

Student Assessment: Measuring Progress Toward Your Goals

Chapter Two

- I. Summative Assessment
- II. Diagnostic Assessment

Introduction

Just as a guide leading a group of hikers has a mountain to climb, the teacher leading a class of students has standards. It is evident when the climbers have met their goal: they are standing on the summit. How does a teacher know when students have met their goal – what is the summit of student achievement? And how will you know your students have gotten there?

Remember the three questions we posed at the start of this course:

- 1. What should your students know, understand or be able to do?**
- 2. How will your students demonstrate their mastery?**
- 3. How will you instruct your students so they can reach that level of mastery?**

As we saw in the last chapter, you must first determine what your students are expected to know, understand, or be able to do. This means more than “learn geography” or “think critically.” We saw standards stating that eighth graders in Texas are expected to explain Manifest Destiny. Fourth graders in Arizona are required to distinguish fact from opinion. Those are fairly clear guidelines. But what will be acceptable evidence of a child’s ability to do these things? How will you know what to prepare your students to do if you do not first determine what success looks like in these tasks?

Planning lessons (question three above) before planning measures of success (question two) can quickly become a case of the tail wagging the dog. When teachers have not taken the time to think through the ways in which their students will need to demonstrate mastery of standards, their lessons often undershoot the mark, featuring simplistic or unrelated explanations and activities. These teachers then write tests based on the altered content they’ve presented. They never realize that they’ve strayed from the standards.

As Wiggins and McTighe note in *Understanding by Design*,

What would we accept as evidence that students have attained the desired understandings and proficiencies—*before* proceeding to plan teaching and learning experiences? Many teachers who have adopted this design approach report that the process of “thinking like an assessor” about evidence of learning not only helps them to clarify their goals but also results in a more sharply defined teaching and learning target so that students perform better knowing their goal.⁶

If, as those Texas social studies standards from Chapter One state, students are expected to “identify the areas that were acquired to form the United States,” you may decide that the most reliable assessment would be to give students a blank map of the continent and create a series of overlays representing American expansion. Your instruction would then have to give students all of the knowledge and practice

⁶ Wiggins, Grant and Jay McTighe. *Understanding by Design*. Alexandria: ASCD, 1998, 8-9.

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on how to accomplish this independently. **Simply put, once you've determined *what* you are supposed to teach, you should determine what students will *do* to prove that they understand the material in the required ways.** This approach to instruction is called “backwards planning” because it requires you to start by identifying what you want students to know at the end of instruction. By doing so, you can gear your instruction to ensure that students perform the way you originally envisioned.

In addition to being helpful as a planning tool, assessment is the means by which we gauge progress. We need to have a clear sense of what our students have achieved so that we can make decisions about how we approach future instruction, where individuals need particular support and, more generally, how we are succeeding. One standout trait of teachers who make major progress with their students is frequent assessment. The focus becomes not “what I taught” but rather “what my students learned.” In this sense, assessment is vital to our mission as an organization. In order to close the achievement gap, we need to make dramatic, measurable gains with our students. We will not know if we have accomplished our goals if we do not record where our students started – and where and by how much they have grown. Assessment holds us accountable to our goals.

Thus, this chapter is about compiling acceptable evidence for student achievement. What does it mean to demonstrate mastery of academic goals, and how do teachers go about collecting such evidence? This chapter is also about using evidence. How can teachers take stock of their students and use that information to shape further instruction and address individual needs?

I. Summative Assessment

While this section focuses on summative assessment, there are two other equally important forms of assessment that we will discuss in this course. *Diagnostics* gauge student mastery of prerequisite knowledge and skills and prior knowledge of content at the beginning of learning. We will discuss this form in section II of this chapter. *Formative* evaluations check student progress during the course of a lesson and unit of study and inform the adjustment of instructional decisions. We will discuss these in Chapter Five.

Summative assessments, the focus of this section, are the most familiar type of assessment. These are the tests, the examinations, the final projects – the ways in which a teacher formally measures students' understanding of learning goals at the end of each unit or at the end of the year. These are the tools that provide teachers with data on the sum of student knowledge and serve as an important source for official progress reports and grades for children, parents and school officials.

Types of Assessments

Diagnostic – Before instruction begins, used to determine mastery of prerequisite knowledge and skills and prior knowledge of future content (e.g., reading readiness test).

Formative – Throughout a unit and lesson cycle, used to gauge progress (e.g., student practice problems during independent practice, weekly quizzes).

Summative – At the end of a unit or end of the year, used to measure growth and achievement formally (e.g., end-of-unit test).

This section will introduce you to the following topics:

- The different incarnations of summative assessments
- The guiding questions for creating assessments
- How to use summative assessments as planning tools to set clear, high expectations
- How to design summative assessments as an accurate and fair evaluative tool to communicate student progress

Types of Summative Assessment

The primary goal of the summative assessment is to determine student understanding and growth, and teachers use a variety of tools to do this. Paper-and-pencil tests cannot measure every skill, nor would an extended interview be helpful (or practical) to gauge all learning.

- **Tests and quizzes** are, of course, a tried and true method of assessing student progress. They are relatively quick (but surprisingly challenging) to design and evaluate, and they provide huge flexibility in terms of structure. Tests and quizzes are an excellent means of generating quantifiable data that can be compared across your classroom or, in the case of standardized achievement tests, across your school, district, or state.
- **Performance assessments** require students to demonstrate a task rather than simply answer questions. For example, a student may be asked to generate scientific hypotheses, converse in a foreign language, or conduct research on an assigned topic. Performance tasks are designed to be similar to the challenges that adults face every day, requiring students to use higher-order thinking skills, such as judging, innovating, and creating rather than reciting, responding, or listing. Performance assessments are often termed “authentic” assessments because they ask students to perform tasks in a real-world-like context – for a specific purpose and audience under realistic constraints. Since they require students to actively apply knowledge and skills in an unprompted, novel situation, authentic assessments can reveal the highest possible level of student mastery. Note that performance assessments can also be challenging to administer and grade efficiently. You can look at some examples of performance assessments in the **Instructional Planning & Delivery Toolkit** (pp. 7-11: “Performance Assessments”), which can be found online at the Resource Exchange on TFANet. ✖
- **Portfolios**, which contain a variety of student work (from writing samples to standardized tests scores), can be used both to help students identify areas for improvement and to present a summative picture of students’ progress. Working with the teacher, perhaps during regular conferences, students identify appropriate work samples to include in portfolios—either to reflect the children’s best work, or to show steady progress over time. This process encourages students to reflect upon and assess their own accomplishments. In addition to student work, portfolios frequently include written teacher evaluations and student self-assessments of the portfolio contents.
- Like many of these tools, **journals** can be used at all phases of assessment and provide a useful record of student work over time when communicating with students and parents about student achievement and needed areas of growth. As a summative assessment, journals can be used for students to write about what they have learned, apply what they have learned to a new situation, or jot down lingering questions about the topic.

Assessment at the Pre-K Level

Even though the methods we use to assess pre-K students at KIPP SHINE Prep are different from the methods we use to assess our older students, the results are equally essential for guiding and individualizing our instruction. I use work samples, child observations (it’s incredible how much you can learn about a child’s development from watching him or her!), one-on-one assessments, and standardized tests to obtain a holistic picture of each of my pre-K student’s progress towards meeting the state standards. I also maintain a portfolio about each of my students so I can track their progress throughout the year. All of these methods are developmentally appropriate and allow me to obtain valid and reliable evidence about my students’ growth and development.

