5 Proven Ways to Increase Achievement

Be diligent in trusting that what we do in the classroom could possibly echo for a lifetime in the heart of a student.

— Robert John Meehan

KASC
LEADING THE WAY TO STUDENT SUCCESS

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HOW WILL PARTICIPANTS BENEFIT FROM THIS SESSION?

KASC believes in using the newest research on quality teaching and learning. We "practice what we preach" and design all training sessions to model effective strategies.

In an energetic session, participants will:

- Explore content in brain-friendly, memorable ways
- Experience research-based strategies first hand
- Apply the learning to classroom and school settings
- Be equipped with practical strategies that can be used immediately to improve student achievement

Session Components:

This session focuses on five factors that produce high results with students. These five factors will be explored and strategies will be shared for school-wide impact or for individual teacher implementation:

- Growth Mindset
- Effective Feedback
- Student Engagement
- Cognitive Skill Building
- Relationships

ACTIVITY 1: JOB ASSIGNMENTS

- ❑ The facilitator will briefly describe the jobs to be used throughout the session. Each participant should choose a job to have for the workshop.

Job Assignments	Name
Leader — ensures that everyone understands the activity and has the needed supplies. The leader encourages participation from all group members.	
Summarizer — is in charge of ensuring understanding of the information that is being read or shared in the group. The summarizer will summarize (or lead the group to summarize) main points at the end of each section.	
Timekeeper — manages the time to ensure that each person is able to contribute and the group completes the activity in the allotted time.	
Energizer — is in charge of an activity that will be used during breaks to make sure the brain is at the optimal learning capacity. Examples of energizers include marching in place, crossovers, toe lifts, or Simon Says. Be creative and try to share an energizer that a fellow teacher could take back and lead in a classroom.	

Throughout this session, we will learn about five factors that have great impact on student achievement. Researchers call that impact "effect size."

What is effect size?

Effect size is used by researchers to help non-statisticians understand and visualize the effect, or impact, of an action, product, etc. Since almost any factor can have a positive effect, instead of asking ourselves if it "works," effect size helps us determine how well it works in a range of contexts.

What is a high effect size?

Effect Size	Impact	Example *Effect Size Factors
0.00 or less	= Negative effect	Student mobility -.34 Retention -.12
0.00 — 0.20	= Negligible, unclear effects	Teacher subject-matter knowledge +.09 Ability grouping +.12
0.20 — 0.40	= Small-moderate effects	Class size +.21 Homework +.29
0.40 — 0.60	**= Strong effects**	Parental involvement +.51 Mastery learning +.58
0.60 — 2.00	**= Extreme positive effects**	Student Engagement +.71 Relationships +.72 Cognitive Skill Building +.80 Growth Mindset +.80 Feedback +.81

**Effect sizes vary in different studies, but the extreme positive effect factors were in the top 20 of multiple meta-studies.*

An effect size of:
0.50 = approximate improvement of 1 grade level

1.00 = approximate improvement of 2 grade levels

Source: Eric Jensen, Game Changers Brain-Based Teaching for Change Agents

ACTIVITY 2: NOTES ON EFFECT SIZE

High-effect size factors in this session were singled out by Eric Jensen using the following criteria:

1) Doable in schools

- Allows for quick gain in student _____
- Cost _____: cheap/free to implement quickly with low to moderate skill set needed
- Evidence of school-_____ implementation

2) Proven results

- _____ size of .5 or higher
- Peer-reviewed scientific _____
- Top 20 of multiple _____ -studies
  (Meta-studies means a group of studies have already been analyzed by other researchers - and then those results were pulled together to integrate the findings.)

High Effect Size Factors/Influences	*Approximate Effect Size	Council Role/Responsibility	TPGES Connection	PPGES Connection
Growth Mindset	.80	Instructional Practices Discipline & Classroom Management Spending for Textbooks, Instructional Materials, and Student Support Professional Development Closing Achievement Gaps School Improvement Plan	Domain 2B, 3A, 3C	Performance Standards 2.2, 2.9, 2.11
Feedback	.81		Domain 3D	Performance Standard 1.5
Student Engagement	ranges from .25 to 1.17		Domain 3C	Performance Standard 1.5
Cognitive Skill Building	.80		Domain 2B, 3A, 3C, 3E	Performance Standards 1.4, 1.8, 2.3, 2.11
Relationships	.72		Domain 2A	Performance Standards 2.3, 2.11 and 5.4

**The effect sizes vary in different studies, but all of these factors were in the top 20 of multiple meta-studies.*

Source: Eric Jensen, Game Changers Brain-Based Teaching for Change Agents

Background on Teaching Growth Mindset

A. Dr. Carol Dweck from Stanford University teaches students how their brains really work, empowering students to understand that they CAN learn, even when it doesn't come easily.

> *Many people don't know much about intelligence and how it works. When they do think about what intelligence is, they believe that a person is born smart, or average, or dumb — and stays that way for life. New research shows that the brain is more like a muscle — it changes and gets stronger when you use it. And scientists have been able to show just how the brain grows and gets stronger when you learn.*

The brain forms new connections and "grows" when people practice and learn new things. The more you challenge your mind to learn, the more your brain cells grow. Then, things that you once found very difficult or even impossible — like speaking a foreign language or doing algebra — become easy.

B. In a school with a **Growth Mindset,** adults and students believe in, and act upon, research about the possibilities for all students:

- The brain is always changing, and intelligence is not fixed.
- Students are capable of completing learning tasks; there is a connection between actions and outcome, and more effort will lead to better results.
- "Expert" performance is not dependent on talent. It is developed through deliberate practice, which includes immediate feedback, specific goal setting, and time devoted to improvement.
- Test scores are a measure of where a student is, but NOT where a student could end up.

Sources: *Mindset* by Carol Dweck and
Cambridge Handbook of Expertise and Expert Performance, Edited by K. Anders Ericsson

ACTIVITY 3: PAIR, PREPARE, SHARE

- ❑ **Pair:** Form partners at your table.
- ❑ **Prepare:** Decide who will read and summarize Part A and Part B. Individually spend two minutes reviewing the material and deciding how you will summarize your section for your fellow group members.
- ❑ **Share:** Teach your partner your section. Together, decide what words complete the blanks below:

Intelligence is not f_____. **Your brain can always g_____.**

ACTIVITY 4: NEUROPLASTICITY: THE BRAIN IS ALWAYS CHANGING

- ❑ Skim through the viewing guide below to prepare to listen for the important points in the video.
- ❑ Watch the Neuroplasticity video by Sentis and fill in the viewing guide.
  https://www.youtube.com/watch?v=ELpfYCZa87g

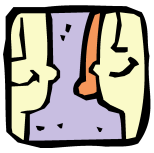
Video Viewing Guide

1. Neuroplasticity means the brain is adaptable and does c_____ throughout our lives.

2. The pathways of our brain are strengthened by p_____, thinking in a certain way, or feeling a specific e_____. If we think about something differently, learn a new task, or choose a different emotion, we carve out a new pathway in the brain.

