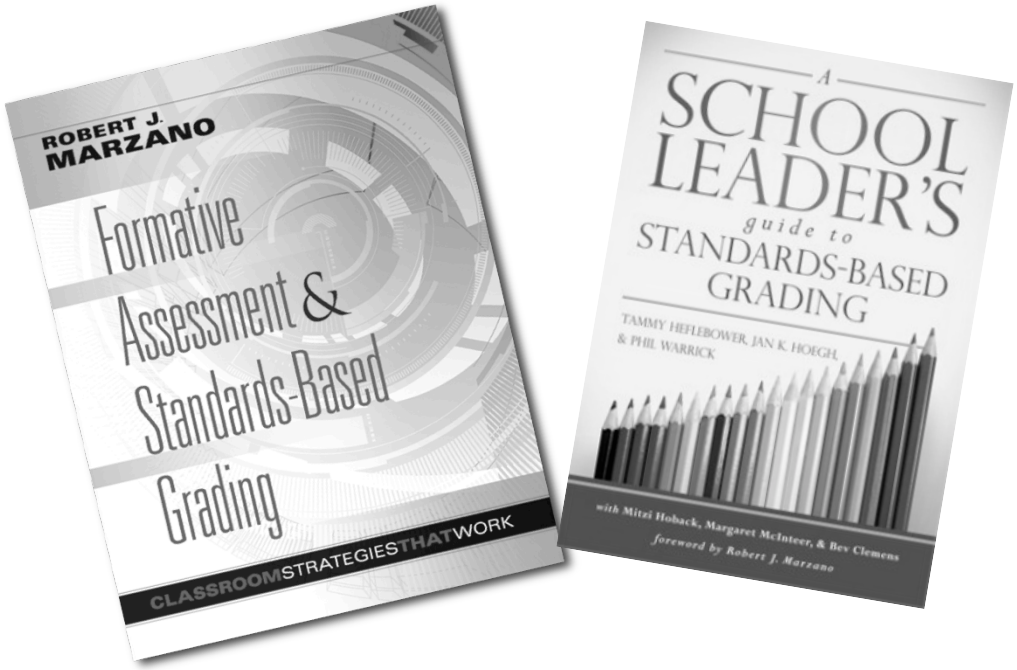
Formative Assessment
&
Standards-Based Grading



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MARZANO
Research Laboratory

Session Outcomes

•Discover research on feedback, assessment, and grading.
•Solidify and practice the process of determining essential learning goals.
•Know, understand, and practice the development of proficiency scales aligned to essential learning goals.
•Review and discuss the development of high quality assessments and understand how they align to proficiency scales.
•Learn how to align grading and reporting practices to essential learning goals and proficiency scales.

Three Critical Interventions (COMMITMENTS)

- **A system of individual clear learning goals connected to student feedback and evaluation at the classroom, school, and district levels.**
- Ensuring effective teaching in every classroom.
- Building background knowledge for all students.

Assessment Process

- First, prioritize essential learning goals from existing work or Common Core State Standards.
- Then, develop a proficiency scale for each essential learning goal.
- Next, create common assessments aligned to one or more proficiency scales.
- Finally, design and adopt a standards-based reporting system.
- Throughout the process, make sure there is horizontal and vertical alignment.

The Need for a New Scale

A. Items 1–10 Ten items that require recall of important but simpler content that was explicitly taught	Total for section =
B. Items 11–14 Four items that ask for application of complex content that was explicitly taught AND in situations similar to what was taught.	Total for section =
C. Item 15–16 Two items that ask for application in novel situations that go beyond what was explicitly taught	Total for section =
	Total: /100

Problems with the 100-point Scale

- Scoring range is major source of error.
- Teachers weigh sections differently, often without reliability between them.
- There is often little consideration as to how well assessment items match varied levels of difficulty.

Notes:

Learning Goals vs. Activities

Learning Goals

- Statements of what students will know or be able to do.
- A desired future state of competence in a subject area.