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- Most school districts administer **standardized tests** to benchmark student progress across the district, state, or country, and you are not likely to have a choice as to whether or not to administer them. While the interruptions caused by these tests can be frustrating for both students and teachers, they can also provide useful information as to what students have learned. They are often the most accessible way of measuring progress over longer periods of time. Be aware, though, that standardized tests often set a low bar for student achievement, so using them as your sole method of goal-setting is not always a recipe for high expectations.

Guiding Questions for Creating Assessments

When creating any assessment, you should use the same backwards planning mindset that frames all of your instructional planning. To help you backwards plan your assessments, consider the following questions:

1. **What are your learning goals or standards?**
2. **What evidence would you need from students to demonstrate mastery of the standards/goals?**
3. **What method will you use to assess?**
4. **What questions or prompts will you include on the assessment?**
5. **What are the criteria for success? What are the characteristics of a high quality response?**

These questions will help organize the complicated process of creating an assessment and will ultimately increase the overall effectiveness of your end product. Note that while this section will primarily focus on summative assessments, these guiding questions can be used in designing any assessment, including diagnostic and formative tests used prior to and during instruction. To aide your assessment design, refer to the **Instructional Planning & Delivery Toolkit** (pp. 12-13: "Assessment Plan – Guiding Questions"); this Toolkit can be found online at the Resource Exchange on TFANet. ✖

1. What are your learning goals or standards?

As we discussed in Chapter One, excellent teaching begins with identifying and understanding your course standards. Creating your assessment is no different. You must first identify what learning goals or standards your assessment will cover in order to begin developing a quality tool to measure student understanding. Creating your summative assessments immediately after considering what your students are supposed to know or be able to do – both on the long-term level and as you plan a series of lessons – is an essential practice of effective teaching. That way, your eventual instruction is much more likely to be aligned with state expectations. If a summative assessment is used to measure student mastery at the end of a unit (a group of learning goals), you will need to center your tool on those learning goals identified for instruction. For example, if your students are expected to be able to compare democracy and communism, you will need to design an assessment that asks them to demonstrate their mastery of this goal. (Asking students to name a list of countries that fall into those categories would be insufficient.) Knowing what you're going to expect your students to do, you will then gear your instruction to helping them achieve your goals. This does not mean that you will spend your instructional time giving your students the answers to your test, but you will ensure that your teaching is focused on helping students meet those objectives, as set by the state. As we will discuss in Chapter Three (Long-Term Planning) and Chapter Four (Unit Planning), you will identify your standards and more specific learning goals at the beginning of the unit planning process. When you create the vision of your unit plan use these goals as the starting framework for creating your end-of-unit summative assessment.

2. What evidence would you need from students to demonstrate mastery of the standards/goals?

Now that you have identified the learning goals driving your assessment, you can continue to backwards plan by determining the evidence that would indicate that students have successfully achieved these

goals. What would it look like for someone to know the content and perform the skills masterfully? What would students need to do to prove that they had mastered the unit's learning goals? It is important to carefully consider and answer these questions to develop a clear vision for what you want your assessment to accomplish.

Building on the work you did to understand your standards and learning goals in Chapter One, you will now interpret them further to get a clear vision of student mastery. At this stage, your vision does not need to be completely detailed, but you should have an overarching sense of what you will need to see from students. Later in the process (during question five) you will refine this vision even further by identifying how responses look differently at varying proficiency levels.

To help interpret your standards and learning goals first ask:

- What are the **verbs** of my standards?
- What is the **content** on which the verbs take action?

For example, look at the following example of a social studies standard:

5.3 Students describe the cooperation and conflict that existed among the Native Americans and between the Native American nations and the new settlers, in terms of:

1. The competition among the English, French, Spanish, Dutch, and Native American nations for control of North America.
2. The cooperation that existed between the colonists and Indians during the 1600s and 1700s (e.g., in agriculture, the fur trade, military alliances, treaties, cultural interchanges).
3. The conflicts before the Revolutionary War (e.g., the Pequot and King Philip's Wars in New England, the Powhatan Wars in Virginia, the French and Indian War).

If these were your standards, you would identify the **verb** as "describe" and the **content** as including the "cooperation and conflict" between Indians and new settlers, the "competition" among different nations, the "cooperation" between colonists and Indians, etc.

After deciphering the verbs and content of each individual goal, holistically analyze the learning goals as a collective group. Think about which of the following is necessary in order to master this group of unit goals:

- **Knowledge or understanding**
- **Reasoning**
- **Skill performance**
- **Products**

Using the standards above you may realize that students will need **knowledge** of the pre-Revolutionary War conflicts, and the ways Native Americans, settlers, and colonists competed and cooperated. Additionally, the **understanding** of why these relationships existed and how they developed will be necessary for demonstrating mastery of the standards.

Further, it will be necessary for students to comprehend how these people and events are interrelated (one part of the **reasoning** required by the standard) and demonstrate abilities to describe Native American tribes and nations, the conflicts among colonists, settlers, and Native Americans, and why these relationships existed (a few of the **skills** necessary for standard mastery). Ultimately, for students

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to show mastery of the overall standards, they will need to prove their factual knowledge of the relevant events, people, and actions by producing a description (in some form, whether written, visual, etc.). This **product** would serve as appropriate evidence for evaluating student understanding of the social studies standard.

Once you have unpacked your goals applying these suggestions, stop and reconsider the original guiding question – what will it look like for students to demonstrate mastery of the learning goals? Make sure you can confidently answer this question before you continue to create your assessment. Without a solid conception of what students will need to do, it will be difficult to make an assessment that provides you with the information you need.

Before proceeding, take time to consider the prioritization of topics to be included in your assessment. Out of all the learning goals to be assessed, which are the most important for students to master? What learning goals are “enduring” - or serve as prerequisite foundations for subsequent units or course standards? Answering these questions will help you to prioritize your learning goals while designing your assessment, enhance your decision-making abilities, and maximize the value and purpose of your measurement tool.

Understanding what evidence you will expect from students is an essential step in creating any assessment. Next, you will determine how you will design your assessment questions and prompts to gather this necessary evidence.

3. What methods will you use to assess?

Methods of Assessment

How do you design assessments that align with expectations and generate the evidence you need to determine student mastery? The key is *to be purposeful in the types of assessment questions you ask*.

When designing an assessment it is important to understand the two main categories or types of assessment questions: **objective** and **non-objective**. At the most basic level “objective” assessment questions are items that are generally not open to interpretation (e.g. multiple choice) while “non-objective” assessment questions are more open-ended and allow greater room for interpretation (e.g. essays).

By carefully considering what each type of assessment question or task actually demands of students, you will be much more likely to match your assessment with your goals for your students. There are specific reasons to use the various types of assessment questions based on what you wish students to demonstrate. For instance, when assessing a student’s knowledge of an unknown vocabulary word, providing four multiple choices of potential definitions, each much different from the next, might allow the child to be able to select the correct answer by mere process of elimination. It would be a much more accurate and authentic measurement of a child’s understanding to include the unknown word in a sentence and ask the student to provide a synonym, or at least make the multiple choices reflective of some common misconception of the word. **It is always important to think about *what* a student has demonstrated – and not demonstrated – by providing a correct response to your question.** Note the distinctive purposes of the following four test questions, keeping in mind that there is a time and place for each task:

Examples of Assessment Question Types

Objective questions -
multiple choice, matching, true/false, fill in the blank, computation.

Non-objective questions -
essays, presentations, short-answer responses, constructed-responses, projects.

