

master grade-level material are at risk for boredom at best and alienation at worst. I need to be sure I consider their needs when I set up my classroom and plan my lessons. I ask myself questions such as: "What extension activities are available?" "For a lesson concerning material that my advanced students have clearly mastered, what other activity choices can I offer?" and "Can I make the day's assignment more challenging by adding a constraint (*You must use at least three operations.*) or requiring more solutions (*Find at least ten ways to show fifty percent on the geoboard.*)?"

Scheduling and Pacing Lessons

Effective literacy instruction requires consistently large chunks of everyday time. In order to become successful readers and writers, students need daily opportunities to practice what they are learning. These opportunities include the use of spontaneous teachable moments that arise each day; teachers use such moments to teach students exactly the literacy skills and understanding they need. In addition, daily classroom routines are skillfully woven into literacy activities.

Likewise, effective mathematics instruction requires large chunks of everyday time. Though classroom instructional time is limited, we can draw conclusions about how to schedule mathematics instruction by looking at effective literacy instruction:

- ◆ *Allocate time.* Students need daily instruction in mathematics concepts and skills. A solid chunk of time—at least forty-five minutes for kindergartners and up to an hour and a half for upper-elementary students—allows time for teachers to present a lesson, for students to practice or explore the mathematics at hand, and for the class to reflect on its developing understanding. This time is most productive early on in the day; too often math is the last topic of the day—a difficult time for anyone in the classroom (teachers included) to focus on challenging cognitive tasks. Give math at least a couple of morning slots.

- ◆ *Go outside the math lesson.* Students need opportunities to practice their math skills outside of the daily lesson. This may happen as

a separate session of math games or at intervals between lessons (students waiting in a cafeteria line can practice skip-counting, for example). My upper-grade students get a lot of mileage out of skip-counting around the room—a five-minute math activity. They also log a lot of computation practice by doing three problems each morning before our first formal lesson of the day. During literacy, social studies, and science lessons, students use math organically and productively to figure out how many pages they are reading daily, visualize how much space each of the 102 Mayflower passengers had on the 80-foot boat (24 feet across at its widest part), or sort and categorize different species of butterflies.

- ◆ *Meet students where they are.* Effective mathematics teaching meets students where they are. Teachers need to be attuned to students' individual needs and prepared to address them in spontaneous math lessons, both within the math period and outside it. I taught a lot of math when I helped a kindergartner decide if she had enough money to buy a cupcake at the bake sale and helped a fifth grader figure out how many more books he needed to read in order to fulfill our school's requirement.
- ◆ *Integrate math into life.* Mathematics should be part of the daily life of the classroom. After all, math is integral to our daily lives: we use math to manage time, plan for the weather, spend (and save!) money, cook, create art, get from here to there, and so on. Students benefit from seeing the daily usefulness of the math they are learning. In effective classrooms, teachers emphasize math's place in our lives. In doing so, we can sneak a lot of other rich math (graphing, problem solving, and estimating) into these routines, as the following table exemplifies:

Integrating Math with Daily Classroom Routines

TIME	<i>Grades K–1:</i> Give five-minute warnings before transitions (and really make them five minutes!). Help students see what a minute feels like by jumping, drawing stars, closing their eyes, and so on for one minute. Mention and point out specific times on the clock: "We have fifteen minutes until lunch." "It is one o'clock—time for read-aloud!"
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Grades 2–3: Use the clock purposefully to manage time. Post small clock faces in connection with the daily schedule.

Grades 4–5: Ask students to manage their own time during work periods; have them set goals for reading and other projects.

WEATHER

Grades K–1: Students take note of the weather each day and record features (sunny, cloudy, raining, etc.) on a bar, tally, or pictograph. Discuss the graph periodically.

Grades 2–3: Students record daily temperatures and keep track on a line graph. Discuss the graph periodically.

Grades 4–5: Students track temperature, sunrise and sunset, and/or tides, and look at trends through the seasons. Local information can be compared with information from a distant place.

CALENDAR

Grades K–1: Present whole calendars and use them to keep track of important events (trips, birthdays, holidays, special school events). Students talk about "How many days since ...?" and "How many days until ...?" Make an effort to refer to *today*, *yesterday*, and *tomorrow* on the calendar in the context of daily classroom life.

Grades 2–3: Use calendars to track the number of days of school and prepare for upcoming events (class celebrations, trips, holidays, etc.).

Grades 4–5: Students use the calendar to do long-term planning.

ATTENDANCE/LUNCH

Grades K–1: Students participate in whole-class discussions regarding the number of present and absent students. Each child indicates that he's present by signing in or moving an attendance card. Individual students may report to the class the number of absent and present students and confirm with a head count. Students may also assist in taking a school lunch count and reporting it to the appropriate school personnel.

Grades 2–3: Students may indicate that they're present by participating in a class graph. While discussing the data, students note the number of children participating and the number absent.

Grades 4–5: Students collect attendance data daily and record it on a bar graph. Students periodically discuss trends in attendance: "Why was it so bad that week in February?" "What happens right before and right after a vacation?"

SNACKS/TREATS

Grades K–1: Students count out and serve snacks. They may nibble crackers into different geometric shapes.

Grades 2–3: When served small snacks (fish crackers or raisins), students can estimate how many they have in their hand.

Grades 4–5: Students use the nutrition information panel to determine how much snack each student gets: *If there are 3 crackers in a serving of Ritz crackers and 50 servings in a box, how many can each student get?*