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Why Check for Understanding?

Checking for understanding permeates the teaching world. If you doubt that, consider the last lecture you heard. Whether the lecture was about chemical reactions, the great American novel, or the causes of World War II, the person speaking most likely checked for your understanding several times during the lecture by using such common prompts as "Any questions?", "Did you all get that?", "Everybody understand?", or "Does that make sense?"

Rather than respond to these questions, most learners will sit quietly, and the lecturer doesn't know whether they understand, they are too confused to answer, they think they get it (but are off base), or they are too embarrassed to show their lack of understanding in front of others. Such general questions are simply not sufficient in determining whether or not students "get it."

Additionally, students aren't always self-regulated learners. They may not be aware of what they do or do not understand. They sometimes think they get it, when they really don't. If you doubt this, consider how often you have heard students comment, "I thought I knew this stuff, but I bombed the exam."

Much of the checking for understanding done in schools is ineffective. Thankfully, there are a number of ways to address the situation. We've organized this book, and the ways that teachers can check for understanding, into larger categories, including oral language, questioning, writing, projects and performances, tests, and

Feedback: Responding to student work. The second component of a comprehensive formative assessment system, and the one that is more commonly recognized, relates to the individual responses to their work that students receive from teachers. Of course, these responses should be directly related to the purpose and performance goal. The best feedback provides students with information about their progress or success and what course of action they can take to improve their understanding to meet the expected standard (Brookhart, 2008). Ideally, feedback occurs as students complete tasks so that they can continue to master content. If learning is the goal, teachers should not limit feedback to a summative review but should rather provide formative feedback that students could use to improve their performance. For example, in a unit of study on writing high-quality introductions, Kelly Johnson provided her students multiple opportunities to introduce topics using various techniques such as humor, questions, startling statistic, direct quotation, and so on. For each introduction they produced, Dr. Johnson provided feedback using a rubric so that students could revise their introduction and use that information on their next attempt. She did not simply note the mechanical errors students made but rather acknowledged areas of success and provided recommendations for students to focus on in their next drafts.

Feed-forward: Modifying instruction. The final component required for creating a formative assessment system involves using data to plan instruction. Feed-forward systems involve greater flexibility in lesson planning, because teachers can't simply follow a script or implement a series of lesson plans that are written in stone. This is the formative aspect of checking for understanding and one that is often missing. When teachers examine student work, whether it is from a daily checking for understanding task or a common formative assessment tool, they can use that information to plan instruction and intervention. For example, students in a 3rd grade class completed a collaborative poster in response to a word problem. One of the groups had a problem that read: *Six students are sitting at each table in the lunchroom. There are 23 tables. How many students are in the lunchroom?* The students in this class knew that they had to answer the question using words, numbers, and pictures. Not only did the students with this problem do it wrong, but nearly every group had the wrong answer. Given this information, the teacher knew that she needed to provide more modeling for her students about how to solve word problems. The feed-forward, in this case, required a whole-class reteaching.

to predict probability about genotype," she said, "they can tell me what dominate and recessive alleles are, but they can't calculate them in a meaningful way." A third type is a *transformation error*. Ms. Jackson notes that the Punnett square procedure is only valid when the traits are independent of one another. "Although I use examples and nonexamples in my teaching, some of them still overgeneralize the procedure and try to use it with polygenic traits such as hair color," she said. "For some, they have learned a tool and now they want to use it in every situation." A fourth type of error, the *misconception*, can result from the teaching itself. "I have to stay on guard for this," Ms. Jackson said. "Because I teach them Punnett squares, many of them hold this misconception that one gene is always responsible for one trait. These ideas can be stubbornly held, so I have to teach directly with misconceptions in mind."

An important part of the learning process is identifying and confronting misconceptions that can interfere with learning. Consider, for instance, how appreciating and addressing students' misconceptions can inform instruction in the following areas:

- Incorrect beliefs of young children that paintings are produced in factories (Wolf, 1987)
- Elementary students' misunderstanding that an equal sign in mathematics indicates an operation, rather than a relation (Ginsburg, 1982)
- K–3 students' beliefs that Native Americans who lived in tepees did so because they were poor and could not afford a house (Brophy & Alleman, 2002)
- Mistaken beliefs about living creatures—for example, that flies can walk on the ceiling because they have suction cups on their feet, and beavers use their tails as a trowel (Smith, 1920)
- Science students' misconception that larger objects are heavier than smaller ones (Schauble, 1996)
- The belief by adolescents (and adults) that there is a greater likelihood of "tails" in a coin toss after a series of "heads"—also known as the "Gambler's Fallacy" (Shaughnessy, 1977)