1. True or false: Renoir's work was painted in the Impressionist style of art.
Used because you want to confirm a student's knowledge of a basic fact, this true-false question tests if a student is able to make a positive association between Renoir and the term Impressionism. (Just be aware that this does not necessarily mean that the student knows what the term implies.)
2. Fill-in: The style of art known as _____ features nature or everyday situations, unmixed, shimmering colors and small brushstrokes blended by the viewer's eye.
A correct answer signals that a student is able to match the details of Impressionism with the term.
3. Multiple choice: Renoir's style most closely resembles (a) Degas, (b) Van Gogh, (c) Seurat, (d) Dali.
This question wants the student to compare each artist in relation to Renoir. Note that a correct response suggests that the student sees some similarity between Renoir and Degas – but does not necessarily signal an understanding of Impressionism.
4. Essay: Explain how Renoir's work is emblematic of the Impressionist style of art.
This question asks students to recall details about both Renoir's work and the elements of Impressionism, and then synthesize the two.

The purpose of these examples is not to say that one type of question is always better than another in every situation. Every single question format could be appropriate at some point, depending on your intention, and most teachers often incorporate a number of different question types – both objective and non-objective – into one single assessment. You must be aware, though, of the limitations and potential functions of each type as you select or design an assessment to measure student learning.

The chart below lists some common ways to use the various types of assessment questions.

Assessment Question Types and Their Uses

Question	Purposes	Examples
Multiple choice (objective)	Discriminate between options, comprehend concepts, make simple judgments	<ul style="list-style-type: none"> Where are you most likely to find freshwater trout? (a) the Dead Sea, (b) Lake Tahoe, (c) the Atlantic Ocean, (d) the neighborhood pond.
Matching, sequencing (objective)	Identifying relationships, classifying items, charting cause and effect	<ul style="list-style-type: none"> Label the following items with an (E) for executive branch, (L) for legislative or (J) for judicial. Put the following events in chronological order.
True-false, yes-no (objective)	Knowledge of generalizations, relationships and examples; predicting, evaluating	<ul style="list-style-type: none"> Under the first amendment, you have the right to: Assemble peaceably T F Say anything you want T F
Factual short answer, fill-ins (objective)	Recalling or classifying facts, terms or concepts, solving simple science and mathematical problems	<ul style="list-style-type: none"> Define tundra. Draw a diagram explaining the water cycle. Name the political philosophy promoted in the following speech.
Higher-order short answer (non-objective)	Summarizing, applying, concluding, evaluating, predicting, analyzing	<ul style="list-style-type: none"> After reading the news story below, write a summarizing headline. Given her previous actions, what is Lady Macbeth likely to do next?
Short or long essay (non-objective)	Organizing ideas, developing a logical argument, comparing concepts, evaluating a position or data, communicating thoughts or feelings, demonstrating original thinking	<ul style="list-style-type: none"> Read the above poem (John Donne's "Death Be Not Proud") and describe the purpose and power of its major metaphor. What would Darwin say about human cloning were he alive today?

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While all question types may be appropriate at different times, non-objective tasks that require in-depth student responses generally produce more valid information about student understanding. Thus, you should attempt to use these types of items when possible. To be sure that students know how to give a speech, for instance, it is best to have them deliver one. Realize, though, that non-objective tasks can be time consuming to administer and evaluate. Because of this, it will not always be appropriate to use these types of prompts. Always balance the benefit of using more valid measurement tools with the values of efficiency and feasibility.

Choosing the best assessment question type for a particular unit or group of students may feel complicated and overwhelming. To aide your selection of the appropriate assessment method, consider the following factors:

- **Content of the unit** – what exactly are you trying to assess and what questions would be best suited to measure understanding of this content?
- **Efficiency** – what types of assessment will simplify the creation, administration, and grading of the assessment?
- **Breadth of material** – how suited is the assessment to cover different quantities of material?
- **Depth of knowledge** – how much will your assessment reveal about student understanding/misunderstandings?
- **Distorting factors** – what factors might distort scores and prevent the assessment from accurately revealing student mastery (see question four below)?

Considerations for Assessment Question Types (p. 14) ✖ will provide you valuable guidance in considering how these factors affect both objective and non-objective assessment questions. Use this chart to help you design the best assessment given your needs.

4. What questions or prompts will you include on the assessment?

Now that you know what learning goals you will assess and what type of assessment you will use, it is important to consider how you are going to ask students to demonstrate their mastery. What questions or prompts will you use? How will you word these items to elicit accurate evidence of student mastery? Answering these questions is imperative for developing an effective assessment. To reiterate, summative assessments are hugely important, not only for planning but to measure the achievement and growth of your students. Employing rigorous, effective assessment questions is integral to painting an accurate picture of student learning and leading your class to achieve significant academic growth. Summative assessments serve as the official documentation of student knowledge and skills, occurring at the end of every bundle of related lessons (called a “unit”) to gauge progress relative to the baseline of student skills established at the beginning of the course. The results of these tests lead to formal decision-making, both in your own classroom as you plan instruction and in your school as it determines a child’s academic future. Thus, it is vital that your assessments are valid and reliable.

Here are a number of concrete strategies for designing assessments to ensure they are effective measurements of progress:

(1) In order for your assessment to be valid, it must test what it is designed to test and allow students to demonstrate true mastery.

To create an assessment that will give you valid information, you must create assessment items (questions, tasks, prompts, etc.) that (a) align with your learning goals and (b) allow students to demonstrate their true mastery of the learning goals.

a. Alignment (of test items to learning goals)

If you've focused your instruction on learning goals involving similes and metaphors, it would be unreasonable to have sections about personification and hyperbole on your test. This may seem like an obvious point, but it can be tricky to ensure that your test is *exactly aligned* to all parts of your learning goals, and nothing else. To make sure your questions are valid and aligned, make sure that there are no items on your test that are not required by your learning goal. Including "extraneous" questions that don't match your learning goals will only confuse or frustrate your students and prevent you from getting a clear picture of their relevant mastery levels.

Further, you also need to craft test items that match the exact action or performance that is required by the learning goal. Return to question two above and review the verbs of your standards. These give you clear guidance for what you should expect students to do on your assessment. For example, if your learning goal asks students to *compare* the phases of matter, then your assessment items should call for students to perform this exact action. Requiring students to merely identify phases of matter would not sufficiently assess this learning goal.

Similarly, when there are multiple parts to a learning goal you must ensure that your assessment has questions aligned to every related section of that goal. If a learning goal requires students to identify, describe, and compare the three phases of matter, you should make sure that your assessment tests students' ability to perform *all three* actions. Simply asking students to list examples of solids, liquids, and gases will not be fully aligned to your standard. This will prevent you from completely understanding whether your students have reached the level of mastery demanded by the grade-level goal. To ensure that your assessment is a valid test of student mastery, always create items that accurately (and exclusively) match the actions or performances required by your learning goals.

Also note that, as discussed in question three, some types of assessment questions are better suited for or more aligned to different demands of your content area. Return to the table above detailing assessment question types and their uses. This will assist you in determining what kinds of questions are better suited for the demands of your learning goals.

b. True Mastery

In addition to being aligned to your learning goals, a valid assessment must allow students to show their genuine understanding of the content you are testing. If "true mastery" is indeed being measured (and revealed), then students who have mastered a goal or objective will almost always correctly answer a question aligned to that goal, while students who have not mastered a goal or objective will incorrectly answer the aligned question. There are a variety of factors that may prevent assessment items from providing a valid measure of student mastery. To avoid these potential problems, consider the following guidance:

- Be aware that your students may get tripped up on aspects of a question you had not intended, impairing your ability to assess their mastery of the skill you meant to test. A word problem, for example, requires students to read and understand the terms of the scenario, determine what kind of computation is required, develop an equation for the problem, and solve it correctly. In this instance, requiring students to show their work can help you pinpoint where your students may have lost their way.

