Though it may seem that classroom management comes naturally to some teachers, upon closer examination you'll probably discover that preparation and adaptation are more important than any innate ability when it comes to successful classroom management. Any experienced middle school science teacher can tell you that successful classroom management is an ongoing, evolving process—teachers need to modify their daily practices based on the observed behaviors and feedback of their students.

Setting expectations

Classroom management must be developed throughout the year with specific focus on the first days of school. It is important to develop a community in the classroom where students feel they have input in their learning and are able to take risks. At the start

MANAGING
INQUIRY-BASED
CLASSROOMS

by Christie Nicole Wolfgang

of the school year, all teachers should do community-building activities in which students are able to express themselves and learn about their fellow classmates. Taking this time creates a caring environment and signifies that we are all individuals and must respect each other for our differences. In the beginning of the year it is also important to establish classroom expectations for students. Doing this helps to ensure that students are able to meet these requirements throughout the year because they are the ones who help set them.

In my classroom, I have students make a T-chart that identifies characteristics of "Good Teachers" on one side and "Good Students" on the other. This engages students and allows them time to think about the traits they value in their teachers and fellow classmates. Next, we discuss the traits and decide which five or six are the most important. The next day, each class reviews their own list as well as the ones generated by my other classes. After discussing the other lists, we finalize the class's own list and it is ready for posting (Figure 1). I find that students are more willing to abide by a list of rules that they have helped develop than one developed without their input and imposed on them by the teacher.

FIGURE 1 Photograph of posters/student journals with T-chart

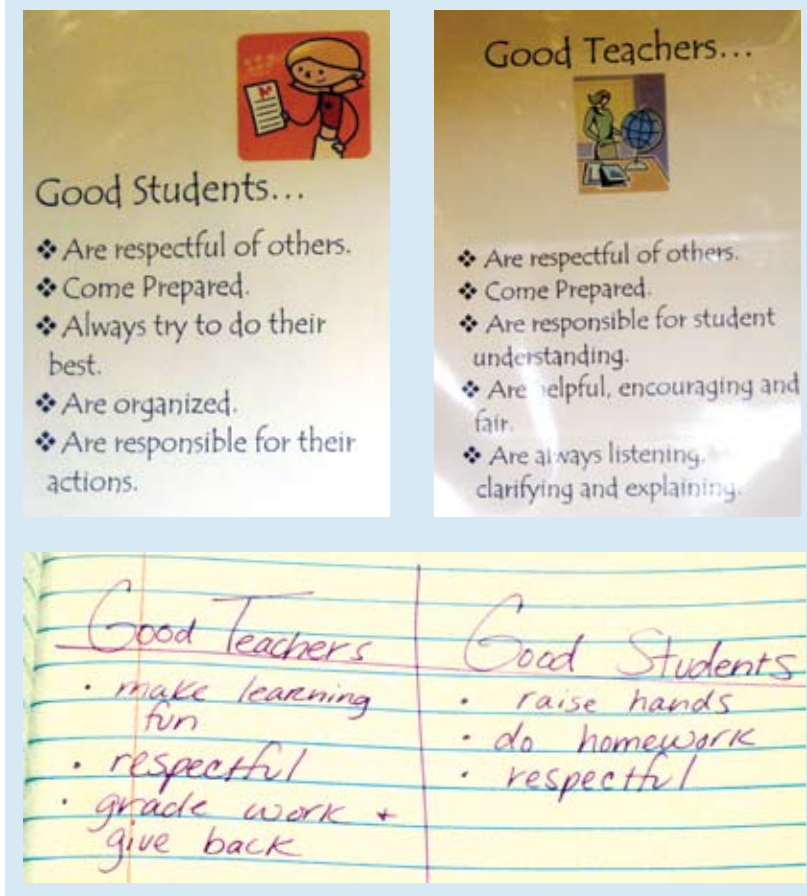PHOTOS COURTESY OF THE AUTHOR

Daily planning

The most important piece in class management occurs before students ever enter the classroom. Teachers who are prepared and organized prior to class have fewer behavioral problems because students are usually engaged in learning during class time. Effective classroom managers foresee confusion and make modifications to lesson plans before confusion begins.