Activities or Assignments

- Tasks or learning progressions students are asked to do daily to move toward a learning goal.
- They are critical for getting to the end, but they are not the end.

Content knowledge can be organized into two broad categories
Declarative knowledge or Procedural knowledge

Declarative knowledge is informational in nature.
Procedural knowledge involves strategies, skills and processes.

The format for writing a declarative or procedural learning goal is:

Students will understand
_____
Students will be able
to_____

Why do we need to specify learning goals?

- So new teachers (or teachers new to a grade level) know what to teach.
- So we have clear understanding for all teachers of what is essential at each grade level / course.
- So we don't rely on programs and supplemental materials to tell us what to teach.
- So teachers don't simply pick what they like, and students end up with gaps in learning.
- So students have the opportunity to gain deeper, connected understandings of Essential Standards.
- So we stop talking "about" teachers at other grade levels and begin talking, planning, and teaching WITH them!

Notes:

What are the criteria for prioritizing essential learnings?

- ***Endurance*** (Will this provide knowledge and skills that will be of value beyond a single test date?)
- ***Leverage*** (Will this provide knowledge and skills that will be of value in multiple disciplines?)
- ***Readiness*** for next level of learning (Will this provide students with the "tools" they need for success at the next level or grade.)
- ***Teacher Judgment*** (Do you as the content expert believe this skill/knowledge is critical for all students to know or be able to do?)
- ***Assessment Connected*** (Will this skill/knowledge be assessed on an instrument used for instructional decision making?)

Reeves, D. Cited in Ainsworth, L. (2003). "Unwrapping" the Standards. Englewood, CO. Advanced Learning Press.

Identifying Priority Learning Goals

Learning Goal	Teacher Judgment	Endurance	Leverage	Readiness	Assessment Connected

Generic Proficiency Scale

4	In addition to exhibiting level 3 performance, in-depth inferences and applications that go beyond what was taught in class
3.5	*In addition to exhibiting level 3 performance, partial success at in-depth inferences and applications that go beyond what was taught in class*
3	No major errors or omissions regarding any of the information and/or processes (SIMPLE OR COMPLEX) that were explicitly taught
2.5	*No major errors or omissions regarding any of the simpler information and/or processes and partial knowledge of the more complex information and processes*
2	No major errors or omissions regarding the simpler details and processes BUT major errors or omissions regarding the more complex ideas and processes
1.5	*Partial knowledge of the simpler details and processes, but major errors or omissions regarding the more complex ideas and processes*
1	With help, a partial knowledge of some of the simpler and complex details and processes
0.5	*With help, a partial knowledge of some of the simpler details and processes but not of the more complex ideas and processes*
0	Even with help, no understanding or skill demonstrated

- Website
  http://www.marzanoresearch.com
- FREE resources
  - Proficiency scale bank
  - Scales for CCSS

Notes:

READING			
Questioning, Inference, and Interpretation			
Grades 9–10			
Score 4.0	**In addition to score 3.0 performance, the student demonstrates in-depth inferences and applications that go beyond what was taught.**		
	Score 3.5	*In addition to score 3.0 performance, partial success at score 4.0 content*	
Score 3.0	**The student will:** • cite textual evidence to support analysis of what a grade-appropriate text says explicitly, as well as inferences drawn from the text (RL.9–10.1; RI.9–10.1)		**Sample Activities: After reading a passage from *The Narrative of the Life of Frederick Douglass*, identify pieces of evidence to support the author's argument against slavery. Cite specific examples from Douglass's life to show why he would be against the practice of slavery.**
	Score 2.5	*No major errors or omissions regarding score 2.0 content, and partial success at score 3.0 content*	
Score 2.0	**The student will recognize or recall specific vocabulary, such as:** • analysis, cite, explicit, inference, logical, support, text, textual evidence **The student will perform basic processes, such as:** • describe what a grade-appropriate text says explicitly and draw logical inferences		**Sample Activities: Given a highlighted passage from *The Narrative of the Life of Frederick Douglass*, students will choose which statements best support the author's argument that he is against slavery.**
	Score 1.5	*Partial success at score 2.0 content, and major errors or omissions regarding score 3.0 content*	
Score 1.0	**With help, partial success at score 2.0 content and score 3.0 content**		
	Score 0.5	*With help, partial success at score 2.0 content but not at score 3.0 content*	
Score 0.0	**Even with help, no success**		

