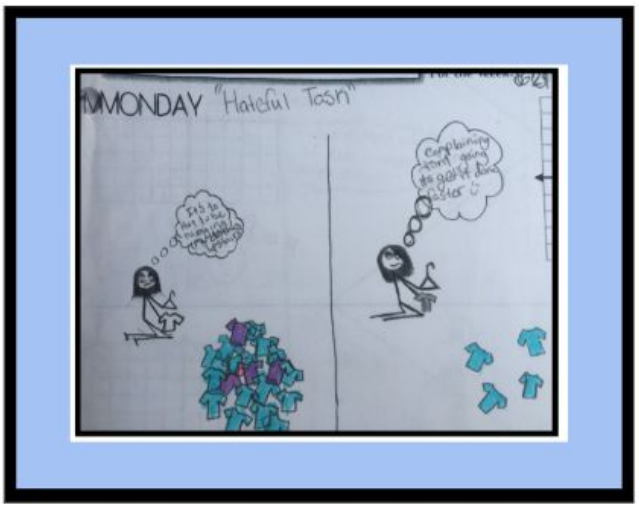
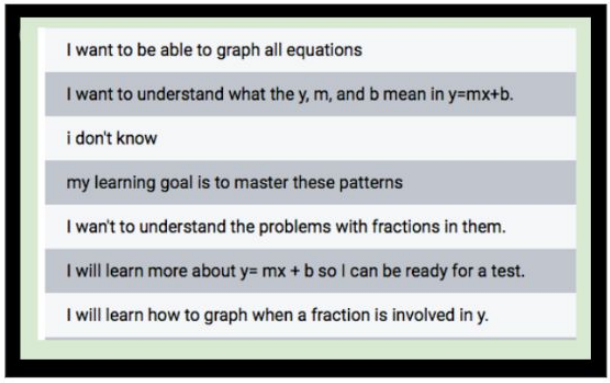
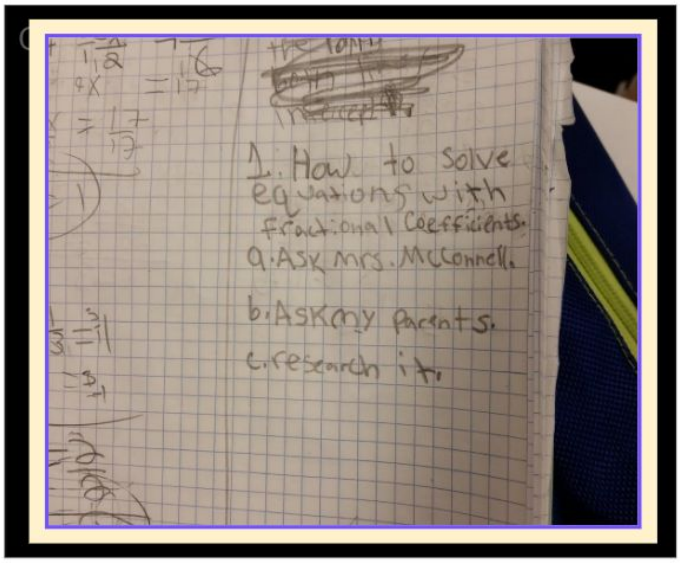
Small Goals Yield Big Rewards

Creating a Student-Centered Classroom Through Goal Setting







By

Denise Dedini, Christy McConnell and Cathy Sinnen

The following paper captures the results of a multiple-year investigation of goal setting conducted by the CPM Educational Program Teaching Redesign Corps (http://cpm.org/trc). Our investigations began in July of 2016 as a set of research proposals crafted during the TRC 3.0 meeting in Las Vegas, Nevada. Since that initial meeting, several cohorts of Teacher Researchers have collaborated to explore the instructional practice of creating a student-centered classroom through goal setting by systematically changing our teaching behavior while observing and recording differences in student learning. We, the lead authors, would like to acknowledge the exceptional effort made by our fellow researchers Josue Cordones, Kayla Green, Natalie Ijames, Chris Kintz, Jesse Knetter, Sara O'Connell, Mollie Siegel and Louis Tiller. Our collective student populations were diverse, with representation from multiple SES levels, rural, urban, suburban, large and small schools, grades 6 -12, and courses including pre-algebra through calculus. We have synthesized what we feel are the best practices and activities that were effective in all of our classrooms.

Disclaimer: CPM is glad to share the findings from the TRC investigations, but these are just ideas. It is expected that teachers will rely on their knowledge of their students, the mathematics they are teaching, and the circumstances surrounding their specific teaching assignment when modifying their own behavior and selecting appropriate instructional strategies. A given strategy may have a positive effect on student learning in some situations and a negative effect in others. Please use your own best judgement as you continue to improve your teaching practice.

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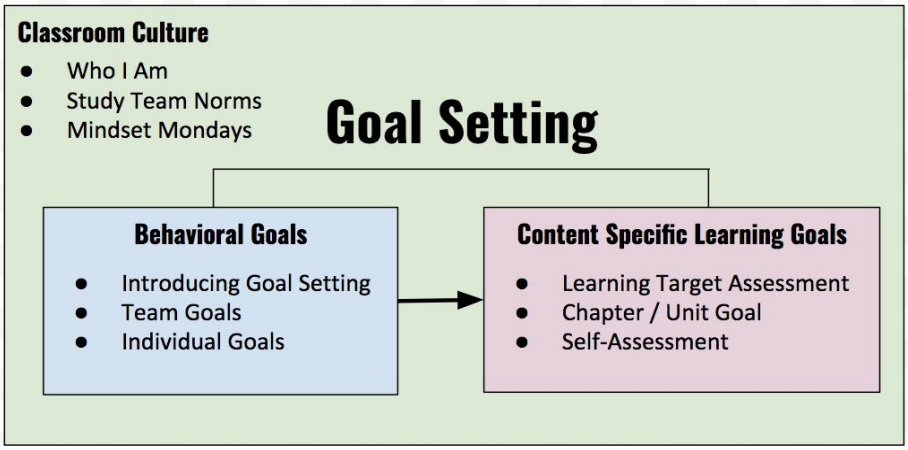
Introduction

Who's doing the math in *your* classroom? Do your students take charge of their own learning? Have you ever wondered how to empower your students to care more about the math they are learning than the grade on top of their paper? As teachers, we were looking for answers to these questions and searching for strategies to promote student-centered thinking without adding another time commitment or "one more thing." After attempting to accomplish this using multiple approaches, we discovered that goal setting was the most promising strategy. Over a period of three years, several classroom Teacher Researchers set out to refine the goal setting process, identifying what worked and discarding what didn't, so others could easily replicate it. We are sharing what we have learned so that others can benefit from both our successes and mistakes. In our experiences, we found that teaching self-regulation through goal setting can create a more student-centered classroom and promotes efficiency in planning, differentiation, parent-student communication, behavior management, formative assessment, teamwork and collaboration.

During our initial attempts to teaching goal setting we asked students to write goals without much, if any, direction. These goals were then put away and not revisited; therefore, nothing was accomplished. After experimenting with different strategies in our classrooms, we identified a progression for teaching goal setting that has worked successfully in different environments and with varying ages. Although there were several activities unique to each of the different classrooms, the progression that emerged and worked for each classroom included the same three elements: *Classroom Culture, Behavioral Goals,* and *Content Specific Learning Goals* [see Fig. 1]

Figure 1 - *Three Elements of Goal Setting*



As teachers strive to build higher capacity classrooms - accomplishing more with greater efficiency - it is important to note that the ideas shared herein are part of an ongoing process rather than a final product. In fact, this process could look very different in every classroom. Teaching and learning goal setting in the classroom, when implemented in an intentional way, can yield a stronger, more student-centered environment and enhance student learning. All of this begins with strong classroom culture.

Classroom Culture

Rationale

In order for goal setting to become an effective learning tool, it was imperative for us to cultivate a growth mindset culture in which mistakes would be valued as a natural part of learning.

As students progress in education, they become increasingly aware of achievement, equating their intelligence with the grades they receive. When students understand that "failure" and making mistakes are a natural and integral part of the learning process in mathematics, they develop a strong foundation for goal setting.

In our research, we found that the type and order of activities was not critical to the development of a rich classroom culture; rather, ***regular opportunities*** *to explore these ideas and a* ***sustained focus*** *on growth mindset in the classroom turned out to play a key role in the goal setting process. Take advantage of those first days of school - begin building classroom culture on day 1!*

Included in this table are activities we found to be highly effective in building classroom culture. For additional ideas, refer to Appendix C-Toolkit of Activities.

Instructional Activity: Who I Am [adapted from Meyer 1]

Teacher Moves:

Directions:

1. Students are asked to introduce their neighbor by first finding out the following three things:

a. Their first name
b. An adjective describing them, using the same letter as their first name
c. A single word that describes ***math***

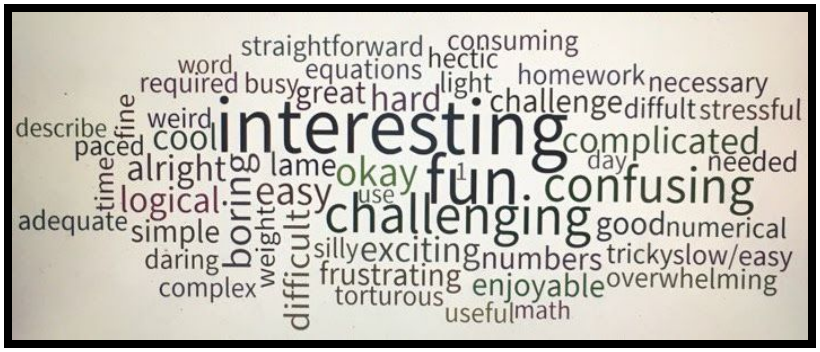
Examples:

- "This is *Snappy* *Sam*. He thinks math is ***logical.***"
- "I'm going to introduce *Marvelous* *Marta*. She thinks math is ***difficult.***"

2. Choose one group to coach others on how to stand tall, speak clearly, then sit quickly to model behavior for the rest of the class.

3. Write each one-word description of math on the board under the title, "Math is…"

4. A ***word cloud*** is generated for each class to reference as a gauge of the overall class perception of math at the start of the year, then later compared to the perception at the end of the year (or other time interval), when the activity is repeated.



Instructional Activity: Backwards Bicycle - *Knowledge Doesn't Equal Understanding*

This is an activity that seems to level the playing field in the classroom. It breaks down barriers, similar to an icebreaker while also team building. Start by showing the video the *Backwards Bicycle*. The students love this video, and their first impressions are, *I bet I could ride a backwards bicycle*. Since we don't have backward bicycles in our

rooms, we can do an activity that produces a similar outcome.

Teacher Moves:

Non-Dominant Handwriting Challenge

Directions:
On a sheet of paper, print your first and last name (using your dominant writing hand). Under your printed name, write it again using cursive handwriting.

Possible follow-up questions:

1. Did you need to think about what you were asked to do? Why? (The most common reply is, "it's automatic!" The second most common reply is, "I don't know/remember what a cursive '*S*' looks like.") Was there any problem solving or experimentation in the process? What made it automatic?

Directions:
Now, using your non-dominant hand, print your first and last name. (This will take some time and is noisy. Listen closely and jot down the comments your students make as they struggle, fail, fumble around and laugh at their less than wonderful penmanship.)

Possible follow-up questions:
What did you notice? What do you think about the results? Did you need to do any problem solving?

Directions:
Now, using your non-dominant hand, write your name in cursive.

Possible follow-up questions:
What did you notice? Why was this difficult for you? How is this activity like the backwards bicycle?

Closure:
Ask: "Why did we do this activity today? Why do you think I chose this particular activity? What could we learn from this?"

Possible student responses / lines of thought:

- Allow us to see others in a new light
- Everyone struggles
- Experience perseverance
- Camaraderie & team support

If students are up for the challenge, have them use their non-dominant hand until

class time the next day. Not only is it fun, it's also a great exercise in perseverance and resilience.

Instructional Activity: Study Team Norms

Students quietly ponder the questions, "*What do you <u>like</u> about working in groups?"* and *"What is it about working in groups that you <u>don't like</u>?"* as you allow think time. Each student "passes the pen" and records his/ her response on the "DO" or "DON'T" side of a chart. While writing the response, students tell the class what they wrote explaining the thinking behind it.

Examples:

*"I don't like it when I work in a group with someone who is **bossy**. It's really hard to learn with one person telling everyone what to do."*

*"I appreciate it when I'm working in a group and the team **organizes** work so everyone can understand and explain it."*

Once ideas are exhausted and sharing is finished, the chart is posted in a prominent place in the classroom as an anchor chart, reminding students about collaboration and their roles as team members.

Instructional Activity: Mindset Mondays [see following example & Appendix C]

As the new school year begins to fall into regular weekly patterns, we suggest gradually shifting from ***<u>establishing</u>*** the classroom culture to ***<u>sustaining</u>*** that culture. This is accomplished through the development of a year-long routine called *Mindset Monday.* Each Monday, during the first ten minutes of math class, provide a video, graphic, roleplay scenario, or activity provoking student thinking as outlined in the above rationale.

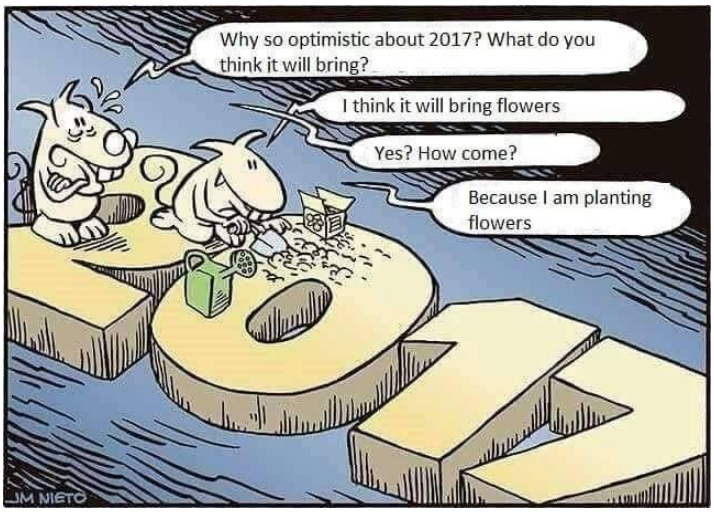
As *Mindset Mondays* become a regular part of the classroom culture, students embrace the practice and look forward to a new experience each week. The benefits of this weekly time investment include:

- Positive attitude and behavioral shifts
- Students view math as something at which everyone can become proficient

- Math conversations trend toward collaboration and support of ideas rather than simply getting the “right” answer

Mindset Monday Example from Denise’s Classroom

I found a comic over Christmas break that fit nicely into my intentions for our new calendar year, highlighting the ideas of growth mindset, the value of mistakes, and the power of “yet.” Before displaying the comic, I asked my students to ponder the following three questions independently as they quietly viewed the comic for one minute:



- *What does this comic have to do with growth mindset / positive self-talk?*
- *Is this comic REALLY about flowers?*
- *What message does this image portray?*