3. We all have the ability to l_____ and c_____ by rewiring our brains.

4. It takes repeated and d_____ attention toward a desired change to rewire the brain.



Talk to a partner

The main thing I leaned about the brain is…

ACTIVITY 5: FIXED OR GROWTH MINDSET CARD SORT

A fixed mindset is the opposite of what you and your partners just discussed. Complete this activity for a better picture of the differences between a fixed mindset and a growth mindset.

- ❑ Working in groups of four, the leader deals out the cards among the members.
- ❑ Take turns reading and sorting the cards into two piles — Fixed Mindset or Growth Mindset.
- ❑ Be ready to support your choices.
- ❑ The timekeeper will allot 5 minutes.

ACTIVITY 6: THE GROWTH MINDSET VIDEO — Sal Khan and Carol Dweck

- ❑ Watch the video and make note of important points you want to discuss with your group. **https://www.khanacademy.org/youcanlearnanything**

After viewing:

- ❑ The leader calls on each person in the group to share one idea that had an impact on his/her thinking.
- ❑ Complete the viewing guide cards in your envelope. Lay out all of the statements, and fill the blanks with the appropriate word card.
- ❑ Signal your facilitator to check your answers.
- ❑ The summarizer should summarize two important ideas from the video and discussion.

Resource — Other Videos to Use with Students

Khan Academy:

- ❑ You Can Learn Anything
- ❑ Growing Your Mind
- ❑ John Legend

YouTube:

- ❑ Famous Failures
- ❑ You Don't Know Jack- Morgan Spurlock- GE Focus Forward
- ❑ Audri's Rube Goldberg Monster Trap
- ❑ Fast Company Exclusive: Inside Google X
- ❑ Will Smith, Hard Work Beats Talent

Mindsetkit.org
View lessons for teachers to find many videos useful with students

ACTIVITY 7: WHAT DOES GROWTH MINDSET SOUND LIKE?

The chart below contains feedback comments and self-talk which could reinforce a fixed mindset and discourage continued effort.

- ❑ Read each fixed mindset statement and consider what a teacher or student could say that would be a growth mindset response. The facilitator will lead you through the first one.
- ❑ With a partner, fill in appropriate growth mindset responses for each fixed mindset statement.
- ❑ The timekeeper will set a timer for 5 minutes.

Fixed Mindset	**Growth Mindset**
Ex: I'm not going to try because I can never get it.	Ex: *You haven't gotten it YET, but your brain just needs to think about it differently. What other strategy could you try? OR Have you tried it this way?*
You're so smart!	
This is good enough.	
This is too hard.	
I'm too dumb to do this.	

- ❑ The leader should read the following to the group:

Reinforcing "Not Yet" — *"The word 'yet' is valuable and should be used frequently in every classroom. Whenever students say they can't do something or are not good at something, the teacher should add, 'yet.' Whenever students say they don't like a certain subject, the teacher should say, 'yet.' This simple habit conveys the idea that ability and motivation are fluid."*

Source: Educational Leadership, "Even Geniuses Work Hard" by Carol S. Dweck

When students don't master specific content or a unit of study, they need to see the opportunity for improvement and learning instead of viewing it as a failure. Instead of a grade, give students a "*Not Yet*," or something similar. Students won't feel shame and will understand they are expected to master the material after revision or multiple efforts.

- ❑ Complete the Personal Reflection on your own.

Personal Reflection: What words or statements do I need to add to my teacher talk?

What words or statements do I need to delete from my teacher talk?

ACTIVITY 8: IMPLEMENTING A GROWTH MINDSET PLAN

- ❑ The group leader should assign sections of the Plan for Developing a Growth Mindset Classroom on the following page to each group member.
- ❑ Read your section and prepare to summarize for the group. (1 minute)
- ❑ Take turns sharing each section of the plan.
- ❑ Please share personal examples of how you've implemented this strategy in your own classroom.

Plan for Developing a Growth Mindset Classroom

Explicitly teaching students and staff about growth mindset must be done intentionally and reinforced over time.

GROWTH MINDSET ENVIRONMENT

The term "environment" is used as the broadest representation of attitudes, beliefs, actions, words, etc., of the students and adults in a classroom. Everything in a classroom can add to (or take from) the environment/climate/culture needed for growth mindsets to flourish. The following components contribute to a growth mindset classroom.

ENVIRONMENT

TEACH ABOUT THE BRAIN

Students and adults are more likely to buy into a concept that's grounded in science. Knowing how the brain works can motivate students because they can see that effort and practice can pay off with a better brain.

Main point: Every brain is capable of growing stronger.

TEACH GROWTH MINDSET TRAITS

Educators have to teach mindset vocabulary so students thoroughly understand the traits that contribute to a growth mindset.

Main point: Knowing the traits that go along with a growth mindset provides a clearer path to that mindset.

USE AND TEACH GROWTH MINDSET TALK

Teacher talk needs to provide a positive environment that reinforces a growth mindset. The language students hear greatly impacts the kind of mindset they have. Teach students what to say to themselves, and others, to transform their own thinking from a fixed to a growth mindset.

Main point: The right kind of talk motivates and inspires students to keep learning; the wrong kind discourages effort.

USE EFFECTIVE FEEDBACK

Effective feedback gives students knowledge/skills they can use on the current assignment and apply in future work.

Main point: A growth mindset means students believe they can learn with effort; in order to actually develop as stronger leaners, they need feedback with strategies for improvement.

ENVIRONMENT

ACTIVITY 9: GROWTH MINDSET STRATEGIES

- ❑ Review the strategies and decide which strategy fits best (FOR YOUR CLASSROOM) for each of the statements below:

I could:	Strategy #
Use this strategy in my class tomorrow.	
Teach students this strategy and ask them to start using it next week.	
Share this strategy with parents and ask them to use it at home next month.	

- ❑ Compare your answers to those of others in your group.

1. S.E.A. of Attribution — Instead of praising intelligence, focus on the SEA of Attribution and praise **strategies**, **effort**, and **attitude**.

- **Strategies** example: *"You tried so many **strategies** on that problem until you found the solution."*
- **Effort** example: *"You refused to give up! That extra **effort** will help you succeed again and reach your goal."*
- **Attitude** example: *"Before you began, you thought you could do it. That positive **attitude** helped you succeed."*

2. Grading for growth — When students don't master specific content, instead of a grade, give students a "*Not Yet*," or something similar, until they can show mastery and get a regular grade.

3. Pre-tests reinforce a growth mindset — *"Make students' progress explicit by giving pre-tests at the beginning of a unit that purposely cover material students do not know. When students compare their inevitably poor performance on these pre-tests with their improved performance on unit post-tests, they get used to the idea that, with application, they can become smarter."*

Source: Educational Leadership, "Even Geniuses Work Hard" by Carol S. Dweck

4. Welcome mistakes — Help students understand that the brain grows most when making mistakes and facing challenge. Make it clear that mistakes are expected in order to learn. Once a week reflect on the "best mistake" made and what was learned from it. Support them when they take risks and focus on progress rather than comparing to others in the class.

