6th Grade Pre-Algebra
Differentiated Unit

Diane Peneycad
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Differentiated Unit - Introduction
Algebra Strand– 6th grade

This three week unit focuses on the fundamental knowledge, reasoning, and skills students will need as a foundation to the more in-depth, application based study of pre-algebra/algebra that they will face in the next 1-3 years. The unit will begin with a pre-assessment to determine readiness and background knowledge. Additionally, formative assessments, exit cards, and teacher observation will be used throughout the unit to monitor student progress toward meeting the objectives. Regarding content, this unit starts out with the basic knowledge that we can use a variable in place of an unknown value and moves to writing algebraic expressions and equations from words. From there, students will learn how to keep equations balanced in the process of solving for the unknown value. The unit will end with students applying their understanding of algebraic equations by graphing the solution set to a linear algebraic equation.

Forest Hills Benchmarks:
6.A.1 Determine whether a number sentence is true or false.
6.A.2 Use letters, with units, to represent quantities in a variety of contexts, e.g., y lbs., k minutes, x cookies.
6.A.3 Distinguish between an algebraic expression and an equation.
6.A.4 Use standard conventions for writing algebraic expressions, e.g., $2x + 1$ means “two times $x$, plus 1” and $2(x + 1)$ means “two times the quantity $(x + 1)$.”
6.A.5 Represent information given in words using algebraic expressions and equations.
6.A.7 Simplify expressions of the first degree by combining like terms, and evaluate using specific values.
6.A.8 Solve simple variable linear equations using algebraic and geometric methods and use the context of the problem to interpret and explain the solution.
6.A.10 Graph and write equations for linear functions of the form $y = mx$.
6.A.11 Understand that adding or subtracting the same number to both sides of an equation creates a new equation that has the same solution.
6.A.12 Understand that multiplying or dividing both sides of an equation by the same non-zero number creates a new equation that has the same solutions.
6.A.13 Solve equations of the form $ax + b = c$, e.g., $3x + 8 = 15$ for positive integer coefficients.
Learning Targets

Know:
• I can use a variable in place of an unknown value.
• I can identify an algebraic expression.
• I can identify an algebraic equation.

Understand:
• I can determine if a number sentence is true or false.
• I can convert an algebraic expression into an English sentence.
• I can convert an English sentence into an algebraic expression or equation.