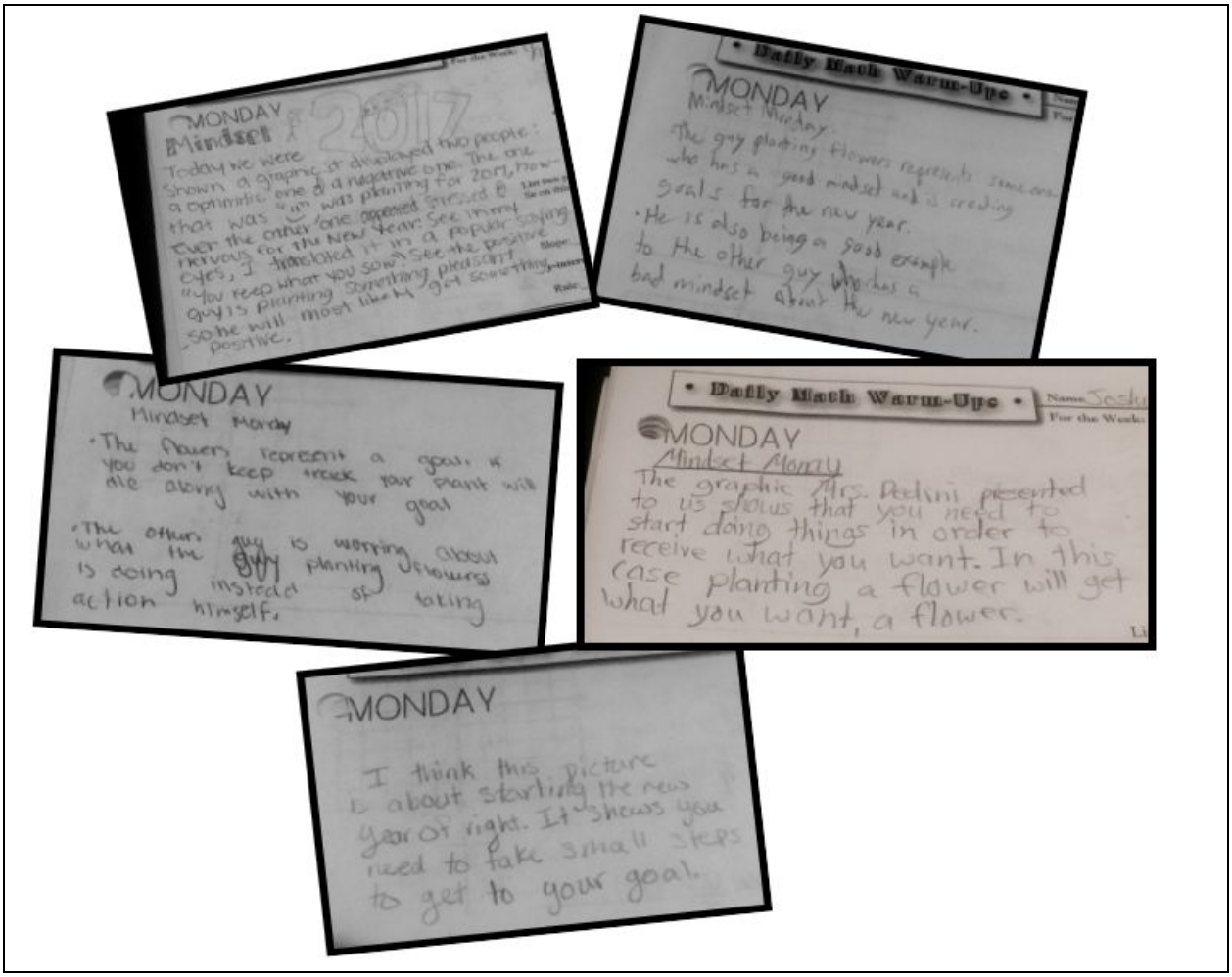
After our 1-minute timed reflection, students shared thoughts with their teams for an additional minute, discussing each of the three questions. Then I asked the Recorder / Reporters to report out on one of the three questions for their team.
*Overall, I was pleasantly surprised at the students’ ability to creatively interpret several aspects of the message portrayed by this comic. Students clearly understood the use of metaphor, and some argued that the analogy of the flowers aptly represented the goals our students had written. One student noted, “**The planted seeds are like our goals...we don’t see results at first, but after tending to them like a gardener, we start to see the results grow!”** Another student responded, “**I agree - kind of like you get out of something the amount of work you are willing to put into it.**” Another student pointed out the anxious face of the first character as it contrasts with the calm, happy expression of the second character. **“The guy with positive self-talk seems happier.”***

I firmly believe that this activity helped launch my students into the new year, ready to race to the Quarter 2 finish line as smoothly as possible. This year, the dreaded return from winter break did not yield the snoozing students or extra rowdies, as usual. I like

to think this is at least partially attributed to the fact that my classes took the time to re-connect and re-ground with their teammates and their goals in this way.

Once *Mindset Mondays* become an established routine in the classroom, students begin anticipating and looking forward to the lessons. This investment of five to ten minutes each Monday yields high impact results for students' shift in mindset. In Denise's class, students voiced disappointment the week of the first Monday holiday: *"What? How come we don't have a Mindset Monday this week?"* and *"Can't we just do Mindset TUESDAY?"* The strong buy-in provided by these regularly scheduled *growth mindset* messages resulted in student responses that gradually increased in depth of reflection and insight. A key example of this phenomenon occurred at the end of the first semester, when students were able to examine, analyze and provide meaningful insights about the 2017 comic. [see Figure 2]. Students' writing showed a level of maturity many adults were unable to muster, following a tumultuous presidential election year.

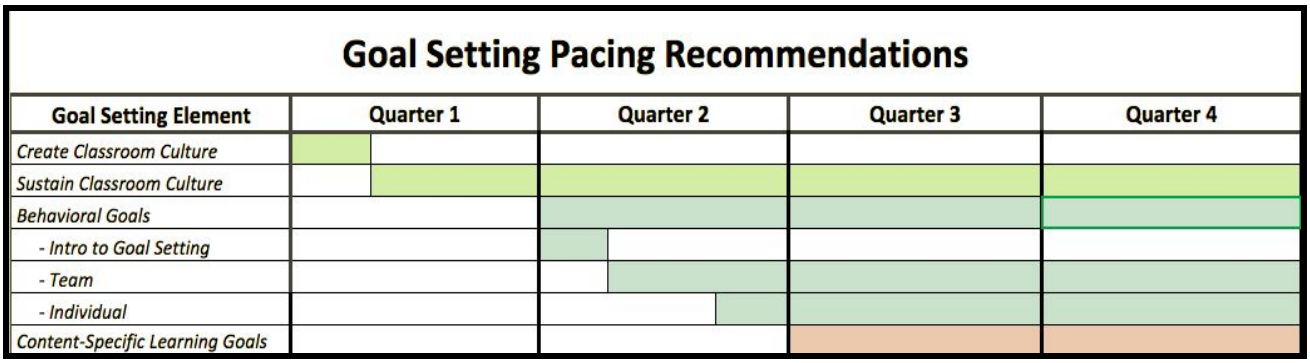
Figure 2 - *Mindset Monday Student Examples*



Classroom Impact

All three teachers spent the first few months of the year developing classroom culture. The mini-lessons and activities used to teach growth mindset provided rich background knowledge and motivation for our students. Similarly, cultivating the belief that mistakes are learning opportunities enhanced productive struggle and perseverance in our classrooms while reinforcing and expanding students' resiliency (Dweck, 2008; Boaler, 2016). Shifting student thinking toward a growth mindset is not a simple task. Teachers are the catalyst for change in classroom culture. In order for students to adopt a growth mindset, it is essential for the teacher's words and actions to reflect that thinking. From the start of a new year, teachers must anticipate possible student comments and plan growth mindset responses. We recommend anticipating student fixed mindset statements and planning growth mindset teacher responses [see 10 Growth Mindset Statements, Appendix A]. Likewise, addressing mistakes takes on a different perspective, as teachers guide conversations toward valuing mistakes as a natural and beneficial part of the learning process. A change in classroom culture requires intentional teacher effort, infusing a growth mindset perspective into everyday experiences over the course of the entire year [illustrated in Figure 3]. Our research teams found the following pacing guide very helpful:

Figure 3 - *Suggested Goal Setting Pacing*



Taking the time to create and sustain a culture of growth mindset impacted our classrooms in several ways. Each teacher noticed the classroom transforming into a "safe" place for learning; students felt safe taking risks as they learned. More students were engaged and on task, offered contributions during whole class discussions, and completed assigned *Review-Preview* problems (homework). Additionally, study teams used a discussion strategy called *Rough Draft Talk* (Jansen, 2017); where students are asked to think and talk as they would when writing a rough draft. Using the term "rough draft" implies that the contribution will be edited and doesn't need to be perfect; prompting students to share without fear of judgment. The practice initiates, elevates,

and sustains mathematical discourse, encouraging student conversations where others' ideas are valued and built upon. An increase in team communication produces unity and "grows" the trust component in a classroom culture.

Once a growth mindset culture is developed in the classroom and students feel safe sharing ideas and making mistakes, goal setting with students can begin. However, during our first year of goal-setting research we found that students, in general, do not know how to write goals. Our challenge: *What is the most effective way to introduce, write, and evaluate goals in the classroom setting?*

Introducing the Process of Goal Setting through Behavioral Goals

For most students, writing a goal is synonymous to making a New Year's resolution, which they see as something lofty you decide to do then forget about three days later. As adults, we recognized that the process of goal setting promotes self-regulation in students and reflects characteristics of highly successful people. Our objective was for students to first learn the goal setting process so they could eventually write content specific learning goals.

Initially we tried starting with content specific learning goals and found it to be frustrating for students. When first introducing learning goals in Cathy's class she asked the students to read the guiding questions at the beginning of a chapter and write a goal about what they wanted to learn. Students responded with quizzical looks and blank stares; apparently they had no idea what they should be learning. The students could not write a learning goal about a topic with which they had no experience. Essentially, they "didn't know what they didn't know." The progression that worked best with students started with behavioral and then moved to content specific learning goals tied to a recent assessment or learning experience.

There are great benefits in beginning with behavioral goals. They are: non-threatening, not necessarily academic, student selected, easy to evaluate, therefore there is student buy-in to the process. Additionally, the goals are familiar, something the students own because they are passionate / motivated / interested, allowing students to learn the goal setting process. [Illustrated in Fig 4]

Figure 4 - *Types of Goals*

Performance *(Achievement Oriented)*

Definition

- Goals based on an external evaluation (*dependent upon teacher feedback*)
- Goals are either achieved or not achieved
- Often involve rewards
- Competitive
- Associated with *fixed mindset* thinking (Dweck and Leggett, 1988)

Examples:

- *I will come in first in the race.*
- *I will get an A in math.*
- *I will get at least 75% on my test.*

Mastery *(Progress Oriented)*

Definition

- Self-regulated (*students begin to analyze and monitor their own progress*)
- Goals can increase competence
- Cooperative
- Associated with *growth mindset* thinking (Dweck and Leggett, 1988)

Examples:

- *We will listen and provide feedback for all ideas.*
- *I will learn how to calculate a unit rate.*

Sub-Categories

Behavioral

- Goals based on an action you will take. The outcome is usually observable.
  - Team
  - Individual

Example:

- *I will bring my materials to class every day.*
- *We will talk only about math in my team.*

Content Specific/Learning

- Goals based on a specific learning criteria or target. The outcome is usually measured by an assessment or self-assessment and is based on concepts or skills.

Example:

- *I will accurately graph an equation from a table.*

An important precursor to student-initiated goal writing is their active participation in helping the teacher set a goal and define the steps. Teacher goals were presented each year in every classroom and were identified as a critical first step in the

development of student understanding of the entire goal setting process - complete with ups and downs, successes and failures. Each teacher informally shared a personal goal and asked the class to help write the goal in S.M.A.R.T. (specific, measurable, attainable, realistic, and timely) goal format and help establish action steps. We found this to be a highly engaging activity and encourage teachers to begin by sharing any sort of personal goal with students. Here is one example:

Teaching the Goal Writing Process in Christy's Classroom

Monday's class started with students raising their hand if they had ever set a goal. Some hands were raised, so I asked those students if they would share their goal. Interestingly, none of the goals shared were academic; instead, most were sports related or a goal to save money for something. As we continued to discuss goals, I inquired if their past goal setting had been helpful. One student said it was motivational, another chimed in that it helped keep him accountable and focused. These answers intrigued their classmates and provided a perfect segue to our activity of goal writing.

I reminded my students after sixteen years of having and enjoying well-behaved dogs, my husband, Dennis, and I were back in the business of being new puppy parents. Along with the fun of a new puppy comes a lot of work. For the past eight weeks we diligently attended puppy kindergarten and worked enthusiastically with our dog practicing manners and behaviors so he's a fun, likable family member and guests and friends enjoy being around him, too! However, he is graduating this week, and I want to continue working with him, as he's not super-dog, YET. Needless to say, the word puppy causes excitement with middle school students; they were curious about my dog and they wanted to meet him. Their enthusiasm gave me an idea to add to my plan; I revealed my S.M.A.R.T. goal: By January 19th, I want my dog to be "well-behaved" so that I can bring him to visit my classroom.

Since I wanted the students to experience creating action steps, the key components necessary in order to be successful with a goal, I solicited their help. The brainstorming session was on. Students were relentless with suggestions - from training books, continue attending dog school, take a private lesson, daily walks with distractions and lots of people, visit the dog park, make sure he gets plenty of exercise, to call my Dad--he's a great dog trainer. This list of ideas would be used as I guided my students to create my action steps. Furthermore, it would serve as a go-to bank as I evaluated and adjusted my goal. The finished product looked like this:

> By January 19th, I want my dog to be "well-behaved" so that I can bring him to visit my classroom.
>
> 1. Keep practicing what we've learned, 5-6 x/wk.

2. Visit the dog park 3x/week to socialize with other dogs and people. (track on calendar).
3. Walk where we encounter lots of distractions and people 1-2x/week. (track on calendar).

Before the end of the first week, students were checking-in with me to see if I was diligently working with my puppy. These quick conversations and interactions with students reinforced the relationship that we were building. Assuming the novelty of their checking-in might wear off, I was tickled when it only intensified.

Evaluating Progress in Christy's Classroom

The board displayed my goal and the student-created action steps. Below that, in a different color, I wrote the date, summarized my goal in a sentence and the action steps as bullet points. A short note of evaluation, or a five star rating system accompanied each bullet point. Given that the evaluation showed progress, I did not need to adjust the steps, rather I could continue along the same course.

Well behaved dog-Jan. 19! (Summarized goal)

1. Practice 5-6x/wk. I showed them my calendar where I track the practices. (we're on track)
2. Dog park 3x/week. I showed where I mark dog park on the calendar. (Whoop, whoop!! We've been there daily!)
3. Walk (distractions and people) 1-2x/week. Again, I evaluated the calendar. (We go once a week, however it needs to be twice a week.)

Prior to students writing their own goals, they learn about accountability through the evaluation process with their teacher's goal.

- Analyze successes first
- Identify areas where there was lack of progress and recognize these as opportunities for growth
- Revise action steps / recommit to goal, if necessary

Classroom Impact

Each teacher in this study shared a personal goal with students to reinforce the idea that achieving a goal requires perseverance, evaluation of progress, coping with

setbacks, as well as revising the action steps. We found that a teacher does not have to go to great lengths to model this process for students. One teacher had a goal to reduce his daily consumption of soda. Although this was a simpler goal, the benefits of sharing the teacher goal were the same: provide the opportunity to witness a teacher's vulnerability, create a socio-emotional connection, and present a common experience for conversation. Likewise, teachers gain more insight into students' lives outside the classroom and students are more likely to strive to do their best in this type of environment. Trust and respect become the norm. In essence, this first step sets the stage for students to write their own goals.

Furthermore, an important purpose behind the shared teacher goal is the public nature of this common experience. Once goal-setting intentions are made known, a person is more likely to follow through on those plans. This leads to a culture of accountability, where students become involved in reminding teammates, monitoring goals, and checking on the progress made toward the goal. Moreover, if things aren't going well, students are there to troubleshoot and provide feedback for each other.

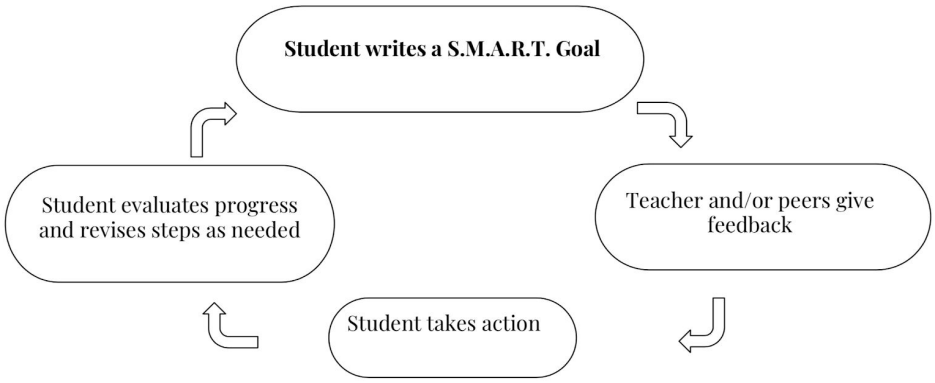
This process transfers well to teaching goal setting to students. When asking students to write a long-term or quarter goal - just as with the teacher's example - it is critical to highlight the importance of regular goal checks to monitor progress. Typically a two week check-in seemed about right, providing about four goal evaluation periods throughout the quarter. Continued modeling of the process is a necessary step, since goal setting is new to many students. [see figure 5 below]

Figure 5

Goal Setting Steps

1. Teacher's Goal
    a. Either share or have students help you create a S.M.A.R.T. goal
    b. Students create your action steps
    c. Students help evaluate progress

2. Students write behavioral goals: either personal, related to their team, or class norms



3. Students monitor goals
    a. Celebrate
    b. Get feedback
    c. Revise

All teachers involved in this study acknowledge that the investment of time spent building the culture in our classrooms and developing relationships with students through a shared teacher goal was valuable groundwork in preparation for student goal setting. We found that sharing a personal teacher goal was a critical *first step* when introducing goal setting in the classroom environment so students could learn the process in an accessible, non-threatening way.

Behavioral Goals

Rationale

After students examined the process of goal setting through the teacher's example, they had a concrete model for writing their own personal goals. In the initial phases of our research we found that most students, when left to their own devices, set broad, achievement-oriented academic goals. As teachers, we found it difficult to focus students on the ***understanding*** *of the math content instead of a score or letter grade. Therefore, it was decided that behavioral goals could give students an opportunity to learn and practice the process of personal goal setting without the added pressure of selecting something content related. This simple step of starting with a behavioral goal provided students a more tangible and successful initial goal setting experience.*

Habits such as evaluation, sharing, and revision created student accountability and supported student collaboration. Students with similar goals became "accountabilibuddies," working together and supporting each other.