5. Reframing challenge — *"When presenting learning tasks to students, the teacher should portray challenges as fun and exciting, while portraying easy tasks as boring and less useful for the brain. When students initially struggle or make mistakes, the teacher should view this as an opportunity to teach students how to try different strategies if the first ones don't work—how to step back and think about what to try next, like a detective solving a mystery."*

Source: Educational Leadership, "Even Geniuses Work Hard" by Carol S. Dweck

6. Identify and reinforce growth mindset traits — Point out times when the students and you are using positive traits that accompany a growth mindset, for example, facing failure, resilience, and perseverance. Help students understand that we all struggle and make mistakes. When possible, then share how you worked to overcome a problem. NEVER reinforce a fixed mindset with, "I never could do _____ either."

7. Break down "I can't…" — When students get bogged down and fixed, back them up to review what they CAN do. Review content or the process to find the point of difficulty. From there ask them questions that point them in the right direction and help them vocalize the process. Keep asking "why" throughout to get them to explain their thinking.

ACTIVITY 10: SUMMARIZE THE CONTENT

- ❑ The summarizer shares 3 facts, concepts, or ideas gained from this section of the workshop.
- ❑ The timekeeper allots 5 minutes.

Feedback actually increases connections in the brain. Feedback gives the learner a chance to take in information about his/her knowledge and performance and make necessary adjustments to improve.

Remember the old saying, “Practice makes perfect?” In reality for the brain, the correct saying is that “practice makes permanent.” Students who have quality feedback on their learning can address mistakes and increase understanding.
"Continued attempts for mastery require that the performer always try … to correct some specific weakness, while preserving other successful aspects of function.”

Cambridge Handbook of Expertise and Expert Performance, Edited by K. Anders Ericsson

It’s “deliberate practice” that makes perfect.
“Deliberate practice entails more than simply repeating a task… Rather, it involves setting specific goals, obtaining immediate feedback and concentrating as much on technique as on outcome. These researchers have spent years studying expert performers in all kinds of areas and found what made experts was focus on improvement through deliberate practice and time devoted to improvement.”

Cambridge Handbook of Expertise and Expert Performance, Edited by K. Anders Ericsson

Feedback is one of the factors identified as having a high impact on student achievement or a high effect size. An approximate effect size for quality feedback is .81, and 0.60 — 2.00 means this factor can lead to extreme positive effects. *Source: Eric Jensen, Game Changers: Brain-Based Teaching for Change Agents*

ACTIVITY 11: CLASSIFYING FEEDBACK SAMPLES

- ❑ Follow the facilitator’s lead as the whole group works through some of the samples.

Once small groups are working on their own:

- ❑ The leader designates the first reader.
- ❑ Review the first sample together and decide if it is an **example** or **non-example**. Circle the appropriate answer.
- ❑ Change a non-example to be an example.
- ❑ Continue with the same pattern for the rest of the summaries.

Characteristics of Effective Feedback		
A. Feedback is TIMELY AND ONGOING — Needs to occur as soon as possible; when learning a brand new skill, the feedback needs to be more immediate; students shouldn’t practice the wrong way, or that will become hard to undo *(One modification for special-needs students is to shorten the time lapse between answer and reinforcement.)*		
Sample: The teacher uses technology for quick grading of formative assessments so students get feedback on their responses immediately. This allows students to ask for more help, gives the teacher the opportunity for a short re-teaching session before class is over, or allows the teacher to adjust instruction for the next class. Quick grading on multiple-choice also allows more time for conferencing about more complicated assignments and provides an item analysis for teachers to see whole-class results. *Note: There are many free or inexpensive options.*	**example**	**non-example**
Is this feedback **timely and/or ongoing**? If not, how could it be?		

B. Feedback is ADVANCING TOWARD A GOAL — Most feedback is given in response to a product, but students also need to view it as information that will move them forward. They need to be able to react to the feedback by improving their work.		
Sample: Mariah's goal is to improve her MAP reading score by ten points by the end of the semester. *"Looks like you have improved by five points, but you still need to improve by five more points."*	**example**	**non-example**
Will this feedback help a student **advance toward a goal**? If not, how does it need to be changed?		
C. Feedback is SPECIFIC — Gives details about what is observed; is **not** vague like "good job" or "keep it up," or just a grade; uses the language of the standards or scoring guide, as appropriate; is clear on what/how to improve		
Sample: Teacher writes on quiz: *+19/20 I can tell math is no problem for you.*	**example**	**non-example**
Is this feedback **specific**? If not, how could it be?		
D. Feedback is FREE OF JUDGMENT — Is part of an effort to improve; is **not** praise like "good work," grades, or criticism like "unacceptable"		
Sample: *"This is a weak project. Your initial thesis is confusing, and the evidence you provide is all over the place. It doesn't look like you even tried to do a good job."*	**example**	**non-example**
Is this feedback **Free of Judgment**? If not, how does it need to be changed?		
E. Feedback is AVAILABLE FROM A VARIETY OF SOURCES — Not just from the teacher; could come from other adults, students, or as a self-assessment; from criteria on a checklist or scoring guide. On their own, teachers can't give feedback the way students need. Students must be taught how to self-assess; peers must be taught how to give meaningful feedback.		
Sample: Before the student-teacher writing conference, the teacher has a peer review process set up. The peer group compares the author's purpose and scoring guide against the author's work and points out to the author where the purpose was best achieved and not achieved.	**example**	**non-example**
Is this feedback **available from a variety of sources**? If not, how does it need to be changed?		
F. Feedback is USER-FRIENDLY AND CONCISE — Is easily understood and not overwhelming; encourages students to keep trying		
Sample: *Situation* — A student is preparing a display of science project findings. The purpose the students have been given for the assignment is to interest people in the project and to describe the facts discovered in the experiment. *Feedback* — The teacher puts notes on the display board saying: "The board is teeming with information, the font sizes are distracting, there is too much data on each page, and your descriptions are perplexing and overwhelming. Look at the scoring guide again and see what you have done poorly."	**example**	**non-example**
Is this feedback **user-friendly and concise**? If not, how does it need to be changed?		

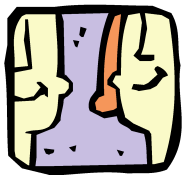
ACTIVITY 12: MAKING FEEDBACK MEANINGFUL

You will watch a video about Sean McComb, a high school English teacher in Baltimore, Maryland. His goal is to provide targeted and differentiated feedback based on needs demonstrated in students' first drafts. He states multiple times in the video that his responsibility is to prepare students to be more independent learners.

McComb's assignment to these high school sophomores is to create a blog for an inquiry project on social justice. The workshop begins with a mini-lesson on opening sentence techniques, which he identified as a need in student drafts.

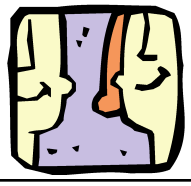
- ❑ Review the chart below to find the "look fors" during the video.
- ❑ As you watch, take notes under each heading.

Types/Modes of feedback	Purpose/goal of feedback	Structures to keep students productive



Small group discussion after Part 1 of video:

- How does Sean McComb use questioning as an effective tool?
- How does feedback make students more independent?



Small group discussion after Part 2 of video:

- What other modes and structures for effective feedback have you experienced?
- What other ideas can you share for balancing work and life while still maintaining quality feedback?

ACTIVITY 13: PULLING IT TOGETHER

- ❑ On the facilitator's signal, participants will take their booklets and walk ten steps to find a partner.
- ❑ With your partner, discuss each of the examples of feedback from the video.
- ❑ Connect each example below with one of the characteristics of feedback we covered earlier.
- ❑ In the right-hand column, write the letter of the characteristic that each example covers.

