


The Art & Science of Teaching

A Common Language for Instruction


Dr. Phil Warrick, Associate VP
Marzano Research Laboratory
www.marzanoresearch.com



cutting-edge research concrete strategies sustainable success

Only in Education....

Test questions and the answers students provided.....



cutting-edge research concrete strategies sustainable success

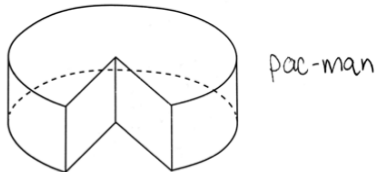
F in Exams

I didn't fail the test,
I just found 100 ways
to do it wrong.

—BENJAMIN FRANKLIN,
politician, author, and inventor

F in Exams

The solid figure can best be described as:



pac-man

Change $\frac{7}{8}$ to a decimal.

7.8

F in Exams

Expand $2(x + y)$

$2(x+y)$
 $2(x+y)$
 $2(x+y)$
 $2(x+y)$

Upon ascending the throne the first thing Queen Elizabeth II did was to . . .

Sit down

F in Exams

Why was the Berlin Wall built?

Germany was competing
with China.

F in Exams

What were the circumstances of Julius Caesar's death?

Suspicious ones

Correct the error in the sentence:
The girl were extremely intelligent.

The boy were extremely intelligent.

What scale do seismologists use to measure the force of earthquakes?

*A very strong one
(not glass).*

F in Exams

Adam cuts his arm. Blood gushes out and is red in color. What does this show?

*He is not a robot,
he's a real boy!*

F in Exams

To change centimeters to meters you _____.

+ take out centi.


F in Exams

The road to success is always under construction.

—LILY TOMLIN,
actress

The reality of our business...

- There is rarely, if ever, a perfect day of teaching....



Mazeno Research Laboratory
Powered by Sustainable Success

cutting-edge research concrete strategies sustainable success

2 minute discussions




Mazeno Research Laboratory
Powered by Sustainable Success

cutting-edge research concrete strategies sustainable success

Do you agree or disagree? What's the role of talent?

Effective teachers are made, not born.

What's the role of deliberate practice?




Mazeno Research Laboratory
Powered by Sustainable Success

cutting-edge research concrete strategies sustainable success

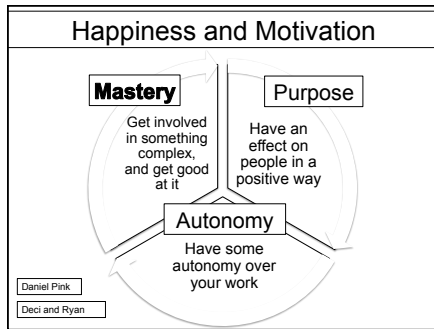
Do you agree or disagree?

Most people are satisfied with competence, and never strive for expertise.



Mazeno Research Laboratory
Powered by Sustainable Success

cutting-edge research concrete strategies sustainable success



In Learning Organizations..

Everybody Should Be Learning...

Michigan Research Laboratory
Powered by Sustainable Time

cutting-edge research concrete strategies sustainable success



"What Matters Very Much is Which Classroom?"

"If a student is in one of the most effective classrooms, he/she will learn in 6 months what those in an average classroom will take a year to learn. And if a student is in one of the least effective classrooms in that school, the same amount of learning takes 2 years."

Deborah Loewenberg Ball, Dean of Education, University of Michigan

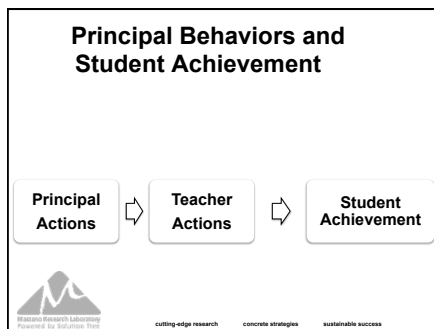
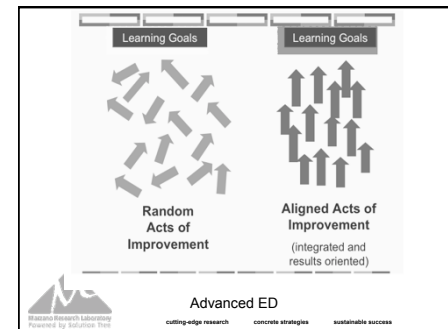
Michigan Research Laboratory
Powered by Sustainable Time

cutting-edge research concrete strategies sustainable success

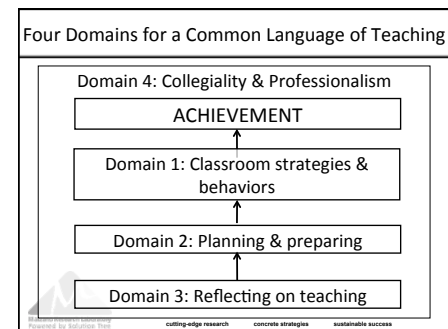
School and District Leadership **not only matters**, but also has a **direct correlation and measurable effect on student achievement!**

Michigan Research Laboratory
Powered by Sustainable Time

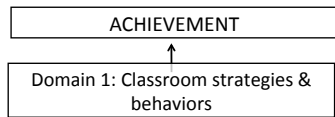
cutting-edge research concrete strategies sustainable success