Strand: Properties and Principals of Force and Motion			
Topic: Forces are classified as either contact forces or non-contact forces that can be described in terms of direction and magnitude			
Grade: 7			
Score 4.0	**In addition to Score 3.0, in-depth inferences and applications that go beyond what was taught.**		**Sample Tasks** • Design a web showing contact vs. non-contact forces with differentiated areas for direction, magnitude, rest , and motion
	3.5	In addition to score 3.0 performance, in-depth inferences and applications with partial success.	
Score 3.0	**The student:** • identifies and describes the types of forces acting upon an object in motion and at rest and measures the forces being used **The student exhibits no major errors or omissions.**		• Groups of students will design and act out objects at rest and in motion based on various forces. "Audience" (individual students) will classify those motions/forces as to type • Design motions that use spring scales to measure force and make those measurements
	2.5	No major errors or omissions regarding 2.0 content and partial knowledge of the 3.0 content	
Score 2.0	**There are no major errors or omissions regarding the simpler details and processes as the student:** • recognizes or recalls specific terminology such as: o newton, force, spring scale • measures the amount of newtons of force acting upon an object • recognizes and recalls accurate statements about the types of forces **However, the student exhibits major errors or omissions regarding the more complex ideas and processes.**		• Identify what is motion and what is rest based on the above demonstrations • Use spring scales to measure the newtons involved in specified motions • identify or produce definitions to given terms
	1.5	Partial knowledge of the 2.0 content but major errors or omissions regarding the 3.0 content	
Score 1.0	**With help, a partial understanding of some of the simpler details and processes and some of the more complex ideas and processes.**		
	0.5	With help, a partial understanding of the 2.0 content but not the 3.0 content	
Score 0.0	**Even with help, no understanding or skill demonstrated.**		

Common Core State Standards for Mathematics		
Domain: Expressing Geometric Properties with Equations		
Using Coordinates (use coordinates to prove simple geometric theorems algebraically) (G-GPE)		
High School		
Score 4.0	**In addition to Score 3.0, in-depth inferences and applications that go beyond instruction to the standard. The student will:**	**Example Activities**
	3.5 In addition to score 3.0 performance, in-depth inferences and applications with partial success.	
Score 3.0	**The student will:** • use the slope criteria of parallel and perpendicular lines to solve geometric problems (G-GPE.5) • find the point on a directed line segment between two given points that partitions the segment in a given ratio (G-GPE.6) • use coordinates to compute perimeters of polygons and areas of triangles and rectangles (G-GPE.7) **The student exhibits no major errors or omissions.**	Perimeters of Polygons – Students will be given multiple different polygons placed on the Cartesian Plane. The students will be required to work individually using the distance formula to determine the length of each side and ultimately the perimeter of each polygon. The teacher will circulate the room as the students work providing immediate and specific feedback to students. A student will get an accuracy check before moving to the next polygon.
	2.5 No major errors or omissions regarding 2.0 content and partial knowledge of the 3.0 content	

Score 2.0	**There are no major errors or omissions regarding the simpler details and processes as the student will:**
	• recognize or recall specific vocabulary, such as:
	  ○
	• perform basic processes, such as:
	  ○ use coordinates to prove simple geometric theorems algebraically (G-GPE.4)
	  ○ prove the slope criteria for parallel and perpendicular lines (G-GPE.5)
	
	However, the student exhibits major errors or omissions regarding the more complex ideas and processes.
		Simultaneous Response Method – Students will use a simultaneous response system (e.g., white boards, clickers, socrative) as the teacher displays two lines. The students will calculate the slope of each line to determine if the lines are parallel, perpendicular or neither. The teacher will provide immediate specific feedback to the students as they respond.