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Here are some strategies for crafting test items that reveal true mastery, many of which were adapted from Anthony Nitko's *Educational Assessment of Students*⁷:

- **Ensure that items don't give away answers.** Make sure your questions do not "give away" their own answers with irrelevant clues, or help students answer other questions on the test. Remember that the goal of your assessment is to learn if students have truly mastered objectives.

Not so good: Someone who studies architecture is called an _____.

Better: Someone who studies building design is called a(n) _____.

Not so good: 1. Someone who studies building design is called a(n) _____.
5. If you wanted to design a building, what type of professional would you need? _____

Better: Only use one of the above questions on the same assessment.

- **Focus the item.** Watch your wording and be explicit if you're looking for a specific answer. Otherwise, your question could yield unintended answers or allow for a range of unwanted responses.

Not so good: The author of *Huckleberry Finn* was _____. (The student could conceivably put "a man," "criticizing slavery," etc.)

Better: What is the pen name of the author of *Huckleberry Finn*?

Not so good: Where is New Orleans located? _____

Better: New Orleans is located at the mouth of the _____ River.

- **Test one idea at a time.** Some teachers try to trick their students by placing more than one true and false fact in the same question. Yet this strategy does not allow teachers to know what piece of the question students are deeming true or false.

Not so good: Tobacco was the chief crop of Virginia, the first British colony in America. T F

Better: Tobacco was the chief crop of colonial Virginia. T F
Virginia was Britain's first colony in America. T F

- **In a multiple-choice question, ensure that the incorrect answer choices are at least plausible to someone who lacks knowledge.** Make sure that some of your incorrect answer choices are rigorous "distracters," plausible answers based on common student errors or misconceptions. (You know you're in trouble when your tests resemble the \$100 questions on "Who Wants to Be a Millionaire?") Remember the goal is for students to demonstrate their understanding of the material.

⁷ Nitko, Anthony. *Educational Assessment of Students*. New York: Prentice Hall, 2003.

Not so good: The country directly west of Spain is (a) Rome, (b) Antarctica, (c) Brazil, (d) Portugal.

Better: The country directly west of Spain is (a) Italy, (b) France, (c) Switzerland, (d) Portugal.

Crafting these quality distracters will greatly enhance the validity of your multiple choice questions. They increase the likelihood that you will accurately learn whether students truly understand the objective - and did not simply guess or eliminate obviously incorrect choices. Additionally, the process of creating plausible answer alternatives will stimulate your thinking about the misunderstandings students may experience during instruction and the background knowledge and skills they will need for standards mastery. You can then proactively plan to address prerequisite skills and prevent misunderstandings as you create your units and lessons.

- **Avoid posing questions in the negative.** Negative questions greatly enhance the chances that a student will misunderstand the question. Use short, exact and positive statements. If you must write a question in the negative, that fact should be highlighted.

Not so good: What mistakes should you not make if you don't want your reader to become confused by your writing? _____

Better: What should you avoid doing to make your writing clear for your reader? _____

- **Be conscious of potential bias.** Are you unintentionally promoting gender or racial stereotypes by making generalizations in your test questions? Since context familiarity is a key ingredient for comprehension, your reading passages should reflect the cultural experiences of your students. What values or perspectives do your questions assume? Consider this question, where the examples may seem foreign:

Mr. Jones ate a _____ breakfast of oatmeal, sausage links and a croissant with marmalade. (a) bizarre (b.) nourishing (c) feeble (d) skimpy

Think critically about the cultural perspective from which you operate. Students are likely to feel detached or alienated from school when their experiences are ignored. Recognizing personal bias is discussed in greater detail in the *Diversity, Community, & Achievement* textbook.

- **Ensure answers are definitely true or definitely false.** A statement should not be so general that a knowledgeable student can think of exceptions that reverse the answer's intended truth or falsity. Beware of generalizations, for example.

Not so good: In Galileo's time, everyone believed that Earth was the center of the universe except him. T F

Better: Galileo disputed the common belief that the Earth was the center of the universe. T F

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Note that well-constructed test items require students to truly know the material in order to supply the correct answer, whereas poorly constructed tasks will give clues that allow less knowledgeable students to appear proficient, compromising the validity of the results. Questions that don't reveal true mastery may confuse students and lead to potentially misleading data. It is crucial to avoid these problems because when you incorporate assessment results into your ongoing planning, inadequate or inaccurate data will lead to flawed conclusions about student mastery. This will prevent you from making appropriate instructional decisions that lead your students to their ultimate goal – dramatic academic achievement. For further examples and information about crafting valid questions see the **Instructional Planning & Delivery Toolkit** (p. 15: "Guidance for Creating Valid Assessment Items"); this Toolkit can be found online at the Resource Exchange on TFANet. ✖

A Note on Scaffolding

We will discuss the creation of diagnostic and formative assessments later in this chapter. In general, the same guidelines provided in this section apply to the creation of all assessment types. Additionally, to increase the validity of these assessments – or any summative assessment used to inform your instruction - you will also need to **"scaffold"** questions. That is, you should include multiple items that progress from simpler to increasingly more complex cognitive levels (we discuss scaffolding in greater detail in Chapter Four). This allows you to pinpoint the specific skills and knowledge your students know and exactly where they struggle with a particular concept. This provides you with more detailed information about student mastery, which in turn allows you to make more informed and effective instructional decisions.

Remember that certain summative assessments (such as end of the year course assessments and some unit assessments) are designed to tell you the sum of student knowledge at the completion of a series of learning goals. The results of these tests are not used to influence your subsequent instruction. For those purposes, it would not be appropriate to include scaffolded questions on each objective or learning goal. Doing so could lead your test to be extremely long, making it burdensome to administer and grade, and generally inefficient. Further, scaffolding questions on certain topics might unintentionally assist or prompt students in demonstrating mastery of a given learning goal. This may ultimately prevent the assessment from revealing what students are genuinely able to do without additional support or "cognitive clues".

(2) In order for your assessment to be reliable, you must ensure that it will yield consistently accurate results and provide every student with the opportunity to accurately demonstrate his or her knowledge.

- a. Include multiple items and varied ways to assess each learning goal.** If a test has one question for a particular learning target, it becomes unclear whether students really know the material or just happened to guess the correct answer in that instance. Provide each student with multiple opportunities to demonstrate competence on each learning goal. You should also create a variety of ways for students to show what they know through a combination of test questions, papers, models, dramatizations and journal entries. If a student is consistently having trouble with pen-and-paper tests, and you are not assessing a child's ability to write, try testing his or her understanding orally. You may discover that you need to teach the child test-taking skills. Remember that the goal of any assessment is to gather evidence of a student's mastery; the format should not be an impediment to that process. Including multiple opportunities and a variety of ways to elicit understanding increases the validity of assessments by enabling students to demonstrate their true mastery of your learning goals.

- b. **Be clear about the directions on the day of the assessment.** portfolio, or performance assessment, and give an example of how to follow those instructions correctly. On a quiz you might have a sample multiple-choice question with the answer filled in. For a performance assessment you might give a sample final product against which other students can compare their work.
- c. **Develop a standard grading system.** To ensure that a student's score does not rest on your own particular feelings about that child, or on your mood or inclination that day, use a systematic procedure to assign quality ratings or marks for every student. Many assessments, including short-answer questions and essays, will evoke a number of different responses, and you will need to develop criteria to judge the merits of each answer. Make sure your grading system reveals how students progress on individual objectives or learning goals. This will enhance the detail and reliability of your grading system and provide you with more valuable information to inform instruction. Further, be sure to assign a proportionate number of points to items of a different nature. A prompt that has two distinct parts, for instance, should not be assigned the same number of points as a simple multiple choice question. (We will discuss creating a grading system in greater detail under question five that follows.)
- d. **Be fair in the administration of your assessment.** Most students should be given the same amount of time and take the assessment under similar conditions. At the same time, however, be mindful of your students' special needs. As you will read later in this course, students with special needs may require extra time, fewer answer choices, larger print, or an oral assessment, to name just a few potential modifications and accommodations. The fact that a student has special needs does not mean that you do not assess them. Rather, you refer to the student's Individualized Education Program (IEP) to determine the appropriate adjustments in the assessment process.