A. Feedback is timely and ongoing
B. Feedback is advancing toward a goal
C. Feedback is specific
D. Feedback is free of judgment
E. Feedback is available from a variety of sources
F. Feedback is user-friendly and concise

EXAMPLE FROM VIDEO	CONNECTION TO CHARACTERISTICS OF EFFECTIVE FEEDBACK
McComb highlights sections of text and provides written feedback on students' first drafts.	
During the mini-lesson on varying sentence beginnings, he asks the class to give a "degree of thumb" to gauge	

their understanding and readiness to begin independently.	
McComb uses models/resources as feedback	

ACTIVITY 14: PRACTICE GIVING FEEDBACK

- ❑ Work in groups of three.
- ❑ Quickly decide which of the two student sample pieces you will use.
- ❑ Decide who will be the: Student, Feedback Provider, and Observer.
- ❑ Make sure each person has 1) the *Student Sample* and 2) the criteria for *Communicating with an Audience through* ***Idea Development***.
- ❑ Follow the directions below for your role:

Step	Student	Feedback Provider	Observer
1 2 min.	Silently read the sample piece (this is "your" writing)	Silently read the criteria for *Communicating with an Audience through* ***Idea Development***	
2 2 min.	Read "your" writing aloud	Follow along on the hard copy	
3 2 min.	Playing the role of student, participate in the discussion with the feedback provider	Provide feedback to the student	Observe and check the kind of feedback you see; record one specific feedback example
4 2 min.	❑ Discuss which characteristics were used in the feedback discussion.		

OBSERVATIONS		
✔	**Characteristics of Effective Feedback**	**Give One Example**
	Specific	
	Free of judgment	
	User-friendly and concise	
	Advancing toward a goal	**Not applicable for this practice activity**
	Timely and ongoing	
	Available from a variety of sources	

Personal Reflection: What did you learn from this experience to help improve how you give feedback?

ACTIVITY 15: FEEDBACK STRATEGIES

- ❑ Read each strategy on your own.
- ❑ Select the strategy you are most effective at using and mark it **S** for STRENGTH.
- ❑ Select the strategy where you NEED the most IMPROVEMENT and mark it **NI**.
- ❑ On the facilitator's signal, walk to find a partner.
- ❑ Each partner shares a strength **(S)** and **WHY** it's a strength.
- ❑ Then, share the needs improvement **(NI)** strategy and **HOW** you could improve.

1. Feedback is part of the learning — Explain (to students and adults) and reinforce the purpose of feedback. Change the mindset from getting assignments "done" to using the experience to grow and learn. Feedback is about the learning process and the ability we all have to improve. Feedback is not about what a student did wrong; it's the opportunity to know for sure what a student did well and in what specific direction a student can continue to develop.	
2. Formative assessments *(NOT to be used for grades)* **—** Use formative assessments regularly to check student understanding. Without formative assessments, ongoing and effective feedback isn't possible. Some easy ways to formatively assess and give feedback include: ● **Review and check** — Simply stop to review material by having 2-5 questions for student response. This retrieval practice helps students better remember content and gives the teacher a chance to provide some quick feedback. You can use paper and pencil, wipe-off boards, or technology like Gradecam, Socrative, or Poll Everywhere for immediate feedback and data for teacher use. ● **Flashbacks —** Give multiple-choice or short-answer questions for review at the beginning of each class. The questions should review prior skills/content. This type of daily review keeps the content fresh and, using high-tech or low-tech means, allows tracking of student retention. Use the information you can gain to plan for reteaching and/or extension. ● **Ending review (or Exit Slips) —** During the last five minutes of a class, pose one or two questions for students to answer. Use index cards or post-its, or make it higher-tech with a program like the ones mentioned above. Collect and review the student responses, prepare feedback for students, and organize for re-teaching.	
3. Peer feedback — Teach students how to give and receive peer feedback. Model what specific, constructive feedback looks like and sounds like. Have students practice giving each other feedback, and continue practicing until students master those skills.	
4. Self-assessment — Teach students how to provide their own "feedback." Model and reinforce how to: ● Use the language of scoring guides to identify their own strengths and areas for improvement. ● Use established criteria to explain why their work meets the criteria. ● Apply others' feedback to identify needed improvements and to set goals.	
5. Wrong-answer analysis — Lead students in meaningful wrong-answer analysis, or have the students work in small groups to analyze wrong answers. Conference with students about what they missed, and reteach to correct their misconceptions. Complete this analysis in a way that isn't like a rote activity but is an engaging learning experience.	

Individual Classroom Ideas

- Take every opportunity available for on-the-spot mini-conferences with students. (Reinforce what you talk about with a quick note jotted down as you talk.)
- When quiet is needed, use a clipboard with post-it notes to make notes of feedback for students; simply put notes on students' desks during class.
- Create scoring guides with your class so they internalize the standards and are more independent in their quality checks.
- Have self-checking answer keys available so students can identify where they are having problems and then ask for help.
- Set up routines for peer conferences and peer reviews to check for accuracy; work that is part of the learning process shouldn't be given a grade.
- Establish an "Expert of the Day" – have students check with the "expert" when they have content questions.
- Instead of trying to figure out on your own what students need or how to reach them, go to the source. Ask students for help: "What would help you learn this content?"
- Don't accept work until it is high quality — quality work is more important than a large quantity of work. If work isn't up to standard, give specific feedback and let students have another attempt before spending the time fully grading it.

Ideas That Require School/District Support

- Give teachers release time from extra duty to analyze student work.
- Have classified staff or subs monitor students during classroom tests. Teachers use the time analyzing student work and planning instruction.
- Shorten class periods and create an extra period to review or re-teach concepts or provide enrichment.
- Use faculty meetings for student work analysis and discussions about instruction and learning.
- For those who tutor, train them how to provide quality feedback. Teachers, parents, and students can work within formal tutoring programs to help struggling students.

ACTIVITY 16: SUMMARIZE THE CONTENT

- ❑ The summarizer shares two facts, concepts, or ideas gained from this section of the workshop.
- ❑ The summarizer asks each person around the table to share one fact, concept, or idea gained.
- ❑ The timekeeper sets a timer for 5 minutes.

ACTIVITY 17: DO MORE, DO LESS

What should students experience MORE? What should they experience LESS?

Shuffle the cards and deal them out among your small group members.

Put the heading cards on the table.

STUDENTS SHOULD DO MORE… **STUDENTS SHOULD DO LESS…**

Take turns reading the cards and decide as a group if students should do more or less of those kind of experiences. (Remember that LESS doesn't mean never; it means less.)

After you finish, you can check any cards you were unsure of against the answer key in the back of this booklet.

ACTIVITY 18: UNDERSTANDING STUDENT ENGAGEMENT AS COGNITIVE ENGAGEMENT

The leader should assign the three parts of reading below to different members of the group.

After reading, the leader should lead the group to discuss:

Look back at your "Do More" cards from the last activity. If kids are doing more of these things, will they be engaged?

A. Education experts and practitioners define student engagement in many different ways. One misnomer is that engagement refers only to students being on task and busy in their work. Actually, there's more to it.