	1.5 Partial knowledge of the 2.0 content but major errors or omissions regarding the 3.0 content	
Score 1.0	**With help, a partial understanding of some of the simpler details and processes and some of the more complex ideas and processes.**	
	0.5 With help, a partial understanding of the 2.0 content but not the 3.0 content	
Score 0.0	**Even with help, no understanding or skill demonstrated.**	

Strand: Physical Education			
Topic: Principles of Exercise			
Course: PE II, Sophomore			
Score 4.0	**In addition to Score 3.0, in-depth inferences and applications that go beyond what was taught.**		**Sample Tasks** • Participates in athletics, maintains journal/written evidence from outside source (parents/instructor/trainer/gym manager)
	3.5	In addition to score 3.0 performance, in-depth inferences and applications with partial success.	
Score 3.0	**The student:** • describes and applies principles of exercise *(e.g., principles of overload, progression, and specificity)* **The student exhibits no major errors or omissions.**		• Students describe principles of exercise (e.g., principles of overload, progression, and specificity).
	2.5	No major errors or omissions regarding 2.0 content and partial knowledge of the 3.0 content	
Score 2.0	**There are no major errors or omissions regarding the simpler details and processes as the student:** • recognizes or recalls specific terminology such as: o frequency, intensity, time *(FIT)* • performs basic processes, such as: o recognizing or recalling principles of exercise **However, the student exhibits major errors or omissions regarding the more complex ideas and processes.**		• Given a list, matches the principle of exercise with the correct description. • Given true/false statements, students identify the correct answer.
	1.5	Partial knowledge of the 2.0 content but major errors or omissions regarding the 3.0 content	
Score 1.0	**With help, a partial understanding of some of the simpler details and processes and some of the more complex ideas and processes.**		
	0.5	With help, a partial understanding of the 2.0 content but not the 3.0 content	
Score 0.0	**Even with help, no understanding or skill demonstrated.**		

Topic: Craftsmanship/Technical skills			
Grade: 9-12			
Score 4.0	**In addition to Score 3.0, in-depth inferences and applications that go beyond what was taught.**		**Sample Tasks**
	3.5	In addition to score 3.0 performance, in-depth inferences and applications with partial success.	
Score 3.0	**The student:** • demonstrates refined *(e.g., attention to detail, sequential process/ development, polished, etc.)* craftsmanship and technical skills in a portfolio/collection of original two/three-dimensional works of art *(e.g., traditional/digital portfolio)* • consistently uses thumbnail sketches & rough drafts to show evidence of improvements **The student exhibits no major errors or omissions.**		
	2.5	No major errors or omissions regarding 2.0 content and partial knowledge of the 3.0 content	
Score 2.0	**There are no major errors or omissions regarding the simpler details and processes as the student:** • recognizes or recalls specific terminology such as: o craftsmanship, quality 'press quality', awareness of industry standards, finish fired, attention to detail • performs basic processes, such as: o demonstrating works of art with appropriate craftsmanship **However, the student exhibits major errors or omissions regarding the more complex ideas and processes.**		
	1.5	Partial knowledge of the 2.0 content but major errors or omissions regarding the 3.0 content	
Score 1.0	**With help, a partial understanding of some of the simpler details and processes and some of the more complex ideas and processes.**		
	0.5	With help, a partial understanding of the 2.0 content but not the 3.0 content	
Score 0.0	**Even with**		