The act of checking for understanding not only identifies errors and misconceptions but also can improve learning. In a study by Vosniadou, Ioannides, Dimitrakopoulou, and Papademetriou (2001), two groups of students participated

FIGURE 1.1 **Comparison of Formative and Summative Assessments**

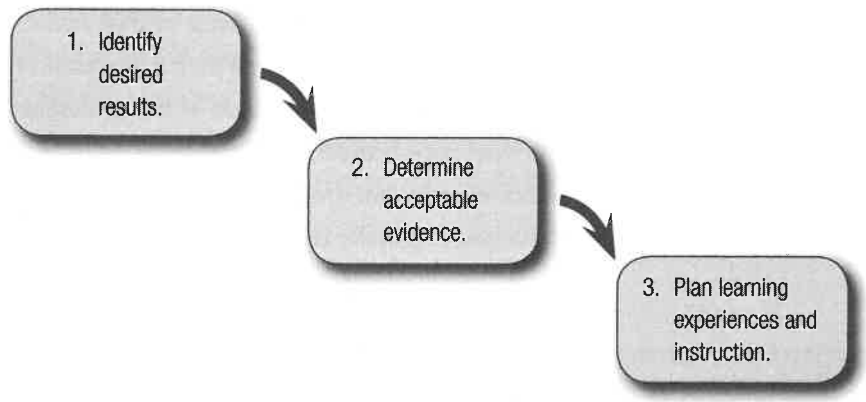
Formative Assessments		Summative Assessments
To improve instruction and provide student feedback	**Purpose**	To measure student competency or mastery
Ongoing throughout unit	**When administered**	End of unit or course
To self-monitor understanding	**How students use results**	To gauge progress toward course- or grade-level goals and benchmarks
To check for understanding and provide additional instruction or intervention	**How teachers use results**	For grades, promotion

Checking for understanding is a systematic approach to formative assessment. Let's explore the difference between formative and summative assessment in greater detail. Figure 1.1 provides a comparison between the two assessment systems.

Formative assessments are ongoing assessments, reviews, and observations in a classroom. Teachers use formative assessment to improve instructional methods and provide student feedback throughout the teaching and learning process. For example, if a teacher observes that some students do not grasp a concept, he or she can design a review activity to reinforce the concept or use a different instructional strategy to reteach it. (At the very least, teachers should check for understanding every 15 minutes; we have colleagues who check for understanding every couple of minutes.) Likewise, students can monitor their progress by looking at their results on periodic quizzes and performance tasks. The results of formative assessments are used to modify and validate instruction.

Summative assessments are typically used to evaluate the effectiveness of instructional programs and services at the end of an academic year or at a predetermined time. The goal of summative assessments is to judge student competency after an instructional phase is complete. Summative evaluations are used to determine if students have mastered specific competencies and to identify instructional areas that need additional attention.

FIGURE 1.2 **Stages in the Backward Design Process**



Source: *Understanding by Design* (p. 18), by G. Wiggins and J. McTighe, 2005, ASCD. Used with permission.

students' understanding) to know whether or not our instructional interventions, modifications, accommodations, and extensions are working.

Checking for understanding presumes that students are able to demonstrate their understanding in different ways. This demands not only that products are differentiated but also that our ways of analyzing them are differentiated. Consider this example of a student's different responses to the same question.

Mariana, a 5th grader, was reluctant to speak in class. Mariana's teacher, Aida Allen, asked her to describe the character of Byron, the oldest brother in *The Watsons Go to Birmingham—1963* (Curtis, 1995). Byron is the kind of big brother who torments his younger siblings, sometimes making their lives miserable. However, his love for his brother and sister manifests itself in some surprising ways. Readers usually respond to Byron strongly, as his hurtful acts and flashes of kindness elevate him to the level of a realistic character. But in reply to Ms. Allen, Mariana merely mumbled, "Mean." Ms. Allen knew that Mariana had been enjoying the book and had overheard her talking to another member of her book club about it. A teacher who didn't understand checking for understanding might have cajoled Mariana for a minute or two and then moved on to another student who would supply a richer answer. But because she was interested in checking Mariana's understanding and