Included in this table are activities we found highly effective when working on behavioral goals with students. For additional ideas, refer to Appendix C - Toolkit of Activities.

Instructional Activity: The Hateful Task [see student examples - Appendix B]

Teacher Moves:

Directions:

The teacher asks all students to think about a task they are responsible for at home that is their most hated, dreaded task.

Examples:

- *doing the dishes*
- *scooping dog poop*
- *mowing the lawn*

Directions:

1. Ask students to raise their hand as soon as they think of their task.
2. Next, ask them to close their eyes and picture themselves performing that hateful task. They should imagine their posture, their facial expression, as well as what they'd be thinking or saying to themselves as they perform this dreaded task.

3. Direct students to open their eyes and quietly sketch a stick figure drawing of themselves performing this hateful task. As they draw, remind them to include the facial expression they would be making as well as either a thought- or talk-bubble expressing what they would think or say while performing this task.
4. Students share their drawings with teammates and describe how they felt and what they were thinking or saying about this task. [approx. 4 min.]
5. Conduct a whole-class discussion.

Possible Teacher Questions:

- How many of you found someone who shared a *hateful task* similar to your own?
- I'm interested in hearing about some of your tasks. May I get a few volunteers who wouldn't mind sharing?
- What were you thinking or saying to yourself when you were performing this task?
- The messages you wrote in your dialogue bubbles are understandable, and many are very similar to each other. I'm wondering - do these messages ever change the fact that your *hateful task* must be done? So, can we agree that complaining and "attitude" do not help when working to complete your task? (Students will agree that no matter what is said or thought, they still need to do the task.)
- When your *hateful task* was complete, how did you feel? Was it as bad as you had anticipated? (Many students will concede that the task really wasn't as bad as they had originally thought.)

6. Lead a brainstorming session. "Now that we acknowledge that this negative self-talk doesn't help our situation when dealing with a hateful task, let's brainstorm some positive thoughts or phrases that could replace the negative statements." The teacher records student brainstormed responses on the board for all to see.

Possible Responses:

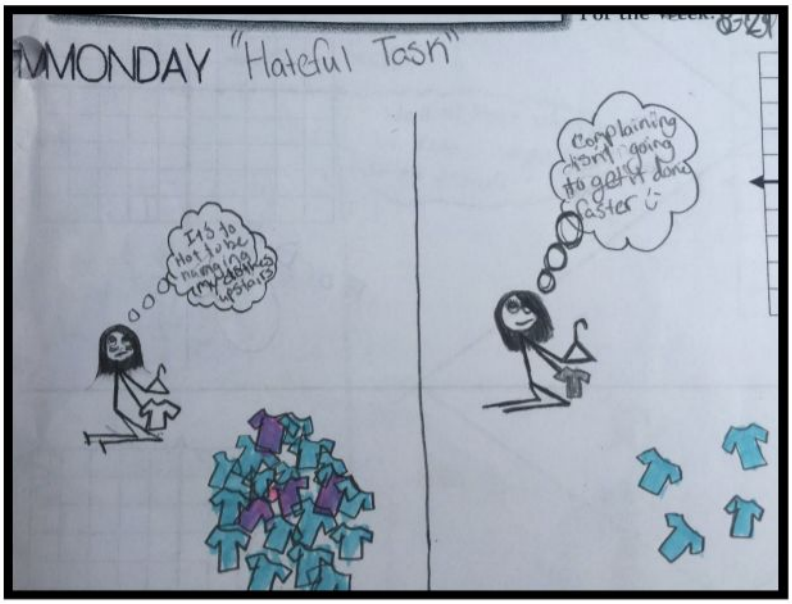
- "This will only take a few minutes, and then I can…"
- "If I do this without complaining, I will be able to earn my allowance this week."
- "I can listen to my music while I do this and the time will go by faster."

7. Ask students to draw a contrasting picture of themselves performing the <u>same task</u>, this time with a new *positive self-talk* dialogue bubble phrase and accompanying facial expression. They may use one of the ideas written on the board, if they wish, or think of their own.

Possible Teacher Comments:

- "Congratulations! You just learned how to rewire your brains through positive self-talk!"
- "These messages can help us as we work to achieve goals and reach a new step along the way."

- “I’d like to challenge you to catch yourself the next time you find that you are grumbling with negative self-talk. When you do, swap out your negative message with positive self-talk to see how this makes a difference. It will be interesting to share these messages and hear how this might help you through challenges, and as we set goals in the future.”



Instructional Activity: Team Goals

Teacher Moves:

Collaboration and the shared responsibility aspect of team goals makes this a good starting point for students’ first goal writing experiences. We have had success writing team goals related to class norms or team norms.

Directions:

1. Prompt study teams to discuss an area for improvement based upon discussion of study team norms.
2. Give students sentence starters and examples to make the process of writing a team goal accessible.
3. Teacher circulates, discusses and supports teams as they develop a goal. This provides a great opportunity for a teacher to develop a participation quiz based upon student written team goals.
4. Provide a daily reminder for teams to read their goal.
5. Monitor progress by celebrating what went right, providing feedback and revising goals collaboratively.

Note:

The nature of a team goal generates more study team interactions. Students take

more responsibility for the team or classroom norms. Using the participation quiz, teachers give feedback on study team goals and students reflect on the day's work and progress.

Instructional Activity: Individual Goals [Appendix A]

Teacher Moves:

We suggest that a student's first experience with *individual* goals be about personal life or classroom life.

Directions:

1. Ask your class to generate a list of potential individual goals, either personal or classroom related while you record ideas.

Possible Responses:

- *"I'll walk my dog every day*.."
- *"I will record my work accurately every day."*
- *"I will stay on the same problem as my study team."*

2. The students write individual S.M.A.R.T. goal(s) inspired by the generated list and create action steps supporting progress toward the goal.

3. Teacher provides feedback on student goal(s), which opens dialogue: student-student and/or teacher-student.

4. Asking students to share a goal with teammates creates opportunities for accountability and peer support.

5. Students individually evaluate and monitor the progress of their own goal, then share their findings with each other or within teams.

   *At the end of the evaluation step, students continue in the goal setting cycle - either revising, continuing with the same goal, or writing a new goal.

Goal Writing Format Ideas:

- Google Docs
- Notecards
- Goal Folders
- Daily Math Composition Books
- Goal Setting forms [Examples are included in Appendix A - Sample Documents]

Team and Individual Behavioral Goal Examples

From Cathy's Classroom

First Prompts for Team Goals:

> *Work with your team and write one behavior goal. Make sure that you discuss it and come to agreement before you record your goal.*

Examples of student written team goals:

- *We will stay on the same problem that everybody is on.*
- *We will continue working together and not talking between groups.*
- *We will try to work together and communicate as a team.*
- *Our team goal is to explain how and why we got the answer we did.*
- *We will be on the right tabs on all times.*
- *We will work together as a group and participate on the same problem.*
- *We will not argue with each other.*

First Prompts for Individual Goals:

> *You are going to write a goal for the next week in math class. Your goal can be about your team work or your individual work.*

Examples of individual teamwork goals:

- I will do all parts of my team role and not talk outside the group.
- I will ask questions when I don't understand.
- I will listen to others in my team.
- I will be ready to work when class starts.

Examples of individual goals:

- I will try all of the problems on my homework.
- I will have materials every day.
- I will correct my homework and ask questions.
- I will ask three questions in class during whole group time.
- I will use my class time well on accelerated math days.

Notice that the students' goals are not all S.M.A.R.T. (Specific, Measurable, Achievable, Relevant, Time-based). This is a learning process. Students need to be given feedback and a chance to revise their goals. In Cathy's class, feedback was given by the teacher, but this could also be peer feedback. Students turned in goals on Google Classroom and were given suggestions in the form of comments. For example, the student who wrote, "I will use my time wisely," was asked, "What does wisely mean? What actions will you take? What will you do?" The goal needed to be more specific. A similar process was followed for team goals. Circulating the classroom while teams are discussing appropriate goals is helpful to ensure that the conversations are positive and the students are using "we" statements.

Example of a goal setting form used with Google Classroom when students were writing and revising team and individual goals.

Use complete sentences and answer each section. Write your goals as specific, measurable, attainable, realistic, & time based.

Section 1: Team Goal

Last week's goal:

Describe your team's progress on your team goal last week:

Discuss with your team and write a new team goal for 3/7 or revise or keep last week's goal:

Section 2: Individual Goal

Last week's goal:

Describe your progress toward last week's goal:

Write an individual goal for this week or rewrite last week's goal if you are still working on it :

As the process of goal writing progressed, students were asked to evaluate their goals and revise if necessary. If they had achieved a goal, they were directed to write a new one. Sometimes students would write a goal that wasn't challenging. For example, a student wrote, "I will bring my pencil to class everyday." For some students this might be a worthy goal, but it presented no challenge to this particular student. As a class, we discussed the importance of writing challenging goals. If you have already mastered a concept or behavior, it is no longer a goal.

The majority of our students became more comfortable with the goal writing process which led to greater efficiency. On average, the goal writing/editing process only took a short period of classroom time; maybe ten minutes. "Mindset Mondays" became the designated goal time in our classroom.

Classroom Impact

Learning to write and revise goals caused our students to take more responsibility for their own learning and became more self-directed. They learned to look for evidence of their progress and reflect on their next steps instead of asking the teacher, "What should I write for a goal?" Although students sometimes reported that goal setting was difficult or boring, they seemed to take pride in their accomplishments and willingly revised their "not yets."

The team goals served as a means for study teams to discuss how they worked together and what actions they could take to make better progress. As a result, teams

took more responsibility for team norms and monitoring their own learning. In a nutshell: goal setting led to more on-task behavior.

Since behavioral goals are familiar and personal, our students learned to exercise self-regulation instead of relying on their teacher to direct their thinking. It was exciting for us to see students grow as individuals and learners through this process. Providing students with this experience brought changes to our math classrooms and served as just the right preparation in setting the stage for *content specific* goal setting with our students.

Content Specific Learning Goals

Rationale

The initial objective in our goal setting research was to empower students with the necessary knowledge and skills to write content specific goals. This would shift their focus from achievement oriented thinking (getting a grade) toward conceptual understanding. As teachers, we often set goals for a chapter or a concept and use tools to evaluate progress. We wanted to provide our students with a similar experience.

A major challenge when teaching content specific goal setting is that, generally speaking, students don't know what they don't know. When asked about progress on a particular standard, skill or concept, students are not accurate self-reporters. In our experience, the most effective way to initiate the process of writing content specific learning goals is to provide students with a hands-on opportunity to reflect on their level of mastery after an assessment or working on challenging concepts in a new chapter.

We have found that writing content specific learning goals helps students put a spotlight on challenging mathematical ideas and provides a support system to assist them in growing their understanding of these concepts. Content specific goals, just like behavioral goals, should be regularly assessed and revised. This type of goal serves as formative assessment, allowing teachers to differentiate instruction according to student needs.

This might look different in each classroom. Included in this table are activities we found highly effective when working on content specific goals with students. For supporting resources, refer to Appendix A - Sample Documents.

Instructional Activity: Self-Reflection to Get Unstuck

Teacher Moves:

This reflection occurs in real-time as students interact with mathematics on a daily basis and find themselves stuck on a concept or procedure. The process takes time to develop as part of the class culture. Teachers should encourage student teams to assist each other in recognizing “what they don’t know” and taking action on “stuck points” along the way.

Directions:

1. Ask students to identify challenges by sharing stuck points with their team. If they struggle with this step, we recommend the teacher provide support through questioning or other strategies. This is an ideal time to implement the *Huddle*, *I Spy,* or *Ambassador* study team strategies.

2. Prompt students to use appropriate vocabulary athey verbalize what they don’t know and write a content specific goal to address the need. Students needing assistance in writing these goals should utilize their team as a first resource.

3. The next step is to have students create action steps to support reaching their goal and understanding the mathematics.

Note:

This is similar to problem solving. Many times, as students reflect and write their action steps, the pieces begin to fall into place. They learn to identify challenges and develop a well-sequenced plan. In doing so, a sense of control emerges, which builds confidence.

Examples:

- *ask for some review and support on changing fractions to like denominator*
- *use web resources for some additional fraction practice problems*
- *ask my team or the teacher for support*

Instructional Activity: Learning Target Assessment

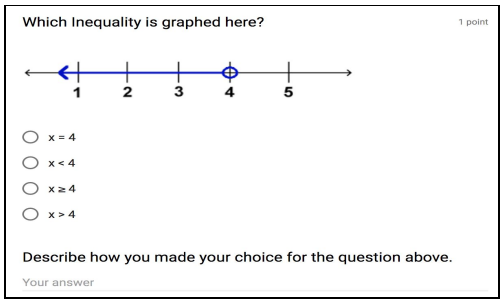
Teacher Moves:

Students are given assessment questions followed by reflection questions. The topic can be a math checkpoint or another skill or concept where you hope students have mastery level understanding. Immediate feedback is critical in order for students to determine areas where further growth is needed. At the end of the assessment students are asked to identify the areas they need to improve.

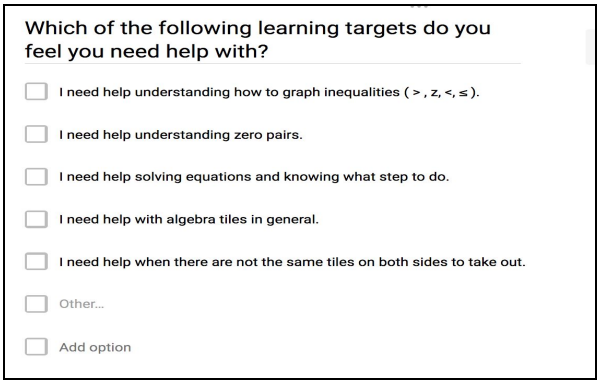
Directions:

1. Give students an assessment (3-5 problems) on a topic where mastery is expected and they have experience.

2. Students receive immediate feedback on the correctness of their responses. A Google Quiz is one way to receive immediate feedback (teachers can provide narrative feedback on multiple choice responses which can be sent to students immediately). Here is an example:



3. Ask students to reflect on their mastery and identify an area where they need help.



4. After reflecting, students are asked to write a goal and are provided some sentence starters:

> Use your response on the last question to write or change your learning goal for these topics. You may choose a learning goal on another topic if you have mastered inequalities and equations. Possible sentence starters: “I need to learn…”,“I want to understand ..”, “I want to get better at…”

5. After students write or revise a learning goal, the next step is to create action steps necessary to reach their goal. Getting students to identify what they don’t know is a critical first step in drafting their content specific learning goals. In a given class, students will be working on different learning goals. One strategy

is to group students in “goal alike” or “different goal” groups and use a reciprocal teaching strategy to address the goals. Each student is both a learner and a teacher in this situation.

Note:
Additional resources for support include: teacher-created mini lesson, CPM Homework Help and Checkpoint materials, Desmos, math videos on YouTube, or other web resources. We recommend providing class time for these activities; it is important to do this work in teams because students have the opportunity to examine different problem solving strategies through the support of other students’ ideas and serve as “accountabilibuddies” with their teammates. After students have completed their action steps, we suggest providing an opportunity to evaluate progress made toward their goal.

Instructional Activity: Self-Assessment Form [see sample forms - Appendix A]

Teacher Moves:

1. Prepare a copy of the assessment key containing handwritten exemplar work - ***but without markings indicating point values***. Again, this keeps the focus on the mathematics rather than a score.

2. Have students enter the classroom and sit down *without opening their backpacks*. Waiting on each student’s desk is a blank self-assessment form and a green (for growth) pen. Pass back each student’s UNGRADED and UNMARKED test. These elements are important because you will want students to evaluate their own understanding while viewing their unaltered assessment. Our purpose here was to ***shift the focus from scores, grades, and teacher feedback: we wanted to our students to get a clear view of their understanding of the mathematics.***

3. Display the key under the document camera, showing one question or skill at a time, so the whole class can view the projected image. We found that chunking the solutions this way helped maintain the whole class conversation and kept the questioning on one topic at a time. This helped students assess a single skill with a “Not Yet,” “Pretty Close,” or “I’ve Got This!” ranking. We expected every student to choose one of these three rankings for each assessed skill during the class discussion and used this opportunity to highlight common errors that students made in each of the problems. We also asked how they might be able to avoid making the same mistakes in the future. While using this technique, we have observed that students are both honest and accurate with their self-assessment skills.

4. At the end of the assessment process, ask your students to give an overall

ranking of their holistic knowledge of the skills assessed on this test. We used a continuum ranging from, “I understand only a little right now,” to “I understand everything perfectly.” We found it to be a rare occurrence for students to make a mark clear to the left or right of the continuum. This would seem to indicate that students recognize that they have some knowledge and also have room to grow. Determining as overall ranking helps move students from a pass/fail mentality for each individual skill to a broader view of their mathematical knowledge and understanding. For some students, this might be the first time they realized they aren’t “dumb” in math. Instead, they identify both strengths and growth opportunities as a baseline for goal setting.