Student engagement has two layers; students who are engaged are:

- participating in an activity, discussion, etc.
- making meaning from their learning experience

B. For true learning, students can't be passively "receiving" information from the teacher; simply being busy isn't enough. Students need to be making meaning with activities like the following:

- reflecting on, or processing, information
- creating a product or proposal
- solving a problem
- evaluating a situation
- demonstrating thinking
- discussing or debating a topic
- answering "what if?" questions
- discovering patterns
- connecting to real experiences, real life

C. This higher level of engagement is also called "cognitive engagement" or "cognitive challenge" in the *Framework for Teaching* used to guide teacher performance in PGES. *("Cognition" is the general term for a person's ability to process information — evaluate, analyze, compare, connect, etc.)* The Framework states that the distinction lies with whether *students are developing their understanding through what they do.*

ACTIVITY 19: LEVELS OF ENGAGEMENT

As you read before, the *Kentucky Framework for Teaching* distinguishes how cognitive engagement is different. The purpose of this activity is to distinguish among classroom experiences that promote different levels of engagement. You will be matching each activity (in a set of three) into the categories below.

- ❑ Work in groups of about 4.
- ❑ From the card set, the leader pulls these category headings and places them on the table:

Participation	Active Engagement	Cognitive Engagement

- ❑ The leader deals out the rest of the cards to everyone in the group.
- ❑ The facilitator will go through one example with you.
- ❑ Continue with categorizing the set of cards for #1 through #3.
- ❑ The timekeeper should allot 5 minutes.

ACTIVITY 20: STUDENT ENGAGEMENT STRATEGIES

- ❑ Read each strategy on your own.
- ❑ Select at least one strategy to label with each letter:
  - **T** for…Could be done **TOMORROW** (no materials, planning, or further study needed)
  - **P** for…Will require **PLANNING/PREPARATION**
  - **A** for…Will require **ADDITIONAL** professional learning, support, coaching
- ❑ Share any one of the strategies you marked with your full group.

1. Cognitive engagement any time — Teach students how to engage themselves cognitively. As part of teaching students to be the leaders of their own learning, they can increase the cognitive level of a low-level classroom activity, television-watching experience, field trip, etc., by: ● Asking mental questions ● Making connections to previous learning ● Evaluating the information to see if it supports previous understanding or challenges it	
2. Active formats for discussion — ● **Human graphs —** Have students respond to any statement by forming a human graph. For example, ask the question, "Can all forms of physical change on the Earth's surface be measured?" Students then form lines to represent their thinking—Agree, Don't Know, Disagree. After students select a line, have each student turn to a partner and explain why the particular line was selected. Have one person from each line explain why he/she chose that line. After hearing the explanations, allow students to change lines. Finally, take note of the final graph and send the students back to their seats. ● **Four Corners —** Ask students to react to a series of statements about a topic of study. (For quality discussion, statements need to be on topics where students will have a variety of opinions.) Students move around the room to show their level of agreement or disagreement with various statements relating to the topic.	
3. Quick engagement strategies — These quick strategies will promote more activity and social participation in a lesson. The content and tasks will determine if students are cognitively engaged: ● Guided practice with partner or team ● "Repeat after me" (working memory) ● Partner quiz and discuss ● Write this in your own words or write a 4-5 line summary paragraph (processing) ● Role play/practice new learning	

4. Discussion technology — Extend class discussions by creating a blended environment that allows teachers and students to participate in physical and online conversations. This setting provides more communication opportunities and allows students to interact beyond the classroom with thoughts or opinions, creating a different way for students to be involved in learning. Use one of the following or a similar program. In TodaysMeet, https://todaysmeet.com, teachers create private chat rooms so that students may ask questions or leave comments during class. Padlet, http://padlet.com, is a digital bulletin board where students can share thoughts, pictures, videos, and links.	
5. Initiating friendly debate — Differences of opinion help to engage and maintain student interest while also digging deeper into content. Below are some ways to structure debate and discussion. a. Class vote — Students vote on a particular topic, such as whether to switch from an income tax to a flat tax. To make it productive, students must explore both positions before and after the vote and be open to changing their minds. b. Debate model —Teachers also can structure a formal debate to motivate productive controversy. Include time for presenting arguments, cross-examining, and making rebuttals. c. Town hall meeting — Unlike a debate, the purpose of a town hall meeting is for students to hear about an issue from a variety of perspectives. The teacher provides a packet of background material and then creates different roles for students to play during the meeting.	
6. Jigsaw group discussion — This structure engages students and holds them accountable. 1) Students are in their initial group, and each student is given a different topic on which to become an "expert." 2) Students leave that group to go work with the other "experts" on the same topic to learn and discuss their thoughts. 3) Students return to their original group to present their expert findings and teach the non-experts to understand the topic as well as the expert.	

RESOURCE

If you are asking yourself, *"What does this all look like in my classroom?"* use the following checklist as a self-assessment or planning tool when developing experiences for students.

Elements of an Engaging Classroom	
Lesson Plan Elements	**Classroom Environment Elements**
❑ Level of academic challenge (cognitive engagement)	❑ Positive interactions (teacher-student; student-student)
❑ Active and collaborative learning (all students are accountable and working together)	❑ Students persist in challenges (growth mindset)
❑ Meaningful learning experiences (focused on clear standards, problem-solving, inquiry-based)	
❑ Activities/tasks are personally relevant to students	
Evidence to look for: ❑ What are the students being asked to do? ❑ What are students saying as a result of what the teacher has done or has planned? ❑ What are students doing as a result of what the teacher has done or has planned?	

ACTIVITY 21: SUMMARIZE THE CONTENT

- ❑ The summarizer shares 3 facts, concepts, or ideas gained from this section of the workshop.
- ❑ The timekeeper should set a timer for 5 minutes.

Cognitive skills are the basic mental building blocks that enable us to think, study, and learn.

ACTIVITY 22: JIGSAW OF COGNITIVE SKILLS

- ❑ To jigsaw the below information, the Leader assigns each participant in the group A, B, C, D, or E. Try to divide the reading as equally as possible, depending on the number sitting at your table.
- ❑ Each group member reads the information assigned and makes note of how that cognitive skill affects learning. Be prepared to teach the rest of the group. (Timer — allow 5 minutes for preparation)
- ❑ The group leader should allow each person 1 minute to teach his or her cognitive skill(s) and share the connection to learning.

Cognitive Skill	Description
A. Processing	Taking in information and interpreting it for use
☐ Auditory processing	Analyzing and interpreting sounds in words
☐ Visual processing	Analyzing and interpreting visual images
☐ Processing speed	Speed at which a student can read a passage and understand the point, take directions for a task and know what to do next, or hear a question and formulate an answer
How does processing affect learning?	
B. Reasoning	Consciously making sense of things; establishing facts, applying logic, examining a problem, organizing questions and thoughts to create solutions, and then testing those solutions
How does reasoning affect learning?	
C. Attention	A student's ability to focus and concentrate on incoming information
☐ Sustained Attention	Ability to remain focused and on task, and the amount of time we can focus
☐ Selective Attention	Ability to remain focused and on task while being subjected to related and unrelated sensory input (distractions)
☐ Divided Attention	Ability to remember information while performing a mental operation and/or attending to two things at once
How does attention affect learning?	
D. Memory	Ability to encode, store, retain, and subsequently recall information and past experiences
☐ Working memory	Absorbing and retaining information in order to process and use it; temporary recall; some examples include mental math, following directions, remembering a new phone number
☐ Long-term memory	Being able to retrieve information from previous learning; average capacity limitless; average duration up to a lifetime (*short-term memory becomes long-term with the right conditions)*
How does memory affect learning?	
E. Executive Functioning (a broad category that often includes others listed above)	Ability to use mental skills/processes that help you get things done: manage time, plan, switch focus, self-regulate, be flexible, think logically, problem solve, etc.
How do executive functions affect learning?	