(3) In order for your assessment to be efficient, you must design your questions to maximize space and time, while remaining purposeful.

- a. **Take time to prioritize those test items that truly represent content of great value** to a student's learning; otherwise, you could write questions for every single fact and concept.
- b. **Order items from easier to harder** so students do not spend all of their time on questions with which they may struggle. (You should, of course, also teach your students test-taking strategies, such as skipping and later returning to challenging problems.)
- c. **Consider how long the test will take to administer.** Of course, certain test items take longer to complete than others (see chart). Take the test beforehand, and assume that you can complete it three to four times faster than the average student. Taking the test ahead of time also helps you catch mistakes and confusing questions.

Estimates for Student Completion of Tasks

True-false items	20-30 seconds
Multiple-choice (factual)	40-60 seconds
One-word fill-in	40-60 seconds
Multiple-choice (complex)	70-90 seconds
Matching (6 choices)	2-4 minutes
Short-answer	2-4 minutes
Word problems	5-10 minutes
Short essays	15-20 minutes
Data analysis/graphing	15-25 minutes
Drawing models / labeling	20-30 minutes
Extended essays	35-50 minutes

Source: Nitko, Anthony. *Educational Assessment of Students*. New York: Prentice Hall, 2003, p. 117.

Measuring Progress Toward Your Goals

- d. **Consider how often your students are being tested.** There are simply too many skills to teach to spend all of your time testing. Plus, students lose concentration, focus, and motivation when they are tested too long or too often. If you teach middle or high school, work with your students' other teachers to see if you can establish a set day of the week for testing in your subject area.
- e. **Consider how long the test will take to grade.** Checking 150 short answers takes much longer than it takes the eye to scan a row of multiple-choice answers along a margin. It is, of course, your professional responsibility to create tests that can accurately reflect student understanding, which could rarely occur through multiple-choice questions alone. Yet when two different types of test questions could serve the same purpose, it is acceptable to use efficiency as a deciding factor.

In drafting assessment items, it is important to remember that there are no “perfect” assessments. Often you must make tradeoffs between one characteristic of an effective assessment and another. For instance, an extremely valid assessment may be inefficient to administer and less reliable to grade. It is your job to select or design an assessment that strikes the best balance between these values given your instructional goals and student needs. Remember to return to the resource “Considerations for Assessment Question Types” in the **Instructional Planning & Delivery Toolkit** (p. 14) ✂ to help determine what types of questions are best suited for different purposes. By ensuring that your assessments are as **valid, reliable, and efficient** as possible, you will help identify the gaps in student learning that you need to go back and address. Well-designed summative assessments also will help generate accurate and useful data for students, parents, and school officials about a student’s achievement and progress.

5. What are the criteria for success? What are the characteristics of a high quality response?

To create assessment prompts that provide accurate information about student performance, you need to determine what it means to be successful on these questions. How do you know if you are maintaining the high expectations that are so important to achieving dramatic academic gains? What will an excellent response look like, and how will it differ from an average or incorrect response? While these points are addressed under the heading of the ‘final’ guiding question, they are actually vital throughout the assessment creation process. This is the stage where you will be able to double check your assessment prompts to ensure that they elicit the quality of evidence necessary for student mastery (as determined earlier this chapter). Further, by undergoing this process you will be able to clearly articulate the elements and features of successful responses to your test items.

As noted earlier, you can use standards, district curriculum guides, resources on the Internet, professional organizations, textbooks and standardized tests to determine what it means for a child in your grade level to achieve at high levels. Here are some more in-depth suggestions about using some of these resources to establish the proper standard for student performance.

(1) Depend on the other teachers that you work with. While you will likely spend many hours looking at student work and assessment results on your own, looking at student work with colleagues is a growing practice among effective teachers. Group consideration of student work enables you to check your expectations for students and tap into the professional experience and unique perspective of other teachers about what might hold students back from fulfilling their true potential. See “Protocols for Evaluating Student Work” in the **Instructional Planning & Delivery Toolkit** (p. 18), which can be found online at the Resource Exchange on TFANet. ✂

(2) Compare and contrast your students' work with exemplary work of students of a similar age. New teachers and veterans alike find it very useful to look at their students' work alongside examples of student work that have met high standards. The simplest and most cost-effective means of obtaining exemplary work is from veteran teachers in your school, district, or region. Veteran teachers will have developed a keen eye for strong work and will probably have samples available to show you.

Your regional office also has sets of computer CDs produced by Exemplars © that contain examples of student work at four different levels (novice, apprentice, practitioner, and expert) for a variety of performance tasks in math, science, writing, and reading. You can assign these performance tasks to your own students ("students will publish a propaganda newspaper, taking a pro-patriot or pro-loyalist point of view on the Boston Massacre") and then compare their work to the examples. The annotated examples of student work can be used to help you answer two questions: "Is what I consider quality student work also considered quality by others?" and "What does 'excellent' achievement look like?"

To ensure that we are providing our students with an education equal to the education received by students in wealthier communities, we need to measure our students' achievement and compare it with that of their counterparts in those wealthier communities. Without this measurement and comparison, we run the risk of perpetuating the educational inequity that has plagued so many children in our nation for so long.

Jason Botel, Baltimore '97
Executive Director, KIPP Schools

Once you have an idea of the quality of work you should expect from your students, you will need to develop a standard grading system to evaluate their work. Grading systems allow you to define and articulate what specific degrees of mastery on different prompts or tasks will look like. They set the bar for success on your assessment and guide you in classifying and interpreting student responses. In doing so, they help paint a reliable picture of student performance on the learning goals covered in your assessment. There are many different grading tools that teachers commonly use when evaluating student performance. In this section we will discuss two of the most effective tools – anchor papers and rubrics.

Anchor Papers

For many assessment types it will be essential to undergo the process of creating "**anchor papers**" – the writing and classifying of different student responses to open-ended prompts. After designing these prompts, teachers often create an anchor paper for each level of student mastery on their grading scale to help differentiate qualities of various responses. These papers will greatly help clarify your vision of student mastery across the spectrum of proficiency levels. Anchor papers enable you to visualize potential gaps between how your students might respond versus how you would like them to respond, so that you can prepare them to accomplish the latter. Thus, these tools will aid your instruction in addition to providing you with a clear, rigorous, and standardized grading system for accurately evaluating your students' completed work.

Rubrics

Another effective way to develop a standard method for assigning grades is developing sliding scales, or **rubrics**. There are two types of rubrics that you can develop – one for your own use, when planning and evaluating substantive responses to questions, and one for your students, when outlining the expectations of a performance task. Both types go beyond typical checklists by stating explicit outcomes for a specific performance and delineating different levels of quality for that performance. Both are created before a lesson begins to help students meet grade-level expectations.

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Rubrics to anticipate student responses

The first kind of rubric is an internal document that helps a teacher anticipate how students might interpret and relate to a particular test question. The rubric below, adopted from the state of Maine's Department of Education⁸, shows a grading system that provides a fair, balanced framework for consistently evaluating responses to open-ended math prompts. Notice how this rubric breaks down the elements of a student's response and categorizes them under different proficiencies.