Do:
• I can solve an algebraic expression using a given value for the variable.
• I can simplify an algebraic expression or equation by combining “like” terms.
• I can solve a one-step equation by adding or subtracting the same number from both sides of the equation.
• I can solve a one-step equation by multiplying or dividing the same number from both sides of the equation.
• I can determine the value of a variable in a two - step algebraic equation such as: 3y + 2 = 11.
• I can draw a graph of a linear function in the form y = 5x.
<table>
<thead>
<tr>
<th>Lesson</th>
<th>Whole Class Component</th>
<th>Differentiated Components</th>
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</table>
| Lesson 1: Multiple Intelligence Survey & Pre-assessment | Introduce Pre-Algebra unit. 5 minutes                                                  | • Introduce concept of Multiple Intelligences.  
• Give Multiple Intelligence Survey and Triarchic Intelligence Survey to determine students’ learning preferences. (see supplemental materials)  
• Through discussion, compare and contrast the two surveys.  
• Discuss results of survey. 45 minutes |
| 2 class periods of 45 - 50 minutes |                                                                                       |                                                                                                                                                              |
| Day 1  | Learning Targets Scorecard – pass out scorecard and discuss learning targets. (see supplemental materials) 10 minutes | Give Pre-Assessment to all students. (see supplemental materials) 25 minutes                                                                                   |
| Day 2  |                                                                                       | Introduction and explanation of Tic-Tac-Toe Board Anchor Activity (see supplemental materials). Anchor activity is differentiated by interest and learning profile. 15 minutes |
| Independent Study |                                                                                       | Introduce Independent Study option to those who qualify based on unit pre-test.                                                                           |
| Lesson 2: Variables/Translating Words into Math Expressions & Equations | • Variable review.  
• Translating words into algebraic expressions and vice-versa – instruction. 20 minutes |                                                                                                               |
<table>
<thead>
<tr>
<th>Day 1</th>
<th>2 class periods of 45-50 minutes</th>
<th>Provide a chart with key words/phrases and their math symbol equivalents for students needing extra support. (see supplemental materials)</th>
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<tbody>
<tr>
<td></td>
<td>• Expressions vs. equations – compare &amp; contrast discussion. • Translating words into algebraic equations and vice-versa – instruction. <strong>15 minutes</strong></td>
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<td>Introduce <strong>Profiler Activity</strong> – begin working, as time permits. (see supplemental materials) <strong>15 minutes</strong></td>
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<td>Day 2</td>
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<td><strong>Profiler Activity</strong>: work time and presentations. <strong>50 minutes</strong></td>
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<td>Lesson 3: Evaluating Expressions for Given Values</td>
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<td>Introduce evaluating algebraic expressions when a value is given for the variable. <strong>14 minutes</strong></td>
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<td></td>
<td>1 class period 50 minutes</td>
<td><strong>Structured Academic Controversy</strong> (see supplemental materials) <strong>36 minutes</strong></td>
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<tr>
<td>Lesson 4: Selected Response Formative Assessment</td>
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<td>Differentiated Formative Assessment (versions 1 &amp; 2) and student reflection. (see supplementary materials.) <strong>50 minutes</strong></td>
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<td></td>
<td>1 class period 50 minutes</td>
<td><strong>Tic-Tac-Toe Anchor Activity</strong> As time allows.</td>
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<tr>
<td>Lesson 5: Simplifying Expressions</td>
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<td>Conference with students individually regarding their performance on, and reflection of, the formative assessment. <strong>25 minutes</strong> <strong>Tic-Tac-Toe Anchor Activity</strong> – while teacher is meeting with students individually.</td>
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<td>Activity</td>
<td>Time</td>
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<tr>
<td>Introduce the concept of “like terms.” Practice simplifying expressions by combining like terms – use individual white boards to evaluate student progress.</td>
<td>10 minutes</td>
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<tr>
<td><strong>Flexible Grouping</strong>&lt;br&gt;Based on level of each student’s mastery, group them by ability for further practice using the white boards.</td>
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<td><strong>Lesson 6:</strong>&lt;br&gt;Solving Algebraic Equations Using the Inverse Operations: 2 class periods 45 – 50 minutes each</td>
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<td><strong>Day 1</strong>&lt;br&gt;Addition and Subtraction</td>
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<td><strong>Day 2</strong>&lt;br&gt;Multiplication and Division</td>
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<td>Introduce solving 1 - step equations by performing the inverse operations of addition and subtraction.</td>
<td>15 minutes</td>
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<td>Partner Practice &amp; Exit Slip with mixed ability partnerships.</td>
<td>30 minutes</td>
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<td>Review solving 1 – step equations that involve the inverse operations of addition and subtraction.</td>
<td>5 minutes</td>
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<td>Introduce solving equations by performing the inverse operations of multiplication and division.</td>
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<td>Think Dots Activity</td>
<td>30 minutes</td>
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<td><strong>Lesson 7:</strong>&lt;br&gt;Solving Two-Step Equations 2 class periods 45 - 50 minutes each</td>
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<td><strong>Day 1</strong></td>
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<td>Review of solving one-step equations and instruction on two – step equations.</td>
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<td>Tiered Practice Assignment (see supplemental materials)</td>
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<td>Day 2</td>
<td>2-Step Equation – Review and Q &amp; A</td>
<td>20 minutes</td>
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<td>Tri-Mind Activity</td>
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<td>(see supplemental materials)</td>
<td>15 minutes</td>
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<td>Tic-Tac-Toe Anchor Activity</td>
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<tr>
<th>Lesson 8: Application of Pre-Algebra Learning</th>
<th>Problem-Based Learning</th>
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<tbody>
<tr>
<td>3 class periods</td>
<td>(see supplemental materials)</td>
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<td>45 – 50 minutes each</td>
<td>90 minutes</td>
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<tr>
<th>Day 3</th>
<th>Modified Structured Academic Controversy</th>
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<th>Lesson 9: Wrap-Up &amp; Review</th>
<th>RAFT Writing</th>
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<td>Review each of the learning targets and complete examples of each.</td>
<td>(see supplemental materials)</td>
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<td>15 minutes</td>
<td>35 minutes</td>
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<tr>
<th>Lesson 10 Unit Summative Assessment &amp; Presentations</th>
<th>Unit Final Assessment</th>
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<tbody>
<tr>
<td>3 class periods</td>
<td>(see supplemental materials)</td>
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<td>45 – 50 minutes each</td>
<td>50 minutes</td>
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<tr>
<th>Days 2 &amp; 3</th>
<th>Tic-Tac-Toe Presentation Preps</th>
<th>Tic-Tac-Toe Activity Presentations</th>
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Pre-Algebra Unit
6th Grade Math

Unit Description

Lesson 1 - Introduction and Pre-Assessment (2 class periods of 50 minutes)
Differentiated components are indicated with an asterisk (*)

Day 1
Unit Introduction (5 minutes)
Give a quick overview of the new unit and discuss the learning goals/targets.
Students will be given a learning targets chart listing the learning targets for the unit in student friendly terms on Day 2.