- ### Where should a school begin?
- Develop a common language of teaching
 - 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
-
- Michigan Research Laboratory
Powered by Sustainable Time
- cutting-edge research concrete strategies sustainable success



Four Domains for a Common Language of Teaching



cutting-edge research concrete strategies sustainable success

The Art and Science of Teaching



cutting-edge research concrete strategies sustainable success

Nine Lesson Design Questions

1. Learning Goals and Feedback
2. Interacting with New Knowledge
3. Practicing and Deepening
4. Generating and Testing Hypotheses (application)
5. Student Engagement
6. Establishing Rules and Procedures
7. Adherence to Rules and Procedures
8. Teacher-Student Relationships
9. High Expectations

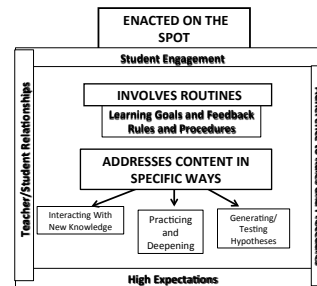
The Art and Science of Teaching

Three Segments of a Lesson

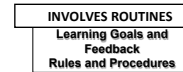
1. Segments that involve **routine behaviors**.
2. Segments that address **content** in specific ways.
3. Segments that are **enacted on the spot**.



cutting-edge research concrete strategies sustainable success



Today we will focus on Routine Lesson Strategies



cutting-edge research concrete strategies sustainable success

ROUTINE SEGMENTS

- Component 1.1 (Goals/Scales)
- Component 1.2 (Celebrate Success)
- Component 5.1 (Organizing the Classroom)
- Component 5.2 (Rules/Procedures)
- Component 6.3 (Tracking Student Progress)

ROUTINE SEGMENTS

- Component 1.1 (Goals/Scales)
- Component 1.2 (Celebrate Success)
- Component 5.1 (Organizing the Classroom)
- **Component 5.2 (Rules/Procedures)**
- Component 6.3 (Tracking Student Progress)



cutting-edge research concrete strategies sustainable success

Do some Solo Thinking...

What are some key rules and procedures teachers need to establish for a successful learning environment?



cutting-edge research concrete strategies sustainable success

Please compare lists with your elbow partners....



cutting-edge research concrete strategies sustainable success

Did you list any of these?

- Attention and Refocus Signal
- Transition Signal
- Strategies to group and re-group learners
- Bell ringers or sponge activities

Age = Attention Span

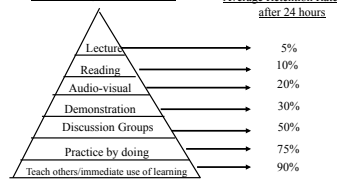
- Change of state for the learner is needed...
- Tops out at 18-20 minutes...
- Adult learners need change also...



cutting-edge research concrete strategies sustainable success

Page 2

Boosting Retention



Adapted from David Sousa's figure 3.8 in his text, [How the Brain Learns](#)



cutting-edge research concrete strategies sustainable success

Transition Signal....

- So they know for sure when you want them to move...
- Mine will be: When I say "GO"



cutting-edge research concrete strategies sustainable success

Attention and Refocus Signals

- Consistent Location (Physical Cue)
- Consistent Language (Verbal Cue)
- Expected Result
- Sound of Silence



cutting-edge research concrete strategies sustainable success

My Attention and Refocus Signal

- Move to the front and center.
- Announce time remaining in activity.
- Count down last 10 seconds out loud.
- At "Zero" everyone is in seat and ready.
- If anybody isn't ready, I'll just wait....



cutting-edge research concrete strategies sustainable success

Processes for grouping and re-grouping learners.



cutting-edge research concrete strategies sustainable success

Table Team or Table Family

- Everyone at your table...
- Best if groups are 5 or smaller...
 - Use teams of teams to stay below 5



cutting-edge research concrete strategies sustainable success

Each team needs a facilitator...

- When I count to 3 everybody point at someone at your table...
- Person with the most pointing at you please stand up...
- You get to pick the facilitator for the group.



cutting-edge research concrete strategies sustainable success

Close Partners

- Groups of 2 or 3 with people sitting near you but not at your table.



cutting-edge research concrete strategies sustainable success

Across the Room Partners...

- Groups of 2 or 3 with people not sitting near you in the room.
 - Cross-town Buddies
 - Blind Date



cutting-edge research concrete strategies sustainable success

Elbow Partners....

- Groups of 2 or 3 to your left and/or right...
- You could elbow them...but please don't
 - Stand when working with elbow partners



cutting-edge research concrete strategies sustainable success

Speed Date Discussions

- 1 minute discussion (group of 2 or 3)
- 10 seconds find new partners
- 1 minute discussion....
- Repeat as needed...



cutting-edge research concrete strategies sustainable success

Learning Appointments

- Schedule learning appointments with groups of 2 or 3.
- Record your appointments so you remember who you are meeting with.



cutting-edge research concrete strategies sustainable success

One:	Topic:
Two:	Topic:
Three:	Topic:



cutting-edge research concrete strategies sustainable success

What other grouping strategies do you use?

Please share your ideas with your table family



cutting-edge research concrete strategies sustainable success

Some important considerations

- Why 5 or less?
- Why groups of 2 or 3?
- Why use more than one strategy?



cutting-edge research concrete strategies sustainable success

Additional Ideas...

