

Appendix D

Assessment and Evaluation

Assessment

Assessment should provide students over time with a variety of ways to demonstrate what they know and are able to do with many different types of text. It is the journey of their learning. Teachers collect, interpret and synthesize information from a variety of student learning activities to gather information about student progress in relation to achieving learning outcomes.

Students must recognize each learning activity as worthwhile and relevant, and understand the expectations for each. Information provided through assessment activities allows teachers to give descriptive feedback to students to support and monitor future learning, and allows for necessary adjustments to instruction.

Designing Effective Assessment

Effective assessment improves the quality of learning and teaching. It can help teachers to monitor and focus their instruction and help students to become more self-reflective and feel in control of their own learning. When students are given opportunities to demonstrate what they know and what they can do with what they know, optimal performance can be realized.

Teachers must collect evidence of student learning through a variety of methods. Valuable information about students can be gained through conversations, observations and products. A balance among these three sources ensures reliable and valid assessment of student learning.

- Conversations may either be informal or structured in the form of a conference, and can provide insight into student learning that might not be apparent through observation or from products. Student journals and reflections provide a written form of conversation with the teacher.
- Observing a student while they are engaged in a learning activity allows a teacher insight into this process at various points throughout the activity. Observation is effective in assessing achievement of many of the speaking and listening outcomes.
- Products are work samples completed by a student. Samples can be in the form of written texts, visual, or oral products.

Effective assessment strategies

- are explicit and communicated to students and parents at the beginning of the course or the school term (and at other appropriate points throughout the school year) so that students know expectations and criteria to be used to determine the quality of the achievement
- must be valid in that they measure what they intend to measure
- involve students in the co-construction, interpretation, and reporting of assessment by incorporating their interests (students select texts or investigate issues of personal interest)

Designing Effective Assessment (continued)

- reflect where the students are in terms of learning a process or strategy and help to determine what kind of support or instruction will follow
- allow for relevant, descriptive and supportive feedback that give students clear directions for improvement
- engage students in metacognitive self-assessment and goal setting that can increase their success as learners
- are fair in terms of the students' background or circumstances to provide all students with the opportunity to demonstrate the extent and depth of their learning
- accommodate the diverse needs of students with exceptionalities including those with strategies outlined in individual learning plans
- assist teachers in selecting appropriate instruction and intervention strategies to promote the gradual release of responsibility
- are transparent, pre-planned and integrated with instruction as a component of the curriculum
- are appropriate for the learning activities used, the purposes of instruction, and the needs and experiences of the students
- are comprehensive to enable all students to have diverse and multiple opportunities to demonstrate their learning consistently, independently, and in a range of contexts in everyday instruction
- include the use of samples of students' work that provide evidence of their achievement
- are varied in nature, administered over a period of time, and designed to provide opportunities for students to demonstrate their full range of their learning

Rubrics

The strength of rubrics is that they clarify expectations and ensure that student creations are judged based on common criteria. One of the greatest strengths of a rubric comes from it being created with input from the students prior to the assigned task. This helps to ensure that the students truly understand what the task is and what the expectations are. Rubrics also provide students with information and direction for the future. Consider the following suggestions for creating rubrics:

- involve the students in the process
- try to avoid or limit the use of words and phrases such as “very”, “often”, “sometimes”, and “to a great extent”
- limit the number of criteria being focused on at one time; individual students may require modified criteria
- consider the range of descriptors provided – three as a minimum, five a maximum
- decide if certain criteria require only two descriptors (this may be necessary if a criterion is simply met or not, with no range in between)
- decide if some criteria are more important than others; weight these criteria more heavily, especially if grades are being assigned as a result of the rubric

Purpose of Assessment

- use student work samples of a variety of strengths to generate criteria and descriptors; students can examine them and build a rubric with these in mind

According to research, assessment has three interrelated purposes:

- assessment *for* learning to guide and inform instruction;
- assessment *as* learning to involve students in self-assessment and setting goals for their own learning; and
- assessment *of* learning to make judgments about student performance in relation to curriculum outcomes.

Other research indicates that assessment *as* learning should be viewed as part of assessment *for* learning, because both processes enhance future student learning. In all circumstances, teachers must clarify the purpose of assessment and then select the method that best serves the purpose in the particular context.

The interpretation and use of information gathered for its intended purpose is the most important part of assessment. Even though each of the three purposes of assessment (*for, as, of*) requires a different role for teachers and different planning, the information gathered through any one purpose is beneficial and contributes to an overall picture of an individual student's achievement.

Assessment for Learning

Assessment *for* learning involves frequent, interactive assessments designed to make student understanding visible to enable teachers to identify learning needs and adjust teaching accordingly. It is teacher-driven, and an ongoing process of teaching and learning.