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Instruction and assessment are not simply random events in a classroom. They are linked in profound ways. It's the intentional and targeted instruction that provides students with experiences that teachers can use to check for understanding. And it's this same intentional and targeted instruction that allows teachers to address the errors and misconceptions that they unearth as they check for understanding. Intentional and targeted instruction is based on the gradual release of responsibility framework (Fisher & Frey, 2013b; Pearson & Gallagher, 1983). The framework we have developed includes four recursive phases: focused instruction, collaborative learning, guided instruction, and independent learning. In each phase, teachers can check for understanding. Additionally, each phase can be used to address student's errors or misconceptions, depending on the type of error and the number of students who made the error.

Focused instruction. As we noted earlier in this chapter, the purpose for learning must be established in a clear and coherent manner with students. A clearly articulated purpose provides teachers with guidance about checking for understanding and allows students to share responsibility for learning. When the purpose is not clear, or not agreed upon, students may complete a number of tasks yet not be motivated to assume responsibility. They may fail to understand the relevance of the content. Students practically beg for an established purpose when they ask, "Why do we gotta know this stuff?"

In addition to establishing purpose, focused instruction involves teacher modeling. Simply stated, students deserve an example of thinking and language required of the task before being asked to engage independently. In addition, there is evidence that humans are hard-wired to mimic or imitate other humans, which might explain why modeling is so effective. And further, there is evidence that scientists, historians, and mathematicians think differently and that this thinking is part of the discipline in which students need to be apprenticed (Shanahan & Shanahan, 2008).

Modeling requires that teachers provide an example of what happens in their minds as they solve problems, read, write, or complete tasks. Modeling is not an explanation or a time to question students, but rather an opportunity to demonstrate the ways in which experts think. Examples of modeling include:

In her geometry class, Ms. Chen has students complete a collaborative poster for each proof they solve. Each student must contribute to the poster, and she knows if they contribute by the color of marker they use. Each student in the group of four has an assigned color, and students must sign their name to each poster. In addition to this collaborative task, the group must ensure that each of its members can explain the proof independently. This requires a significant amount of reteaching, negotiation, support, and trust. In other words, students are assuming responsibility for their learning and the learning of their peers.

Guided instruction. While purpose, modeling, and collaborative tasks are important aspects of learning, students also require guided instruction to be successful. We define guided instruction as the strategic use of questions, prompts, or cues designed to facilitate student thinking. Guided instruction should be based on assessment information. While guided instruction can be done with the whole class, our experience suggests that it is most effective with small groups. While students are engaged in collaborative tasks, the teacher can meet with a small group for guided instruction. Members of the group should be selected based on the data collected during checking for understanding. In her discussion with a group of students who misunderstood photosynthesis, Ms. Grant was able to use a series of questions and prompts to increase understanding.

Ms. Grant: Some of you thought that plants ate soil to grow. This is a very common misconception that we should talk about further. Do you remember the video we saw about photosynthesis? What role did soil play in that video?

Destini: Well, it wasn't about the dirt. It was about the sun and carbon dioxide.

Andrew: And how the plants make oxygen for humans.

Ms. Grant: Plants make oxygen for humans?

Andrew: Yeah. Well, I guess that they'd make oxygen even if there weren't humans.

Michael: It's called a by-product. They don't make oxygen for humans. They just make oxygen.

Ms. Grant: And what is left, once they've made this oxygen?

Destini: Carbon. They take in carbon dioxide and then give off oxygen, so carbon is left.

Ms. Grant: And what do you know about carbon?

Schmoker (2006) notes, "an enormous proportion of daily lessons are simply never assessed—formally or informally. For the majority of lessons, no evidence exists by which a teacher could gauge or report on how well students are learning essential standards" (p. 16). Some tips to consider when integrating checking for understanding into your instructional plans include the following:

- Begin with the outcomes in mind. Know what you want your students to know and be able to do, and let them in on that secret.
- Create engaging lessons—focused instruction, collaborative learning, guided instruction, and independent learning—aligned with those outcomes.
- Plan to check for understanding, using a wide range of tools and strategies, on a regular basis.
- Take action based on the data that you collect. In other words, examine student responses to figure out what they know and what they still need to learn. And then plan additional instruction using some combination of focused instruction, collaborative learning, guided instruction, and independent learning to lead students to greater and greater success.