5. We found it important to acknowledge the unstated, always being truthful with students about the reality that their performance on this test will make its way to the gradebook in the form of a number. We emphasized, however, the score isn’t really where they should focus their time or attention. We let them know that they are in school to learn, and can learn best when they monitor their own knowledge through self-reflection such as this.

6. We suggest that student Self-Assessment Forms are kept in a portfolio with their original assessments as artifacts of learning. We used these items to help students identify and recognize growth over time and pulled them as evidence of learning for stakeholders (parents, administrators, etc.). With these resources available, our students felt that they had a solid means to communicate their identified strengths and growth opportunities.

Classroom Impact

Writing content specific goals transformed our classrooms and empowered students to see challenges as problems they could solve instead of viewing them as setbacks or as final grades that could not be altered. As students took on more responsibility for their own learning, we noticed an increase in mathematical discourse, including more analytical and mathematically engaging conversation. The students’ level of concern became about what they knew, or needed to learn and less about the grade.

Previously, our students were accustomed to only receiving teacher feedback about their level of mastery. However, through goal setting, we orchestrated a change in our assessment routines. Teachers provided opportunities for students to identify their own needs, preparing them to write content-specific goals. Initially, teachers supported students so they could learn to clearly communicate their goals; this transition took time. Students began by comparing the verbiage of written learning targets to their work on individual assessments. Once students identified their own strengths and areas for growth, they used vocabulary from the learning target as a starting point from which to

write content-specific goals. As students gained the ability to identify their learning needs they became active participants in our classrooms.

The following anecdote is representative of the self-assessment experience for many of our students:

My student, who we will call Michael, started the year with an attitude. He rarely made eye contact, never volunteered during classroom discussions, and often hung his head with a downward gaze while sitting at his table group. The slowest to pull out materials at the start of class and quickest to clean up, Michael made it to the top of my "concerns list" from day one. As many teachers do, I took this situation and viewed it as a challenge. Pouring over his past files, I quickly found that this boy came from a broken home and lived a very rough life on a meager income, being raised by a family member. It didn't take long before a Student Study Team (SST) meeting was called to identify ways to support this student in all of his classes. During this meeting, Michael revealed his self-perception regarding math: "I'm not good at math. I never have been." I also learned about the one glimmer of hope in Michael's life - ***football****. This boy lived to practice and play the game.*

From that day forward, I would intentionally include football-related examples in math class. When we talked about integers, I would give examples of gained and lost yardage on the football field. Any chance I could get, I would make connections for Michael as they applied to current concepts. After awhile, I noticed a wry smile washing across Michael's face and he would often mutter (excellent) responses under his breath during classroom conversations. He recognized and appreciated my efforts; however, through our one-on-one conversations his self-perception remained the same. His views about math simply would not budge.

As the third quarter came to a close, I decided to try a Self-Assessment [see Michael's Story, Appendix B], modified from a suggestion in Jo Boaler's Mathematical Mindsets book. One of my colleagues was on board to try it with me, and we both mapped out a plan to allow students the opportunity to self-assess their own knowledge on the most current individual assessment. This process served as a key turning point in my endeavors to provide meaningful goal setting experiences to my students. Self-assessment, in my opinion, served as the final component in creating meaningful goals. Finally, students could speak to the recurrent issue, "They don't know what they don't know." A few observations about self-assessment that struck both myself and my colleague were:

- *When given clear expectations and guidelines, students will follow along with the process seriously and meaningfully.*
- *Students are incredibly accurate in their own self-assessment. Yes, there are the occasional off-target rankings of understanding; however, students tend toward ranking their levels lower rather than higher.*
- *Students are able to write clear reflections using appropriate vocabulary based upon their self-assessments.*

- *Students are able to identify strengths and growth opportunities based upon clear evidence of their work on the individual assessment.*
- *Once students accurately identify both strengths and growth opportunities, they have tools in place to choose and write appropriate goals.* [see updated version of the Self-Assessment Form - Appendix A]
- *Although our assessment scores were eventually entered into the electronic gradebook, not one students asked, "What's my grade?" or, "Did I get an A?" with regard to the test. The importance of the test shifted from an achievement orientation to one based upon knowledge and understanding - all due to this one relatively simple cultural move.*

After the initial self-assessment process took place in my classroom, I had a quick conference with Michael. I noted the markings on his self-assessment form indicating the "I've got this!" ranking on several of the learning targets. When I remarked, "I thought you said you weren't good at math," Michael's face brightened with a wide smile as he replied, "I guess I was wrong." This is what made a believer out of me. For Michael, the self-perceptions he had built up over the course of years had begun to melt away and he finally saw his abilities through the filter of his own understanding.

I feel that transferring the process of evaluating an assessment to the students provides them with an incredibly powerful opportunity to learn self-regulation. Rather than relying on a teacher to tell them if they did well on a test, are "good at math" or provide them with a score, students can grasp and communicate their understanding in meaningful ways.

There will be students who capture this process, and those that do have a lasting tool to use not only in the classroom, but the rest of their lives.

Final Thoughts

Goal Setting Doesn't Always Go as Planned. The process we have described above largely evolved through trial and error which provided a refinement of strategies distilled into three common themes: Culture Building, Behavioral Goals, and Content-Specific Learning Goals. Many strategies were attempted by different teachers, implemented in classrooms full of students varying in age, region, ability, and background. Some attempts to teach goal setting fell flat [see "Blooper Reel" - Appendix B] and seemed to have little or no impact, while others rose to the top of our "must do" list. Through our goal setting research, we have learned it is important for teachers to maintain a growth mindset, accepting mistakes when things don't work and making adjustments along the way. We want to encourage any teacher wishing to take the risk

and teach goal setting. Minor setbacks will likely occur. Here are some common setbacks we have experienced:

- Student goals are set too early--classroom culture may not be fully developed
- Student goals are too general--your goals are not S.M.A.R.T. goals
- Student goals are related to grade / score / percentage--focus is on achievement rather than mastery
- Students struggle to understand what they don't know--teacher-driven feedback on assessments
- Goal setting is not working in the classroom--rigid adherence to a pacing guide rather than consideration for the human element

Although the strategies previously highlighted reflect those that worked well in our own classrooms, we acknowledge that following these exact activities is unimportant. Of critical importance, however, is to sequence the main three elements in the recommended order for best results [see Goal Setting Pacing Guide - Figure 3]. Creating, developing, and sustaining a classroom culture that is supportive of growth mindset and open dialogue is essential to the goal setting process and should be fiercely maintained over the course of the school year. Culture creation is time well invested early in the year, which will provide a higher yield of positive results when properly tended. This positive classroom culture provides fertile ground in which the idea of goal setting can be cultivated. This starts with teaching students the structure and value of goal setting through the more approachable behavioral goals and then extending to the highly focused content-specific learning goals. This process provides students the opportunity to expand their academic skill set in self-regulation, metacognition, and clear communication, to name just a few.

In essence, goal setting has transformed our classrooms into better managed, trusting learning environments rather than teacher managed spaces.

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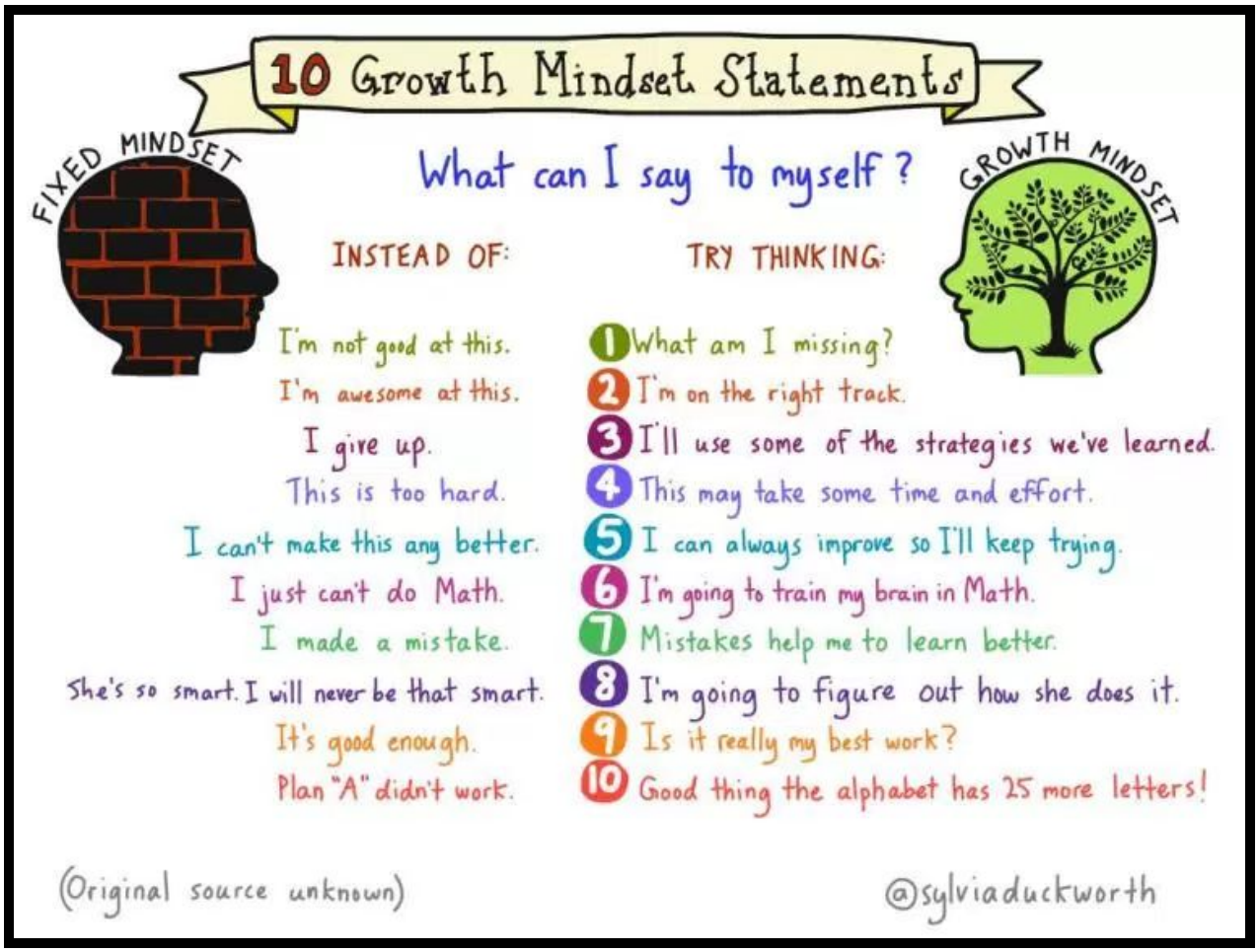
Appendix A - Sample Documents

Document 1 - Growth Mindset Responses



Document 2 - Goal Setting Sheet Example 1

Name:

ATTITUDE
Goal: *I want to be _____ (more positive, more respectful, more eager to learn, eager to help others, etc.)*

Action: *I will _____ (remind myself each day that what I'm learning today will help me achieve my life dreams, offer to help another student each day, offer to help the teacher each day, etc.)*

Math
Goal: *I want to become a better _____ (team leader, better at Math practice completion, raise my hand more, ask questions, etc.) in Math.*

Action*: I will _____ (be specific, set a weekly date with my teacher, ask questions, not just say, "I don't know," etc.)*

BEHAVIOR
Goal: *I want to be _____ (more focused, less talkative in class, more prepared, more respectful, etc.)*

Action: *I will _____ (change my seat away from a person I talk with too much, help other students more when I'm done with my work, ask the teacher how I can help, apologize when I do something wrong, etc.)*

ACADEMIC
Goal: *I want to get a(n) _____ (A, B, C) in class.*

Action: *I will _____ (be specific; do not just say I will try hard. What does it mean to try hard?)*

Document 3 - Goal Setting Sheet Example 2 (Behavioral)

Name:

You are going to write a goal for the next week in math class. Your goal can be about your teamwork or your individual work. Some examples of teamwork goals:

- I will do all parts of my team role job and not talk outside the group.
- I will ask questions when I don't understand.
- I will listen to others in my team.
- I will be ready to work when class starts.

There are many other goals you could write related to teamwork.

Examples of individual goals:

- I will have materials every day.
- I will ask three questions in class during whole group discussion time.
- I will use my class time well.
- I will try all the problems on my homework.
- I will correct my homework and ask questions.

There are many other goals you could write related to your individual efforts.

1. Will your goal be about your teamwork or individual work?

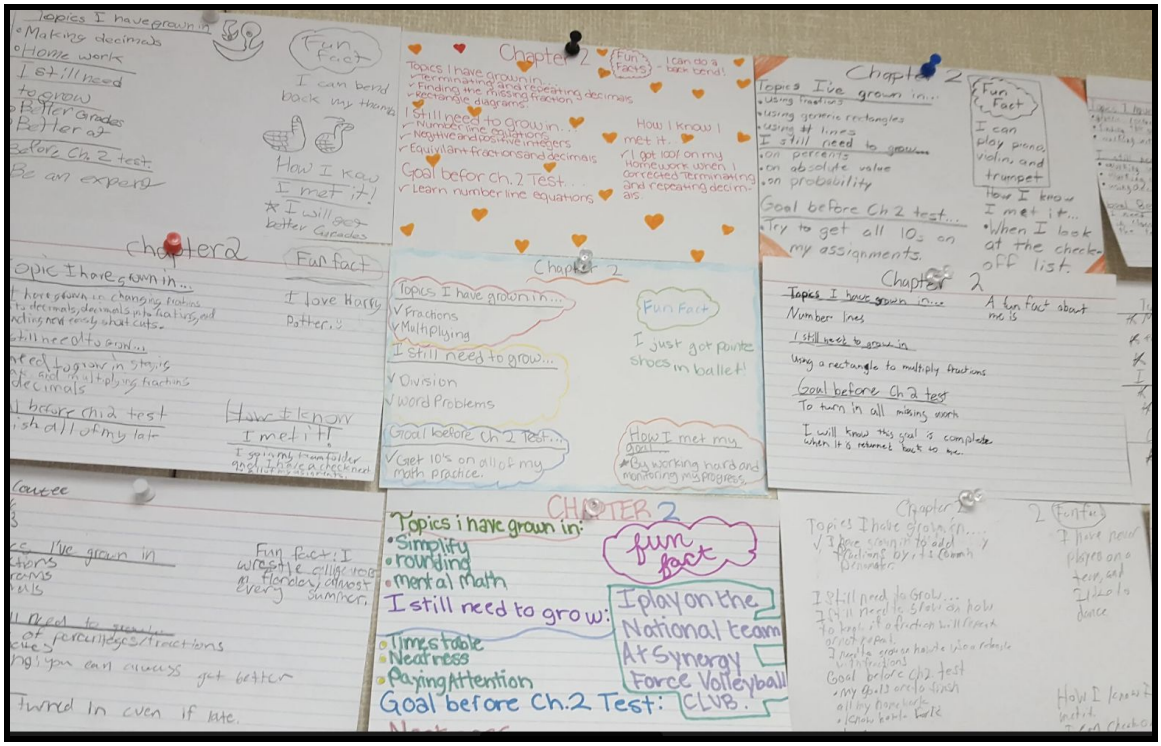
2. Write your goal as an "I will" statement below:

3. Record your goal, as stated above, in your composition book. Each day next week you will reflect on your progress.

Document 4 - Using Notecards for Goals

Procedure:

1. Pass out an index card to each student.
2. Have them put their name and period on one side of the card.
3. On the other side of the card, prompt the students to record:
    a. three math concepts/topics that they are good at.
    b. three math concepts/topics that they need more practice with and are not good at yet.
    c. two goals that they will work on for the month ahead.
    d. two things that they will know if their goal is met.
4. Repeat this process after every major test.



Modifications: Teachers have had success with using a large single card for an entire term so that students can observe the progress they are making.