Assessment *for* learning

- integrates strategies with instructional planning
- requires the collection of data from a range of assessments as investigative tools to find out as much as possible about what students know
- uses curriculum outcomes as reference points along with exemplars and achievement standards that differentiate quality
- provides descriptive, specific and instructive feedback to students and parents regarding the next stage of learning
- actively engages students in their own learning as they assess themselves and understand how to improve performance
- allows for judgments to be made about students' progress for reporting purposes
- provides information on student performance that can be shared with parents/guardians, school and district staff and other educational professionals for the purposes of curriculum development

Assessment as Learning

This type of assessment provides ways to engage and encourage students to acquire the skills of thoughtful self-assessment and to promote their own achievement. Students' achievement is compared to established criteria rather than on the performance of other students.

Assessment *as* learning actively involves students' reflection on their learning and monitoring of their own progress. Student-driven and supported with teacher guidance, it focuses on the role of the student as the critical connector between assessment and learning, thereby developing and supporting metacognition in students.

Assessment *as* learning is ongoing and varied in the classroom and

- integrates strategies with instructional planning
- focuses on students as they monitor what they are learning, and use the information they discover to make adjustments, adaptations or changes in their thinking to achieve deeper understanding
- supports students in critically analyzing their learning related to learning outcomes
- prompts students to consider how they can continue to improve their learning
- enables students to use information gathered to make adaptations to their learning processes and to develop new understandings

The goal in assessment *as* learning is for students to acquire the skills to be metacognitively aware of their increasing independence as they take responsibility for their own learning and constructing meaning for themselves with support and teacher guidance. Through self-assessment, students think about what they have learned and what they have not yet learned, and decide how to best improve their achievement.

Assessment of Learning

Assessment *of* learning involves strategies designed to confirm what students know, demonstrate whether or not they have met curriculum outcomes or the goals of their individualized learning plans, or to certify proficiency and make decisions about students' future learning needs. Assessment *of* learning occurs at the end of a learning experience that contributes directly to reported results.

Traditionally, teachers relied on this type of assessment to make judgments about student performance by measuring learning after the fact and then reporting it to others. However, used in conjunction with the other assessment processes previously outlined, assessment *of* learning is strengthened.

Assessment *of* learning

- provides opportunities to report evidence to date of student achievement in relation to learning outcomes, to parents/guardians, school and district staff and other educational professionals for the purposes of curriculum development
- confirms what students know and can do
- occurs at the end of a learning experience using a variety of tools
- may be either criterion-referenced (based on specific curriculum outcomes) or norm-referenced (comparing student achievement to that of others)
- provides the foundation for discussions on student placement or promotion

Because the consequences of assessment *of* learning are often far-reaching and affect students seriously, teachers have the responsibility of reporting student learning accurately and fairly, based on evidence obtained from a variety of contexts and applications.

Involving Students in the Assessment Process

Students should know what they are expected to learn as designated by learning outcomes, and the criteria that will be used to determine the quality of their achievement. This information allows students to make informed choices about the most effective ways to demonstrate what they know and are able to do.

It is important that students participate actively in assessment by co-creating criteria and standards which can be used to make judgments about their own learning. To get an idea of some possible criteria, students may benefit from examining various scoring criteria, rubrics, and student exemplars.

Teachers can involve students in the process by using the following suggestions:

- incorporating students' interests into assessment tasks (for example, students can select texts to read/view that relate to their interests and select a forum for response)
- providing opportunities for students to self-assess their learning
- co-creating assessment criteria with the student, working to describe how a specific skill or product is judged to be successful
- using student exemplars to illustrate a range of skill development (students can use them to compare to their own work, or practice using the assessment criteria that would be used for their own activities)

Students are more likely to perceive learning as its own reward when they have opportunities to assess their own progress. Rather than asking teachers, “What do you want?”, students should be asking themselves questions such as, “What have I learned? What can I do now that I couldn’t do before? What do I need to learn next?” Assessment must provide opportunities for students to reflect on their progress, evaluate their learning, and set goals for future learning.

Assessment Techniques

Several assessment techniques have been suggested throughout this guide and are listed in the section Considerations for Program Delivery. These techniques are described below.

Observation (formal and informal)

This technique provides a way of gathering information fairly quickly while a lesson is in progress. When used formally the student(s) would be made aware of the observation and the criteria being assessed. Informally, it could be a frequent, but brief, check on a given criterion. Observation may offer information about the participation level of a student for a given task, use of a piece of equipment or application of a given process. The results may be recorded in the form of checklists, rating scales or brief written notes. It is important to plan in order that specific criteria are identified, suitable recording forms are ready, and that all students are observed in a reasonable period of time.

Performance

This curriculum encourages learning through active participation. Many of the curriculum outcomes found in the guide promote skills and their application. There is a balance between scientific processes and content. In order that students appreciate the importance of skill development, it is important that assessment provide feedback on the various skills. These may include the correct manner in which to use a piece of equipment, an experimental technique, the ability to interpret and follow instructions, or to research, organize and present information. Assessing performance is most often achieved through observing the process.