Making sure materials are readily available helps move the lesson along smoothly and curbs classroom distractions. In my classroom, I provide students with small plastic containers that hold any items they might need during daily lessons, and I keep these bins on desks so that students can easily and quietly access the materials. For laboratory activities, I use the same idea but have larger bins with the materials that are kept on side lab desks to prevent distractions during prelab discussions (Figure 2).
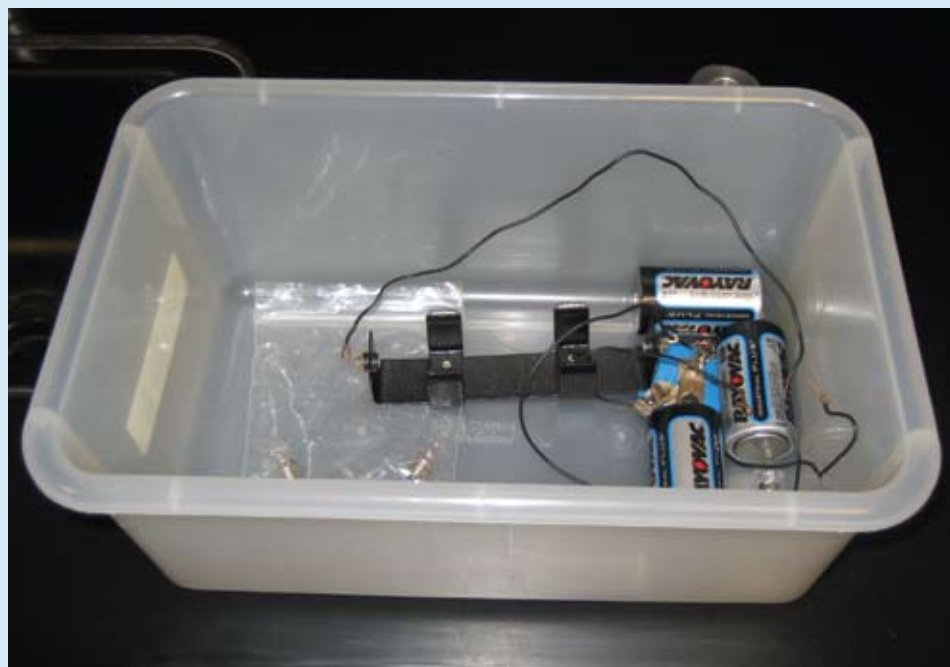
For middle school students, I find that having materials all together saves time, which is especially important for teachers who have a short 45 minutes to activate knowledge, discuss prelab, address safety, set up materials, perform lab, clean up materials, and summarize learning.

Daily management with student groups and roles

When students arrive, you should already know the number of students per laboratory group and the type of grouping you will be using. Structured and varied grouping is important to classroom management and maintains the standard of valuing collaboration and cooperation. One of the biggest "life lessons" I try to teach students is that, no matter who they are placed with, they must be able to work effectively and value each other's ideas. I always vary my groups

FIGURE 2 A materials bin for a circuit activity

use a symbol to represent each of the skills I want to assess and then place that symbol next to the names of students who demonstrated proficiency. This prevents students from knowing exactly what I am assessing if they happen to peek at my evaluation sheet, so they need to model proper behavior and lab techniques in all areas as I circle the room.

Managing cleanup chores

Students need to be taught to clean up properly and efficiently so that materials are ready for the next class to use. In my class, when I call "time out," everyone stops what they are doing and quiets down so I can explain where the materials should be returned and how their work areas should be prepared for the next class. During the cleanup, I give a lot of verbal praise to groups and individual students. Giving praise instead of criticism in front of the entire class sets expectations for students and provides positive reinforcement for those who are meeting expectations. If you need to correct individuals or groups, make sure to do so during an active time when everyone else is engaged so that attention is not drawn to those students. This is especially important to maintaining a safe classroom where students learn from mistakes.

according to ability level, personalities, interests, and work efficiency.

Of course, getting to know all students and their individual needs usually takes a couple of weeks, so effective grouping takes time to achieve. Throughout the year, it is also important to get a feel for which pairings may create conflict and which students have a hard time finding partners. Being sensitive to these needs and to student grouping requests, *within reason,* will also maintain productivity. In addition, I provide groups with different roles to ensure group efficacy and to give each student a feeling of worth within the group. Depending on the group makeup, you can assign roles or allow students to choose their roles. Having students complete a self-assessment of their lab role (Figure 3) after the activity also helps set expectations and reduce time wasted.

Efficient assessment

While each group is working, rotate among groups asking probing questions. Reduce the amount of grading you will have to do later by making notes as students answer questions so you can easily focus on the parts of the assignment or skills you did not have a chance to assess in class. From my experience, this simple system reduced my grading tremendously. I

Reflection

Even though I am exhausted at the end of the day, it is helpful to make notes on how the activity played out. Making these notes will help management and learning for successive years and for future lab activities. When planning for the next year, these notes can be used to modify the activities, questions, lab setup, grouping, time allotted, and other aspects of the lab. It also helps management of activities later in the year because you learn how quickly students grasp concepts and identify conflicts that may be eliminated. Currently, I make these notations on the actual

FIGURE 3 Example of role assignments within a student group of four (adapted from Frazier 2009)

Use the following chart to select your role and monitor your performance during lab today. Submit one chart per group.

Number	Role	Duty	Student name	These were my strengths while performing my role	These are things I should work on next time while performing this role
1	Materials manager	Gather, maintain, and return materials			
2	Recorder	Record notes and data from all tests			
3	Safety engineer	Monitor and promote safety; report safety breaches			
4	Intelligence officer	Read instructions; gather additional information			
	Test pilot	Perform tests	Rotate this role (every student performs this role at least two times)	Not applicable	Not applicable

document inside my curriculum binder so I can be very detailed and specific while reducing the amount I need to remember the following year.

Conclusion

The National Science Education Standards highlight expectations that science students participate in hands-on, inquiry-based science instruction (NRC 1996, p. 30) in an environment where they are safe (p. 43) and held accountable for their learning (p. 36), so they are able to develop scientific literacy (p. 13). For this to happen, teachers must be effective classroom managers. Key to classroom management is building a nurturing community through community-building exercises and a set of expectations that students have helped to develop. Also important is to adequately prepare and organize for each day with attention to student grouping. A coding system supports efficient grading of student learning during instruction, and an effective and efficient cleanup routine ensures that class time is maximized. By striving to do all these aspects, the classroom envisioned in the National Science Education Standards is more accessible and easier to maintain, which leads to more successful science students. ∎

References
Frazier, W.M. 2009. Student group facilitation chart. Fairfax, VA: George Mason University. Unpublished document. Used with permission.
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