Durable Learning

Make Learning Stick!
Goals

Participants will take away for their practice:

– An understanding of the science behind learning that lasts.
– Routines used with their current curriculum to deepen learning.
– Prompts that encourage learners with diverse strengths and needs to think for themselves.
– Routines for small group collaboration to build and challenge understanding.
Exploring our own understanding
Exploring our own understanding

1. What is something that you understand well?

2. How did you develop that understanding?

3. How do you know you understand?
Your Chart

<table>
<thead>
<tr>
<th>Name</th>
<th>What you understand</th>
<th>How did you develop that understanding?</th>
<th>How do you know you understand??</th>
</tr>
</thead>
<tbody>
<tr>
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</tbody>
</table>
Learning is more durable when...

Brown, Roedinger, & McDaniel, 2014

• it’s **harder** and **active**.
• the abstract is made more **concrete** and personally **meaningful**.
• students **elaborate** on how new learning connects to prior knowledge (e.g., build mental models).
• students engage in genuine self-assessments (regular **self-quizzing**) that helps them to identify what they know and don’t know (**to counteract** illusions of knowing and **overconfidence**).
• students engage in periodic, self-quizzing that
  • is **spaced** out over time,
  • incorporates the practice of two or more topics (**interleaved practice** rather than blocked practice),
  • **revisits** old topics.
Learning is more durable when...

Brown, Roedinger, & McDaniel, 2014

• students engage in **generation** - attempt to solve a problem before being taught the solution.

• **failure** is a part of learning.

• students engage in **reflection** (e.g., *What went well? What could have gone better? What does this experience remind me of? What strategies would you use next time to get better results?*)
A Map of Understanding

Reason with Evidence • Reason with Evidence

Explain & Describe

Compare, Contrast, & Connect

Capture the Heart of the Matter

Explore Different Viewpoints

Consider Consequences & Conclusions

Reason with Evidence • Reason with Evidence
<table>
<thead>
<tr>
<th>Understanding</th>
<th>Memorizing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Applying knowledge and skills with purpose</td>
<td>Reciting facts</td>
</tr>
<tr>
<td>Problem solving and finding</td>
<td>Rote learning</td>
</tr>
<tr>
<td>Useful in many subject areas and over time</td>
<td>Relevant only to a discrete topic</td>
</tr>
<tr>
<td>Transferring knowledge, skills, and understanding to different contexts</td>
<td>Replicating in similar context</td>
</tr>
<tr>
<td>Searching for relevant patterns</td>
<td>Using patterns to increase memory</td>
</tr>
<tr>
<td>Sense-making and meaning-making</td>
<td>Memorizing</td>
</tr>
<tr>
<td>Dialog – exchange of ideas, building on ideas</td>
<td>Lecture</td>
</tr>
<tr>
<td>Facilitating</td>
<td>Telling</td>
</tr>
<tr>
<td>Simulation</td>
<td>Observation</td>
</tr>
<tr>
<td>Teams &amp; Individual</td>
<td>Individuals</td>
</tr>
<tr>
<td>Hands-on</td>
<td>Passive listening</td>
</tr>
<tr>
<td>Personalized</td>
<td>One approach for all</td>
</tr>
<tr>
<td>Self-regulated learning</td>
<td>Prescribed learning</td>
</tr>
<tr>
<td>Practice</td>
<td>Practice</td>
</tr>
</tbody>
</table>
Today's Number

1. Write it
2. Draw it
3. Find some of its factors
4. Multiply it by 37
5. Divide it by 18
6. Find 50% of it
7. What is 1/4 of it?
8. Create a word problem using it

57
<table>
<thead>
<tr>
<th>Important Themes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tell the story of exploration from the explorer's point of view.</td>
</tr>
<tr>
<td>What number might represent your explorer? Explain why this number is significant for the explorer.</td>
</tr>
<tr>
<td>Draw a shape that could represent the explorer. How does the shape express the explorer's story?</td>
</tr>
<tr>
<td>What patterns in our world could the explorer's story fit into?</td>
</tr>
<tr>
<td>Describe a time when you have explored something. How did your exploration lead or not lead to change?</td>
</tr>
</tbody>
</table>
**Social:** Use one of the questions below to guide your observations of the frog and discuss your observations with a partner.