<p>Maine Holistic Rubric for Mathematics Open-Ended Items Source: Maine Department of Education Subjects: Mathematics Grade(s) Not specified</p>	
4	A correct solution and an appropriate strategy are shown or explained and the solution is shown with correct label or description if necessary.
3	<ul style="list-style-type: none"> • A complete, appropriate strategy is shown or explained but: <ul style="list-style-type: none"> - an incorrect solution is given due to a simple computational or other error or - no solution is given. • A correct solution is given with no solution strategy or explanation shown. • A correct solution and appropriate strategy is shown or explained, but not labeled correctly when necessary
2	<ul style="list-style-type: none"> • Some parts of an appropriate strategy are shown or explained, but some key elements are missing. • Some parts of an appropriate strategy are shown or explained, along with some inappropriate parts. • Appropriate strategy shown or explained, but implemented incorrectly.
1	<ul style="list-style-type: none"> • Some work or explanation shown beyond re-copying data, but work would not lead to a correct solution. • One or more incorrect approaches attempted or explained.
0	<ul style="list-style-type: none"> • No work or solution shown or explained. • Incorrect solution and no work shown or explained. • Some data from the problem copied over, but no evidence of any strategy is shown or explained.

While it serves as a reliable and relatively efficient grading tool, the rubric above does not feature anchor examples of student work to illustrate what the different proficiencies look like. Many valuable rubrics also include these samples of student work to help delineate between different levels of potential responses. See how the rubric that follows accomplishes this:

⁸ Math Rubrics, http://intranet.cps.k12.il.us/Assessments/Ideas_and_Rubrics/Rubric_Bank/MathRubrics.pdf, accessed 12/20/07

Question: Why did the colonists in Massachusetts rise up against the British in the 1770s?

<p>“To be free.” “To protect their families.” “To prove their strength.”</p> <p>“They were angry about the tea tax.” “They felt mistreated by King George.” “Because they were taunted by the British army.”</p> <p>“They were being taxed on tea without getting representation in Parliament.” “They felt threatened when the British shut down the Boston harbor and installed a royal governor.”</p> <p>“The British made a number of political gestures that compromised the growing autonomy of the American colonies, including the imposition of taxes, the regulation of trade, the installation of troops, and the appointment of a royal governor.”</p> <p>“This question presumes that all colonists rose up against the British, which is not the case. Colonists in America were divided into loyalists and rebels, the former group finding security and/or economic benefit in their association with King George. The rebels, on the other hand, found the crown’s tightening financial and military grip on the independent colonies a great burden, resenting the taxes on stamps and tea...”</p>	<p>1—These responses are not relevant because they do not address the particular historical issues at play, focusing instead on generalities.</p> <p>2—These responses are of higher quality than the first set because they apply a relevant fact to their answer.</p> <p>3—These responses are even better because they consider two facts and make a logical connection between them.</p> <p>4—This response is of a higher quality than the previous ones because the student refers to a number of relevant facts and synthesizes them into a complete explanation.</p> <p>5—This response is more abstract and complex than all of the others. It challenges the generalization implied by the question by referring to a case in which the generalization may not be true. The student goes on to answer the question as intended with a lengthy, extended response.</p>
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By anticipating these various tiers of responses and distinguishing between them, effective teachers are able to envision an ideal answer, the ways in which their students may typically respond, and what it would take to move students from one level to another. Of course, since this kind of rubric supplies desired responses, you would not distribute it before the test. You would, however, ensure that classroom instruction prepared your class to accomplish the highest level of the rubric. You could also show your students examples of the kind of sophistication expected in their work, perhaps by reviewing a different question and a sample set of answers.

Rubrics to make expectations transparent

The second type of rubric is a public document; teachers utilizing authentic assessments – projects, demonstrations, speeches, etc. – should give students rubrics along with the actual assignment. These rubrics often take the form of a table, with criteria on one axis and degrees of accomplishment on the other axis.

Consider, for example, the rubric for a performance task in which sixth-grade students create a 10-page punctuation handbook, with each page focusing on one punctuation mark. Each page must have a title, illustration, explanation of the punctuation mark’s function, and a grade-level appropriate example sentence using the punctuation mark.

Measuring Progress Toward Your Goals

Rubric for Grading “Punctuation Handbook”

	1 (Beginning)	2 (Developing)	3 (Accomplished)	4 (Exemplary)
Complete Pages	Three or more pages are missing one of the following (title, explanation, illustration, or example sentence).	1-2 pages are missing one of the following (title, explanation, illustration, or example sentence).	There are 10 complete pages (each page has a title, explanation, illustration, and example sentence).	There are more than 10 complete pages (each with a title, explanation, illustration and example sentence).
Correct Explanation of Punctuation Mark Function	Three or more explanations of the functions are explained incorrectly.	1-2 explanations of the functions are explained incorrectly.	All 10 explanations of the functions are explained correctly.	If more than 10 punctuation marks were included, all of their functions were explained correctly.
Sentence Quality of Example Sentences	The example sentences are simple sentences. (<i>The cat's tail is long.</i>)	The example sentences are simple sixth-grade sentences. (<i>The cat's long tail moved back and forth.</i>)	The examples are solid sixth-grade sentences. (<i>The cat's long tail quickly swished back and forth.</i>)	The examples are interesting and creative six-grade sentences. (<i>The cat's long tail quickly swished back and forth, a sure sign she was preparing to pounce on her dinner.</i>)
Overall Quality of Book	The book is messy and/or difficult to read.	The book is somewhat neat and easy to read.	The book is neat and easy to read.	The book is creative, colorful, neat, and easy to read.

Teachers find rubrics appealing both as scoring tools and student motivators. As scoring tools, rubrics save the teacher’s time by making it easier to process an otherwise unwieldy student project, paper or presentation. A rubric provides illustrations of various degrees of proficiency and gives the teacher clear, fair criteria for evaluating student work. Additionally, a well-developed rubric lays out clearly for the students what the expectations for a particular performance task will be. Students are more motivated to achieve if they fully understand the requirements for success and are able to evaluate their progress towards that success before the final product is due.

For more information on rubrics, refer to the **Instructional Planning & Delivery Toolkit** (pp. 19-21: “Rubrics”), which can be found online at the Resource Exchange on TFSANet. ✖ You can also consult with veteran teachers and use the resources in your region (e.g., the Student Achievement Toolkit, PDs) to view quality rubrics that you can use in your classroom.

II. Diagnostic Assessment

Once you develop summative assessments to help you plan where you’re going, diagnostic assessments can tell you where to begin so you know how far you’ll need to travel. Diagnostic assessments, which in general should be administered prior to the introduction of any new material, are most often conducted once at the beginning of the year and then again at the beginning of each unit. There are two general reasons to use diagnostic assessments.

(1) We need a baseline against which to compare future academic gains. If you set a goal for your students to improve at least 1.5 grade-levels in their reading abilities over the course of the year, you need to determine their starting grade-level. If you set a goal for your students to be able to measure distance, mass, and temperature in standard and metric units by the end of a six-week unit, you need to determine their measuring ability before the unit begins. Identifying where students currently perform allows you to compare that baseline data with the results from the end-of-unit or end-of-year assessment. Tools used for this purpose often need to be quantitative in nature so that comparisons can be made across spans of time.

(2) We must evaluate the strengths and weaknesses of our students so that we can shape our teaching accordingly. If your students lack the prerequisite knowledge necessary for achieving the units' or year's learning goals, your teaching will not be effective without filling in those gaps. Alternatively, your students may have already mastered sections of the curriculum that you expect to cover, and you should not spend time teaching what they already know. You need to reach all students by beginning instruction at their current academic level. Otherwise, you risk frustrating, discouraging, or boring them.

