

## Assessment Options

When students use the Materials World Modules, their learning can be represented in a number of ways, such as improvement of science and math skills, increased communication skills, and better collaboration during group projects, as well as greater understanding of concepts presented in the modules. You can tailor each of the modules to fit the goals you stress in your classes, using a number of different assessment styles.

### Inquiry-based Assessment

With inquiry-based learning, students focus on finding answers to their own questions. A complete assessment plan includes items that deal with how well students are able to frame the initial questions and how well students pursue answers to their questions. In this way, assessment becomes a way to measure students' participation in the process of inquiry, in addition to measuring their understanding of the module's main science concepts.

The following paragraphs present specific approaches to assessment, based on the science education goals of the Materials World Modules. You can also incorporate ideas from the sections on self-assessment, science process skills, and portfolio assessment that are consistent with inquiry-based learning.

### Applying Learning Goals

The questions at the beginning of each Activity and Design Project address the learning goals for the investigation. You can use these

questions in your assessments; after completing the Activity, students should be able to answer each question and provide evidence from the investigation to support their answers.

### Evaluating Explanations

Students' abilities to explain their answers and to discuss the process by which they arrived at those answers are an excellent basis for assessment. Students who arrive at an incorrect answer but who can articulate their reasoning well and whose data are consistent with their answers should receive a favorable assessment. However, such students should be encouraged to examine the data others have gathered and look for sources of error in their own experiments. Students who have come up with correct answers or solutions but who cannot explain or document how they drew their conclusions should be encouraged to reexamine their data as well as the data of others to develop a suitable explanation for their results.

### Reflecting on the Design Projects

Each Activity presents concepts or techniques students will use when they do the Design Projects. Therefore, you can base Design Project assessments, in part, on how well students apply each of these concepts or techniques. When prompted, students should be able to explain the relationship of each Activity to the Design Project they are working on.

### Understanding Design Implications

Students who are successful at the Design Projects will have considered various design trade-offs. You can tap into this understanding with a series of "what if" questions, such as "What if the material were more expensive? What if it were stronger? Heavier?" Students should be able to address these questions in terms of the plausible effects on the design's performance.

### Science Process Skills

Science Process Skills	
Measuring	Classifying
Making and using models	Recognizing time or space relationships
Collecting and interpreting data	Identifying and controlling variables
Inferring	Predicting
Formulating questions and hypotheses	Making operational definitions

### Traditional Assessment

Ask students to use their notes and their Activity- or Design-Log Sheets to write up a traditional laboratory report for each Activity and Design Project. Assess these reports for format, clarity, accuracy, inclusiveness, and other goals you set for your class.

### Self-Assessment

With your guidance, have students set their own goals for the module and write them down in their science logs. They can refer to them when they start each new

Activity or Design Project. At the end of the module, hold brief conferences with the students to help them assess how well they met their goals.

### Science Process Skills

As students work on the Activities and Design Projects, they use the science process skills listed in the chart above. You can assess students on how they use and improve on these skills while they participate in the module.

### Portfolio Assessment

Students' Activity-Log Sheets, Design-Log Sheets, photographs of their Design Projects, and audio- or videotapes of group presentations are all good candidates for inclusion in students' portfolios. You can also ask students to elaborate on this work by suggesting they do any of the Portfolio Projects suggested in the Teacher's Edition. These more complex projects help students integrate what they have learned from the module.

By looking at the items in each portfolio and talking with students about what they learned during the module, you can assess changes in attitude, skill levels, and communication skills, in addition to how well students have learned some of the key concepts you emphasized while doing the module.