**Narrative:** Using what we know about frogs, can we make our own picture book about a day in the life of a frog?

**Logical:** Do frogs play? What do they do that seems like play?

**Foundational:** Are frogs smart? What makes you think that? How do we know a frog is alive? Do frogs know we are here?

**Experiential:** How can we find out if frogs think? How can we find out if frogs like music?

**Aesthetic/Experiential:** Can we sketch the patterns we see on our frogs with increasing detail? Can we build a representation of our frog?

**Quantitative:** Is our tank big enough?
Self-Regulated Learning

- **Plan**
  - When will I start working?
  - Where and how will I work?
  - What do I need to know to get this done?
  - What do I want to learn?

- **Monitor**
  - Am I accomplishing what I hoped to?
  - Am I being distracted?
  - Is this taking more time than I thought?
  - Am I understanding everything I need to understand?

- **Control**
  - Did I accomplish everything I hoped to?
  - Did I do well/poorly, why?
  - What worked? What didn’t work?
  - What should I do differently next time?

- **Reflect**
  - I don’t think I’m getting this – what should I do differently?
  - What can I do to keep on task?
  - How can I encourage myself to get this done?
Top Facts of SRL

• Self-regulated students
  • Have a growth mindset
  • Are more confident
  • Know more about a topic or task
  • Achieve more
Top Facts of SRL

• Self-regulated learning can be developed for any age group and for any content area...
  • By providing resources (through peers, teachers, and materials) that directly or indirectly prompts them
  • By engaging all learners in the learning process
    • Assess their progress
    • Seek help
    • Pursue goals independently and with others
Self-Regulation

<table>
<thead>
<tr>
<th>Think I know</th>
<th>Questions</th>
</tr>
</thead>
</table>

Track Your Learning
Revisit the T-chart /Box as you learn.

- Check things that are confirmed.
- Cross out things that you no longer think.
- Question things that you would like to find out more about.
- Add new ideas.
**Maths**

**Addition**
- $4362 + 3747 = 8109$
- $4000 + 3000 = 7000$
- $300 + 700 = 1000$
- $60 + 40 = 100$
- $2 + 7 = 9$

I used the column method to add up my totals.

**Subtraction**
- $726 - 244 = 482$
- $124 - 85 = 37$
- $74 - 49 = 25$
- $74 - 8 = 66$

**Doubling**
- $6798 \times 2 = 13596$
- $574 \times 2 = 1148$
- $35 \times 2 = 70$
- $60 \times 2 = 120$

**Halving**
- $2094 \div 2 = 1047$
- $136 \div 2 = 68$
- $28 \div 2 = 14$
- $8 \div 2 = 4$
Read and Note

1. Something Old

2. Something New

3. Something that meaningful for my classroom
## Today's Topic

<table>
<thead>
<tr>
<th>New Vocabulary</th>
<th>Important Information ✓ learned or ✓ confirmed</th>
<th>Ideas</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
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</tr>
</tbody>
</table>

### Questions I have

- 
- 
- 
- 

Today's Topic relates to our Essential Question because...

- 
- 
- 
- 

Today's Topic made me think of...

- 
- 
- 
- 

“TODAY...” (Circle all that apply)

- Helped a classmate
- Asked for help
- Stayed on task
- Followed Directions
- Arrived On Time
- Was prepared to learn

**My next steps are to:**
## Self-Regulation

<table>
<thead>
<tr>
<th>Think I know</th>
<th>Questions</th>
</tr>
</thead>
</table>

**Track Your Learning**
Revisit the T-chart / Box as you learn.

- Check things that are confirmed.

- Cross out things that you no longer think.

- Question things that you would like to find out more about.

- Add new ideas.
Rate the following mathematical terms according to the following scale:

1. I have never heard of this word before.

2. I have heard this term before, but I don't know how to use it in mathematics.

3. I understand the meaning of this term and know how to apply it in mathematics.

___ factor          ___ array
___ product         ___ multiplication
___ multiple        ___ related facts
___ lattice         ___ magnitude estimate
___ all-partial method  ___ repeated addition
OOO + 6 + 4 They grow less in the water

from my imagination

Root plants live down in the water

I didn't know we had pink flowers

Ten hours of the bees are good for sleep

protect your rose

You have too quick 5 hours close they are good in service you can sleep

because we can eat 1 of three if roses best

I thought the sprouting plant was 5 3 6 this

When the plants
The plants only grow when you put water on them.
These stories are about plants and the garden.