Educators cannot ignore the research: teaching cognitive skills can have an effect-size of 0.69. Eric Jensen, renowned educator, author, and researcher promotes the need to *"foster fluid intelligence, or students' ability to use learned skills and thought processes to reason and solve problems in new, unfamiliar contexts."* In his book, *Engaging Students With Poverty in Mind*, Jensen identifies five actions to build student's cognitive capacity, which connects to the five cognitive skills defined previously. Jensen's book also provides many engaging strategies to build students' thinking and learning skills.

ACTIVITY 23: COGNITIVE SKILLS IN THE CLASSROOM

- ❑ The facilitator will divide participants into five groups.
- ❑ Each group will be assigned one of the actions identified by Eric Jensen to build cognitive capacity.
- ❑ Choose a leader for each group.
- ❑ The leader should divide up the strategies (to be read to the small group) in the assigned section.
- ❑ The leader should lead the group to select one example in the chart to demonstrate for the group.
- ❑ The leader should ensure that roles are assigned for the demonstration and everyone is involved.
- ❑ Each group demonstrates their strategy for the whole group.

Build Attention Skills (Cognitive Skill: Attention)
Create a hook — Start lessons/activities with something unique like a teaser or hints to get students to pay attention. Some examples: ▪ *"The last class only completed five of these problems."* ▪ *"I'm obsessed with these characters."* ▪ *"This is my favorite lesson of the year. You are going to love this!"* ▪ *"You aren't going to believe the parallels in the two events we will study today."*
Use prediction — Ask students to make a prediction before the lesson. At times, offer an incentive if their prediction is correct. Prediction makes the brain care about the content because everyone wants to be right.
Use fast physical energizers — When the body moves, it raises the brain's levels of norepinephrine, a neurotransmitter that increases attention and focus. Simon Says, Red Light/Green Light, Freeze, and Follow the Leader are easy for younger students. For older students use activities like "walk and talk" where students are brainstorming, reviewing, or discussing while walking with a partner.
Use redirects — Ask students to redirect their attention by asking them to: find a partner, turn and talk, stand beside their desk, etc. Students will pay attention more if they anticipate the teacher telling them. *"Quickly find a partner…"*
Provide practice — Sustained quality practice enhances students' ability to pay attention (i.e., playing an instrument, piano scales, creating artwork, memorizing lines).
Conduct quick writes — Assign quick writes two to three times a week so that students can focus their attention on one topic at a time without slowing down for edits. This practice builds general attention as well as writing fluency.

Teach Problem Solving and Critical Thinking (Cognitive Skills: Reasoning & Executive Functioning)
Model and scaffold the process — Introduce a real-world problem that is relevant for students. ▪ Guide students through the steps, explaining as you go. ▪ Post the process for students to see and follow steps. ▪ Allow time for students to practice a new problem, implementing the process. Give students feedback on errors and misconceptions. (Group/team problem solving can be effective at this point.) ▪ Give students independent practice on implementing the model.
Foster collaborative problem solving — In pairs or cooperative teams, students can discuss a process or the best way to solve a problem. Require students to record the steps they follow.
Create competition — Assign one problem for the whole class to solve, but allow teams to select their method/process before they see the problem. This works especially well in math where students might approach problems differently (e.g., draw a diagram, work backwards, use a formula, make a table/chart).

Develop Processing Speed (Cognitive Skill: Processing)
Use Show and Shout — To encourage faster math processing in elementary students, have groups of three to five students stand in a circle. On the teacher's cue—the word "SHOW"—students hold up 0-5 fingers on one hand. Everyone in the group adds the total and "SHOUTS" the answer. The winner is the first student with the correct answer. Vary the number of students in the group and the calculation to add 1-10 (two hands) or to multiply. Younger students can order the numbers from lowest to highest. Older students can create proper fractions (one hand on top of the other) and order them least to greatest. To reduce competition, have a group leader give a signal before everyone shouts his/her answer.
Create a Learning List — To improve language arts processing, students can work individually, in pairs, or in small groups to create a list from a chapter or book. The list could include: 1) characters or key ideas 2) questions to build comprehension 3) comments about the content (i.e., theme, personal connections) 4) things that students question or need clarification Have partners or teams share with one another after the given time.
Post Scramble Stories — Post 4-5 sentences from a paragraph in a scrambled order. Students rewrite the sentences in order to make sense. Students check their work with partners and discuss why they put sentences where they did.
Use Posted Models — Posted models help guide students and internalize a process. Use the writing process for writing, steps for problem solving in math, and even steps for dealing with stress.

Foster Self-Control (Cognitive Skill: Executive Functioning)
Calendar Wait Time — To foster think time and exercise impulse control, use the date on the calendar to determine how many seconds students must wait before raising their hand. For example, if it is the 11th day of the month, students must wait 11 seconds before raising their hands. Create a teacher signal to let students know they may raise their hands. You don't want kids counting seconds instead of thinking about an answer.
Use Reverse Active Cues — In the clapping exercise used for working memory, have students clap twice when you clap once and clap once when you clap twice. They have to delay their immediate response and use their working memory to remember the "rules" and sequence. Start with easy tasks and work up to short rhythms. Use variations such as clap three times means to actually clap four times.
Teach the Power of Micro-Goals — Tell students the next task they will be involved in — choosing a partner, going to stations, getting started on practice, etc. Ask them to delay starting by 10 seconds. Once the 10 seconds are up, ask them to wait another 10 seconds. Teach them strategies such as closing their eyes, redirecting their energy (swing your legs), or entertaining themselves. These micro-goals will help students practice setting small goals and delaying gratification, which fosters self-control.

Train Working Memory (Cognitive Skill: Memory)
Practice recall — Boost listening skills and working memory by playing Simon Says or doing the clapping game (clap a simple rhythm and have students repeat; increase complexity as students master).
Word Basket — In small groups of four to six, ask students to generate a review of vocabulary before or after a lesson. Ask each student to generate a word related to the content (e.g., slavery). The next student repeats the word they just heard and adds another (e.g., slavery, emancipation).
Chunk Reviews — Similar to the activity above, students are given time to stop during a lesson and review with a group of three to four. In this case the first student states a fact or concept; then, each student around the circle repeats what they heard and adds a new fact. This activity can be done throughout lessons to allow students to retain and process new information.
Direction Repeat — Give directions to the whole class, and then have students repeat the directions to a partner. Start with one or two steps to train students to articulate fewer directions at a time.
Card and board games — Have students play games that require working memory, from simple games like Memory, Uno, Go Fish, Set, Qwitch, and Blink, to more complicated games like Authors and chess, where students have to hold a plan for offensive moves in their head while also thinking about how an opponent might respond to the moves.
Attention and focus — Show students how to increase their own focus and improve working memory: ● Don't multi-task. ● Involve your senses — create pictures, read aloud, close your eyes and repeat what you heard, connect to colors and smells, etc. ● "Chunk" information—group information in order to hold it in working memory.