- What problems of practice can you address by implementing a classroom routine or procedure?



cutting-edge research concrete strategies sustainable success



What to do if I've Missed Class

- E-mail your teacher before class. Meredith.Lawrence@RoundRock.org
- If you can't e-mail before class, e-mail right after class.
- Look for notes or assignments online.
<http://teacherweb.com/TX/RoundRockHighSchool/Lawrence/A.aspx>
- Ask classmates for information about what happened and ask that they share notes.
 - Ask three friends before you ask your teacher.
 - Ask friends on Facebook or another online social network.
- Come by before school or after school prior to the next class.
 - Ask for a WOW pass.



cutting-edge research concrete strategies sustainable success

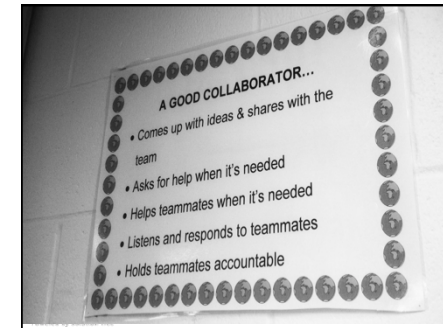
OUR CLASSROOM NORMS

Teacher will:

- Be creative and allow creativity
- Have engaging texts
- Allow choice in class
- Allow student directed discussion/collaboration
- Accept multiple interpretations
- Have fun
- Help students connect and understand
- Show Respect
- Offer tutorials
- Be specific in feedback
- Motivate us
- Meet us at our level

Students will:

- Stay focused
- Produce Quality Work
- Show Respect
- Be Diligent
- Participate
- Don't press up against the door before bell rings
- Trust
- Be honest
- Be on time
- Turn in work on time
- Try hard
- Aim high – for a 4 or 5
- Be kind to each other in class
- Agree on the path
- Buy in and believe



What to say instead of "I Don't Know"

- | | |
|--|---|
| • May I please have some more information? | • May I consult an expert? (use the text/notes or ask additional questions) |
| • May I have some more time to think? | • May I ask a friend for help? |
| • Would you please repeat the question? | • May I poll the class? |
| • Where could I find information about that? | • May I have a clue or fifty-fifty? |

ROUTINE SEGMENTS

- Component 1.1 (Goals/Scales)
- Component 1.2 (Celebrate Success)
- Component 5.1 (Organizing the Classroom)
- Component 5.2 (Rules/Procedures)
- Component 6.3 (Tracking Student Progress)



cutting-edge research concrete strategies sustainable success

PLC Questions #1 and #2


- What do we want our students to learn?
- How will we know if they have learned it?
- What will we do if they have not learned what we want them to learn?
- What will we do if they already know it?



cutting-edge research concrete strategies sustainable success

Learning Goals


Implementing the curriculum at the classroom level.



cutting-edge research concrete strategies sustainable success

Learning Goals and Scales

Implement the curriculum at the classroom level.




cutting-edge research concrete strategies sustainable success

What are learning goals?

A learning goal is a statement of what students will understand and/or be able to do.


Think in Terms of Two Types of Goals...



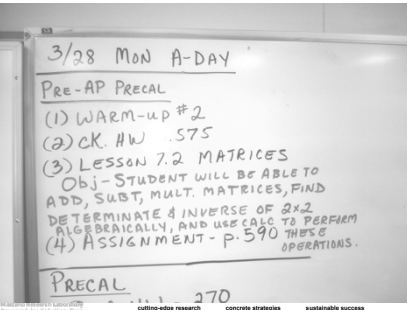

cutting-edge research concrete strategies sustainable success

Professional Dialogue

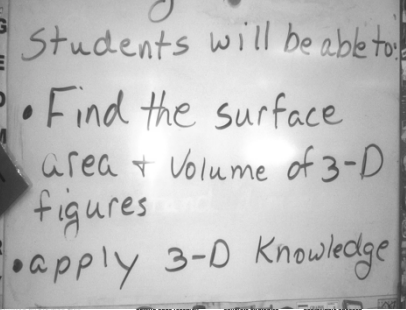

- How do you communicate learning goals to your students?



cutting-edge research concrete strategies sustainable success


cutting-edge research concrete strategies sustainable success

cutting-edge research concrete strategies sustainable success

For each area of teacher expertise:


Distinguished 4	Proficient 3	Basic 2	Unsatisfactory 1
Adapts and creates new approaches to the strategies for unique student needs and situations	Uses the strategies; monitors effects on students; adjusts to achieve desired outcome	Uses the strategies in this area of teacher expertise	Uses strategies incorrectly or with aspects missing



cutting-edge research concrete strategies sustainable success

For each area of teacher expertise:


Distinguished 4	Proficient 3	Basic 2	Unsatisfactory 1
Adapts and creates new approaches to the strategies for unique student needs and situations	Uses the strategies; monitors effects on students; adjusts to achieve desired outcome	Uses the strategies in this area of teacher expertise	Uses strategies incorrectly or with aspects missing



cutting-edge research concrete strategies sustainable success

Formative Assessment Focus on Learning

Review the following research descriptions...



cutting-edge research concrete strategies sustainable success

"the process used by **teachers and students** to recognize and respond to student learning in order to enhance that learning, during the learning." (Cowie & Bell 1999 p. 32)