Journal

Although not assessed in a formal manner, journals provide an opportunity for students to express thoughts and ideas in a reflective way. By recording feelings, perceptions of success and, responses to new concepts, a student may be helped to identify his or her most effective learning style. Knowing how to learn in an effective way is powerful information. Journal entries also give indicators of developing attitudes to science concepts, processes and skills, and how these may be applied in the context of society. Self-assessment, through a journal, permits a student to consider strengths and weaknesses, attitudes, interests and new ideas. Developing patterns may help in career decisions and choices of further study.

Interview

This curriculum promotes understanding and applying scientific concepts. Interviewing a student allows the teacher to confirm that learning has taken place beyond simply factual recall. Discussion allows a student to display an ability to use information and clarify understanding. Interviews may be a brief discussion between teacher and student or they may be more extensive and include student, parent and teacher. Such conferences allow a student to be pro-active in displaying understanding. It is helpful for students to know which criteria will be used to assess formal interviews. This assessment technique provides an alternate method of expression to students whose verbal presentation skills are stronger than their written skills.

Paper and Pencil (assignment and test)

These techniques can be formative or summative. Several curriculum outcomes call for displaying ideas, data, conclusions, and the results of practical or literature research. These can be in written form for display or direct teacher assessment. Whether as part of learning, or a final statement, students should know the expectations for the exercise and the rubric by which it will be assessed. Written assignments and tests can be used to assess knowledge, understanding and application of concepts. They are less successful at assessing skills, processes and attitudes. The purpose of the assessment should determine what form of pencil and paper exercise is used.

Presentation

The curriculum includes outcomes that require students to analyse and interpret information, to identify relationships between science, technology, society and environment, to be able to work in teams, and to communicate information. Although it can be time-consuming, these activities are best displayed and assessed through presentations. These can be given orally, in written/pictorial form, by project summary (science fair), or by using electronic systems such as video or computer software. Whatever the level of complexity, or format used, it is important to consider the curriculum outcomes as a guide to assessing the presentation. The outcomes indicate the process, concepts, and context for which and about which a presentation is made.

Portfolio

Portfolios offer another option for assessing student progress in meeting curriculum outcomes over a more extended period of time. This form of assessment allows the student to be central to the process. There are decisions about the portfolio, and its contents, which can be made by the student. What is placed in the portfolio, the criteria for selection, how the portfolio is used, how and where it is stored, how it is evaluated, are some of the questions to consider when planning to collect and display student work in this way. The portfolio should provide a long-term record of growth in learning and skills. This record of growth is important for individual reflection and self-assessment, but it is also important to share with others. For all students, but particularly younger students, it is exciting to review a portfolio and see the record of development over time.

In planning assessment, teachers should use a broad range of techniques to give students multiple opportunities to demonstrate their knowledge, skills, attitudes and ability to meet curriculum outcomes. The following chart outlines other techniques for consideration.

Assessment Techniques		
	Technique	Purpose
<i>Gathering Information</i>	Questioning	<ul style="list-style-type: none"> asking focused questions to elicit understanding
	Rich assessment tasks	<ul style="list-style-type: none"> complex tasks that encourage students to show connections that they are making among concepts they are learning
	Technology applications	<ul style="list-style-type: none"> systematic and adaptive software applications connected to curriculum outcomes; digital presentations
	Simulations	<ul style="list-style-type: none"> simulated or role-playing tasks that encourage students to show connections that they are making among concepts they are learning
	Learning logs	<ul style="list-style-type: none"> descriptions students maintain of the process they go through in their learning
	Projects and investigations	<ul style="list-style-type: none"> opportunities for students to show connections in their learning through investigation and production of reports or artifacts
<i>Interpreting Information</i>	Developmental continua	<ul style="list-style-type: none"> profiles describing student learning to determine extent of learning, next steps, and to report progress and achievement
	Checklists	<ul style="list-style-type: none"> descriptions of criteria to consider in understanding students' learning
	Rubrics	<ul style="list-style-type: none"> descriptions of criteria with graduations of performance described and defined
	Self assessment	<ul style="list-style-type: none"> processes in which students reflect on their own performance and use defined criteria for determining the status
	Peer assessment	<ul style="list-style-type: none"> processes in which students reflect on the performance of their peers and use defined criteria for determining the status of the learning of their peers

	Technique	Purpose
<i>Record-Keeping</i>	Anecdotal Records	<ul style="list-style-type: none"> • focused, descriptive records of observations of student learning over time
	Student profiles	<ul style="list-style-type: none"> • information about the quality of students' work in relation to curriculum outcomes or a students' individual learning plan
	Video or audio tapes, photographs	<ul style="list-style-type: none"> • visual or auditory images that provide artifacts of student learning
<i>Communicating</i>	Parent-student-teacher conferences	<ul style="list-style-type: none"> • opportunities for teachers, parents, and students to examine and discuss the student's learning and plan next steps
	Records of achievement	<ul style="list-style-type: none"> • detailed records of students' accomplishments in relation to the curriculum outcomes
	Report cards	<ul style="list-style-type: none"> • periodic symbolic representations and brief summaries of student learning for parents
	Learning and assessment newsletters	<ul style="list-style-type: none"> • routine summaries for parents, highlighting curriculum outcomes, student activities, and examples of student learning