Source: Eric Jensen, *Engaging Students With Poverty in Mind,* 2013

ACTIVITY 24: WORKING MEMORY

The key cognitive skills listed above are skills that range from simple to complex, but all are essential for learning. They have more to do with how we learn, remember, solve problems, and focus attention than with content knowledge. Because these abilities are based on networks in the brain, we know they can improve and become stronger with instruction and practice.

All the cognitive skills are important, but *working memory* has been recognized as an area of deficit for many struggling students. In various studies the effect size for increasing *working memory* ranges from 0.72-1.41. So improving *working memory* has **extreme positive effects** on student achievement.

Working Memory, when tested at age 5, was a far greater _____ of student success at age 11 than IQ.

In a decade of studying the link between brain function and education, w_____ m_____ is the number one predictor of learning s_____.

Source: Investigating the Predictive Roles of Working Memory and IQ in Academic Attainment by T.P. Alloway and R.G. Alloway

ACTIVITY 25: EXAMPLE OF WORKING MEMORY WARM-UP

- ❑ The facilitator will lead the group through an example of a working memory warm-up that could be used at the beginning of class to increase processing speed and working memory, focus attention, and engage students.

Using a Deck of Cards for Cognitive Skill Building
Take a deck of cards (or you could use *Blink*) and hold them up to flash the cards to the students. Have them name the cards they see starting with the number. (Easy) On the second round, have them name the color. On the third round, name the suit. (Easy)
On the next round, have them alternate what they are naming. For example name the number of the first card, then the color of the second card. (Moderate)
Increase complexity by alternating naming number, color, suit. (Hard)
Other variations:
Remove the face cards from the deck. As you show students the cards, they have to add one or subtract one when they see a card. (Ex: You show 4 of diamonds, and they must say 5.)
Alternate adding and subtracting by having them add one to the first card, subtract one from the second card, etc.
Create other warm-ups by varying sequence with number, color and suit. Having them work with three variations at once helps them to chunk as they work to remember.

For more in-depth training in cognitive therapy, visit **Equipping Minds** at www.equippingminds.com. Equipping Minds, a non-profit organization located in Danville, offers workshops, on-site trainings, video/workbook series for purchase, and individual brain training.

ACTIVITY 26: SUMMARIZE THE CONTENT

- ❑ The summarizer shares two facts, concepts, or ideas gained from this section of the workshop.
- ❑ The summarizer asks each person around the table to share one fact, concept, or idea gained.

- ❑ The timekeeper allows 5 minutes for summarizing.

Kinds of relationships important to students at each level:	Grade Levels
Foundation — Students need to know they are cared about and supported.	**K-12**
Peer affiliation — Students need social interaction and belonging.	**3-12**
Status building — Students need recognition and status among their peers.	**6-12**
Based on Eric Jensen, *Game Changers Brain-Based Teaching for Change Agents*	
Relationships: Approximate Effect Size .72	

ACTIVITY 27: RELATIONSHIPS AND THE FRAMEWORK FOR TEACHING

The *Framework for Teaching* used in PGES is clear about the need for positive relationships between students and teachers and also among students.

- ❑ Have the leader designate a reader for the description below.
- ❑ Give table members 45 seconds or so to silently highlight examples of teacher-student and student-student relationships.
- ❑ Then have each group member around the table share an example.

Framework for Teaching

Domain 2A: Creating an Environment of Respect and Rapport

An essential skill of teaching is that of managing relationships with students and ensuring that those among students are positive and supportive. Teachers create an environment of respect and rapport in their classrooms by the ways they interact with students and by the interaction they encourage and cultivate among students. An important aspect of respect and rapport relates to how the teacher responds to students and how students are permitted to treat one another. Patterns of interactions are critical to the overall tone of the class. In a respectful environment, all students feel valued and safe.

ACTIVITY 28: CLASSIFYING STRATEGIES

- ❑ With the facilitator, the whole group will do examples first.
- ❑ Then with your small group, classify the kind(s) of relationships that could be strengthened by each strategy.

STRATEGIES FOR BUILDING RELATIONSHIPS **This strategy would promote which kind(s) of relationship?**	Foundation	Peer	Status
A. Establish and hold classroom meetings — Create an effective setting for practicing social skills such as active listening, negotiation, and respectful disagreeing.			
B. **Honor students' interests equally** — Show interest and respect for all students' extracurricular and outside hobbies. Connect student interests to learning when possible so students can share knowledge and expertise.			
C. **Listen to the students —** Many students feel that no one listens to them—not parents, not teachers, and not even their friends. Even the seemingly little things are big things. If adults in the school can listen to the students with open-minds and open-hearts, that will be a great gift in their lives.			
D. **Acknowledge the students —** Thank them for big and little things. Thank them for being in your life. Appreciate little things they do. Give verbal praise, write notes, give hugs and smiles. Let them know that they're special.			
E. Create personal digital stories — When students create personal digital stories about their interests or aspects of their lives, they share themselves with other students. By sharing their stories, both during the making of their digital story and during its presentation, students can establish connections and new relationships. They get to know each other at a deeper level and also receive helpful feedback to enable self-reflection.			
F. Create random groups — When appropriate, use random groupings in which all students work in a group, or as a pair, with all other students throughout the year. This makes it more likely that students will get to know each other and have positive experiences together.			
G. **Include and empower the students —** Ask students for advice, let them participate in decision-making, and help them feel valued. Give options in how to do things as long as students are willing to produce results. Let students take the lead in areas where they have expertise.			
H. Incorporate authentic group projects — Students have an opportunity to bond, work towards a common goal, and share the satisfaction of achieving their group goal with a degree of autonomy and self-direction.			
I. **Learn about the students —** Get to know individual students. Have them fill out surveys that tell about themselves as people. Important questions you can ask are: What is it like for them as a student? What's important to them?			
J. **Make small concessions —** Grant some favors. Bring popular music to class. Do things that can make a big difference, even if it is letting class out thirty seconds early or giving no homework over the holidays; everything helps.			
K. **Model respect —** Include activities and strategies that include multiple cultures. Model understanding and respect for students, staff, and parents.			
L. Treat students as "possibilities" — Treat each student as a potential success, not as a past record. Consider the possibility of their greatness even if it is not evident at the moment or is currently disguised. Keep in mind that part of			

growing up is making mistakes and learning from them. Avoid seeing students as problems, and start seeing all students as grand possibilities.			

ACTIVITY 29: SUMMARIZE THE CONTENT

- ❑ The summarizer shares 3 facts, concepts, or ideas gained from this section of the workshop.
- ❑ The timekeeper will allot 5 minutes.

ACTIVITY 30: REVIEW

Complete the review from memory.
(Research studies show students who tested themselves retained 50% more than their peers who just reread the material.)

Review the answers with the facilitator.