"assessment carried out **during the instructional process** for the purpose of improving teaching or learning" (Shepard et al., 2005, P. 275)



cutting-edge research concrete strategies sustainable success

"Formative assessment refers to frequent, interactive assessments of students' progress and understanding to **identify learning needs and adjust teaching appropriately**" (Looney, 2005, P. 21)

"A formative assessment is a **midstream tool to identify specific student misconceptions and mistakes** while the material is being taught"

(Kahl, 2005, p. 11)



cutting-edge research concrete strategies sustainable success

Discussion Topic

- What does formative assessment mean to you?
- What are your current strategies for formative assessment?



cutting-edge research concrete strategies sustainable success

The Challenge

Goals must be challenging, yet attainable for students.



cutting-edge research concrete strategies sustainable success

Students come with unique gaps in their abilities and previous learning.



cutting-edge research concrete strategies sustainable success

"I have over 25 students in my class."

- **Problem:**
How can I write a goal for all my students that is both challenging and attainable?



cutting-edge research concrete strategies sustainable success

"I have over 25 students in my class."

- **Solution:**
Construct goals at multiple levels of difficulty.



cutting-edge research concrete strategies sustainable success

Create Proficiency Scales



cutting-edge research concrete strategies sustainable success


At the Classroom level...

- We need goals at **various levels** that....
- Identify **Learning Progressions** which....
- Are necessary to achieve a **Target Goal**.




cutting-edge research concrete strategies sustainable success

Begin by designing (and prioritizing) learning goals in all subject areas



cutting-edge research concrete strategies sustainable success


Curriculum should be Guaranteed and Viable



cutting-edge research concrete strategies sustainable success

Discussion Topic

What does it mean to have a guaranteed and viable curriculum?




cutting-edge research concrete strategies sustainable success

What's a guaranteed and viable curriculum?

- A "guaranteed" curriculum means that we ensure it is taught in every classroom teaching the same course.
- Examples:
 - All English I classes have the same essential learning targets identified.
 - All Biology classes have the same essential learning targets identified.
 - The Algebra I story....

Viable Curriculum


- Viable means we are able to teach the curriculum **for understanding** in the time available.
- Teach for understanding....



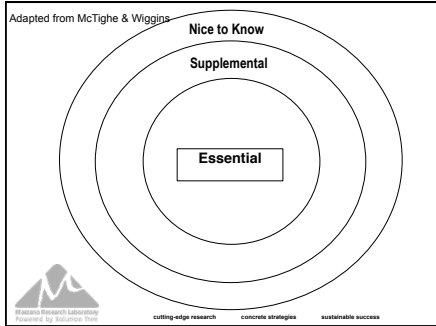
cutting-edge research concrete strategies sustainable success

Identify Essential Learning

Step One.



cutting-edge research concrete strategies sustainable success



What are the criteria for essential?

- **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?)
 - Inquiry, critical thinking, inferences, problem solving
- **Readiness for next level of learning** (Will this provide students with the "tools" they need for success at the next level or grade.)

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


Essential Learning Target Matrix

Standard	Endurance = 1	Leverage = 1	Readiness = 1	State Tested = 1	National Tested = 1

Essential Learning Target Matrix					
Standard	Endurance = 1	Leverage = 1	Readiness = 1	State Tested = 1	National Tested = 1
Explain the steps of the scientific method.	1	1	1	1	1

Using the Matrix...


- PLCs and/or Departments
- Discuss the standards, use the matrix.
- Not everything will make the list....



cutting-edge research concrete strategies sustainable success

“For these are all our children. We will profit by, or pay, for whatever they become.”

James Baldwin



cutting-edge research concrete strategies sustainable success

Welcome Back!


Let's Review



cutting-edge research concrete strategies sustainable success


Talk a Mile a Minute

- Students are given a list of terms that have been organized into categories.
- Each team designates a talker.
- The talker tries to get the team to say each of the words by quickly describing them.
- The talker is allowed to say anything about the terms while talking but may not use any words in the category title or any rhyming words.
- The talker keeps talking until the team members identify all terms in the category.
- If members of the team are having difficulty with a particular term, the talker skips it and comes back to it later.



cutting-edge research concrete strategies sustainable success

Things Associated With Yesterday



cutting-edge research concrete strategies sustainable success

Things Associated With Yesterday


Instructional Framework

Expertise

Routine Segments

Retention

Focused Feedback



cutting-edge research concrete strategies sustainable success

MORE Things Associated With Yesterday



cutting-edge research concrete strategies sustainable success

MORE Things Associated With Yesterday


Professional Growth

Domain 1

Pedagogical Skills

Learning Goals

Dr. Phil



cutting-edge research concrete strategies sustainable success

Question about teaching the learning goal....