1. The roots of the tree are good for deep protection.
2. The leaves and flowers are good to collect flowers.
3. Some plants need water in the garden.
4. Some plants just dream in the garden.
5. Some ideas are not yet in the garden.

I didn't pick any flowers.

I thought the geranium plant was too high.
Guiding Question: How do we transform the slope-intercept form of a line into the standard form of a line?

Write a goal for yourself before we begin this lesson:

Let's first remember how the slope-intercept form and the standard form are similar and different.

\[
\begin{align*}
3y - 2x &= 1 \\
m &= \frac{2}{3} \\
b &= \frac{1}{3} \\
y &= \frac{2x + 1}{3}
\end{align*}
\]

One way to organize the process of transforming the slope-intercept form into the standard form is seen below.
**My Learning Goal:** *When solving math word problems, I will...*
- Read the entire problem.
- Underline key words and numbers.
- Identify the correct operation.
- Apply the correct formula.
- Check the answer to determine if it makes sense.

Write either Y or N for each Learning Target.

Y = Yes      N = Still Need to Do

### LEARNING TARGETS:

<table>
<thead>
<tr>
<th>DATE:</th>
<th>I read the entire word problem and underlined key words and</th>
<th>I identified the correct operation.</th>
<th>I wrote all the numbers and words neatly.</th>
<th>I drew a picture/used a math formula to help me solve the problem.</th>
<th>I checked my final answer.</th>
<th>I asked for help when I had a question or when I was confused.</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>+, −</td>
<td></td>
<td>□ √</td>
<td>?</td>
<td></td>
</tr>
</tbody>
</table>
**Self-regulation**

![Self-regulation diagram](image)

### Sample 6th Grade Math Performance Summary

<table>
<thead>
<tr>
<th>Learning Targets</th>
<th>Complete understanding (2 points)</th>
<th>Partial understanding (1 point)</th>
<th>Not shown in this test (silly mistake or need to know)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Number sense</td>
<td></td>
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<td></td>
</tr>
<tr>
<td>2. Writing about the math</td>
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<td></td>
<td></td>
</tr>
<tr>
<td>3. Number sense</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4. Writing about the math</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5. Number sense</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>6. Number sense</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>7. Commutative Property</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>8. Identity Property</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>9. Identity Property</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>10. Inverse Property</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>11. Inverse Property</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>12. Distributive Property</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>13. Distributive Property</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>14. Representing a situation</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>15. Representing a situation</td>
<td></td>
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</tr>
</tbody>
</table>

**Performance Summary**

Number Sense (#1, 3, 5, and 6) _______/6  
Writing about the math (#2 and 4) _______/4  
Commutative Property (#7) _______/2  
Identity Property (#8 and 9) _______/4  
Inverse Property (#10 and 11) _______/4  
Distributive Property (#12 and 13) _______/4  
Representing a situation (#14 and 15) _______/4  
TOTAL _______/30

**Reflection**

This assessment shows me:

My next steps for learning are to:
<table>
<thead>
<tr>
<th>Standard</th>
<th>Q #: Points</th>
<th>Cumulative Fraction</th>
<th>%</th>
<th>Mastery Calculations</th>
</tr>
</thead>
<tbody>
<tr>
<td>A.N.4 Understand and use scientific notation to compute products and quotients of numbers</td>
<td>7 /2</td>
<td>/4</td>
<td>□ Yes! □ Almost □ Need to Practice</td>
<td></td>
</tr>
<tr>
<td></td>
<td>12 /2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>13 /2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>15 /3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>A.A.12 Multiply and divide monomial expressions with a common base, using the properties of</td>
<td>1 /2</td>
<td>/6</td>
<td>□ Yes! □ Almost □ Need to Practice</td>
<td></td>
</tr>
<tr>
<td></td>
<td>8 /2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>9 /2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td>2 /2</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
## Setbacks and Solutions

<table>
<thead>
<tr>
<th>Setbacks</th>
<th>Solution</th>
<th>Steps</th>
</tr>
</thead>
<tbody>
<tr>
<td>The Shake Down</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Nervous sweat</td>
<td>*</td>
<td>*</td>
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<tr>
<td></td>
<td></td>
<td>1. Turn off the lights</td>
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<td></td>
<td>2. Lie down comfortably on your back</td>
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<tr>
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<td></td>
<td>3. Put your arms down next to you and have your palms facing upwards</td>
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<tr>
<td></td>
<td></td>
<td>4. Begin to breathe in and out/ hum if you feel comfortable</td>
</tr>
<tr>
<td></td>
<td></td>
<td>5. Bring yourself to a calm and serene place in your imagination</td>
</tr>
</tbody>
</table>
# Self-regulation