REVIEW	
	Establishing a growth mindset in the classroom will directly affect (circle all that apply): Feedback to students Student attitude Student achievement Brain development College admission Effort
	Which of the following statements is true about feedback? a. Students cannot be effective in providing feedback to one another. b. Effective feedback is specific and encourages improvement. c. Written feedback is better than oral feedback. d. In order to improve, students need feedback from the teacher on everything they do.
	Engaging students goes beyond getting them actively involved. Other elements of student engagement include: Academic c_____ Active and c_____ learning M_____ R_____activities/tasks Student persists in challenges Positive i_____
	Increasing working memory, improving attention, processing, and executive functions are all a part of building c_____ s_____.
	Students need strong relationships with teachers and among _____. All students need to know they are c_____ about and s_____. Beginning around third grade, most students have a stronger need for social i_____ and b_____. Once students start middle school, there is more focus on r_____ and s_____ among their peers.

My personal commitment to action is:

Improving Long-Term Memory

1. Study skills help students transfer learning into long-term memory: (Based on *17 Scientifically Proven Ways to Study Better This Year*, www.thebestcolleges.org)

- **Retrieval practice** — Teach students how to "test" their knowledge by taking practice tests, completing study guides, or making up other ways to test understanding. Research studies show that students who tested themselves retained 50% more than their peers who just reread the material.
- **Active recall —** Have students exercise their memory after reading or studying content with *active recall* by closing the book and reciting everything they can remember.
    - *Read the text.*
    - *Recall as much of the information as you can on a free-recall test (perhaps writing down as much information as you can remember in a given amount of time).*
    - *Read the text again.*
    - *Complete another free-recall test.*
    - In order to cement long-term memorization, have students revisit the material again after they've seen the holes in what they remember.
- **Spacing reviews** — The first time you learn something new, if you review the material within 24 hours, you prevent yourself from forgetting up to 80% of what you learned. After a week it takes only 5 minutes of review to retain 100% of the information. It's more effective to study closer to the day you learned the material rather than to cram the day of the test.

2. Time for students to process and reflect — Build in time after a new idea is introduced for students to process the content.

- Use the partner talk (discuss with a partner) or think-pair-share (think on your own, discuss with a partner, then share with a larger group or the whole class) strategy to allow all students to be engaged. Allow students to ask for clarifications based on their discussions before moving on to the next part.

3. Brain movies (visualization) — Teach students to create brain movies as they read. When reading a paragraph, stop to discuss what they are seeing sentence by sentence. Make sure students understand the vocabulary before reading the selected passage.
http://www.edutopia.org/blog/brain-movies-visualize-reading-comprehension-donna-wilson

4. Memorization techniques — Teach students how to use these memorization tricks from www.mightymemory.com:

- **Visual images** — Use images that are ludicrous or out of the ordinary to make information easier to remember. For example, "thorns" for remembering the name Tony, "brine" (salt solution) for Brian.
- **Sentences** — The first letter of each word is part of, or represents, the initial of what you want to remember. Musicians, for example, first memorized the lines of the treble staff with the sentence, "Every good boy does fine" (or "deserves favor"), representing the notes E, G, B, D, and F. Medical students often learn groups of nerves, bones, and other anatomical features using nonsense sentences.
- **Acronyms** — initials that create pronounceable words. For example, the colors of the rainbow are ROYGBIV (for Red, Orange, Yellow, Green, Blue, Indigo, and Violet).
- **Rhymes and alliteration** — Do you remember learning "30 days hath September, April, June, and November"? A hefty guy named Benedict can be remembered as "Big Ben" and an obnoxious co-worker as "Pushy Paula" (though it might be best to keep such names to yourself).
- **Jokes** — Funny or peculiar associations using facts, figures, and names you need to recall; these are easier to remember than mundane images.
- **"Loci Method"** — This is an ancient method used by the Romans and an effective way to remember a lot of material, such as a speech. You associate each part of what you have to remember with a landmark in a route you know well, such as your way to work or stations along the subway or even the layout of your house.

Fixed

- IQ is a fixed, permanent trait
- Looking smart is important
- Effort is negative and shows I don't "have it"
- *(After a failure)* I feel helpless
- *(After a failure)* I'll avoid future tasks like it
- *(After a failure)* Invest little or no effort since I won't likely succeed
- *(After a failure)* I may have to cheat off someone smarter

Growth

- IQ is changeable and can be developed
- Being a learner is important
- Effort is positive and gives me more experience
- *(After a failure)* I feel resilient and have renewed energy
- *(After a failure)* I'll learn from my mistakes and improve
- *(After a failure)* Effort is a positive, because I have control over how much I apply. I may need to try again.
- *(After a failure)* I'll be better next time I try this.

1. According to Carol Dweck, a growth mindset occurs when students believe their **abilities** can be developed.
2. Conversely, a **fixed** mindset occurs when students believe they have a certain amount of ability and that's it.
3. Students with a growth mindset get higher grades because they engage deeply and effectively in the **learning process**.
4. Kids who are praised for intelligence do not want a **challenge** and do not want to work hard on tasks.
5. Brains grow by experiencing **mistakes** and struggle.
6. Instead of praising intelligence, concentrate on the following elements: ● Hard work ● Strategies used ● Ideas ● **Focus** ● **Perseverance** These are the ingredients of success.

STUDENTS SHOULD DO MORE…	STUDENTS SHOULD DO LESS…
Using knowledge to solve problems, create a design, or communicate information	Memorizing facts and formulas in isolation
Applying knowledge in the same way as in real-life	Applying knowledge in a way that could only happen in a school setting
Discussing/debating a topic or defending a new position	Discussion of ideas from a common perspective
Creating unique solutions to problems	Completing similar designs or solutions as other students
Solving problems with unknown factors and uncertain results	Solving problems with controlled parameters and routine solutions
Connecting ideas across content areas	Using knowledge in one discipline
Collaborating with others to create solutions	Gathering and storing information in isolation
Demonstrating thinking through writing/oral communication, performance, creation of a product	Answering recall questions

	Participation	Active engagement	Cognitive engagement
Ex.	Students label a worksheet on the water cycle.	In a small group students “pass the pen” to draw and label the water cycle. Using one piece of paper and one pen, students take turns adding to the water cycle. Each student explains what is being added.	Students explain how the water cycle would be affected if chemical runoff from a local factory is introduced to a stream.
1	Students read two opinion pieces about direct election and electoral college system.	In groups of four, each student writes one idea about what might happen if the American voting system allowed for the direct election of presidents (instead of the current electoral college system) on a brainstorming paper that gets passed around the table. Each student adds one idea to the paper until no more ideas can be added. Discussion follows about which ideas are plausible and will be shared with the whole class.	Students formulate a hypothesis about what might happen if the American voting system allowed for the direct election of presidents.
2	Students complete a workbook page on square numbers.	Students use tiles to show the difference between square numbers and non-square numbers.	Students use tiles to create a series of three square numbers and then write a formula for figuring the next three squares.
3	Students brainstorm cardiovascular exercises.	On whiteboards, students brainstorm cardiovascular exercises, then pass their boards to the next person to add another exercise.	Students brainstorm a list of non-cardiovascular exercises on index cards. Then they select one of the cards and write two ways to turn that into a cardiovascular exercise.