Document 5 - Example of Learning Goal Self-Evaluation

Name: Period: *2*

Course: *Algebra 2* Chapter: *6*

Rating Rubric

1 - I can't do this yet.	**2 - I can do this with help.**	**3 - I can do this by myself.**	**4 - I could teach this to someone else.**

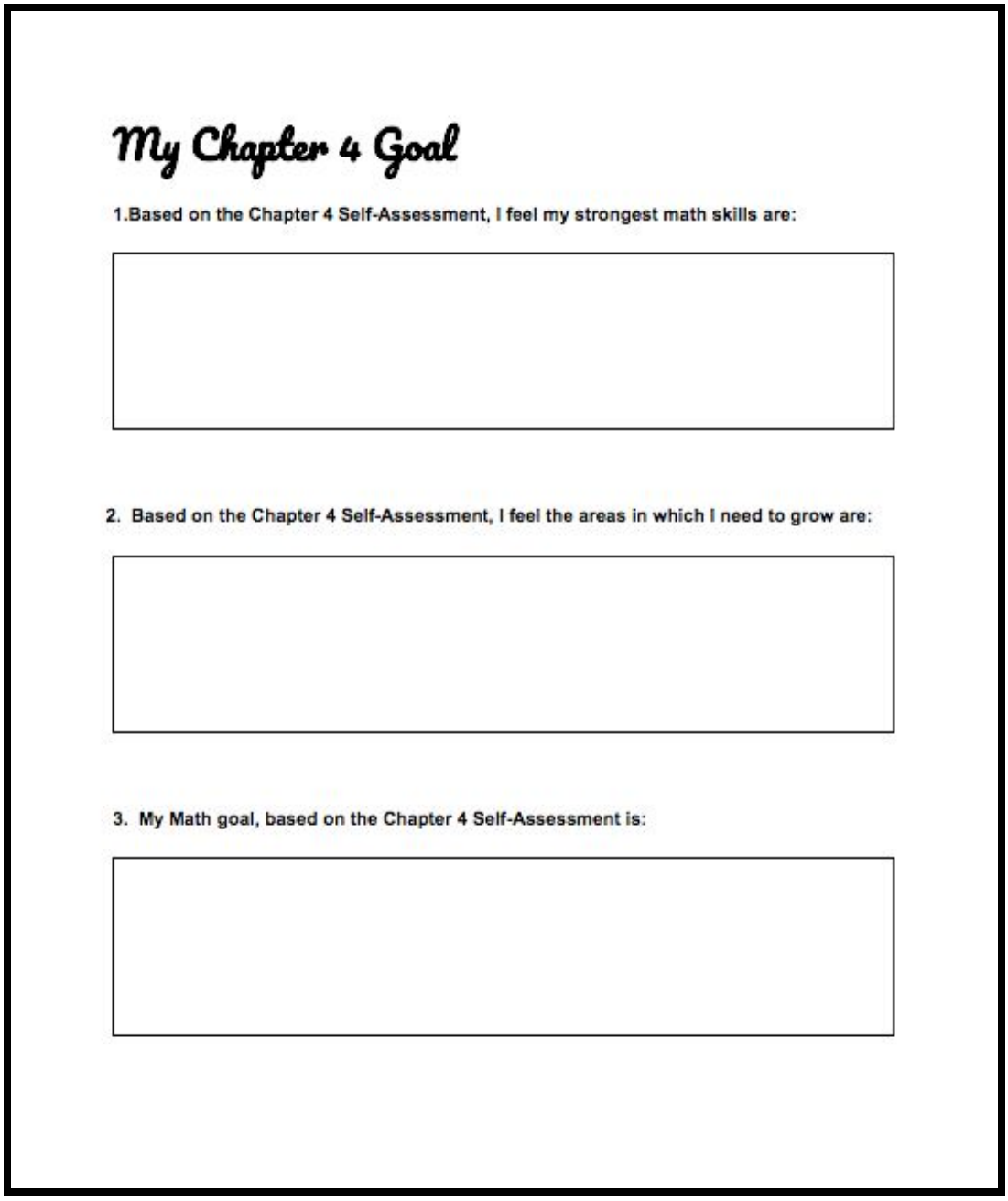
Learning Targets:	**4**	**3**	**2**	**1**
1) I can graph points in three dimensions. (x, y, z)				
2) I can graph equations in three dimensions.				
3) I can graph systems of equations in three dimensions.				
4) I can solve three-dimensional systems of equations.				
5) I can find the equation of a parabola passing through any 3 points.				
6) I can use logarithms to solve exponential equations.				
7) I can use the Product, Quotient, and Power Properties of logarithms.				
8) I can write an exponential equation when given two points and an asymptote.				

SMART Goals (Specific, Measurable, Achievable, Relevant, Timely):

Goal 1:_____

Goal 2: _____

Document 6 - Student Self-Reporting After a Self-Assessment



My Chapter 4 Goal

1.Based on the Chapter 4 Self-Assessment, I feel my strongest math skills are:

2. Based on the Chapter 4 Self-Assessment, I feel the areas in which I need to grow are:

3. My Math goal, based on the Chapter 4 Self-Assessment is:

Document 7 - Sample Self-Assessment Form

Chapter 5 Self-assessment

Name _____

Date _____ Period _____

"I've got this" means I can do the skill on my own, and I can explain my thinking to a classmate or the teacher

"Pretty close" means I can usually do the skill on my own but sometimes make mistakes. Explaining my thinking might be a challenge.

"Not yet" means I need more time. I need examples or some help to get started or finished.

1) ***Skill***	***Not yet***	***Pretty close***	***I've got this!***
I can ***draw*** the growth of a tile pattern. (1a)			
I can ***write a rule*** matching the growth of a tile pattern. (1b)			
I can ***construct a graph*** representing the growth of a tile pattern (1c)			
I can ***complete a table*** showing the number of tiles in a given figure number of a tile pattern. (1d)			

2) ***Skill***	***Not yet***	***Pretty close***	***I've got this!***
I can ***identify*** the ordered pair representing the solution to a system of equations. (2a)			
I can accurately ***match*** a linear equation to the associated graphed line. (2b)			
I can ***explain*** if an ordered pair will lie on the line representing a particular linear rule and ***justify my reasoning algebraically***. (2c)			

3) ***Skill***	***Not yet***	***Pretty close***	***I've got this!***
I can ***find missing values*** for a diamond problem. (3)			

4) ***Skill***	***Not yet***	***Pretty close***	***I've got this!***
I can ***solve an equation*** for a single variable and ***show work*** to justify my answer. (4)			

5)	***Skill***	***Not yet***	***Pretty close***	***I've got this!***
I can ***solve an equation with fractional terms*** for a single variable and ***show work*** to justify my answer. (5)				

6)	***Skill***	***Not yet***	***Pretty close***	***I've got this!***
I can ***use the Equal Values method*** to find the solution to a system of equations. (6)				

BONUS	***Skill***	***Not yet***	***Pretty close***	***I've got this!***
I can ***use the Elimination method*** to find the solution to a system of equations.				

Overall, how well do you think you understand the ideas covered on this test?

Place an "x" in the rectangle that describes your level of understanding.

I understand only a little right now — *I understand everything perfectly*

Based on this self-assessment:

My strongest math skills are

Areas in which I need to grow are

Document 8 - Using a Google Form

First Name *

Your answer

Last Name *

Your answer

My greatest strengths, based upon the Ch 5 Self-Assessment *

Select all that apply.

- [ ] Draw the graph of a tile pattern [1a]
- [ ] Write a rule matching the growth of a tile pattern [1b]
- [ ] Construct a graph representing the growth of a tile pattern [1c]
- [ ] Complete a table showing the number of tiles in a given figure number of a tile pattern [1d]
- [ ] Identify the ordered pair representing the solution to a system of equations [2a]
- [ ] Accurately match a linear equation to the associated graphed line [2b]
- [ ] Explain if an ordered pair will lie on the line representing a particular linear rule and justify my reasoning algebraically [2c]
- [ ] Find missing values for a diamond problem [3]
- [ ] Solve an equation for a single variable and show work to justify my answer [4]
- [ ] Solve an equation with fractional terms for a single variable and show work to justify my answer [5]
- [ ] Use the Equal Values method to find the solution to a system of equation [6]
- [ ] Use the Elimination method to find the solution to a system of equations [BONUS]

My growth opportunities, based upon the Ch 5 Self-Assessment *

Select all that apply.

- [ ] Draw the graph of a tile pattern [1a]
- [ ] Write a rule matching the growth of a tile pattern [1b]
- [ ] Construct a graph representing the growth of a tile pattern [1c]
- [ ] Complete a table showing the number of tiles in a given figure number of a tile pattern [1d]
- [ ] Identify the ordered pair representing the solution to a system of equations [2a]
- [ ] Accurately match a linear equation to the associated graphed line [2b]
- [ ] Explain if an ordered pair will lie on the line representing a particular linear rule and justify my reasoning algebraically [2c]
- [ ] Find missing values for a diamond problem [3]
- [ ] Solve an equation for a single variable and show work to justify my answer [4]
- [ ] Solve an equation with fractional terms for a single variable and show work to justify my answer [5]
- [ ] Use the Equal Values method to find the solution to a system of equation [6]
- [ ] Use the Elimination method to find the solution to a system of equations [BONUS]

I am choosing to work on this skill from these growth opportunities as my Chapter 5 goal: *

Choose ONE skill as your Chapter 5 goal.

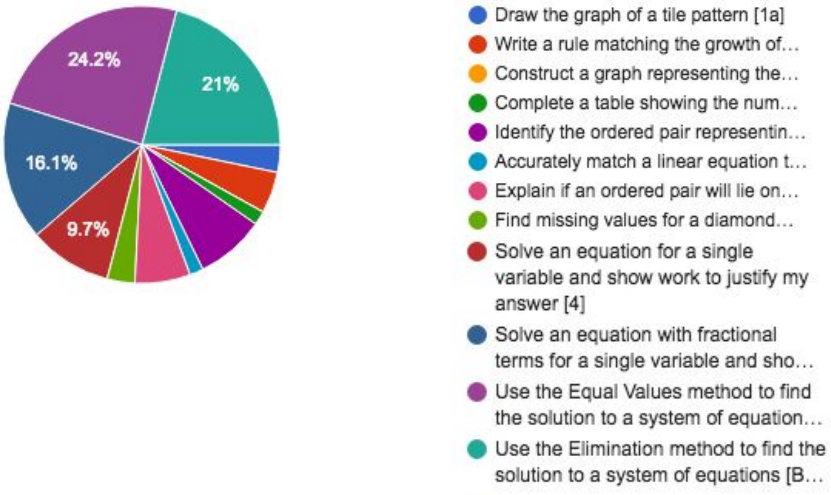
- ○ Draw the graph of a tile pattern [1a]
- ○ Write a rule matching the growth of a tile pattern [1b]
- ○ Construct a graph representing the growth of a tile pattern [1c]
- ○ Complete a table showing the number of tiles in a given figure number of a tile pattern [1d]
- ○ Identify the ordered pair representing the solution to a system of equations [2a]
- ○ Accurately match a linear equation to the associated graphed line [2b]
- ○ Explain if an ordered pair will lie on the line representing a particular linear rule and justify my reasoning algebraically [2c]
- ○ Find missing values for a diamond problem [3]
- ○ Solve an equation for a single variable and show work to justify my answer [4]
- ○ Solve an equation with fractional terms for a single variable and show work to justify my answer [5]
- ○ Use the Equal Values method to find the solution to a system of equation [6]
- ○ Use the Elimination method to find the solution to a system of equations [BONUS]

SUBMIT

Never submit passwords through Google Forms.

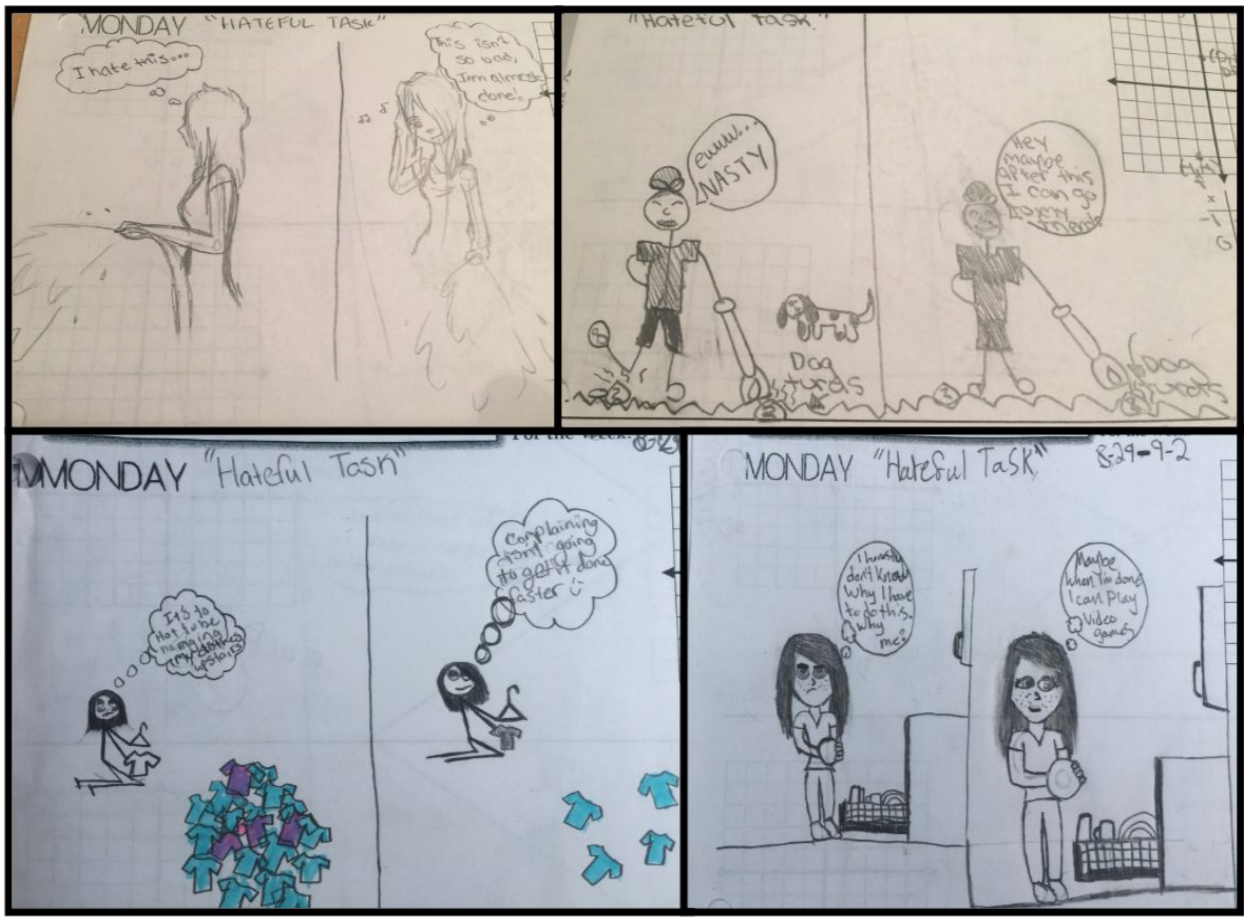
I am choosing to work on this skill from these growth opportunities as my Chapter 5 goal:

62 responses



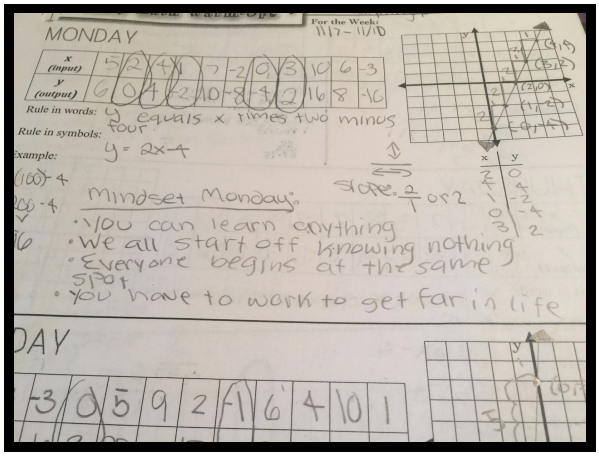
Appendix B - Student Examples

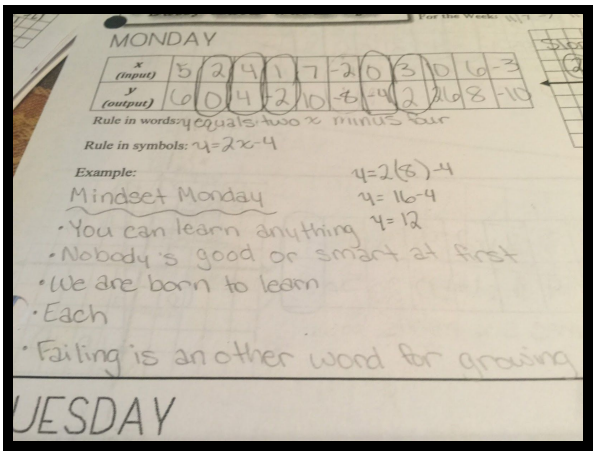
Example 1 - The Hateful Task



Examples of ***The Hateful Task*** as outlined in the Behavioral Goals section of this paper. This activity provides students with an opportunity to examine their behavior in response to stressful situations and learn to process their responses using a growth mindset message.