When you begin a new piece of knowledge...The first time learners are exposed to it.



cutting-edge research concrete strategies sustainable success

Scales = a series of learning goals or learning progressions



cutting-edge research concrete strategies sustainable success

Organize learning goals into a scale

- Advanced = 4.0 More complex learning goal
 - Above and beyond the target goal
- Proficient = 3.0 target learning goal
 - At the level identified in the standards
- Progressing = 2.0 simple learning goal
 - Foundational knowledge needed to reach level 3

Basic Proficiency Scale

4	In addition to exhibiting level-3 performance, in-depth inferences and applications that go BEYOND level 3.
3	The Learning Goal: What you expect the student to know and be able to do to be considered proficient.
2	The simpler or foundational knowledge that is necessary as a step to mastery of the score 3.0 INCLUDES CRITICAL CONTENT VOCABULARY HERE
1	With HELP, a partial knowledge of some of the simpler and complex details and processes
0	Even with help, no understanding or skill demonstrated

Proficiency Scales

Level 1 Beginning	Level 2 Progressing	Level 3 Proficient	Level 4 Advanced



cutting-edge research concrete strategies sustainable success

Basic Scale Includes:

Advanced or 4	Application of the knowledge and skills to new and novel situations.
Proficient or 3	The learning goal at the level required in the standards.
Progressing or 2	Key vocabulary terms. Basic understandings or fundamental skills.

Scale for Types of Business Ownership

Advanced	Apply the knowledge to a business scenario and provide written rationale for your decision.
Proficient	Explain the advantages and disadvantages of three types of business ownership.
Progressing	Know Key Vocabulary: Sole-Proprietorship, Partnership, Corporation Describe the concepts of profit and liability.

Learning Goal Only

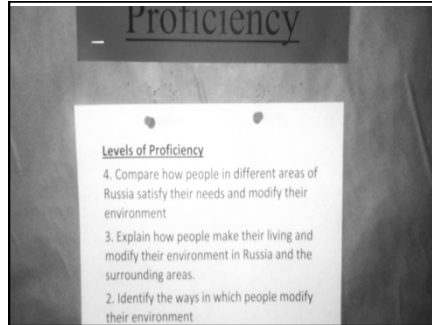
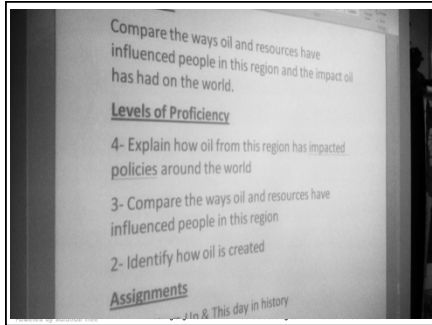
- **Explain the advantages and disadvantages of three types of business ownership.**




cutting-edge research concrete strategies sustainable success

Atmospheric Processes and Water Cycle

4	Infer relationships regarding atmospheric processes and the water cycle.
3	An explanation of: <ul style="list-style-type: none"> • How the water cycle processes impact climate changes • The effects of temperature and pressure in different layers of Earth's atmosphere
2	<ul style="list-style-type: none"> • Recognize and recall basic terms such as: climatic patterns, atmospheric layers, stratosphere, troposphere. • Recognize or recall isolated details such as: <ul style="list-style-type: none"> • Precipitation is one of the processes of the water cycle. • The troposphere is one of the lowest portions of the Earth's atmosphere.




What about Special Education?



cutting-edge research concrete strategies sustainable success


Special Ed. and Scales...

- Accommodations or Modifications?
- Accommodations = Regular Scale if we properly meets accommodations.
- Modifications = Modify scales in conjunction with the IEP goals.




cutting-edge research concrete strategies sustainable success

Consider having students flesh out the meaning of the scale.




cutting-edge research concrete strategies sustainable success

4	
3	I know it just the way my teacher taught it.
2	
1	
0	




cutting-edge research concrete strategies sustainable success

4	
3	I know it just the way my teacher taught it.
2	I know some of the simpler stuff but can't do the harder parts.
1	
0	




cutting-edge research concrete strategies sustainable success

4	I know it even better than my teacher taught it.
3	I know it just the way my teacher taught it.
2	I know some of the simpler stuff but can't do the harder parts.
1	
0	



cutting-edge research concrete strategies sustainable success

4	I know it even better than my teacher taught it.
3	I know it just the way my teacher taught it.
2	I know some of the simpler stuff but can't do the harder parts.
1	With some help, I can do it.
0	



cutting-edge research concrete strategies sustainable success

4	I know it even better than my teacher taught it.
3	I know it just the way my teacher taught it.
2	I know some of the simpler stuff but can't do the harder parts.
1	With some help, I can do it.
0	Even with help, I can't do it.



cutting-edge research concrete strategies sustainable success

PLC Question # 2

- How will we know if our student's have learned what we want them to learn?



cutting-edge research concrete strategies sustainable success

We live in a data-driven world



cutting-edge research concrete strategies sustainable success

We can get data-driven to the point of distraction.



cutting-edge research concrete strategies sustainable success



Data-based decisions are not about gathering reams of data

They are about gathering useful, timely data.



cutting-edge research concrete strategies sustainable success

We need timely, usable data.



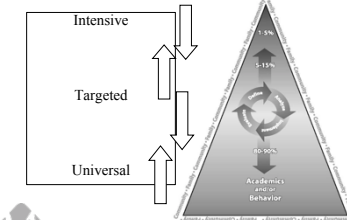
Critical data-based decisions....

- Come from classroom assessments....
- Occur frequently....(even daily)
- Are specific regarding performance....
- Are focused on growth....
- Lead directly to learning....




cutting-edge research concrete strategies sustainable success

Response to Intervention



cutting-edge research concrete strategies sustainable success

Level 1 Beginning	Level 2 Progressing	Level 3 Proficient	Level 4 Advanced
✘	✘	✘	


 cutting-edge research concrete strategies sustainable success


Marzano Research Laboratory will help you!

