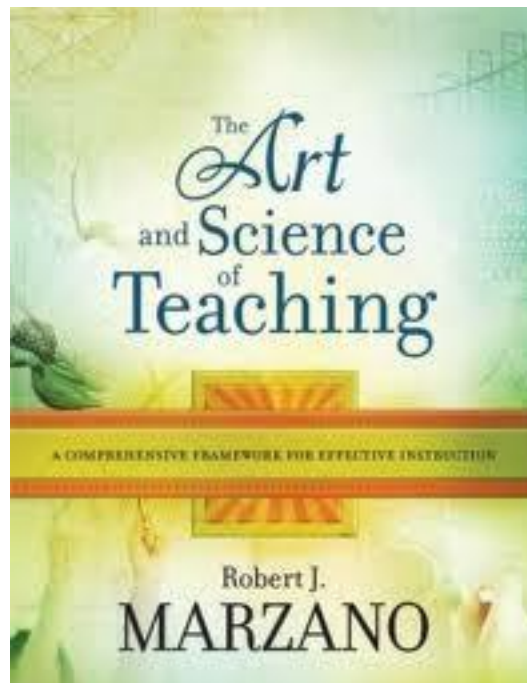


MARZANO RESEARCH
LABORATORY

presents...

*The Art and Science of
Teaching*



*Dr. Tammy Heflebower
Vice President*



OUTCOMES FOR TODAY:

- Experience instructional strategies connected to learning new content, and practice them to deepen understanding.
- Discover the importance of applying knowledge by generating and testing hypotheses.
- Learn important teacher behaviors for engagement and for building teacher-student relationships.
- Incorporate literacy strategies across the curriculum.

“The illiterate of the 21st century will not be those who cannot read and write, but those who cannot learn, unlearn, and relearn.”

--Alvin Toffler

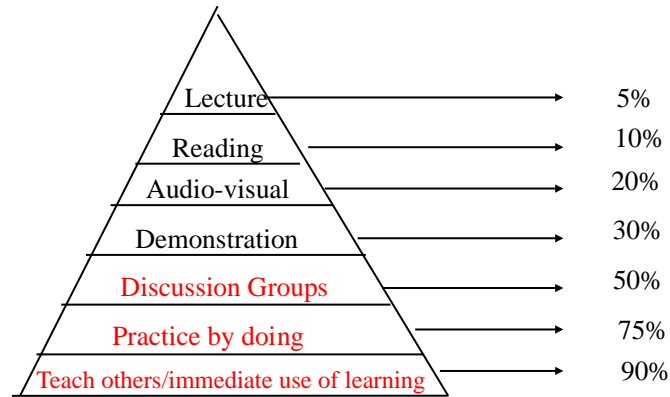


Three Critical Interventions (COMMITMENTS):

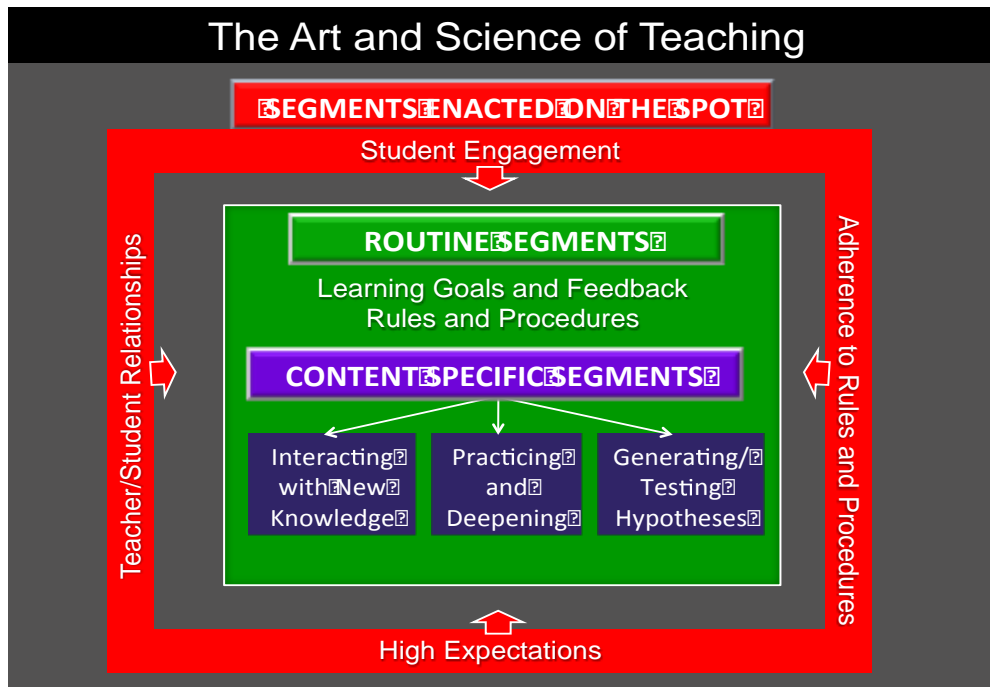
- A system of individual clear learning goals connected to student feedback and evaluation at the classroom, school, and district levels
- **Ensuring effective teaching in every classroom**
- Building background knowledge for all students

