurbished after each use so that all the parts and pieces are present *and* presentable for their next use.

Materials resource centers can also offer additional items, such as appropriate trade books, teaching articles, and supplemental equipment to enhance science instruction using the kit's materials. Many MRCs include these in the services they offer.

## Space: Location, Location, Location

A materials resource center generally starts its life in the first available space—this space is almost always too small. Ideally, an MRC is in an inexpensive space. For example, many centers inhabit old school buildings or occupy space in a district warehouse. Other centers are housed in donated space or in facilities where a business partner subsidizes the rent.

If you are considering establishing a materials resource center, visiting a center will give you good insight as to the kind of space you need to efficiently support science materials. No matter where you visit, most

MRC staffers will likely tell you they would like more space than they have. Why? Because *all* of the materials a center supports have to be able to fit in there a few times a year—over summer break, for example.

Consider the following: If the center supports kits, and each kit typically takes up about 1 cubic meter of space, then just 100 kits take up nearly 10 cubic meters of space—that's about 1/2 of a one-car garage if you stack kits from wall to wall and floor to ceiling, which, by the way, is NOT a convenient, useable way to store the materials!

In addition to actual storage space for kits, MRCs need room for refurbishment materials as well as workspace for refurbishing, office space for staff, and more. Other helpful features of a MRC include a loading dock, a climate-controlled environment, standard utilities, and security.

## Staff: Who Delivers?

If there's anyone who does not need more to do in this world it is a teacher. What teachers *do* need is more time to plan for learning. The support of an effective materials management system—and support staff—can help to free up valuable teacher time.

The many tasks of MRC staff include organizing, inventorying, purchasing, cleaning, refurbishing, shipping, maintaining databases, ensuring safety, and more.

MRC staff ask teachers to check their materials inventory at time of receipt rather than just before they start a lesson. They help teachers to understand what materials are consumable and what are not (i.e., what they can keep and what they must return). They remind teachers there will be a few things they will need to teach the lesson that will not be coming from the MRC (i.e., scissors, rulers, or paper). They help teachers inventory their materials before they return them and offer advice on how to get everything back to the center without spills or other accidents.

The Association of Science Materials Centers (ASMC) recommends the employment of one full-time professional per every 10,000 students served. The ideal MSC employee is a stickler for detail. They have to be able to organize, establish repeatable work processes, keep careful records, scrounge for odd bits and pieces, and be cheerfully service oriented. Many MRC staff are former teachers or retired military personnel; others have had warehouse experience in business or industry.

For MRC support staff, centers may rely on sources of inexpensive labor. This might include senior citizens, volunteers, school service clubs, work-study students, and even persons assigned by the courts to community service.

## Stuff: Tools of the Trade

MRC professionals need tools to do their work effectively. The specific types and quantities of these tools vary from center to center. To keep inventory acces-



Putting science materials management in the hands of a materials resource center frees up time for planning more hands-on science instruction.



sible, many centers start with shelving and cabinets in all sorts of shapes and sizes. Established MRCs tend to have settled on a single design and have invested in sufficient quantities of shelving to get the job done.

Consider, too, that some items may need special storage for safety or other reasons (perishable items). Even common foodstuffs like vinegar, talcum powder, and baking soda have handling and storage safety requirements. Kits purchased from reputable publishers include Materials Safety Data Sheets (MSDS) developed in accordance with Occupational Safety and Health Administration standards. These MSDS publications outline known health or safety hazards associated with the materials.

To manage so many bits and pieces, many MRCs have begun to bar code their inventory and computerize their purchasing processes. Here's a place where a local manufacturing company or warehouse-type store can help you. These companies often employ people with state-of-the-art logistics expertise who can be helpful in setting up your own manageable system. They know where to buy shelving, what makes for a good inventory control system, and how to set up a workstation so that materials are processed quickly and with high accuracy. Here at ASMC, we've partnered with Clemson University's Industrial Technology program to get this sort of technical assistance.

An MRC also needs tools—carts, hand trucks, forklifts, etc.—for transporting inventory. Even a small center may receive full pallets of materials. Inventory on shelves must get moved to a refurbishing area. And, of course, materials need to get to and from the classrooms served by the center. Many centers deliver their materials via the school

district's mail courier service. Centers that serve a large area or multiple districts may contract out the delivery service to a commercial carrier.

One of the most important tasks to take place at a MRC is refurbishing. Refurbishing materials typically requires unpacking, cleaning, sorting, counting, weighing, testing, and repackaging. Centers typically are furnished with large, flat tables, comfortable chairs, a deep-wash sink, and sometimes even a dishwasher.