Strand: Technological		
Topic: Animation		
Standard/Big Idea : Flash Animation		
Grade: 9-12		
Score 4.0	**In addition to Score 3.0, in-depth inferences and applications that go beyond what was taught.**	
	Score 3.5	In addition to Score 3.0 performance, in-depth inferences and applications with partial success.
Score 3.0	**While involved in tasks related to job benefits the student:** • produces an animation from a working storyboard that conveys an idea. (e.g. *animation interpreted from a children's book)* **The student exhibits no major errors or omissions.**	
	Score 2.5	No major errors or omissions regarding the simpler details and process and partial knowledge of the more complex ideas and processes.
Score 2.0	**There are no major errors or omissions regarding the simpler details and processes as the student:** • recognizes or recalls specific terminology such as: o storyboarding, tweening, keyframe, objects (graphic, button, movie clip) • performs basic processes such as: o adding motion and effects to objects **However, the student exhibits major errors or omissions regarding the more complex ideas and processes.**	
	Score 1.5	Partial knowledge of the simpler details and processes but major errors or omissions regarding the more complex ideas and procedures.
Score 1.0	**With help, a partial understanding of some of the simpler details and processes and some of the more complex ideas and processes.**	
	Score 0.5	With help, a partial understanding of some of the simpler details and processes but not the more complex ideas and processes.
Score 0.0	**Even with help, no understanding or skill demonstrated.**	

Strand: Properties & Principles or Matter & Energy			
Topic: Forms of energy have a source, a means of transfer (work & heat), & a receiver			
Grade: 8			
Score 4.0	**In addition to Score 3.0, in-depth inferences and applications that go beyond what was taught.**		**Sample Tasks** • Based on the experiments done in class, what can you predict about chemical energy stored in other chemical compounds that have not been tested in class? Write a paragraph explaining your predictions.
	3.5	In addition to score 3.0 performance, in-depth inferences and applications with partial success.	
Score 3.0	**The student:** • describes how chemical energy is stored in chemical compounds **The student exhibits no major errors or omissions.**		• Investigate how chemical energy is stored in chemical compounds (i.e. food molecules (Cheetos, Fritos), nitrogen explosives (gun cotton), fireworks (grind cracker), batteries (simple circuit), Combustion of a Hydrocarbon (Acetone Demo, Whosh Bottle Demo) and describe the results.
	2.5	No major errors or omissions regarding 2.0 content and partial knowledge of the 3.0 content	

Score 2.0	**There are no major errors or omissions regarding the simpler details and processes as the student:**
	• recognizes or recalls specific terminology such as:
	  ○ chemical energy
	  ○ hydrocarbon (H + O)
	  ○ combustion reactions produce $CO_2 + H_2O$ + energy
	• recognizes or recalls accurate statements about the storage of chemical energy in chemical compounds
	However, the student exhibits major errors or omissions regarding the more complex ideas and processes.
			• Matches term with its definition.
			• Answer forced choice or fill in the blank type questions about the storage of chemical energy in compounds

	1.5	Partial knowledge of the 2.0 content but major errors or omissions regarding the 3.0 content	
Score 1.0	**With help, a partial understanding of some of the simpler details and processes and some of the more complex ideas and processes.**		
	0.5	With help, a partial understanding of the 2.0 content but not the 3.0 content	
Score 0.0	**Even with help, no understanding or skill demonstrated.**		

Strand: History Measurement Topic: WWII (Emergence of U.S.)		Content Area: Social Studies Level: 11th Grade
4.0	*3.0 knowledge and inferences or applications beyond what was taught* • Student is able to meet all expectations for Level 3, plus is able to connect a current example to the continued evolution of the global role of the United States.	*4.0 ASSESSMENT ITEMS: As a result of understanding or being skilled at the knowledge identified in 3.0 the student is able to:* • Connecting to a relevant Current Event: locate a current event or issue which relates to the role of the U.S. in the world today.
3.0	*No major errors or gaps in the following TARGETED, COMPLEX ideas and processes* • Students will understand how the U.S. moved from isolationism to global superpower during, and a result of, its role in WWII.	*3.0 ASSESSMENT ITEMS: As a result of understanding the ideas and/or being skilled at the processes identified in 3.0 the student is able to:* • Writing Prompt: How did the United States move from neutrality to superpower as a result of it's involvement in WWII? Use specific vocabulary and events to define this journey." • Timeline: Choose five specific events which illustrate the move of the U.S. from neutrality to superpower, put in chronological order, and explain the significance of each event.
2.0	*No major errors or gaps in the following FOUNDATIONAL, SIMPLE details and processes* • Students are able to identify vocabulary, concepts, people, and events related to the role of the U.S. in WWII and in the post-war world. • Can identify and/or explain isolationism, neutrality, cash and carry, lend lease, Allies, D-Day, island hopping, total war, atomic bombs (Hiroshima and Nagasaki), Yalta and Potsdam Conferences, superpowers, United Nations, Marshall Plan, Occupation of Japan	*2.0 ASSESSMENT ITEMS: As a result of knowing the details and/or being skilled at the processes identified in 2.0 the student is able to:* • Moodle Quiz over Foundational Knowledge
1.0	*With help..has the 2.0 content*	