Boosting Retention

Average Retention Rate
after 24 hours



Adapted from David Sousa's figure 3.8
in his text, How the Brain Learns



Instructional Design Questions, *The Art & Science of Teaching*

I. Lesson Segments Involving Routine Events	
Design Question 1	What will I do to establish and communicate learning goals, track student progress, and celebrate success?
Design Question 6	What will I do to establish or maintain classroom rules and procedures?
II. Lesson Segments Addressing Content	
Design Question 2	What will I do to help students effectively interact with new knowledge?
Design Question 3	What will I do to help students practice and deepen their understanding of new knowledge?
Design Question 4	What will I do to help students generate and test hypotheses about new knowledge?
III. Lesson Segments Enacted on the Spot	
Design Question 5	What will I do to engage students?
Design Question 7	What will I do to recognize and acknowledge adherence and lack of adherence to classroom rules and procedures?
Design Question 8	What will I do to establish and maintain effective relationships with students?
Design Question 9	What will I do to communicate high expectations for all students?

Design Question 10: What will I do to develop effective lessons organized into a cohesive unit?

Assess students using a formative approach

Have students chart their progress on each learning goal

Recognize and celebrate growth

Present information in small chunks and ask for descriptions, discussion, and prediction

Ask questions that require students to elaborate on information

Have students write out their conclusions or represent their learning non-linguistically

Have students reflect on their learning

<p align="center">Design Question 3: <i>Practicing and Deepening Understanding of New Knowledge</i> (Pages 58-85)</p>	<p align="center">Design Question 4: <i>Generating and Testing Hypotheses about New Knowledge</i> (Pages 86-97)</p>
<p><i>Provide students with tasks that require them to examine similarities and differences</i></p> <p><i>Help students identify errors in thinking</i></p> <p><i>Provide opportunities for students to practice skills, strategies, and processes</i></p>	<p><i>Teach students about effective support</i></p> <p><i>Engage students in experimental inquiry tasks that require them to generate and test hypotheses</i></p> <p><i>Engage students in problem-solving tasks that require them to generate and test hypotheses</i></p>

Determine the extent to which cooperative groups will be used

Assign purposeful homework that involves appropriate participation from the home

Have students systematically revise and make corrections in their academic notebooks

Engage students in decision-making tasks that require them to generate and test hypotheses

Engage students in investigation tasks that require them to generate and test hypotheses

Have students design their own tasks

Consider the extent to which cooperative learning structures will be used

Use appropriate pacing

Demonstrate intensity and enthusiasm for content

Engage students in friendly controversy

Provide opportunities for students to talk about themselves

Provide unusual information

Use classroom meetings

Use direct-cost consequences

Use group contingency

Use home contingency

Have a strategy for high-intensity situations

Design an overall plan for disciplinary problems

Use humor when appropriate

Consistently enforce positive and negative consequences

Project a sense of emotional objectivity

Maintain a cool exterior

When low-expectancy students do not answer a question correctly or completely, stay with them

Develop a flexible draft of daily activities for a unit

Review the critical aspects of effective teaching daily

Resource:

Marzano, Robert J. *The art and science of teaching: a comprehensive framework for effective instruction*. Alexandria, Va.: Association for Supervision and Curriculum Development, 2007

Aligning Essential Content With Instruction and Assessment

	Knowledge and Skills	Classroom Instructional Activities	Assessments
4	Typical knowledge and skills in addition to Score 3.0		
3	Knowledge and skills expected for proficiency		
2	Knowledge and skills just below proficiency <ul style="list-style-type: none"> • Recognizes or recalls specific terminology • Performs basic processes 		

Strand:			
Topic:			
Grade:			
Score 4.0	In addition to Score 3.0, in-depth inferences and applications that go beyond what was taught.		Sample Activities
	3.5	In addition to score 3.0 performance, in-depth inferences and applications with partial success.	
Score 3.0	The student: <ul style="list-style-type: none"> • 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: <ul style="list-style-type: none"> • recognizes or recalls specific terminology, such as: <ul style="list-style-type: none"> ○ • performs basic processes, such as: <ul style="list-style-type: none"> ○ 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 help, no understanding or skill demonstrated.		

SAMPLE SCALES—Please see:

http://www.marzanoresearch.com/Free_Resources/itembank.aspx

Strand: Algebra	
Topic: Algebraic Representation	
Level: 10	
Score 4.0	<p>In addition to Score 3.0, in-depth inferences and applications that go beyond what was taught such as:</p> <ul style="list-style-type: none"> • analyzing unit circle for errors • analyzing conics for error
Score 3.5	In addition to Score 3.0 performance, in-depth inferences and applications with partial success.
Score 3.0	<p>While engaged in tasks regarding algebraic representation, the student:</p> <ul style="list-style-type: none"> • identifies, solves, and graphs conics • labels all parts of the unit circle <p>The student exhibits no major errors or omissions.</p>
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	<p>There are no major errors or omissions regarding the simpler details and processes as the student:</p> <ul style="list-style-type: none"> • recognizes or recalls specific terminology such as: <ul style="list-style-type: none"> ○ conics ○ focus ○ directrix (this is the correct spelling) ○ parabola • performs basic processes such as: <ul style="list-style-type: none"> ○ recognizing or recalling examples of functional representations in tables, equations and graphs ○ recognizing or recalling examples of conics ○ recognizing or recalling a unit circle and its basic parts <p>However, the student exhibits major errors or omissions regarding the more complex ideas and processes.</p>
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.

Topic: Critical Stance		
Strand: Reading		
Standard 3: LITERARY RESPONSE AND ANALYSIS: Respond to literary texts from a range of stances: personal, interpretive, critical.		
Grade 12		
Level 4.0	<p>In addition to Level 3.0, in-depth inferences and applications that go beyond what was taught such as:</p> <ul style="list-style-type: none"> • critiques author’s construction or use of literary devices or provide a suitable alternative structure or device 	
	Level 3.5	In addition to Level 3.0 performance, in-depth inferences and applications with partial success.
Level 3.0	<p>When engaged in tasks involving critical stance the student will:</p> <ul style="list-style-type: none"> • (12.3.1) evaluate how an author’s purpose and message are supported by his/her construction of text and use of literary devices (<i>e.g., use literary terminology in writing and discussions to support an opinion about the effectiveness of a text’s structure and language. i.e., the use of the ghost in the delineation of Hamlet’s character and inaction</i>) • (12.3.2) identify the social or political assumptions in a literary text (<i>e.g., read a text (Jane Eyre) and discuss or write about the social or political assumptions in the novel (the limited opportunities for women in society, especially those who are educated but without means)</i>) <p>The student exhibits no major errors or omissions.</p>	
	Level 2.5	No major errors or omissions regarding the simpler details and process and partial knowledge of the more complex ideas and processes.
Level 2.0	<p>There are no major errors or omissions regarding the simpler details and processes as the student:</p> <ul style="list-style-type: none"> • recognizes or recalls specific terminology such as: <ul style="list-style-type: none"> ○ social ○ political ○ culture ○ opinion ○ purpose ○ tragic flaws ○ foil ○ characterization ○ chronological ○ spatial • performs basic processes such as: <ul style="list-style-type: none"> ○ recognizing or recalling the author’s purpose and message ○ recognizing or recalling the social or political assumptions in a literary text <p>However, the student exhibits major errors or omissions regarding the more complex ideas and processes.</p>	
	Level 1.5	Partial knowledge of the simpler details and processes but major errors or omissions regarding the more complex ideas and procedures.
Level 1.0	<p>With help, a partial understanding of some of the simpler details and processes and some of the more complex ideas and processes.</p>	
	Level 0.5	With help, a partial understanding of some of the simpler details and processes but not the more complex ideas and processes.