Another helpful tool is a display board on which a sample of every item within a given kit of materials is mounted. These boards are especially helpful when introducing a new kit or in training new staff.

While most MRCs don't handle materials more hazardous than grocery store items, there are still hazards with which to contend. Lifting is one such hazard. Spills are another kind of hazard, and cuts are a third. Please take time to investigate all safety concerns associated with managing hands-on materials. This is another area in which local business or industry may be helpful. Manufacturers typically have stringent safety requirements to meet and usually have an in-house safety expert, who can be a valuable source of information. In addition, ASMC has an active electronic mail network where people exchange helpful hints and ideas. Nonmembers can participate in the listserv as well. Go to the ASMS website for details (see Internet Resources).

## Savings: More Resources

I estimate that, excluding the cost of textbooks, a typical school district currently spends somewhere around

\$2.50 per student annually for elementary school science. This does not include the hidden science budget supplied by teachers who may spend hundreds of their own dollars each year on hands-on science supplies (Hardy et al. 1996). You cannot offer an exemplary science program for \$2.50 per student a year.

An MRC reduces a school district's need for "capital" curriculum materials, such as kits. The traditional approach of buying hands-on materials for each teacher requires the purchase of three to four times as many nonconsumable materials as in an MRC-supported program. In a MRC system, materials are shared on a rotation basis. Centers have devised some ingenious systems to allow for groups of teachers—like grade levels—to all have the same teaching materials at the same time.

Most MRCs evolve over time from relying primarily on materials purchased from a publisher's catalog to making purchases from local vendors, to ordering in bulk from wholesale suppliers. In response, some publishers have begun to offer bulk purchase prices, too.

In investigating cost, it is important to compare "apples to apples." Does the cost only account for refurbishment or replacement materials at a well stocked and efficiently operating MRC? Does it account for the costs of space, staff, tools, and transportation?

No matter how well you shop, MRC support will still cost more than a traditional approach. There are MRCs that run on about \$25–\$35 per student annually. This includes everything from kits to utilities to shelving to staff to shipping. Consider this as the real dollar commitment you are making to develop an exemplary science program. This investment will pay off in the classroom by saving teachers valuable time to focus on improving science instruction!

## The MRC Choice

To determine if the MRC approach is right for your schools, visit a nearby center. A list of centers is on the Association of Science Materials Centers (ASMC) website (see Internet Resources).

In addition, the National Science Resources Center (NSRC) an organization of the Smithsonian Institution and the National Academies, offers Science Education Strategic Planning Institutes designed to bring together research and best practices in not only materials support but also exemplary curriculum, professional development, assessment strategies and developing a strong support base for elementary and middle school science (see Internet Resources). These Institutes include a materials resource center field trip.

If, after careful study and planning, you decide what you really want is a way to manage science materials at the school or classroom level the five "Ss" still apply, whether it's a science closet, a lab, or any other space designed to

## Connecting to the Standards

This article relates to the following *National Science Education Standards* (NRC 1996):

### Science Education Program Standards

#### Standard A:

All elements of the K–12 science program must be consistent with the other *National Science Education Standards* and with one another and developed within and across grade levels to meet a clearly stated set of goals.

#### Standard D:

The K–12 science program must give students access to appropriate and sufficient resources, including quality teachers, time, materials and equipment, adequate and safe space, and the community.

meet the materials needs of more than one teacher.

You may only be talking about test tubes and aluminum foil, but you still need to agree on what service the school or teacher is responsible for providing. You still need adequate storage and space. You still need to clean things. You still need access and security. You still need staff to be responsible for purchasing, maintaining, and distributing the materials. Inventory, storage, cleaning, and safety remain areas of concern. Even on a small scale, increased materials support service means thinking out of the box to gain savings—a skill elementary teachers certainly possess!

Whatever your decision on materials management system, the most important factor is maintaining a vision for exemplary elementary science that includes a robust system of materials support. This step respects teachers in their role as leaders of learning and encourages access for all students to the excitement of science found in materials-rich exploration and investigation. ■

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### Resources

Hardy, G.R. et al. 1996. Dollars and Sense. *Science and Children*, 34(3): 12–15.

National Research Council (NRC). 1996. *National Science Education Standards*. Washington, D.C.: National Academy Press.

### Internet

Association of Science Materials Centers

[www.ces.clemson.edu/aophub/ASMC/asmchome.htm](http://www.ces.clemson.edu/aophub/ASMC/asmchome.htm)

National Science Resources Center

[www.nsrconline.org](http://www.nsrconline.org)