Learning Goal Unpacking Template	
Essential Learning Goal	Skills and Knowledge
Tell and write time from analog and digital clocks to the nearest five minutes, using a.m. and p.m.	

Scale Worksheet

Score 4.0 – more complex Demonstrations of learning that go above and beyond what was explicitly taught The student will:
Score 3.0 – the learning goal or expectation The student will:
Score 2.0 – the simpler stuff Foundational knowledge, simpler procedures, isolated details, vocabulary The student will:
Score 1.0 With help, the student can perform Score 2.0 and 3.0 expectations
Score 0.0 Even with help, the student cannot perform expectations

Proficiency Scales and Assessment Alignment

Atmospheric Processes and Water Cycle	
4	Infer relationships regarding atmospheric processes and the water cycle.
3	An explanation of: • How the water cycle processes impact climate changes • The effects of temperature and pressure in different layers of Earth's atmosphere
2	• Recognize and recall basic terms such as: climatic patterns, atmospheric layers, stratosphere, troposphere. • Recognize or recall isolated details such as: • Precipitation is one of the processes of the water cycle. • The troposphere is one of the lowest portions of the Earth's atmosphere.

Three types of assessment items to measure the knowledge and skills defined

- **Level 2 items:** Simpler details and processes that have been explicitly taught
- **Level 3 items:** Complex ideas and processes that have been explicitly taught
- **Level 4 items:** Inferences and applications that go beyond what was taught

Level 3.0 Items

Measuring Atmospheric Processes and Water Cycle

- **Explain** how evaporation affects the climatic pattern in areas around large bodies of water, such as the shoreline communities of Lake Michigan.
- A weather balloon travels up into the stratosphere. **Explain** what would happen to it as it progressed through the various layers of the atmosphere.

Level 2.0 Items

Measuring Atmospheric Processes and Water Cycle

- Define the following terms.
  - Climatic pattern
  - Atmospheric layers
  - Stratosphere
- Identify the true statements with the letter T.

_____ The atmosphere is between the troposphere and the stratosphere.

_____ The Earth's atmosphere helps protect life on Earth by absorbing ultraviolet radiation.

_____ The temperature of the Earth's atmosphere varies with altitude.

Level 4.0 Items

Measuring Atmospheric Processes and Water Cycle

Complete the following analogy.

Condensation is to evaporation as _____ is to _____.

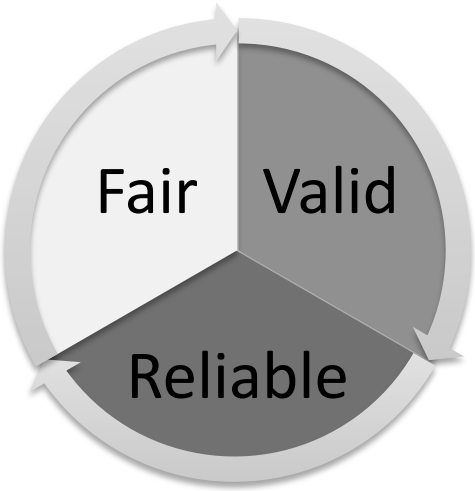
Why is this analogy accurate?

