

Observations, Interviews, and Conferences

Observations, interviews, conferences, and questions provide teachers and students with numerous opportunities to assess progress. At the heart of these types of assessment is the student and teacher working in collaboration in order to ascertain the progress the student has made. A student can analyze her or his own mathematical work by focusing on the quality of the product, the need for revision, changes or additions to be made, and different problem-solving strategies to employ. Performing an effective, critical analysis of one's work is a process that students can adapt for use later in life in their careers.

Observation Suggestions

- 4 Write observations on index cards or on a sheet of address labels that can be transferred to student portfolios or record cards later. Some teachers print up labels with names corresponding to the seating chart so that it is easy to locate students.
- 4 Give the same problem to the whole class but choose one or two groups to observe closely.
- 4 Use a checklist of observation details for each group of students. Rate each group (or simply check if you see the behavior) on such items as whether all members are participating, whether they are estimating before computing answers, whether they are using more than one process, whether they are recording their work, whether they are reporting their work, and whether they evaluate themselves.

Observational Assessment Behaviors

As students are observed in the following categories, note whether the behavior is strong(S), developing(D), weak(W), or not observed(N). Note an example of the behavior.

1. Understanding
 - a. Understands the task at hand and/or clarifies understanding with others before beginning.
2. Communication
 - a. Listens to and follows others' reasoning.
 - b. Incorporates others' ideas in planning a solution strategy.
 - c. Explains own ideas and supports position with evidence.
 - d. Asks questions of others to facilitate own understanding.
3. Problem-Solving Skills
 - a. Devises a plan before beginning work on a solution.
 - b. Organizes information to facilitate problem solving.
 - c. Recognizes and self-corrects flaws in planning, reasoning, and computation. Shows the ability to adapt and work flexibly.
 - d. Judges reasonableness of solution.

[Source: [New Jersey Mathematics Curriculum Framework](#)]

4. Persistence

- a. Persists in investigation even when encountering difficulties.

5. Cooperation

- a. Shares responsibility; supports and encourages others.
- b. Assumes personal responsibility within the group. Becomes actively involved.

Seminars, Labs, and Extended Projects

Assessment may also include student presentations (seminars), labs, and extended projects, particularly in the higher grades. These methods assure the connection between instruction and assessment as well as provide opportunities for relating mathematics to other subject areas. These methods are especially appropriate for assessing students' ability to identify and define a problem and what they already know; to make a plan; to create and modify problem-solving strategies; to collect, organize, and analyze needed information; to discuss, review, revise, and explain results; to persist in work on a problem; and to produce a quality product or report. Possible topics for these types of assessment might include maps, gears and ratios, sound waves and music, traffic patterns, collecting and analyzing litter, studying local water use, census studies, lunch preferences, sports statistics, plant growth, measurement of parts of the body, or nutrition.

The following are a sample of projects assigned to high school students. All projects involve a final presentation to the class, either in person or on videotape. Sophomores must complete three of the following:

- Plan a Day Trip to an Amusement Park
- Redecorate This Classroom
- Origami/Tangrams
- Logic Puzzles
- Conduct and Evaluate a Survey
- Menu Planning
- Chores
- Consumer Reports*

More specific detail is provided for each choice. For example, for *Consumer Reports*, students are told:

Research an item you are considering purchasing in the near future by reviewing the ratings given all makes of this product by a consumer periodical such as *Consumer Reports*. Demonstrate to the class how to read the charts and what each symbol means. Research the actual cost locally of the three highest-rated makes. Choose one and justify your choice.

[Source: [New Jersey Mathematics Curriculum Framework](#)]

Seniors must complete one of the following projects, providing status reports at two points.

- Start Your Own Business (cost projections, loan application, graph of costs and income)
- Buy a Home (financing options, loan application, taxes)
- Design Your Dream Home (scale model, costs)
- Develop a Financial Plan for College or Other Post-Secondary Education (compare costs at four institutions, financial aid application)
- Plan a Community Service Project (survey, cost projections, grant application)
- Simulate Applying for and Getting Your First Post-HS Job and Plan Your Budget for the First Year at this Job
- Plan a Vacation for a Group of Five People for Two Weeks

Math In The News

A high school teacher gives students in a discrete math course an article from a newspaper or magazine on a mathematical topic (such as Andrew Wiles' proof of Fermat's Theorem, DNA, or the Traveling Salesman Problem), and asks them to find two other sources on that topic, write a 3-page paper, and present the information to the class.

Creating opportunities on a regular basis to observe, interview, confer, and question students while at work on their products is an essential component. Strategies such as think alouds, planned conferring periods, dialogue notebooks, and team notebooks afford both teachers and students with the opportunity to investigate student thinking.