<table>
<thead>
<tr>
<th>Skills</th>
<th>Expert</th>
<th>Got It</th>
<th>Practicing</th>
</tr>
</thead>
<tbody>
<tr>
<td>I can do this on my own and explain how to do it. *</td>
<td>I can do this on my own.</td>
<td>I can do this with help or I need more time to practice this.</td>
<td></td>
</tr>
<tr>
<td>Simplify and evaluate expressions using the order of operations.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Add, subtract, multiply, and divide three or more integers.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Multiply and divide powers.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Add and subtract matrices.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Apply the plan.</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Monitor</td>
<td>Plan</td>
<td>Control</td>
<td>Reflect</td>
</tr>
</tbody>
</table>

The diagram shows the cycle of self-regulation with steps including plan, monitor, control, and reflect.
At the end of each round, choose one person to provide feedback. Provide feedback to your peer based on the following criteria:

a. What’s the evidence that the response given was correct?
b. How could they make their response better?

1. Write your thoughts on the post it provided. Give your peer the post it. Do not discard this feedback. You must tape the feedback that you received from your peer in the box below in the correct day.

<table>
<thead>
<tr>
<th>Feedback</th>
<th>Feedback</th>
<th>Feedback</th>
<th>Feedback</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good evidence providing good evidence for your answer.</td>
<td>good evidence provided</td>
<td></td>
<td>You took down main notes and did a good job explaining what was going on</td>
</tr>
</tbody>
</table>

2. Read the writing prompt. Very briefly summary the main ideas of the daily learning target. Write a response to the prompt.

- Was my plan effective today? How do I know?
- Do my responses to the questions reflect mastery of the daily learning target? Why?

<table>
<thead>
<tr>
<th>Reflection</th>
<th>Reflection</th>
<th>Reflection</th>
<th>Reflection</th>
</tr>
</thead>
<tbody>
<tr>
<td>Yes because I used my notes to do the question</td>
<td>I took notes so they helped me out a lot</td>
<td>I used the notes</td>
<td>I used my notes</td>
</tr>
</tbody>
</table>

3. Organize your thoughts in a way that is meaningful to you.
I think I did okay but didn’t master because I lack on cell structures/functionalities. I did my best to follow my plan to allow when explain structures.
Physical and Chemical Changes in Substances

Ten Minute Pause

Directions: You have the option of answering three questions out of the five. However, you MUST answer either question 1 OR question 2.

1. I was surprised by ________________________________
2. I am more aware about ________________________________
3. I can relate what I just learned to ________________________________ in the past because ________________________________
4. I find ________________________________ challenging to understand because ________________________________
5. I want to learn more about ________________________________

Afterwards: With 1 or 2 classmates, you will each share your answers. When you are finished sharing, the other group member(s) must ask you a question why you were 1) surprised OR 2) able to relate to past experiences, OR 3) challenged OR 4) going to expand on your knowledge.

Takeaways:

<table>
<thead>
<tr>
<th>(4) Mastery: I have a strong grasp on the topic and feel I could teach it to others.</th>
<th>(3) Good: I have a good grasp on the topic and feel I can complete my work with minimal help.</th>
<th>(2) Growing: I have some understanding on the topic but I have questions.</th>
<th>(1) Basic: I am confused and have lots of questions.</th>
</tr>
</thead>
<tbody>
<tr>
<td>Identifying Physical Changes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Identifying Chemical Changes</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
Self-Regulation

How are you learning?
Learning Journals

I am filling a story and using the story checklist.

Helena
My learning journal
Structured Diaries & Self-regulated Learning

(Glogger, Schwonke, Holzapfel, Nuckles, & Renkl, 2012; Schmitz, Klug, & Schmitdt, 2011)

Look carefully at your learning from (this week, this unit, or today).

1. What was the activity that you liked the most?

2. Why did you like this activity?

3. Why do you think the teacher asked you to do this activity?
I had to look for the cards and write words on the board. I liked this best because I helped Luca write and Luca helped me too.