- Website
- <http://www.marzanoresearch.com>
- Free resources
- Proficiency Scale Bank
- Email for user name
- Pick a password

Searchable Site...



Provides Samples to Select...



Strand: Processes and Interactions of the Earth's system		Topic: Atmosphere, Weather, and Climate	
Grade 7			
Score 4.0	In addition to Score 3.0, in-depth inferences and applications that go beyond what was taught.	Sample Task	
Score 3.5	In addition to scores 3.0 performance, in-depth inferences and applications with partial success.		
Score 3.0	The student: describes the composition of Earth's atmosphere and how it circulates as air masses describes the role atmosphere plays in precipitation, reflecting/absorbing light, and trapping heat. The student exhibits no major errors or omissions.		
Score 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: - atmosphere, heat, precipitation, air mass recognizes or recalls accurate statements about the composition of the Earth's atmosphere recognizes or recalls accurate statements about the role of the atmosphere However, the student exhibits major errors or omissions regarding the more complex ideas and processes.		
Score 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.		
Score 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.		

Alignment


Curriculum Standards Classroom Instructional Objectives and Activities Classroom Assessment

Scale Worksheet


Topic:	Classroom Instructional Activities	Assessments
Score 4.0 (Exceeding) - More complex Deconstructions of Learning that go above and beyond what was explicitly taught		
Score 3.0 (Meeting) - The Learning Goal or Expectation		
Score 2.0 (Approaching) - The Simpler Stuff Foundational Knowledge/Simpler Procedures, Isolated Details, Vocabulary		

PLC Question # 2

- How will we know if our student's have learned what we want them to learn?


 cutting-edge research concrete strategies sustainable success

Now, you can more accurately connect assessment items or opportunities to the scale = construct validity.


 cutting-edge research concrete strategies sustainable success

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

With your table family...

- Using the proficiency scale for Atmospheric Pressure and Water Cycle...
 - Develop 1 assessment item for level 3.
 - Develop 1 assessment item for level 2.
 - Develop 1 assessment item for level 4.



cutting-edge research concrete strategies sustainable success

Atmospheric Processes and Water Cycle

4	Infer relationships regarding atmospheric processes and the water cycle.
3	An explanation of: <ul style="list-style-type: none"> • How the water cycle processes impact climate changes • The effects of temperature and pressure in different layers of Earth's atmosphere
2	<ul style="list-style-type: none"> • Recognize and recall basic terms such as: climatic patterns, atmospheric layers, stratosphere, troposphere. • Recognize or recall isolated details such as: <ul style="list-style-type: none"> • Precipitation is one of the processes of the water cycle. • The troposphere is one of the lowest portions of the Earth's atmosphere

Level 2.0 Items for Measuring Atmospheric Processes and Water Cycle

- Briefly **define** the following terms: climatic pattern, atmospheric layers, stratosphere
- **Identify** which of the following statements are true:
 - 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.



cutting-edge research concrete strategies sustainable success

Level 3.0 Items for Measuring Atmospheric Processes and Water Cycle

- **Explain** how evaporation affects the climatic pattern in areas around large bodies of water, like the shoreline communities of Lake Michigan.
- Assume that a weather balloon traveled up into the stratosphere. **Explain** what would happen as it progresses through the various layers of the atmosphere.



cutting-edge research concrete strategies sustainable success

Level 4.0 Item for Science Test on Atmospheric Processes and Water Cycle

Complete the following analogy and **explain** why it is accurate:
 Condensation is to evaporation as _____ is to _____,
 because...



cutting-edge research concrete strategies sustainable success

ROUTINE SEGMENTS

- Component 1.1 (Goals/Scales)
- Component 1.2 (Celebrate Success)
- Component 5.1 (Organizing the Classroom)
- Component 5.2 (Rules/Procedures)
- Component 6.3 (Tracking Student Progress)



cutting-edge research concrete strategies sustainable success

Tracking Student Progress

- Occurs formally and informally
- Empowers teachers to provide valuable feedback.



cutting-edge research concrete strategies sustainable success

Interesting research about feedback...



cutting-edge research concrete strategies sustainable success


Predict the effect on student achievement for each type of feedback.



cutting-edge research concrete strategies sustainable success

Types of Feedback		
Type of Feedback	Number of Studies	% Student Achievement Gain or Loss
Right or Wrong	6	
Teacher provides correct answers	39	
Students understanding assessment criteria vs. not understanding	30	
Teacher explains feedback	9	
Student reassessed until correct	4	


Bangert-Drowns, Kulik, Kulik, & Morgan.



cutting-edge research concrete strategies sustainable success

An interesting finding....(Carless, 2006)

- Asked students and teachers whether teachers provided detailed feedback that helped students improve their next assignments...
- 70% teachers claimed they provided such detailed feedback often or always
- 45% of students agreed with their teachers' claims




cutting-edge research concrete strategies sustainable success

Grading & Feedback Study

- Grade only
- Feedback only
- Grade and feedback combined...
- Which group do you think showed the greatest student achievement?

Effects of no feedback, task-related comments, and grades on intrinsic motivation and performance.
Journal of Educational Psychology, 78, 210-216.




cutting-edge research concrete strategies sustainable success

Grading & Feedback Study


- Grade only
- Feedback only
- Grade and feedback combined...
- Unfortunately, the grade "trumps" the comments if used together.