_____

_____

_____

Assessment Quality



Types of Bias

- Offensive content
- Stereotyping
- Unfair representation
- Use of situations that may be unfamiliar to subgroups
- Poorly written items
- Literacy bias (using too sophisticated of language for the nature of the content)—David Meisner.

1. What is the probability of throwing four dice and getting four 6's?
   A. 4/6
   B. 1/36
   C. 4/36
   D. 1/1,296

2. Graph the following salaries of employees of the Acme Chemical Company:

Roger Smith, CEO	$250,000
Mary Kelly, Secretary	$ 17,500
Dr. Frank Hatfield, Chemist	$ 98,000
Francisco Juarez, Custodian	$ 24,000

3. Last year 200 women and children in our community were served by the Safe Haven shelter. Due to the rise of domestic abuse, the shelter is experiencing a 30% increase in residents. Current food costs are listed below. Project the anticipated funds needed for food for the remainder of the year.

4. Maria Yellowhawk needs to purchase beads for necklaces she is making. She has 3 dozen packages of beads, each containing twelve beads. If each necklace requires 120 beads, how many necklaces can she make?

5. Write a short essay of at least 500 words on the topic *Soccer in the United States*. Be sure to engage in pre-writing activities, draft an initial response, and revise your draft. You have 60 minutes to complete this task.

Writing Quality Assessment Items

Selected Response Items

- True/False
- Matching
- Multiple Choice

True/False

- Related to a single idea
- Absolutely true
- Avoid using qualifiers, opinions, and negatives
- Use sparingly, as students have a 50-50 chance of guessing the correct answer

Matching

- Homogeneous in content
- Matching set no more than 7
- Uneven number of items to be matched OR items may be used more than once
- Ordered logically (such as alphabetically)
- Longer reading on the left, matching items on the right

Multiple-choice

- Begin with question-starter (who, what, where, how, why)
- A single task is articulated in the question
- All response options are plausible
- Written in present tense, if possible
- Avoid negatives (e.g. which is NOT)
- May include context: more complex questions

Constructed Response Items

- Fill-in-the-blank
- Short Answer
- Essay Items

Fill-in-the-blank

- Position the blank at the end of the sentence as often as possible
- Limit the number of blanks in an item
- Blanks should be same length
- Be sure information prior to/surrounding the blank is adequate
- May use a word bank

Short Answer and Essay Items

- Make the nature of the response desired clear to the reader
- Develop and communicate a scoring criteria for the question
- Provide adequate space for responses.

Notes:

Assessment Review Checklist

Review Criteria	Yes or No	Item Numbers needing revision	Comments
Assessment is aligned to one or more proficiency scales.			
Assessment contains sufficient items at the 2.0, 3.0 and 4.0 proficiency levels.			
Assessment is free from bias			
Assessment is written at the developmentally appropriate level and correct readability level			
Assessment items follow guidelines and are clearly written. (see handout)			
The Answer Key is accurate and matches the assessment			
EVERY item has an answer. “Answers may vary” is not acceptable.			
A rubric or checklist is provided if needed			
Directions are clear and concise			
The “Materials Needed” list is accurate and complete.			

Process for Backmapping an Existing Assessment

1. Teachers identify the proficiency scale or scales that need to be measured by the existing assessment.
2. Teachers examine each assessment item to determine the level of the proficiency scale that it corresponds with and label it appropriately.
3. Teachers identify assessment items that do not correspond to any levels of the proficiency scale and remove them.
4. Teachers add items for levels of the proficiency scale not represented by items already on the assessment.

Meaningful Grades

"Using proficiency scales and a variety of assessments based on prioritized standards, teachers can assign grades that are valid and consistent."

A School Leader's Guide to Standards-Based Grading, 2014

Determining Grades

1. Examine the student's performance on assignments and assessments.
2. Give more weight to recent information (that is, information from later in the unit).
3. If necessary, discuss the content with the student to shed light on his or her learning progress.
4. Limit the use of zeros.

Other considerations:

Notes