I had to do this because it was a bit difficult and fun.
ALL-ED Framework

**Goals**

*Clear, Accessible, Relevant, Rigorous*

What is the overall purpose of this activity/lesson?
Are goals attainable by everyone and/or attainable parts identified?
Is it interesting/useful/valuable?
Is it challenging enough for everyone?

**Starting Position**

Are the starting positions the same for all students?
What questions do students have about this topic?
What is their prior knowledge?
Will they all understand the vocabulary?
Any misunderstandings I need to address?
Do students feel confident about the topic?

**Action Pattern**

How do I ensure that all students are participating (and that there’s no social loafing?)
How can I make sure that students feel comfortable participating? (that they feel like they can participate)
How can I promote productive group collaborations where students help each other learn?

**Quality Criteria**

How can I make sure that students achieve the objectives of the activity/lesson?
What is the rubric for lesson/activity?
What are the must-haves?
How do I stretch students? What are some quality criteria (yes and …criteria; things that make students go above and beyond?)
Topic You Teach in January

• What will make the learning durable?

• Step 1: What do students need to understand?

• Step 2: How will you prompt Self-Regulation?

• Step 3: How will you enjoy tracking learning?
Unit Planner

Goals
1.
2.
3.
4.
5.
Unit Planner

Goals
1.
2.
3.
4.
5.

Performance #1: T-Chart
Performance #2: Essay
Performance #3: Model
Performance #4: Test
Performance #5: Essay
Unit Planner

1. Performance #1: T-Chart
   - 1, 2, 3

2. Performance #2: Essay
   - 1, 2, 4

3. Performance #3: Model
   - 1, 2, 3, 4

4. Performance #4: Test
   - 2, 3, 4, 5

5. Performance #5: Essay
   - 3, 4, 5
Unit Planner

Goals

1.

2.

3.

4.

5.

Performance #1: T-Chart

Performance #2: Essay

Performance #3: Model

Performance #4: Test

Performance #5: Essay
Unit Planner

Goals
1.
2.
3.
4.
5.

Assessment #1: T-Chart
1, 2, 3 SWF

Assessment #2: Essay
1, 2, 4 TWF, PWF

Assessment #3: Model
1, 2, 3, 4 PWI

Assessment #4: Test
2, 3, 4, 5 TWI

Assessment #5: Essay
3, 4, 5 SWF, TWF
Unit Planner

Goals

1. Looking Closely
   \- 1. Thesis
   \- 3. Supporting Evidence

2. Essay
   \- 1, 2, 4 TWF, PWF

3. Inquiry question

4. Test
   \- 2, 3, 4, 5 TWI

5. Research
   \- 1, 2, 3 SWF, TWI, PWF

Assessment #3: Model
   \- 1, 2, 3, 4 PWI

Assessment #4: Test
   \- 2, 3, 4, 5 TWF, PWF

Assessment #5: Essay
   \- 3, 4, 5 SWF, TWF
Use Assessments to Plan Instruction

Differentiate instruction when needed

• Create an assessment for the unit
• Label what each question assesses
• Add a performance summary so that students can monitor their progress toward the learning goals.
• Note how summaries will be used to plan instruction based on student needs.
Precise feedback leads to learning

How is a score of 80% and this performance summary different?

How will the data from this summary be used plan instruction?

<table>
<thead>
<tr>
<th>Performance Summary</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number Sense (#1, 3, 5, and 6)</td>
</tr>
<tr>
<td>Writing about the math (#2 and 4)</td>
</tr>
<tr>
<td>Commutative Property (#7)</td>
</tr>
<tr>
<td>Identity Property (#8 and 9)</td>
</tr>
<tr>
<td>Inverse Property (#10 and 11)</td>
</tr>
<tr>
<td>Distributive Property (#12 and 13)</td>
</tr>
<tr>
<td>Representing a situation (#14 and 15)</td>
</tr>
</tbody>
</table>

TOTAL ___/45

Comments/Next Steps
Directions: Before group learning: Choose one criteria that you plan to really work on in today’s discussions and place a check next to the row. Determine what actions you will take to accomplish this goal. After the discussion circle the description that best describes your actions. Provide evidence of what makes you circle that description.