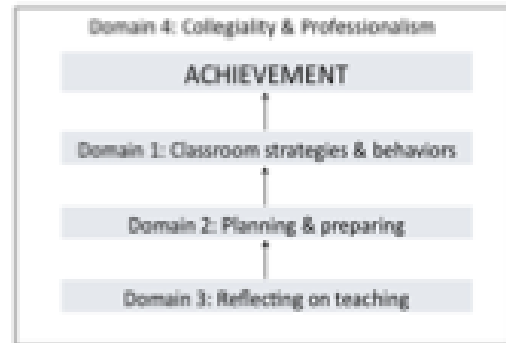
What must a district or school do to develop teacher expertise?

❑ *Develop a common language of teaching*

A way of talking about teaching; not a list of "effective things" that everyone has to do.

- ❑ Provide opportunities for focused feedback and practice
- ❑ Provide opportunities for observing and discussing effective teaching
- ❑ Require individual teacher growth and development plans on a yearly basis.

Four Domains for a Common Language of Teaching



"...we propose that our four domains not only represent a viable way to organize the research and theory on teaching, but they also disclose some important casual linkages."

"Collegiality and Professionalism represents the professional culture in which the other domains operate."

"When this domain (Collegiality and Professionalism) is functioning well, all educators in a district or building consider themselves part of a team with a collective responsibility for the well being and achievement of all students."

"If a district or school has high levels of collegiality and professionalism, Domains 1, 2, and 3 are enhanced."

What must a district or school do? ?

- Develop a common language of teaching
- Provide opportunities for focused feedback on practice
- Provide opportunities for observing and discussing effective teaching
- Require individual teacher growth and development plans on a yearly basis

Opportunities to Observe and Discuss Effective Teaching

- Instructional rounds
- Expert coaches
- Expert videos
- Teacher-led PD
- Virtual communities



"In our model, rounds are one of the primary ways for teachers to observe and discuss effective teaching."



- Teams of teachers (3-5 on the team) led by a lead teacher
- Can be long or short in duration
- Primary focus is for observers to compare and contrast their practice with observed practice
- May or may not be used to provide feedback to observed teachers

- School or district's observational protocols used for recording
- Observers record perceptions during and/or immediately after leaving the observed teacher's classroom

- Debriefing comments should not be shared
- Suggestions should not be made to observed teachers unless requested
- Nothing observed within a lesson should be shared with anyone not a part of the round
- Observed teachers should be thanked and acknowledged for opening their classrooms

- Ideally every teacher should have a chance to participate in instructional rounds at least once per semester
- Teachers who are observed are typically volunteers, drawn from the pool of master teachers in a building