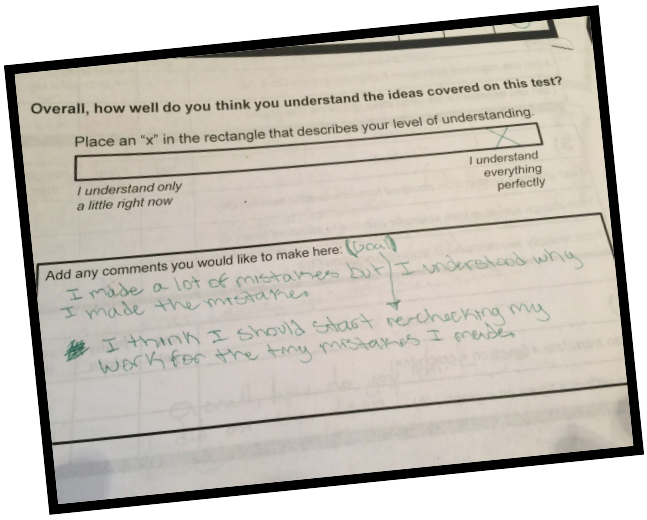
Example 2 - Mindset Monday

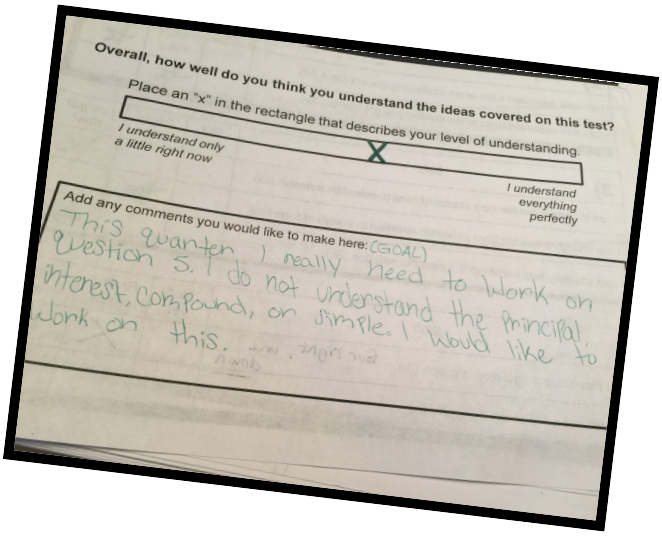




Students' regular installments of ***Mindset Monday*** videos, activities, and messages provided reinforcement of the growth mindset message throughout the year. In addition, the teacher infuses growth mindset ideas as a part of everyday classroom discourse, modeling for students along the way.

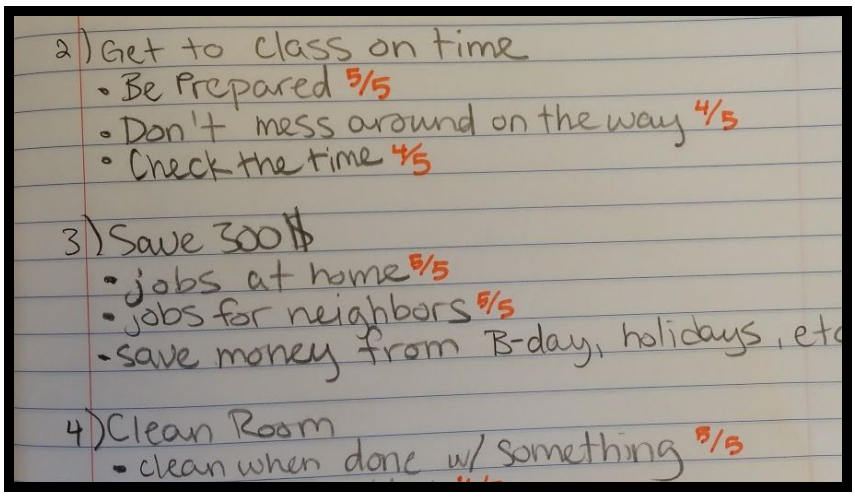
Example 3 - Self-Assessment Response



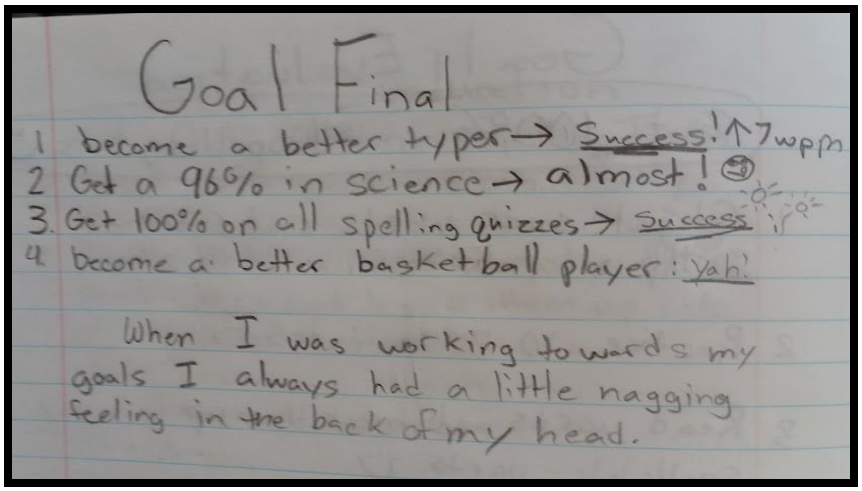


Self-Assessment based upon an individual test gives students the opportunity to evaluate their progress toward learning goals and write a reflection based upon their findings.

Example 4 - Goal Evaluations

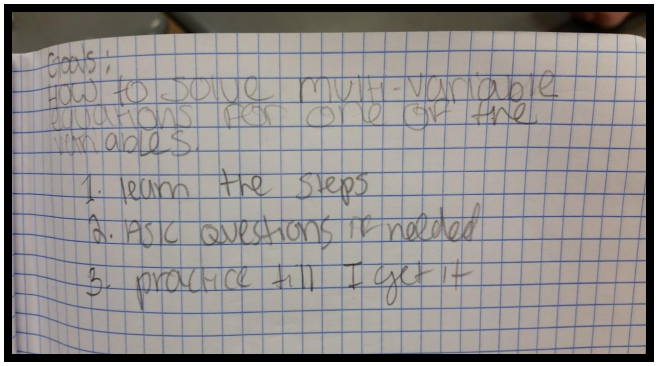


At left is a quick goal evaluation example. After restating their goals briefly on the evaluation page, the students used a 5 star rating system to evaluate their progress.

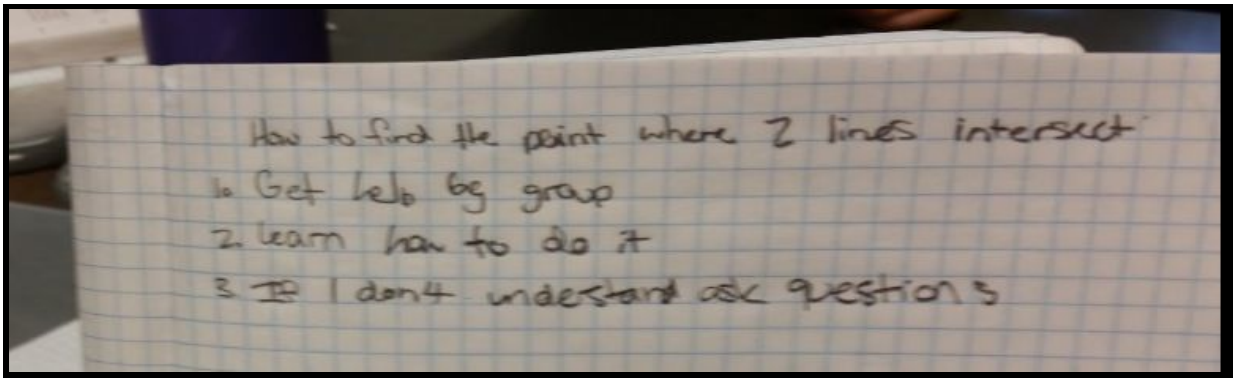


This example shows an end of quarter evaluation of a student's four goals. Lastly, I had them jot down a few sentences stating whether or not they thought the goal-setting process had been motivational, or reminded them to work toward their goal.

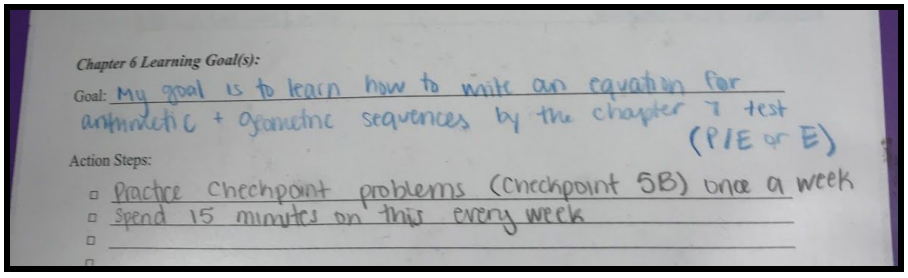
Example 5 - First Attempts at Content Specific Goals



These are examples of students' first attempts at writing content specific goals. Students need to decide what they know and what they need to learn. As they write action steps, they seem to build a bit of confidence that can help motivate them toward success.

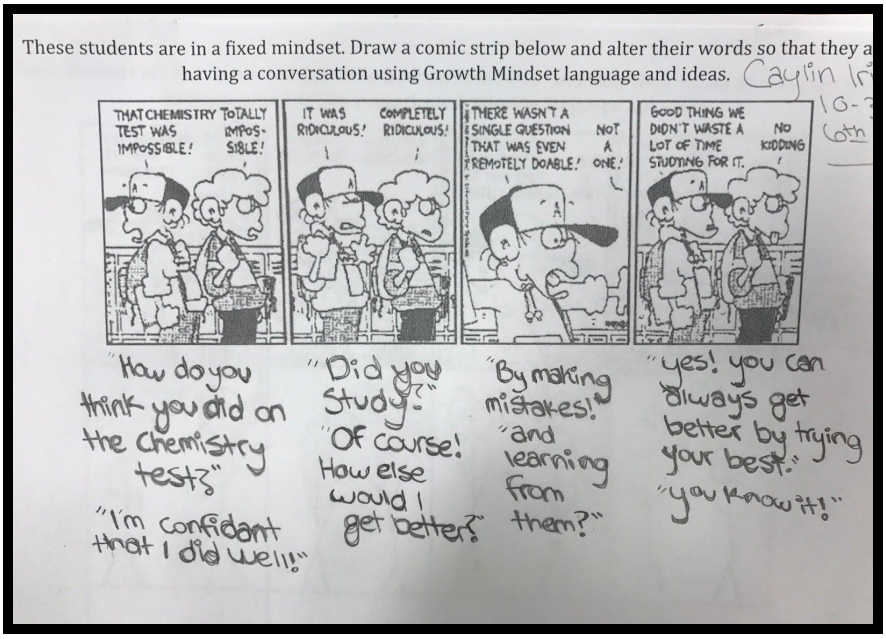


Writing down what you want to learn as a goal provides a sense of empowerment.



Above is an example of what a content specific goal might look like in Algebra I.

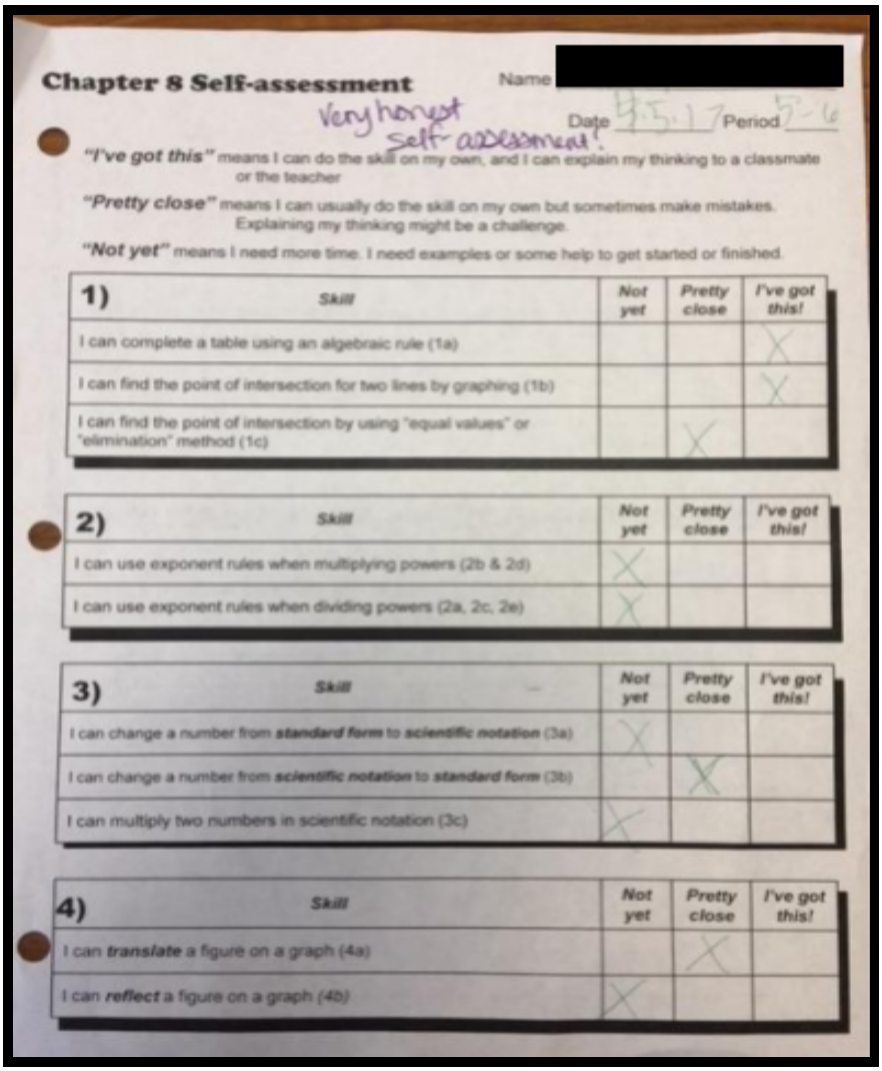
Example 6 - Example of Strategy 11



Students change characters thoughts and words from fixed to growth mindset language. [See Appendix C Toolkit of Activities]

Example 7 - Michael's Story

This is Michael's self-assessment from the Chapter 8 individual test. This experience brought Michael to his *"Ah-ha!"* moment in math class. Through the process of examining and comparing his work to math learning targets, he came to realize that he has math strengths. In fact, his ability to accurately identify the function in *The Silent Board Game* was quite remarkable.



Chapter 8 Self-assessment Name [redacted]

Very honest self-assessment! Date 5.5.17 Period 5-6

"I've got this" means I can do the skill on my own, and I can explain my thinking to a classmate or the teacher

"Pretty close" means I can usually do the skill on my own but sometimes make mistakes. Explaining my thinking might be a challenge.

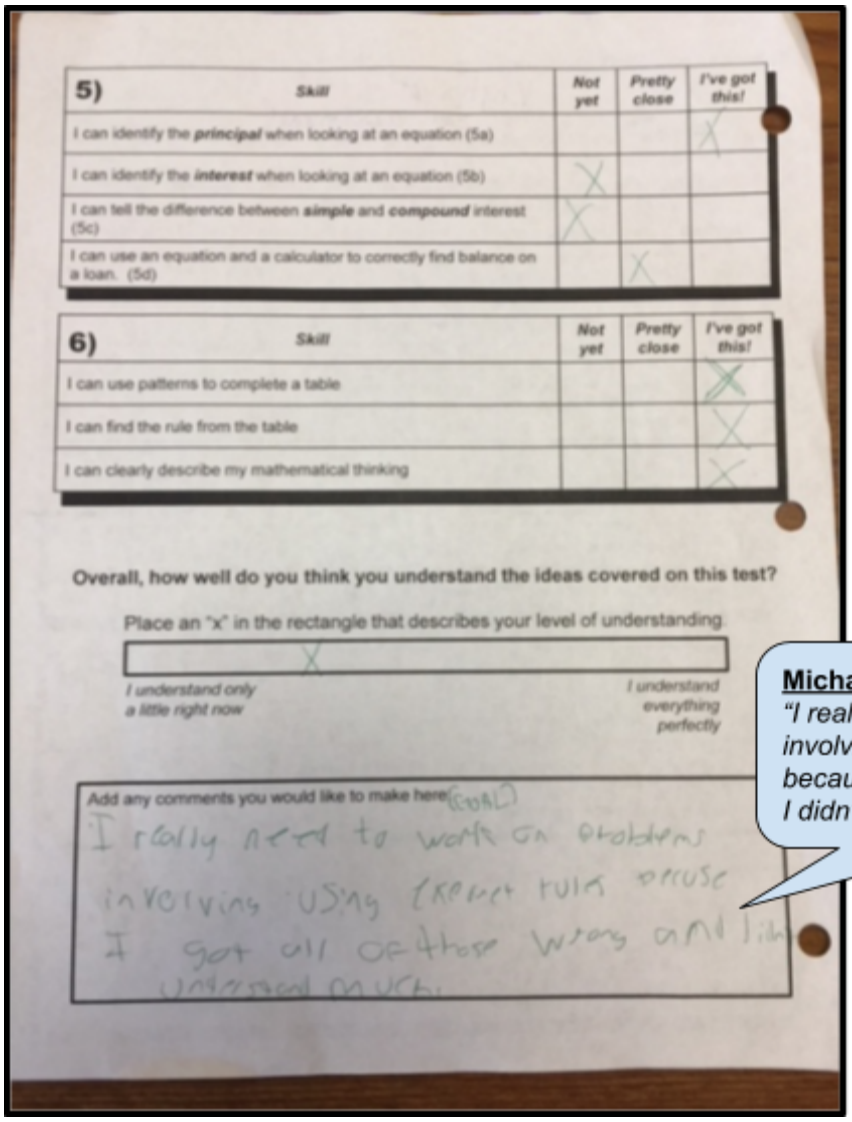
"Not yet" means I need more time. I need examples or some help to get started or finished.