With these two aims in mind, administer diagnostic assessments to your students at the beginning of the year. You should also diagnose your students' knowledge and skills at the beginning of each unit so that you can more efficiently target their strengths and weaknesses and thus push their learning and thinking as far as possible.

Be Aware of Adopting Others' Assumptions About Your Students

In every case, your determination of a particular child's or group of children's needs should come from a legitimate diagnostic assessment, whether that takes the form of informal questioning or a commercially scored standardized test. Unfortunately, it is all too easy to accept impressions of a child's ability –whether positive or negative – that come to you from other sources. As a newcomer to your school community, you can communicate to students that they have a fresh opportunity to put their best feet forward, despite their past performance or supposed reputation.

The next section, "Designing Diagnostics," addresses the use of diagnostics to determine these strengths and weaknesses, as well as individual students' learning characteristics, styles, and preferences.

Designing Diagnostics

Diagnostic assessments come in many shapes and sizes. They can be as simple as a journal entry that asks students to answer a particular question that

would reveal their general knowledge of a given topic. By providing the prompt, "Why do the seasons change?" before a series of lessons on planetary rotation, you could uncover information about student readiness and misconceptions; for example, you'll see if students attribute seasons to some cyclical pattern of the weather, if they believe the earth's distance to the sun is a factor, or if they recognize that planetary axis affects where the sun's rays hit. Many diagnostics, however, will be necessarily more complicated than a single question. In this section we discuss the different types of questions used on diagnostic assessments, as well as how to design these questions so they reveal the necessary information.

Types of Diagnostic Questions

In general, there are two types of diagnostic questions. One set assess **"readiness"** – students' proficiency on the knowledge and skills prerequisite to learning grade-level material. A second set – **"pre-test" questions** - assesses student mastery of the grade-level learning goals you plan to teach, as well as student beliefs, interests, and prior exposure to this content.

Measuring Progress Toward Your Goals

Student readiness

How do you design a diagnostic to determine if your students are ready to take on grade-level content? Begin by studying the learning goals from your long-term plan. Think about the foundational knowledge and skills your students need in order to engage with the goals in your plans. What knowledge or understandings must come before your grade-level content? What should students have learned during the last two years in order to be prepared for your class? If you were teaching genetics, for instance, you could assess student understanding of fractions and proportions to determine their readiness for understanding Punnett squares. Similarly, before beginning a unit on analyzing poetry you would probably need to assess students' knowledge of metaphors, allusions, and other literary devices.

These underlying prerequisites are not explicitly included in your standards, so you should look at the standards, assessments, or textbooks from one or more grade-levels below your class. You may also look at some pre-existing diagnostics from your subject area as they can tell you what other assessment writers think students should know before entering your class. Once you identify these foundational skills, use them as the centerpiece of your diagnostic. This will allow you to target your instruction on the prerequisites your students need, a crucial component of effective teaching. Not only do foundational knowledge and skills prepare students for achievement in your class, they also set up students for future success, both in school and life.

At the beginning of the year, I was required to administer a series of diagnostic tests to my kindergarten students. At first I did not understand why I was testing such young students, nor did I understand what the results of the tests meant. Well, I did some detective work and soon came to find out that a large majority of my 18 kindergarten students were testing on a pre-K level or lower. They were already so far behind. That was my wake up call and what charged me to work with more urgency than ever to ensure that they would leave performing at or above grade level.

Mark Williams, New Jersey '00
Vice President, Country Relations - USA
Teach For All

Pre-test questions

Educational measurement expert Anthony Nitko recommends that teachers assess their students' attitudes towards, knowledge of, beliefs about, and experience with a topic in order to make good instructional choices. Teachers can add or subtract objectives from their curriculum based on these diagnostics, as well as incorporate student interests and attitudes into specific lessons.

Below are some different categories of "pre-test" questions you can use to gauge students' conceptual knowledge of your subject, as well as their more visceral responses to the material. Incorporating assessments that assess both categories can help the teacher shape instruction to serve students' needs.

- Gauge students' **academic experience** with the topic: "Have you ever studied genetics? When? What stands out?" You may learn that some students reconstructed the double helix for last year's science fair, and you can use their model for your lesson on Watson, Crick and Franklin.
- Test students' **knowledge of the technical terms** associated with the topic: "Describe each of these in your own words—DNA, chromosomes, Punnett Square." This type of question allows you to gauge how much vocabulary work your students will need before beginning the more substantive, conceptual learning.

- Determine students' **knowledge of an explanatory model**: "Explain how genes determine what we look like. Make a series of pictures if you wish." By examining the way a student conceives of a problem conceptually, you can begin to see which pieces of the puzzle you will need to fill in, if any. The earlier example about seasons may reveal misconceptions that you will then know to address.
- Distill students' **awareness of common knowledge** associated with the topic: "Imagine you are a doctor, and a couple asks you what you think their child would look like if they had a baby. What sorts of questions would you ask them?" Students may not know the technical or conceptual terms associated with a particular subject, but they may be familiar with the practical applications of your lesson. Tapping into that awareness will allow you to later frame your instruction with students' prior knowledge in mind.
- Assess students' **attitude** about a topic: "What do you like about studying science? What don't you like?" Every teacher wants to be prepared for their students' initial reactions so they will know how hard they will have to work to invest students in the subject.

Comprehensive diagnostics that assess students' prior mastery of a whole grade level's worth of knowledge and skills may be the most difficult to design. For an example of a fourth grade math diagnostic that one corps member created, see the **Instructional Planning & Delivery Toolkit** (p. 22: "Math Diagnostic"), which can be found online at the Resource Exchange on TFANet.✘ When creating your diagnostic, think carefully about the information you need to gather from students. At minimum, you should always administer a diagnostic that assesses student readiness at the beginning of the year. During the year you may also find it useful to create diagnostics with some "pre-test" questions, while continuing to diagnose students on prerequisite skills. Constantly reflect on what else you need to know about students in order to better reach their current levels and meet their needs.

Crafting Valid Questions

In the previous section, "Summative Assessment," we discussed in detail how to write effective assessment items that are both valid and reliable. You should use the same guidelines in creating your diagnostic. However, for your diagnostic to provide even greater detail about a student's academic readiness for specific skills, you should design your assessment to determine the particular aspects of the task your students have already mastered as well as the elements of the task with which they still struggle. To do this, you need to **scaffold** your questions to progress from more basic concepts to more complex. Scaffolding your questions (as discussed earlier in this chapter) increases the validity of your assessment and provides you with more nuanced information about your students' readiness to learn grade-level goals. Examine the sample kindergarten math assignment and math diagnostic that follows. Notice how they scaffold questions from various tiers on the hierarchy of skills.

Measuring Progress Toward Your Goals

Scaffolded Math Assessment- Kindergarten

Standard: Sort objects into groups by an attribute and begin to explain how the grouping was done.