Marzano Observation Protocol Short Form

I.	I. Lesson Segments Involving Routine Events						
A.	Design Question #1: What will I do to establish and communicate learning goals, track student progress, and celebrate success?						
1. Providing clear learning goals and scales to measure those goals (e.g. the teacher provides or reminds students about a specific learning goal)	Notes						
	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 20%;"></td> <td style="width: 10%; text-align: center;">I</td> <td style="width: 10%; text-align: center;">A</td> <td style="width: 10%; text-align: center;">D</td> <td style="width: 10%; text-align: center;">B</td> <td style="width: 10%; text-align: center;">NU</td> </tr> </table>		I	A	D	B	NU
	I	A	D	B	NU		
2. Tracking student progress (e.g. using formative assessment the teacher helps students chart their individual and group progress on a learning goal)	Notes						
	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 20%;"></td> <td style="width: 10%; text-align: center;">I</td> <td style="width: 10%; text-align: center;">A</td> <td style="width: 10%; text-align: center;">D</td> <td style="width: 10%; text-align: center;">B</td> <td style="width: 10%; text-align: center;">NU</td> </tr> </table>		I	A	D	B	NU
	I	A	D	B	NU		
3. Celebrating student success (e.g. the teacher helps student acknowledge and celebrate current status on a learning goal as well as knowledge gain)	Notes						
	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 20%;"></td> <td style="width: 10%; text-align: center;">I</td> <td style="width: 10%; text-align: center;">A</td> <td style="width: 10%; text-align: center;">D</td> <td style="width: 10%; text-align: center;">B</td> <td style="width: 10%; text-align: center;">NU</td> </tr> </table>		I	A	D	B	NU
	I	A	D	B	NU		
	Design Question #6: What will I do to establish and maintain classroom rules and procedures?						
4. Establishing classroom routines (e.g. the teacher reminds students of a rule or procedure or establishes a new rule or procedure)	Notes						
	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 20%;"></td> <td style="width: 10%; text-align: center;">I</td> <td style="width: 10%; text-align: center;">A</td> <td style="width: 10%; text-align: center;">D</td> <td style="width: 10%; text-align: center;">B</td> <td style="width: 10%; text-align: center;">NU</td> </tr> </table>		I	A	D	B	NU
	I	A	D	B	NU		
5. Organizing the physical layout of the classroom for learning (e.g. the teacher organizes materials, traffic patterns, and displays to enhance learning)	Notes						
	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 20%;"></td> <td style="width: 10%; text-align: center;">I</td> <td style="width: 10%; text-align: center;">A</td> <td style="width: 10%; text-align: center;">D</td> <td style="width: 10%; text-align: center;">B</td> <td style="width: 10%; text-align: center;">NU</td> </tr> </table>		I	A	D	B	NU
	I	A	D	B	NU		
	II. Lesson Segments Addressing Content						
	Design Question #2: What will I do to help students effectively interact with new knowledge?						
1. Identifying critical information (e.g. the teacher provides cues as to which information is important)	Notes						
	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 20%;"></td> <td style="width: 10%; text-align: center;">I</td> <td style="width: 10%; text-align: center;">A</td> <td style="width: 10%; text-align: center;">D</td> <td style="width: 10%; text-align: center;">B</td> <td style="width: 10%; text-align: center;">NU</td> </tr> </table>		I	A	D	B	NU
	I	A	D	B	NU		

2. Organizing students to interact with new knowledge (e.g. the teacher organizes students into dyads or triads to discuss small chunks of content)	Notes	
		I A D B NU
3. Previewing new content (e.g. the teacher uses strategies such as: K-W-L, advance organizers, preview questions)	Notes	
		I A D B NU
4. Chunking content into “digestible bites” (e.g. the teacher presents content in small portions that are tailored to students’ level of understanding)	Notes	
		I A D B NU
5. Group processing of new information (e.g. after each chunk of information, the teacher asks students to summarize and clarify what they have experienced)	Notes	
		I A D B NU
6. Elaborating on new information (e.g. the teacher asks questions that require students to make and defend inferences)	Notes	
		I A D B NU
7. Recording and representing knowledge (e.g. the teacher ask students to summarize, take notes, or use non-linguistic representations)	Notes	
		I A D B NU
8. Reflecting on learning (e.g. the teacher asks students to reflect on what they understand or what they are still confused about)	Notes	
		I A D B NU
B.	Design Question #3: What will I do to help students practice and deepen their understanding of new knowledge?	
9. Reviewing content (e.g. the teacher briefly reviews related content addressed previously)	Notes	
		I A D B NU
10. Organizing students to practice and deepen knowledge (e.g. the teacher organizes students into groups designed to review information or practice skills)	Notes	
		I A D B NU
11. Using homework (e.g. the teacher uses homework for independent practice or to elaborate on information)	Notes	
		I A D B NU

12. Examining similarities and differences (e.g. the teacher engages students in comparing , classifying, creating analogies and metaphors)	Notes	
13. Examining errors in reasoning (e.g. the teacher asks students to examine informal fallacies, propaganda, bias)	Notes	I A D B NU
14. Practicing skills, strategies, and processes (the teacher uses massed and distributed practice)	Notes	I A D B NU
15. Revising knowledge (e.g. the teacher asks students to revise entries in notebooks to clarify and add to previous information)	Notes	I A D B NU

Design Question #4: What will I do to help students generate and test hypotheses about new knowledge?