1) Skill	Not yet	Pretty close	I've got this!
I can complete a table using an algebraic rule (1a)			X
I can find the point of intersection for two lines by graphing (1b)			X
I can find the point of intersection by using "equal values" or "elimination" method (1c)		X	

2) Skill	Not yet	Pretty close	I've got this!
I can use exponent rules when multiplying powers (2b & 2d)	X		
I can use exponent rules when dividing powers (2a, 2c, 2e)	X		

3) Skill	Not yet	Pretty close	I've got this!
I can change a number from ***standard form*** to ***scientific notation*** (3a)	X		
I can change a number from ***scientific notation*** to ***standard form*** (3b)		X	
I can multiply two numbers in scientific notation (3c)	X		

4) Skill	Not yet	Pretty close	I've got this!
I can ***translate*** a figure on a graph (4a)		X	
I can ***reflect*** a figure on a graph (4b)	X		



5) Skill	Not yet	Pretty close	I've got this!
I can identify the ***principal*** when looking at an equation (5a)			X
I can identify the ***interest*** when looking at an equation (5b)	X		
I can tell the difference between ***simple*** and ***compound*** interest (5c)	X		
I can use an equation and a calculator to correctly find balance on a loan. (5d)		X	

6) Skill	Not yet	Pretty close	I've got this!
I can use patterns to complete a table			X
I can find the rule from the table			X
I can clearly describe my mathematical thinking			X

Overall, how well do you think you understand the ideas covered on this test?

Place an "x" in the rectangle that describes your level of understanding.

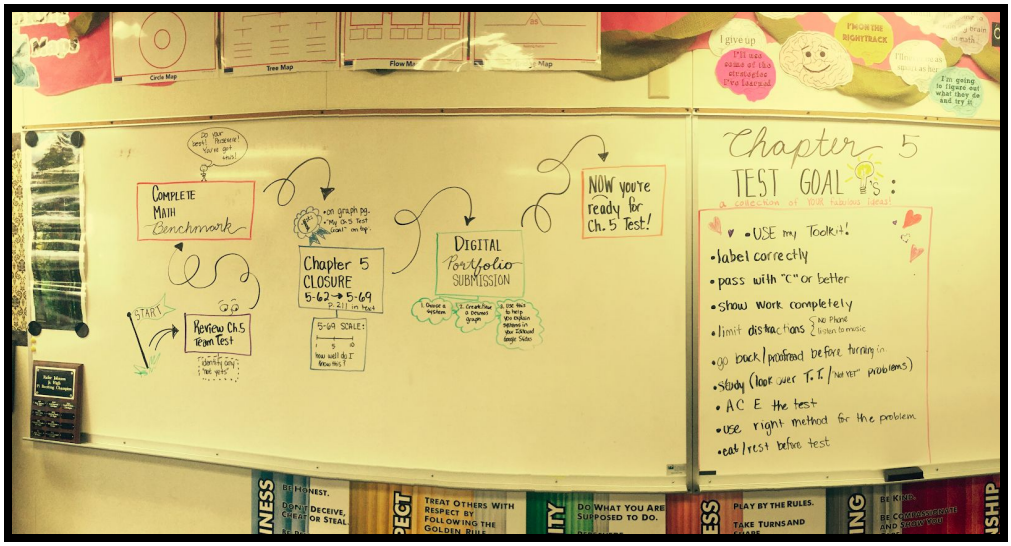
X

I understand only a little right now — *I understand everything perfectly*

Add any comments you would like to make here: (GOAL)
I really need to work on problems involving using [exponent] rules because I got all of those wrong and I didn't understand much.

Michael: (GOAL)
"I really need to work on problems involving using exponent rules because I got all of those wrong and I didn't understand much."

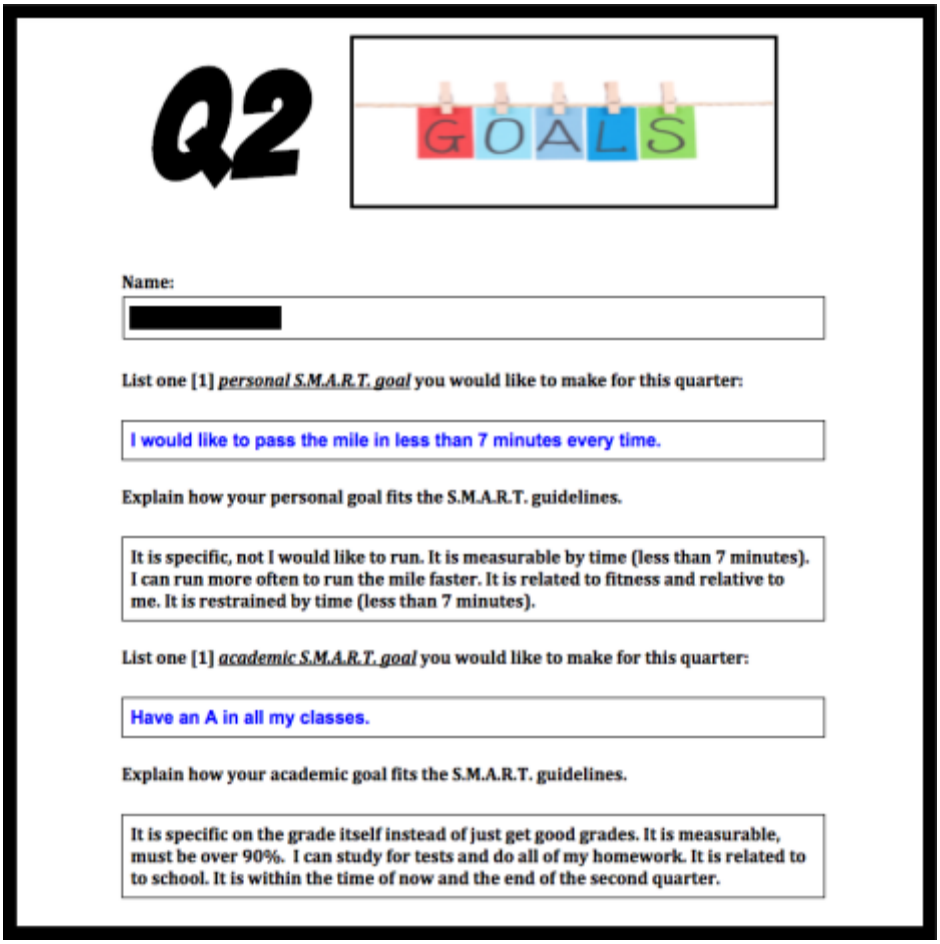
Example 8 - Blooper Reel: Non-Examples and What We Learned



Common Setback #1:
Student goals are set too early, well before the classroom culture may not be fully developed. When we initially embarked on the goal setting journey with our students, we decided to collect a "baseline" for our students' goal setting abilities. Our thought was to get an idea for their ability to set goals. However, when asked to write a goal during the first week of school, it became evident that they had no prior knowledge about how to begin, nor how to attempt writing a goal.
Remedy: Develop classroom culture FIRST, then model goal setting explicitly.

Common Setback #2:
Student goals are too general; they are not S.M.A.R.T. goals. "I want to save money." This goal lacks specificity, it is not measurable, and is not time based.
Remedy: Review elements of S.M.A.R.T. goals and provide opportunities for revision.

Common Setback #3:
Student goals are related to grade / score / percentage; the focus is on achievement rather than mastery. With this type of goal, students do not relate their true understanding or level of mastery to the goal.The student in the example below clearly understood the elements of a "S.M.A.R.T." goal; however, his academic goal was set based upon achievement rather than understanding or mastery.
Remedy: Re-write achievement goals as mastery goals through whole-class discussion.



Q2

GOALS

Name: [redacted]

List one [1] *personal S.M.A.R.T. goal* you would like to make for this quarter:

I would like to pass the mile in less than 7 minutes every time.

Explain how your personal goal fits the S.M.A.R.T. guidelines.

It is specific, not I would like to run. It is measurable by time (less than 7 minutes). I can run more often to run the mile faster. It is related to fitness and relative to me. It is restrained by time (less than 7 minutes).

List one [1] *academic S.M.A.R.T. goal* you would like to make for this quarter:

Have an A in all my classes.

Explain how your academic goal fits the S.M.A.R.T. guidelines.

It is specific on the grade itself instead of just get good grades. It is measurable, must be over 90%. I can study for tests and do all of my homework. It is related to to school. It is within the time of now and the end of the second quarter.

Common Setback #4:
Students struggle to understand what they don't know. This is usually coupled with teacher-driven feedback on assessments. Students who continually request their score or grade following an assessment need help learning how to seek understanding.
Remedy: Students evaluate their understanding on specific learning targets and identify both strengths and areas for growth.

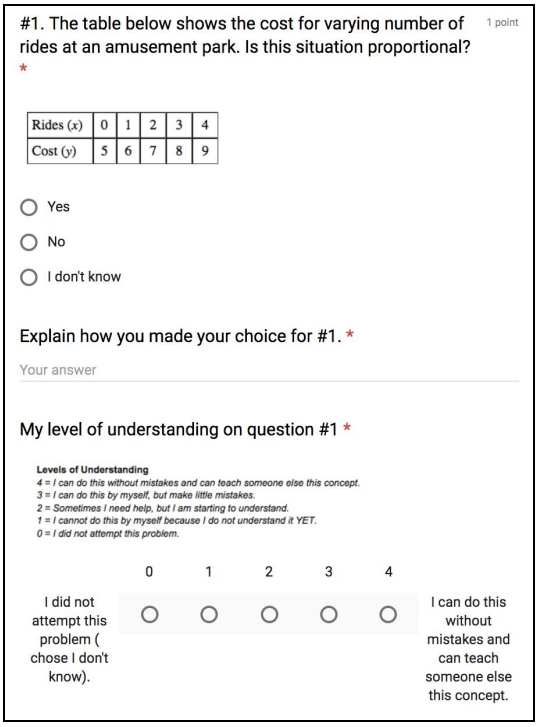
Common Setback #5:
Goal setting is not working in the classroom due to a rigid adherence to a pacing guide. Understanding the human need for mastery over time is ignored.
Remedy: Teachers need to rely on instincts and professional expertise to determine if and when a class is ready to move forward. Taking time and using flexibility are key

elements for success. Below is a classroom example where the teacher avoided this setback.

> Over the three years that teachers have investigated goal setting in their classrooms, we have found that the basic sequence and methods is successful whether you are teaching seventh grade or calculus. It is important to recognize that these groups of students do have different needs and different mindsets at the start. It is important to respond to the needs of the class. One teacher researcher, Louis, found that his calculus class was struggling to maintain a growth mindset as they faced challenges and struggles mathematically, some of the for the first time. In response to this, he spend much more time creating the classroom culture and working on team and individual behavioral goals. The process is the same, the pacing to move through the steps is based on the needs of the students. You can teach goal setting to any age student if you keep this in mind.

Example 9 - Learning Target Assessment Example

Below is question 1 of a 5 question assessment:



#1. The table below shows the cost for varying number of rides at an amusement park. Is this situation proportional? * 1 point

Rides (x)	0	1	2	3	4
Cost (y)	5	6	7	8	9

- Yes
- No
- I don't know

Explain how you made your choice for #1. *

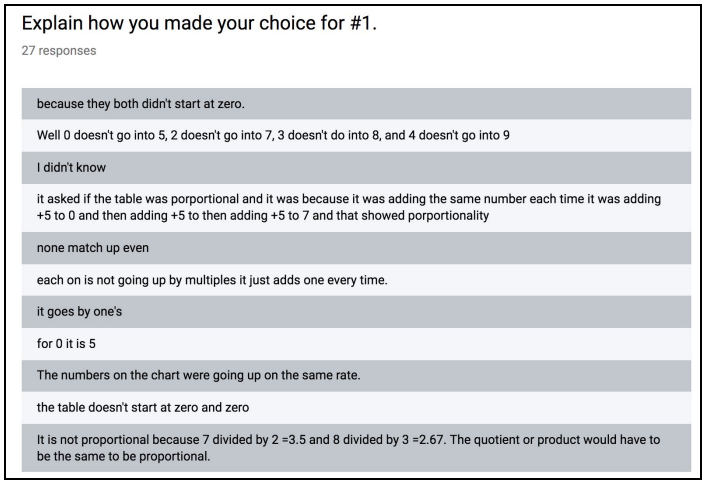
Your answer

My level of understanding on question #1 *

Levels of Understanding
4 = I can do this without mistakes and can teach someone else this concept.
3 = I can do this by myself, but make little mistakes.
2 = Sometimes I need help, but I am starting to understand.
1 = I cannot do this by myself because I do not understand it YET.
0 = I did not attempt this problem.

	0	1	2	3	4	
I did not attempt this problem (chose I don't know).	○	○	○	○	○	I can do this without mistakes and can teach someone else this concept.

The reflection questions help students self-evaluate their level of mastery. They will receive correct/incorrect feedback as well. Google Quiz (Forms) summarizes data in a variety of ways. The open-ended question highlights the error or correctness in the students' thinking. Multiple choice questions provide an opportunity for quick feedback. The students were encouraged to choose the "I don't know" response instead of guessing. We found that such an open response helped clarify student thinking.



Explain how you made your choice for #1.

27 responses

- because they both didn't start at zero.
- Well 0 doesn't go into 5, 2 doesn't go into 7, 3 doesn't do into 8, and 4 doesn't go into 9
- I didn't know
- it asked if the table was porportional and it was because it was adding the same number each time it was adding +5 to 0 and then adding +5 to then adding +5 to 7 and that showed porportionality
- none match up even
- each on is not going up by multiples it just adds one every time.
- it goes by one's
- for 0 it is 5
- The numbers on the chart were going up on the same rate.
- the table doesn't start at zero and zero
- It is not proportional because 7 divided by 2 =3.5 and 8 divided by 3 =2.67. The quotient or product would have to be the same to be proportional.

Appendix C - Toolkit of Activities

<table>
<tr><td>Strategy 1</td><td rowspan="3">Rationale

● A regularly calendared infusion of ideas to promote a shift in classroom culture
● Inform students of the differences between fixed and growth mindsets
● Provide an opportunity for students to identify fixed and growth mindset in “real time”
● Practice replacing traditionally fixed messages with positive ones
● Appreciate the value of mistakes</td></tr>
<tr><td>Mindset Monday

Element</td></tr>
<tr><td>Build Classroom Culture</td></tr>
<tr><td>Resources</td><td>Practice</td></tr>
<tr><td>Class Dojo Series: <u>Growth Mindset for Students</u>

Chapter 1: A Secret About the Brain

Chapter 2: Mojo Bounces Back

Chapter 3: Katie Discovers the Incredible Power of YET

Chapter 4: The Mysterious World of Neurons

Chapter 5: Mojo Puts it All Together</td><td>Each Monday, preferably at the start of the math class, a teacher provides a video, graphic, roleplay scenario, or activity provoking student thinking as outlined in the above rationale.

As Mindset Mondays become a regular part of the classroom culture, students come to embrace the practice and look forward to a new experience each week. The benefits of this weekly time investment include:

● Positive attitude and behavioral shifts

● Students view math as something at which everyone can become proficient

● Math conversations trend toward collaboration and support of ideas rather than simply getting the “right” answer</td></tr>
</table>

<table>
<tr><td>Strategy 2</td><td>Rationale</td></tr>
<tr><td>Group Norms</td><td rowspan="3">Give students a voice and buy-in with classroom culture, to invite ownership of the learning environment.
Empower students in team roles, so you (and the student) get to see talents that may otherwise go unnoticed.
Develop an anchor reference chart to which the class can refer for expectations</td></tr>
<tr><td>Element</td></tr>
<tr><td>Build Classroom Culture</td></tr>
<tr><td>Resources</td><td>Practice</td></tr>
<tr><td></td><td>Students are asked to quietly ponder the questions, “What do you <u>like</u> about working in groups?” and “What <u>bothers you</u> about working in groups?”

⇒ Think Time ⇐

Teachers call on students to “pass the pen” and have them come up to record their response on the “DO” or “DON’T” side of a chart paper. As students write their response, they turn and tell the class what they wrote and the thinking behind it. For example,

“I don’t like it when I work in a group with someone who is bossy. It’s really hard to learn with one person telling everyone what to do.”

“I appreciate it when I’m working in a group and the team organizes work so everyone can understand and explain it.”