Teacher Directions	Student Results	Student is able to...
Materials: 20-25 sort-able manipulatives, Three bowls/cups		
Show the student two identical manipulatives. Ask the student, "Are these the same, or are they different?"	Student says manipulatives are the SAME	match objects that are alike
Give the student six manipulatives, three each of two different shapes/colors. Provide two bowls/cups. Ask the student to put the things that are the same together.	Student groups two types of manipulatives	sort two colors/shapes of objects into two groups
Give the student nine manipulatives, three each of three different shapes/colors. Provide three bowls/cups. Ask the student to put the things that are the same color, shape, or size together.	Student groups three types of manipulatives	sort three colors/shapes of objects into three groups
Give the student a pile of manipulatives, in various shapes/colors. Provide three bowls/cups. Ask the student to make three groups of things that are the same, however they want.	Student groups three types of manipulatives independently	sort a mixed up quantity of objects into at least three groups of their own choice
Using the groups the student just created, ask, "What makes these the same- why are these together?"	Student tells how groups of manipulatives are alike with description (blues, reds, greens)	sort objects into groups by an attribute (shape, color, size) of their own choice, and tell the teacher some reason why the objects in each group are alike
Using the groups the student just created, ask, "How did you sort these?"	Student tells how groups of manipulatives are alike with category (color, size)	use the words "shape," "color," or "size" to identify how they sorted objects
Dump out the manipulatives that the student just sorted onto the table. Say, "Now mix up your objects and sort them in a different way."	Student re-groups three types of manipulatives, sorting by a different attribute.	sort a group of objects in at least two different ways upon prompting

By scaffolding questions these examples are able to pinpoint which objectives students have already mastered and precisely where their understanding of the learning goal breaks down. In doing so, the results can tell a teacher where exactly to begin instruction for a particular class. You should include scaffolding in any assessment where the results will be used to adjust subsequent instruction. As mentioned in the "Summative Assessment" section, this means that scaffolding should be used in diagnostic and formative assessments, but not typically in summative assessments (where results may not be used to re-teach content).

Sample Diagnostic

(a) 17	(b) 15	(c) 433	(d) 337	(e) 654	(f) 43	(g) 63	(h) 562	(i) 667
$\begin{array}{r} -12 \\ 5 \end{array}$	$\begin{array}{r} -13 \\ 2 \end{array}$	$\begin{array}{r} -132 \\ 301 \end{array}$	$\begin{array}{r} -226 \\ 111 \end{array}$	$\begin{array}{r} -423 \\ 231 \end{array}$	$\begin{array}{r} -25 \\ 12 \end{array}$	$\begin{array}{r} -57 \\ 14 \end{array}$	$\begin{array}{r} -453 \\ 111 \end{array}$	$\begin{array}{r} -374 \\ 313 \end{array}$

a. Analysis: Hierarchy of skills

Objectives	Score
(1) Subtract two two-digit numbers. [Items (a) and (b).]	2 out of 2
(2) Subtract two three-digit numbers when borrowing is not needed. [Items (c), (d), and (e).]	3 out of 3
(3) Subtract 2-digit numbers with borrowing from tens' place. [Items (f) and (g).]	0 out of 2
(4) Subtract 3-digit numbers requiring borrowing from either tens' or hundreds' place. [Items (h) and (i).]	0 out of 2

Evaluation and conclusion

By examining the results of the assessment, it is clear that the student has not mastered objectives 3 and 4. This information would lead the teacher to review the concept of borrowing. It will not be necessary to go over objectives 1 and 2.

In preparing to enter the classroom, many beginning teachers search for tools that they can use quickly and immediately. However, by adopting a pre-made diagnostic without thinking about whether it “fits” their students, new teachers fail to gather the information they need to effectively begin instruction. The process of selecting appropriate diagnostic questions varies dramatically depending on your grade level, content area, or school district. Different classes will require different types and levels of evidence to serve your different students.

Selecting Diagnostics

To help you find the right tool, use the Student Achievement Toolkit, textbooks, school and district requirements, and experienced teachers. You may find and use professionally prepared diagnostics, but don't fall into the trap of automatically using any tool without understanding its strengths and weaknesses. As you choose or design a diagnostic, it is essential that you critically evaluate the appropriateness of the tool for your class. To do so, consider the following: What information is my tool providing (or not providing) and why is it important? How will I use the results to drive my instruction? What supplements will I need to gather more detailed information about all of my students? The best diagnostic assessments will provide increasingly detailed information about the prior knowledge and skills of most, if not all, students. Reflect on your diagnostic tool to determine if it provides all the essential information. You may find you need to alter, add, or remove questions to match your unit or course goals. Or you may consider administering different diagnostics to students who are significantly beyond (or behind) the academic level of the majority of the class. Strategically choose those questions that provide the best information possible about your students' prior knowledge and skills. Only by tailoring the assessment to your particular circumstances will you be able to start instruction at the right point for all your students.

Measuring Progress Toward Your Goals

Assessing your students is the most important thing that you will do in the beginning of the year. You need a baseline of what skills they have and what skills you need to teach. Use your diagnostic to start your tracking RIGHT AWAY. This way you can see concretely what each student needs to succeed.

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Since a diagnostic generally tests skills that students may not have yet mastered, your students may feel understandably frustrated if they struggle with its questions. Emphasize the purpose of the diagnostic to your students in order to avoid making your students feel inadequate while taking the test.

While not necessarily comprehensive, a diagnostic can provide a snapshot of what students do and do not know, allowing teachers to schedule instruction accordingly. In Chapter Six, you will learn about the ways in which you can effectively group students by ability level or interest,

a technique enabled by diagnosis. Further, in Chapter Four and in the “Recording Results Effectively” section at the end of this course, you will see how some classrooms make charts or graphs of individual students’ current performance levels on particular skills, regularly updating these records based on incremental progress. This data-driven focus helps teachers stay accountable to the needs in their classroom, and it helps students recognize their own growth.

Throughout this course, you will hear much more about assessment as it is such an integral part of the learning process. But now that you know how to set the destination of student achievement (summative assessment) and determine starting points (diagnosis), you are ready to chart the path in between those two poles. As we discuss lesson planning in Chapter Five, keep an eye out for the third type of assessment: formative assessments used during lessons and units, which allow us to ensure that our entire team of climbers keeps up at all points along the journey.

Conclusion and Key Concepts

We began this chapter by noting that before we begin lesson planning, we must know where we are headed by creating assessments.

- In order to close the achievement gap for our students, we must assess our students’ academic progress. We need a baseline against which to compare future academic gains. We also must evaluate the strengths and weaknesses of our students so that we can shape our teaching accordingly. Most importantly, we must hold ourselves accountable to real, measurable academic gains by our students.
- Diagnostic assessment tools reveal what your students know coming into a lesson, unit, or course. Formative assessment tools monitor students’ understanding of the material during your lessons and throughout the course of a unit. Summative assessment tools measure students’ understanding of concepts that you have already taught, and occur at the end of a unit or the end of the year. Summative assessments can be tests and quizzes, performance tasks, portfolios or journals.
- When writing summative assessments as planning tools, be sure to determine the evidence you need to see from students to judge their mastery and which methods or assessment types are best for your content area and learning goals.

- Your summative assessments must be valid, reliable, and efficient in order to serve as valuable tools for determining whether you have met your instructional goals. This means testing exactly (and only) what you say you will to test; crafting questions that test multiple ideas at once, while not unintentionally revealing answers or allowing for unintended responses; grading and administering tests fairly and consistently; being conscious of potential biases; and considering the length of your test.
- When writing diagnostics, you should scaffold questions, starting from the most basic parts of a learning goal to the most complex, to gather detailed information about the extent of your students' understanding. Include questions that assess student readiness for grade-level content and pre-test items that reveal your students' prior mastery of, experience with, and interest towards a particular set of learning goals – information that is vital for creating your unit, long-term, and lesson plans. Think critically about what information you need and what your diagnostic will actually reveal, and adjust it accordingly.

You should now grasp that the true function of assessment is not only to provide an objective measure of student achievement but also to set high, targeted expectations for students based on standards, to identify concepts and skills in need of reinforcement, and to motivate students to perform at higher and higher levels. The periodic and quantitative measurement of student progress allows you to measure, pace, and motivate yourself and your students in the steady march from “point A” to “point B.”

Once you determine what your students already know through diagnostics, as well as how students are going to demonstrate their new knowledge and skills, you need to develop a pathway for moving them forward. That's what long-term, unit, and lesson planning are for.