



LEARNING POINT

What are “diagnostic assessments”?

Educators assess students for many, varied reasons. These include seeking information about things such as students’ content mastery, progress in learning content, or aptitude. Students and teachers are familiar with these types of assessments.

Sometimes, these assessments yield results that are ends to themselves. Other times the results of assessments may lead to more questions about what students know or don’t know. In these cases, diagnostic assessments may be used to gain more targeted information about student achievement in a content area.

If results from a summative assessment show that a student—or group of students—hasn’t mastered certain content, is that the end of the story? In many cases, the answer is “no.” If there is time available, educators will want to help improve that student’s—or that group’s—mastery of the content.

The summative assessment might not provide enough information to guide instructional remediation. This is not a deficiency, necessarily, of the summative assessment; the purpose of a summative assessment is to certify that students have (or have not) mastered content—not to determine where a student is having difficulty with content. If the results of summative assessment show that a student has not mastered content, additional

assessment information is required to determine the nature of the deficiency and the best way to proceed.

When might a diagnostic test be needed?

When a person isn’t feeling well, a visit to a doctor’s office will prompt health providers to take the patient’s temperature. An elevated temperature alerts the doctor that the patient

the student to determine where the educational deficiencies are that led to the low performance on the summative assessment. One of these activities might be administering a diagnostic assessment.

Diagnostic assessment scenario

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is fighting an infection somewhere but not precisely where. This is useful information for the doctor and patient, but it is not sufficient to diagnose the location of the infection or what might be prescribed. Additional tests are needed.

A summative educational assessment is like taking a temperature. If the score on that test is low, it indicates a problem, but not necessarily where that problem is. A professional educator will engage in activities with

tion about student understanding of content or skill acquisition, including possible misconceptions or gaps in knowledge. Its purpose is not to just certify that a student knows or can do something; it provides information on the processes and interrelation of content.

As an example, suppose a summative assessment indicates that a student is not able to add and subtract fractions. Perhaps a student answered correctly only one of seven questions

relating to this content. Most would agree that this indicates a problem with the student's learning to add and subtract fractions.

The ability to add and subtract fractions requires a number of different things. Students must have some knowledge about the parts and nomenclature of fractions. They must know some requirements that must be met before you can add or subtract fractions and the procedures necessary to meet them. Finally, they must complete the operation of addition or subtraction, especially if fractions with unlike denominators are involved.

A diagnostic test would probably include items about all of the following aspects of working with fractions:

- identifying numerators and denominators
- identifying fractions with common denominators
- finding equivalent fractions
- converting fractions to equivalent ones with a common denominator
- knowing that when you have common denominators, you add (or subtract) only the numerators of the fractions
- reducing the resulting fraction, if necessary

Diagnostic assessment dives deeper into learning

As you can see, adding and subtracting fractions requires quite a bit of knowledge and skill. There are many spots where a misconception or a gap in knowledge can yield an inability to successfully answer questions like: "What is $\frac{1}{2} + \frac{1}{5}$?"

The diagnostic assessment would have multiple items targeted at each of these necessary pieces of content and skills. This would help the educator and student understand what parts of the process the student has

mastered and what elements need more attention.

Note that while the summative assessment had seven questions to certify that a student could or could not complete this content adequately, the diagnostic assessment will have many more items. Each of the six requisite skills described above would require multiple items, as there may be additional subdivisions that need to be assessed for adequate diagnosis. Because of this, a diagnostic assessment will cover a more targeted sample of content at greater depth than a typical summative assessment would. Stated another way, a summative assessment will be built to assess a broader array of topics

within a content area than a diagnostic assessment would.

All assessments should be built for a specific purpose or purposes. The purpose will necessitate some compromises. A diagnostic assessment gives up assessing "breadth" for the ability to assess "depth." Another compromise is that given the purpose of the diagnostic assessment, not all students will take the diagnostic assessment. As such, a diagnostic assessment is typically not used in grading, and the results from students taking the assessment are not aggregated. As with any assessment, the purpose of the assessment should dictate how the results are used.

Figure 1: Diagnostic assessment characteristics

Purposes	Identifies potential learning strengths and difficulties and/or areas that require further development. Provides teachers with information to inform next steps.
Uses/Primary Users	To obtain insight into students' learning strengths and challenges. Most often, teachers use to inform learning support as well as next steps in instruction. May require specialized knowledge about the assessment to administer & interpret results.
Examples	Observation protocol; written or oral assessment; may draw on item banks, but would be carefully constructed to demonstrate balance of representation for standard(s) assessed.
Frequency	Can be used pre- and/or post-instruction; may be given multiple times across year; may be routine if given as part of a cycle of instruction.

To learn more

Be sure to check out other related Learning Points on the following topics. All are available at <https://bit.ly/MAC-LearningPoints>

- **Three C's of a Balanced Assessment System**
- **Choosing Assessments**
- **Formative Assessment**

The Michigan Assessment Consortium's Assessment Learning Network (ALN), is a professional learning community consisting of members from MI's professional education organizations; the goal of the ALN is to increase the assessment literacy of all of Michigan's professional educators.