<table>
<thead>
<tr>
<th></th>
<th>Needs Practice</th>
<th>Have Parts</th>
<th>You’ve Got It All</th>
</tr>
</thead>
<tbody>
<tr>
<td>Listening</td>
<td>I can’t remember anything anyone said.</td>
<td>I can remember most of my group members’ comments, but I didn’t really think about what they said.</td>
<td>I can summarize what each person said and make connections between what was said and things we are learning.</td>
</tr>
<tr>
<td>Speaking</td>
<td>I didn’t confirm or contribute or exchange ideas.</td>
<td>I spoke my ideas, but was too quiet for my group to hear me.</td>
<td>I exchanged ideas with my group loudly and clearly.</td>
</tr>
<tr>
<td>Vocabulary</td>
<td>I did not use specific vocabulary.</td>
<td>I used vocabulary, but I didn’t really know what the words meant.</td>
<td>I used the vocabulary to describe what I was talking about.</td>
</tr>
<tr>
<td>Thinking</td>
<td>I didn’t really think about what was said in my group</td>
<td>I can identify patterns among my group members thinking.</td>
<td>I can identify patterns among group members thinking and the topic we are learning.</td>
</tr>
</tbody>
</table>
4. Goal Setting/Reflection with Specific Subject Area Learning Goals

Circle your goal for this learning target, Meet or Exceed. During our elbow partner exchanges, complete the tasks and ask two different elbow partners to verify your mastery level. Using feedback from your partners, determine the criteria that you currently meet. Place a check next to the criteria and then **finally**, check your current mastery of this learning target.

<table>
<thead>
<tr>
<th>Learning Targets:</th>
<th>Pre-requisite (Before you start)</th>
<th>Criteria to Meet</th>
<th>Criteria to Exceed</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>What I need to learn:</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11) Writing Linear Equations</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Finally:</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>□ Not Yet</td>
<td>□ Know how to find slope.</td>
<td>□ Explain using words, pictures, and numbers what slope and the y-intercept are.</td>
<td>□ Explain using words, pictures, and numbers to two partners a linear equation.</td>
</tr>
<tr>
<td>□ Approaching</td>
<td>□ Know how to find b.</td>
<td>□ Show how to write an equation from two points.</td>
<td>□ Explain the connection between a Linear Equation and its graph.</td>
</tr>
<tr>
<td>□ Meet</td>
<td><em>Sign-up for an expert appointment to learn these things.</em></td>
<td>□ Show how to write an equation from slope and a point.</td>
<td></td>
</tr>
<tr>
<td>□ Exceed</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Vocabulary to use:** Linear Equation • Slope • Y-intercept • Coordinate • Coordinate
Unit Planner

Goals

1. Looking Closely
   - 1. Looking Closely
     - 2. Thesis
       - 3. Supporting Evidence

Assessment #1: T-Chart

1, 2, 3 SWF

Assessment #2: Essay

1, 2, 4 TWF, PWF

Assessment #3: Model

1, 2, 3, 4 PWI

Assessment #4: Test

2, 3, 4, 5 TWI

Assessment #5: Essay

3, 4, 5 SWF, TWF

Supports/Extensions

- Graphic organizer
- Limited sources

Student Choice
- Revision Guide
- Individual
- Conferencing
- Monitoring of Revisions

Topic interest groups

- Topic interest groups
- Supports/Extensions
Understanding Goal

Any two points can intersect
Understanding Goal (UG)
Any two lines on a coordinate plane can intersect at one point, infinite points, or no points. There are three possible solutions to a linear system.

Content knowledge and skills assessed
1. Solve system graphically in $y=mx+b$
2. Solve system algebraically in $y=mx+b$
3. Identify and graph parallel lines
4. Identify and graph perpendicular lines
5. Solve system graphically when not $y=mx+b$
6. Solve system algebraically when not $y=mx+b$
Understanding Goal
Any two lines on the coordinate plane can intersect at one point, infinite points, or no points. These are the three possible solutions to a linear system.