Effects of no feedback, task-related comments, and grades on intrinsic motivation and performance.
Journal of Educational Psychology, 78, 210-216.



cutting-edge research concrete strategies sustainable success

We wanted to know so we asked the question:




cutting-edge research concrete strategies sustainable success

How often have you seen another student at your school...

- Copy someone else's homework?
 - Every Day = 19.9 %
 - Many Times = 25.5 %
 - A Few Times = 31.9 %
 - Once 10.1 %
 - Never 12.6 %

RRHS student climate survey 2009-2010



cutting-edge research concrete strategies sustainable success

New app aims to turn Facebook into a study tool


- The Facebook application Hoot.me diverts students away from their wall and news feed and asks them, "What are you working on?" It then connects students with live group-study sessions on their chosen topic.



cutting-edge research concrete strategies sustainable success

Teachers should not abandon homework. Instead, they should improve its instructional quality.


Robert Marzano
Educational Leadership, March 2007



cutting-edge research concrete strategies sustainable success

Have students correct their own!

- Aligns with feedback research
 - Timeliness
 - Teacher explains answers/corrections
 - Becomes OK to make an error (Learning)
- Provides formative information to the student and doesn't have to be scored.



cutting-edge research concrete strategies sustainable success

Homework quiz strategy.

- Homework becomes practice and instructional feedback....
- It also becomes the best way to study for the homework quiz....
- The homework quiz becomes a formative assessment or score....
- Serves as one piece of evidence of learning....



cutting-edge research concrete strategies sustainable success

2.	Find the inverse: $y = \frac{4}{5}x - 8$
3.	Find the inverse: $y = \frac{3x-4}{13}$
4.	The formula: $C = \frac{5}{9}(F - 32)$ gives the degrees Celsius as a function of degrees Fahrenheit. Find the inverse of the

Feedback is most powerful when it comes *from the student to the teacher.*

Hattie, J. (2009). *Visible learning a synthesis of over 800 meta-analyses relating to achievement.* New York, NY: Routledge



cutting-edge research concrete strategies sustainable success

“Feedback from student to teacher helps make learning visible” (Hattie, 2009).

- Teachers seek
 - What do students know and understand?
 - Where are they making errors?
 - When do they have misconceptions?



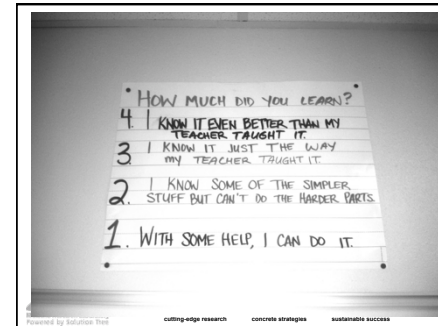
cutting-edge research concrete strategies sustainable success

Quick Formative Assessment

Instructional Feedback



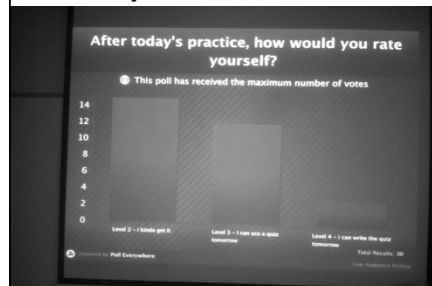
cutting-edge research concrete strategies sustainable success



Powered by Edmentum

cutting-edge research concrete strategies sustainable success

Polleverywhere.com



More formal formative assessment.



cutting-edge research concrete strategies sustainable success


Exit Tickets and Student Surveys

Quick to yield data:

- Don't have to be formal
 - Can occur on a note card or paper
 - Used for any subject matter
 - At numerous grade levels



cutting-edge research concrete strategies sustainable success

 **TICKET OUT THE DOOR**

One thing I understand really well after today is:

I still have questions/want more information about...

I am really excited about...

Marzano Research Laboratory
Powered by Evidence-Based Practice

Name: _____ Period: _____ Ticket Out Door

Level 2 Factor the expression completely:
 $5x^2y^2 - 15x^2y^2 + 20x^2y^2$

Level 3 Solve the equation by factoring:
 $25x^2 + 45x = 10$

Level 4 Factor the expression completely, then solve:
 $6n^2 - n^2 - 24n + 4 = 0$

Marzano Research Laboratory
Powered by Evidence-Based Practice

Having Students Chart Their Progress on Learning Goals

- 14 experimental-control studies conducted at Marzano Research Laboratory
- In research to date, this practice is associated with a 32-percentile point gain in student achievement.

Marzano Research Laboratory
Powered by Evidence-Based Practice cutting-edge research concrete strategies sustainable success

Keeping Track of my Learning

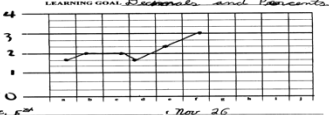
Name: S. H.