Once ideas are exhausted and students have had an opportunity to share, the teacher posts the chart in a prominent place in the classroom as an anchor chart for students to view over the course of the culture-building period. It becomes a list of self-generated “rules” for study teams to remember as they learn to collaborate and exercise their roles as team members.</td></tr>
</table>

<table>
<tr><th>Strategy 3</th><th>Rationale</th></tr>
<tr><td>Who I Am</td><td rowspan="3">Students learn about and acquaint themselves with one another
Establish a safe learning environment
Clearly communicate class message / mantra
Provide students with an anchor message to which they can refer throughout the school year</td></tr>
<tr><td>Element</td></tr>
<tr><td>Build Classroom Culture</td></tr>
<tr><td>Resources</td><td>Practice</td></tr>
<tr><td>Dan Meyer, Who I Am

Who I Am Word Cloud Example: [Appendix B]

Word Cloud Generator

Khan Academy, You Can Learn Anything</td><td>1. Students are asked to introduce their neighbor by first finding out the following three things:
a. Their first name

b. An adjective that describes themselves (using the same letter as their first name)

c. A single word that describes math

Examples:

- “This is Slick Siegel. She thinks math is thinking”

- “I’m going to introduce Mischievous Mary. She thinks math is difficult”

2. Choose one group to coach others on how to stand tall, speak clearly, then sit quickly to model behavior for the rest of the class.

3. Teacher writes each one-word description of math on the board under the title, “Math is…”

4. A Word Cloud is generated for each class to reference / comparison of the overall class perception of math at the start of the year and at the end of the year, if this activity is repeated later in the year.</td></tr>
</table>

<table>
<tr><th>Strategy 4</th><th>Rationale</th></tr>
<tr><td>Two Stars & A Wish</td><td rowspan="3">Precedes “Criticism vs. Critique”
Drives students to select only constructive messages as they evaluate others’ work
Provides an opportunity for students to give both positive and growth feedback without emotion or judgment
Strategic note: 2-to-1 ratio of positive to growth messages intentionally guides students toward the positive
Useful as a formative assessment of students’ readiness to objectively critique</td></tr>
<tr><td>Element</td></tr>
<tr><td>Build Classroom Culture
Develop Self-Regulation</td></tr>
<tr><th>Resources</th><th>Practice</th></tr>
<tr><td>Teacher-selected multi-step problem or performance task to present in the whole-class setting.</td><td>The ideal scenario to introduce this strategy is when groups of students are taking turns presenting ideas / work in a whole-class setting.

The teacher introduces the strategy as constructive feedback for each group. All observers are responsible to participate by giving exactly three pieces of feedback - two of them “stars” (or elements of the presentation that were strong / well done) and one “wish” (a single element that could improve the group’s presentation or content). Each observing student writes this feedback on a piece of paper, and can be used as an exit ticket for accountability purposes.

After each group presentation the teacher randomly selects students to first share “stars” (three or so), and then do the same for the “wishes.” The teacher uses guided questioning to avoid generalizations or vague responses. For example, “I liked your presentation - it was good” might elicit the teacher question, “Can you describe what you liked about this presentation? In your mind, what made this presentation good rather than bad?” If students appear to struggle with providing feedback, the</td></tr>
</table>

	teacher may need to first model an example of both a positive comment (“star”) as well as a growth opportunity (“wish). Examples: ● *“I appreciate the visuals this group provided to support their work”* ● *“The group used descriptive words and appropriate vocabulary so I knew exactly what their group was talking about”* ● *“I wish each group member had an active role in sharing what they learned so we could tell the work belonged to the whole group. In the future, I suggest each person present part of the presentation so it provides the audience with more variety and shows that you worked as a team.”*

<table>
<tr><th>Strategy 5</th><th>Rationale</th></tr>
<tr><td>Criticism vs. Critique</td><td rowspan="3">Anchor lesson leading to “teachable moment” opportunities throughout the school year
A more precise, focused form of “Two Stars & a Wish” strategy
Understand the differences between criticism and critique
Examine scenarios that typically lead to criticism and explore ways to instead provide a constructive critique
Challenge students to identify social scenarios and use this strategy outside the classroom</td></tr>
<tr><th>Element</th></tr>
<tr><td>Develop Self-Regulation
Sustain Classroom Culture</td></tr>
<tr><th>Resources</th><th>Practice</th></tr>
<tr><td>Torch TV Example</td><td>The teacher selects a scenario that could normally generate student criticism, such as a video of student ASB election speeches, recorded daily announcements, or a student oral presentation to classmates.

Before the video / presentation, a whole-class conversation is held on the topic of criticism. A possible question posed to the students would be “Can you think of a time when you were criticized for doing something you enjoy - whether that be playing your favorite sport, dance, music, art, or something else you feel passionate about? Think of the comments used to criticize your performance. Were those comments hurtful or helpful? In other words, did those words make you feel bad or help you become more skilled with your performance in that area?”

⇒ Think Time ⇐

Most students will eagerly agree by a show of hands / consensus that criticism is harmful. Teacher: “If criticism is harmful, does that mean we should only tell people good things about their performance, even if it isn’t as good as we feel it could be?”

⇒ Think Time ⇐</td></tr>
</table>

	Call on a few hands - consensus should reveal that it is also not good to lie or tell a mistruth about someone's performance. "The middle ground we'd like to reach when giving feedback is called *critique*. This is a way to provide valuable, focused feedback to another person by stating what you like about their presentation and think they did well, as well as an opportunity for growth to strengthen their performance. We are about to view _____. As observers we will provide a *critique* of the presentation when it is done. As you are viewing, please watch and listen with the understanding that you will be providing only comments that *build up*, or give feedback that will help improve this presentation. When doing so, we usually begin with what we like, and always give input about an area in which provides this person an opportunity to grow.

<table>
<tr><td>Strategy 6</td><td rowspan="3">Rationale

● Engage students in individual understanding
● Support team collaboration for justifying, critique and arriving at an agreed-upon conclusion
● Teams provide ample evidence - in multiple forms - to convince a skeptic of their answer.
● Students are challenged to read, write, listen and speak for understanding</td></tr>
<tr><td>Convince Yourself, Convince a Friend, Convince a Skeptic</td></tr>
<tr><td>Element</td></tr>
<tr><td>Develop Self-Regulation</td><td></td></tr>
<tr><td>Resources</td><td>Practice</td></tr>
<tr><td></td><td>1. Give all students a problem or performance task to work on independently. All time for all students to make some sense of the problem and begin work toward a solution. Inform students they will not all come to a full solution before asked to work in their team & share what they have accomplished thus far.

2. Ask students to turn to a partner or their team, now explaining the work they began. Students build upon each other’s thinking to come to a collaborative conclusion / answer to the question.

3. Student partners or teams think of possible questions a skeptic might come up with as their work is presented. They develop and prepare counter arguments in response to possible questions of a skeptic.

4. Students teams present their thinking to their designated “skeptics” - either another team or to the whole class - and provide responses according to their prepared counter arguments.

<u>NOTE</u>: The teacher must guide the interactions between students to ensure discourse is thoughtful and respectful.</td></tr>
</table>

<table>
<tr><th>Strategy 7</th><th>Rationale</th></tr>
<tr><td>Stand-Alone Work: Stronger, Clearer, More Convincing</td><td rowspan="3">Calibrate classroom to agreed-upon work expectations
Connect these expectations to an anchor term, “Stand-Alone Work” to which students can refer as the year progresses
Generate student buy-in to provide more substantial responses
Develop a culture of peer critique
Create an anchor chart for Stand-Alone Work to which students can refer throughout the school year</td></tr>
<tr><td>Element</td></tr>
<tr><td>Build Classroom Culture
Develop Self-Regulation</td></tr>
<tr><th>Resources</th><th>Practice</th></tr>
<tr><td>Quality of Work Slides

Stand-Alone Work Anchor Chart
[Appendix B]</td><td>Teacher gives students a math problem to all students, who are asked to provide work to support their thinking (see example, Quality of Work Slides in Resources section). Students work independently on this problem.
The teacher gives students ample time to complete the problem, at the very least, so that most students arrive at an answer and all students have a general understanding for what is being asked of them.
The teacher shows previously-collected anonymous work from various “students,” asking the students to put themselves in the role of teacher.
Teacher asks, “What do you notice?” and “What good math do you see in this student’s work?” for each of the provided examples.
Students provide responses according to what they see in each example. As students respond, the teacher guides the discussion with positive, objective feedback.
The teacher shows the final slide with the question, “Which of these, if any, has given</td></tr>
</table>

	you enough evidence to be convinced?" Students are allowed to respond. Some will cite the example with the best handwriting. Others will argue for the clearly recorded steps of work. Still others will want to give credit for student thinking. The teacher acknowledges each of these as important factors, then makes an important statement about the need for *multiple forms of evidence* to provide enough support to adequately come to a conclusive and convincing answer. 7. The teacher presents the *Court of Law* example in support of this thinking: **If you were to walk into a court of law as a witness, could you walk up to a judge and jury and state your thinking, such as *"Your honor, I know this man is guilty,"* and simply walk away? [this usually provokes a strong student response…"of course not!"] The teacher then asks, "*Why?"* Students likely respond with, *"You need to have EVIDENCE,"* to which the teacher can make the connection to the math work. *"How MUCH evidence should you provide? Is MORE or LESS evidence better?"* Students will agree that the more evidence supplied, the better your testimony.** 8. The teacher then leads the students in creating an anchor chart that students / class periods can add to and refer to throughout the school year. (See examples in [Appendix B]) <u>NOTE</u>: Students tend to ***enjoy*** being placed in the role of a teacher / critiquer, when given the opportunity. Placing them into this analytical role will help remove the stigma of student mistakes as a negative, instead communicating the message that mistakes are a natural part of the learning process.

<table>
<tr><td>Strategy 8</td><td rowspan="2">Rationale
Develop a regular pattern of academic reflection
Focus students on knowledge and understanding rather than solely on achievement
Provide a starting place for self-selected academic goals based upon learning targets
Regular and appropriate use of academic vocabulary
Challenge students to identify goals and the means with which to meet them</td></tr>
<tr><td>Self-Assessment

Element

Develop Self-Regulation
Sustaining Classroom Culture
Goal Setting</td></tr>
<tr><td>Resources</td><td>Practice</td></tr>
<tr><td>Ch 2 Self-Assessment
Student SA - Ex. 1
Student SA - Ex. 2
Ch 3 Self-Assessment
Ch 4 Self-Assessment
Ch 5 Self-Assessment
Ch 6 Self-Assessment
Ch 7 Self-Assessment</td><td>Have students enter the classroom and sit down without opening their backpacks. Waiting on each student's desk is a blank self-assessment form and a green pen. The teacher then passes back each student's UNGRADED and UNMARKED test, These elements are important because we want students to remain honest and shift the focus from scores, grades, and teacher feedback to a clear view of their understanding of the mathematics.
The teacher has a copy of the assessment KEY containing handwritten exemplar work - but NO markings indicating point values. Again, this keeps the focus on the mathematics rather than a score.
The key is displayed under the document camera - one question or skill at a time - for the whole class to view the projected image. The chunking of information helps maintain whole class conversation and questioning on one topic at a time, so students can remain focused on the single skill they are assessing with a "Not Yet," "Pretty Close," or "I've Got This" ranking. As a result, students arrive at the face-to-face convergence of the skills they</td></tr>
</table>

	are asked to learn and their own knowledge of those skills. During this process, the teacher takes the opportunity to ask the class for possible common errors a student might make in each of these problems, and how they might be able to avoid making these same mistakes in the future. Observation: students are both honest and accurate with their self assessment skills. 4. <u>At the end of the assessment process, students are asked to give an overall ranking of their holistic knowledge of the skills assessed on this test.</u> The continuum of the ranking ranges from "***I understand only a little right now***" to "***I understand everything perfectly***." The teacher acknowledges it would be a rare occurrence to make a marking clear to the left or right of the continuum, because we all have some knowledge and also have room to grow, but to place the mark somewhere along the range of ranking marks. This overall ranking helps move students from the chunked skills to a broader view of their mathematical knowledge and understanding. Students look over individually ranked skills to gather their interpretation of where they fall on the overall ranking. For some students, this might be the first time they realized they aren't "dumb" in math. Instead, they identify both strengths and growth opportunities as a baseline for goal setting. 5. <u>Acknowledge the unstated.</u> Being truthful with students about the reality that their performance on this test will make its way to the gradebook in the form of a number; however, the score isn't really where we should focus our time or attention. We are in school to learn, and we learn best when we can monitor our own knowledge through self reflection such as this. 6. It is suggested that student Self-Assessment forms are kept in a portfolio with their original

	assessment as artifacts of learning. In the future, these items are used to identify student growth over time and can be pulled as evidence of learning for stakeholders (parents, administrators, etc.) With these resources available, students, themselves, have a solid means to communicate their identified strengths and growth opportunities.

<table>
<tr><td>Strategy 9</td><td rowspan="2">Rationale
Develop specific goals based upon learning targets
Use appropriate vocabulary when communicating goals
Student self-regulation based upon meaningful evaluation of their own understanding
Encourage communication between students, teachers, and parents about mathematical understanding
Shift from an achievement-oriented focus to an academically focused classroom</td></tr>
<tr><td>Identifying Goals Based Upon Self-Assessment

Element

Develop Self-Regulation Goal Setting</td></tr>
<tr><td>Resources</td><td>Practice</td></tr>
<tr><td>Option 1 Example
[see Appendix B]

Option 2 Example
[see Appendix B]

Screenshot of Results
[see Appendix B]</td><td>A self-completed Self-Assessment Form from each student is used to identify:

<ol type="a">
Strengths
Areas for Growth
One Academic Goal
<u>Option 1</u>:<ol type="a">
Each students is provided with a copy of a Google Doc that is pre-plugged with the three prompts.
Students fill in and return their responses.
The teacher adds comments to each student’s response with a guiding question.
Students are expected to provide a comment response back to the teacher and make any corrections, if needed, in order to receive full credit on this assignment. [suggestion: an initial 4 out of 5 possible points until a response is received or students do not receive any score until the full digital “conversation” take place]
<u>Option 2</u>:</td></tr>
</table>

	a. A Google Form pushed through Google Classroom, where students identify *strengths* and *growth opportunities* by clicking on learning targets self identified on the hard copy self assessment form. b. Students then click on the ***one learning target*** identified as their academic goal. c. The teacher can view the analytics on the back end of the form to easily identify if one of the learning targets requires whole class reteaching, and differentiated groups might be formed to fit the needs of the students in a class. 4. Identified learning targets can be cross referenced on intervention programs, such as IXL, so students can get extra practice, understanding, and gain confidence as they work toward achieving their goals.

Strategy 10	**Rationale**
3-Column Strategy **Element** *Develop Self-Regulation*	• I assign most review/preview problems for homework. The first time I assigned homework in the book, I spent the day modeling for students how to get the most out of review/preview problems. I showed them homework help. I talked through how I would use hints, why some problems will show the answers and other will show steps. I preached how thinking through this problems is a great way to study math. “Best way to study math, is to do math”.
Resources	**Practice**
3-Column Strategy Example: [Appendix B]	I modeled note-taking and self-reflection via the 3-column strategy on the first day. I told them that this is a highly structured class. We use the skills we do in chapter 1 within chapter 12. This can seem like a lot if we don’t keep up. There is no excuse because “I got you”. Follow my instructions on binder set up, labeling papers, and reflection on what you’ve done and you will learn. I established an organizational strategy inspired by Cornell Notes. Students folded a sheet of graph paper into three columns. One column is for the problem number and two or three words that describe the type of problem it is. This makes clear what content is being covered so they can notice what kinds of problems they have mastered, mastered with hints, or have not mastered yet. I also have them record if they think this is a review problem and preview problem. This is the first year I’ve been intentional so early in the year for all students to note the difference and the purpose of each type. Usually I save the conversation for student who have done poorly on the first test. The next test is coming up. I wonder if the earlier intervention will make a difference. The middle column is the largest column. It is the work shown

	column. Students are to show all thinking clearly. Then the last column is reserved for notes or questions. Sometimes review/preview problems introduce vocabulary or stress certain connections. All should be recorded. This is also where questions can be written. Students get full credit for homework for genuine effort and completion. I define this as students categorizing each type of problem in the first column and writing notes/questions in the third. Problems should always be started. I tell them to write the most specific thing they know about the problem, because they always know something. Then try to figure out what it is that you don't know. Where are you getting stuck? What do you need to know? I check for all of this while students are invited to talk through answers with their study team the next day. I give 8 minutes for them to talk strategies while the final answers are shown on the board. 2 minutes are given for whole class questions. If students need further clarification, they now have the feedback already started to look at later individually, with a friend, or afterschool with me (the teacher).

<table>
<tr><td>Strategy 11</td><td>Rationale</td></tr>
<tr><td>Comic Strip</td><td rowspan="3">To get students to change Fixed Mindset thoughts and statements into Growth Mindset thoughts and statements on someone else other than themselves.
This allows them the freedom to not be self conscious about their own mindset, and to really think about how they could alter the words from a fixed to a growth mindset..</td></tr>
<tr><td>Element</td></tr>
<tr><td>Develop Growth Mindset</td></tr>
<tr><td>Resources</td><td>Practice</td></tr>
<tr><td>Newspaper Comic Strips
[See Appendix B]</td><td>Provide students with a comic strip depicting a Fixed Mindset. Below the comic strip, have them write new language for the speech balloons, so the characters are having a conversation using Growth Mindset language and ideas.</td></tr>
</table>