16. Organizing students for cognitively complex tasks (e.g. the teachers organizes students into small groups to facilitate cognitively complex tasks)	Notes	I A D B NU
17. Engaging students in cognitively complex tasks involving hypothesis generating and testing (e.g. the teacher engages students in decision making tasks, problem solving tasks, experimental inquiry tasks, investigation tasks)	Notes	I A D B NU
18. Providing resources and guidance (e.g. the teacher makes resources available that are specific to cognitively complex tasks and helps students execute such tasks)	Notes	I A D B NU

III. Lesson Segments Enacted on the Spot

C. Design Question #5: What will I do to engage students?

1. Noticing and reacting when students are not engaged (e.g. the teacher scans the classroom to monitor students' level of engagement)	Notes	
2. Using academic games (e.g. when students are not engaged, the teachers uses adaptations of popular games to reengage them and focus their attention on academic content)	Notes	I A D B NU
3. Managing response rates during questioning (e.g. the teacher uses strategies to ensure that multiple students respond to questions such as: response cards, response chaining, voting technologies)	Notes	I A D B NU
4. Using physical movement (e.g. the teacher uses strategies that require students to move physically such as: vote with your feet, physical reenactments of content)	Notes	I A D B NU
5. Maintaining a lively pace (e.g. the teacher slows and quickens the pace of instruction in such a way as to enhance engagement)	Notes	I A D B NU
6. Demonstrating intensity and enthusiasm (e.g. the teacher uses verbal and nonverbal signals that he or she is enthusiastic about the content)	Notes	I A D B NU
7. Using friendly controversy (e.g. the teacher uses techniques that require students to take and defend a position about content)	Notes	I A D B NU
8. Providing opportunities for students to talk about themselves (e.g. the teacher uses techniques that allow students to relate content to their personal lives and interests)	Notes	I A D B NU
9. Presenting unusual or intriguing information (e.g. the teacher provides or encourages the identification of intriguing information about the content)	Notes	I A D B NU
Design Question #7: What will I do to recognize and acknowledge adherence or lack of adherence to rules and procedures?		
10. Demonstrating "withitness" (e.g. the teacher is aware of variations in student behavior that might indicate potential	Notes	

disruptions and attends to them immediately)			I	A	D	B	NU
11. Applying consequences (e.g. the teacher applies consequences to lack of adherence to rules and procedures consistently and fairly)	Notes						
			I	A	D	B	NU
12. Acknowledging adherence to rules and procedures (e.g. the teacher acknowledges adherence to rules and procedures consistently and fairly)	Notes						
			I	A	D	B	NU

D.	Design Question #8: What will I do to establish and maintain effective relationships with students?						
13. Understanding students' interests and backgrounds (e.g. the teacher seeks out knowledge about students and uses that knowledge to engage in informal, friendly discussions with students)	Notes						
			I	A	D	B	NU
14. Using behaviors that indicate affection for students (e.g. the teacher uses humor and friendly banter appropriately with students)	Notes						
			I	A	D	B	NU
15. Displaying objectivity and control (e.g. the teacher behaves in ways that indicate he or she does not take infractions personally)	Notes						
			I	A	D	B	NU
	Design Question #9: What will I do to communicate high expectations for all students?						
16. Demonstrating value and respect for low expectancy students (e.g. the teacher demonstrates the same positive affective tone with low expectancy students as with high expectancy students)	Notes						
			I	A	D	B	NU
17. Asking questions of low expectancy students (e.g. the teacher asks questions of low expectancy students with the same frequency and level of difficulty as with high expectancy students)	Notes						
			I	A	D	B	NU
18. Probing incorrect answers with low expectancy students (e.g. the teacher inquires into incorrect answers with low expectancy students with the same depth and rigor as with high expectancy students)	Notes						
			I	A	D	B	NU



Additional Notes/Strategies/Take-Aways:

Thank you!

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