Learning Goal: Understand and use decimals and percents

My score at the beginning: 8 My goal is to be at 3 by Nov 30

Specific things I am going to do to improve: Work 15 min three times a week

LEARNING GOAL: Decimals and Percents



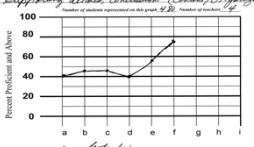
Marzano Research Laboratory
Powered by Evidence-Based Practice

TRACKING STUDENT PROGRESS: School

School: YV2 Middle School

Grade/Subject: 8th Grade Math Writing Paragraphs with Supporting Details, Sentences, and Paragraphs

Learning Goal: Write paragraphs with supporting details, sentences, and paragraphs



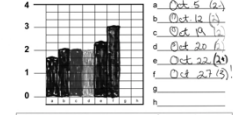
Marzano Research Laboratory
Powered by Evidence-Based Practice

Tracking My Own Learning

Student Name: H. Date: _____

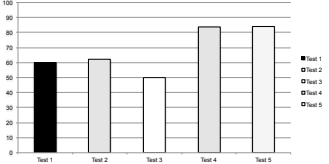
Learning Goal: Understand and use decimals and percents

My score at beginning: 8 My goal: 3 by Nov 30



Marzano Research Laboratory
Powered by Evidence-Based Practice

Spelling Test Scores



Marzano Research Laboratory
Powered by Evidence-Based Practice

Key Learning - Understand the concepts of Intermolecular Forces

Name: _____ Learning Targets: _____

4 Days Strategy: _____

Advanced Proficient Progressing

Marzano Research Laboratory
Powered by Evidence-Based Practice

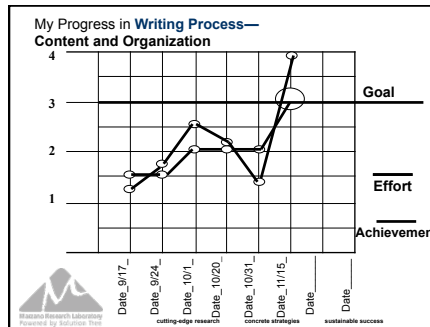
Consider also tracking effort and preparation....

Marzano Research Laboratory
Powered by Evidence-Based Practice

Scale for Effort and Preparation

Score 4.0	To be sure I accomplish my goal, I'm trying harder and preparing more than I think is necessary.
Score 3.0	I'm trying hard enough and preparing well enough to accomplish my goal.
Score 2.0	I'm trying hard but not preparing as well as I could.
Score 1.0	I'm not trying very hard or preparing very well.
Score 0.0	I'm not really trying or preparing at all.

Mazeno Research Laboratory
Powered by Science Trust cutting-edge research concrete strategies sustainable success



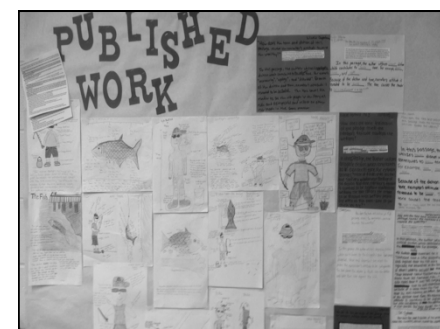
- ### H.S. History Teacher St. Louis
- Tracks student progress academically as correlated to preparation.
 - Homework, test review guide, essay outline
 - Completed all three = Ave grade on test
 - Completed two = Ave grade on test
 - Completed one = Ave grade on test
 - Complete non = Ave grade on test

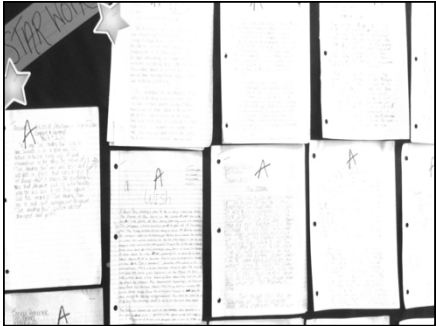
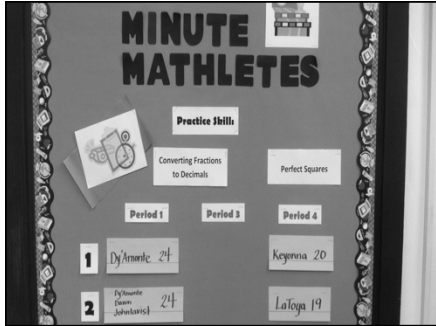
- ### What has he found???
- Usually 30 points or more difference in the test between most and least prepared.
 - Kids are shocked first time or two and many begin to prepare better.
 - Makes excellent data for parent teacher conferences.
- Mazeno Research Laboratory
Powered by Science Trust cutting-edge research concrete strategies sustainable success

- ### Group discussion...
- How do you track student progress?
 - What informal and formal methods do you use for formative assessment?
- Mazeno Research Laboratory
Powered by Science Trust cutting-edge research concrete strategies sustainable success

- ### ROUTINE SEGMENTS
- Component 1.1 (Goals/Scales)
 - Component 1.2 (Celebrate Success)
 - Component 5.1 (Organizing the Classroom)
 - Component 5.2 (Rules/Procedures)
 - Component 6.3 (Tracking Student Progress)
- Mazeno Research Laboratory
Powered by Science Trust cutting-edge research concrete strategies sustainable success

- ### Discussion....
- What do you do to celebrate the success of your learners?
- Mazeno Research Laboratory
Powered by Science Trust cutting-edge research concrete strategies sustainable success





Little things....Big differences....

- ATLAS program celebrations
- High school students not on track to graduate...some had dropped out once.