Content Knowledge/ Skills Taught/Assessed

1. Solve System graphically in \( y = mx + b \)
2. Solve System algebraically in \( y = mx + b \)
3. Identify and graph parallel lines
4. Identify and graph perpendicular lines
5. Solve system graphically when not \( y = mx + b \)
6. Solve system algebraically when not in \( y = mx + b \)

Performance 1: Graphic models
1, 3, 4, 5 SVI

Performance 2: Quiz
1, 3, 4, 6 TWI

Performance 3: Book project
1, 3, 4, 5 PWF

Performance 4: Test
1, 2, 5, 6 TWF
Algebra 1 Prep

3. Solving Inequalities Algebraically and Graphing Inequalities

Essential Questions:
- How do you represent relationships between quantities that are not equal?
- Can inequalities that appear to be different be equivalent?
- How can you solve inequalities?
**Algebra 1 Prep**

**Unit 3**

Solving Inequalities
Algebraically and Graphing Inequalities

---

**Essential Questions:**

- How do you represent relationships between quantities that are not equal?
- Can inequalities that appear to be different be equivalent?
- How can you solve inequalities?
Understanding Goal

SWBAT evaluate equations with variables by justifying their steps for solving equations and applying their knowledge to real-life situations by completing a variety of assessments with 70% accuracy.

Content Knowledge/ Skills Taught/Assessed (number each learning target)

1. Inverse operations
2. Graphing equations
3. Word problems asking to create an equation
4. Solving one-step equations
5. Solving multi-step equations

Household Budget Project (Interim Assessment):
Formal, Written, Teacher – Rubric, Self - Reflection

Quizzes, Exit Slips, and Homework Assignments (Formative Assessments):
Informal, Written or Verbal, Teacher and Self (Reflections or Self-Regulation Rubrics)

Leading a Part of a Lesson:
Informal, Verbal, Peer – Asking questions during the class and peer assessments of what is being taught

Unit Test (Summative Assessment):
Formal, Written, Teacher
Understanding Goal: All students will be able to complete a process to identify various minerals.

1. What is a mineral?
2. Mineral’s color
3. Mineral’s luster
4. Mineral’s hardness
5. Mineral’s streak
6. Mineral’s breakage pattern
7. Mineral’s special properties

Assessment: Exit Slip Feedback: FWT
Assessment: Determine a mineral’s hardness using a penny, nail, and mirror Feedback: FWP
Assessment: Examine minerals to determine cleavage/fracture Feedback: IVT
Assessment: Use taste, acid, and magnets in conjunction with other properties to identify common minerals Feedback: FWT
THE LADDER OF FEEDBACK

1. CLARIFY
Ask questions of clarification about the work being reviewed.

2. VALUE
Comment on the strengths of the work.

3. CONCERNS
Comment on your concerns about the work.

4. SUGGEST
Make suggestions for improving the work.

Rigor = Effort * Complexity

- Sustained Focus
- # Parts
- # Ways Parts Fit Together
- Thinking Required to Arrange the Parts
<table>
<thead>
<tr>
<th>Level One Activities</th>
<th>Level Two Activities</th>
<th>Level Three Activities</th>
<th>Level Four Activities</th>
</tr>
</thead>
<tbody>
<tr>
<td>Recall elements and details of story structure, such as sequence of events, character, plot and setting.</td>
<td>Identify and summarize the major events in a narrative.</td>
<td>Support ideas with details and examples.</td>
<td>Conduct a project that requires specifying a problem, designing and conducting an experiment, analyzing its data, and reporting results/solutions.</td>
</tr>
<tr>
<td>Conduct basic mathematical calculations.</td>
<td>Use context cues to identify the meaning of unfamiliar words.</td>
<td>Use voice appropriate to the purpose and audience.</td>
<td>Apply mathematical model to illuminate a problem or situation.</td>
</tr>
<tr>
<td>Label locations on a map.</td>
<td>Solve routine multiple-step problems.</td>
<td>Identify research questions and design investigations for a scientific problem.</td>
<td>Analyze and synthesize information from multiple sources.</td>
</tr>
<tr>
<td>Represent in words or diagrams a scientific concept or relationship.</td>
<td>Describe the cause/effect of a particular event.</td>
<td>Develop a scientific model for a complex situation.</td>
<td>Describe and illustrate how common themes are found across texts from different cultures.</td>
</tr>
<tr>
<td>Perform routine procedures like measuring length or using punctuation marks correctly.</td>
<td>Identify patterns in events or behavior.</td>
<td>Determine the author's purpose and describe how it affects the interpretation of a reading selection.</td>
<td>Design a mathematical model to inform and solve a practical or abstract situation.</td>
</tr>
<tr>
<td>Describe the features of a place or people.</td>
<td>Formulate a routine problem given data and conditions.</td>
<td>Apply a concept in other contexts.</td>
<td></td>
</tr>
</tbody>
</table>