*Multiple intelligence and triarchic intelligence surveys (45 minutes)
Explain the purpose of these surveys – to determine how each student learns best. Go over the directions for each of the surveys and answer any questions students raise. Once students have completed the surveys, discuss the results and how the information will be used by the students and the teacher to direct instruction to each student’s strengths and interests. Compare and contrast the two surveys in the information they provide. These surveys are located in the Supplemental Materials section.

Day 2
Learning Targets Scorecard (10 minutes)
Introduce the learning targets for this unit. Remind students that they are responsible for keeping track of their own learning and developing a plan for revisiting material not yet mastered. The Scorecard is located in the Supplemental Materials section.

*Unit Pre-Assessment (25 minutes)
The pre-assessment will help the teacher to understand: what the students already know about this unit of study – what standards, objectives, concepts & skills individual students understand, what further instruction and opportunities for mastery are needed, what requires re-teaching and how to set up flexible groups. The pre-assessment is located in the Supplemental Materials section.

*Tic-Tac-Toe Board Anchor Activity (15 minutes)
Remind students that the Tic-Tac-Toe board activities are to be worked on when they have finished their activity/assignment prior to others, or when the teacher is assisting other students. Pass out the anchor activity and introduce the 9 learning activities. Discuss the rubric and expectations for each activity. Note that the activities correlate to various intelligence types. Encourage students to choose activities that are in their areas of strength according to the MI survey. This activity may be further differentiated by adjusting the number of activities required (up or down) depending on student readiness. Students should keep their choice board in their math folders in the “current work” pocket. Tic-Tac-Toe materials are located in the Supplemental Materials section.
Independent Study
Introduce the optional independent study project to those students who demonstrated mastery of the unit content on the pre-assessment.

Lesson 2 - Variables/Translating Words into Math Expressions
(2 class periods of 50 minutes)
Differentiated components are indicated with an asterisk (*)

Day 1
Variable Review (5 minutes)
Review the topic of variables as letters of the alphabet used to represent an unknown quantity, and algebraic expressions as containing one or more variables, numbers, and operations.

Translating Words into Mathematical Expressions (15 minutes)
Have students read algebraic expressions aloud. Write down words used that correlate to the symbols and numbers in the algebraic expressions. Brainstorm and make a chart of words associated with each operation.

*Provide copy of chart to students below grade level or with stated accommodations. Mathematical operations-to-words chart is located in Supplemental Materials section.

Expressions vs. Equation (15 minutes)
Provide an example of an expression and another example of an equation. Have students compare and contrast the two in order to arrive at an understanding of what constitutes each.

*Profiler Activity – Introduce and Begin (15 minutes)
Pass out and explain the Profiler activity. This activity allows students to demonstrate their mastery of the learning target through their preferred multiple intelligence. Students can work alone or in groups of up to 3. Describe each option: artist, commentator, actor, musician, writer and the requirements for each final product. Explain that they will be presenting their final product to the class the next day. The Profiler Activity and rubric is located in the Supplemental Materials section.

Day 2
*Profiler Activity - Work time and Presentations. (50 minutes)
Students should get right to work with their group on their activity. Allow the last 15 minutes for students to present. Remind students that when they are done with this activity they should work quietly on a tic-tac-toe activity until the class is ready to move on.
Lesson 3 - Evaluating Expressions for Given Variables
(1 class period - 50 minutes)
Differentiated components are indicated with an asterisk (*)

Evaluating Expressions (14 minutes)
Introduce/review evaluating algebraic expressions by substituting a given value for the variable. Pose several problems of increasing difficulty and have students solve the expression on individual white boards. Students will hold up their board when they have the answer so teacher can assess student understanding. Continue until students demonstrate mastery.

*Structured Academic Controversy (36 minutes)
Pass out the Structured Academic Controversy (SAC) directions and worksheet (see supplemental materials). Explain the directions and answer any questions students have. Split students into pairs of mixed ability. Each pair will be given one side of a topic to discuss. Each pair will have 10 minutes to make a list of the reasons they agree with this side of the issue. They will then get with a pair of students who have the opposing viewpoint. Each pair will then have 3 minutes to state their viewpoint and give supporting reasons and examples to try to convince the other pair. The opposing side will have 1 minute for rebuttal. The students should now take on the opposite viewpoint and repeat the procedure. A consensus should be drawn at the conclusion of the activity. The Structured Academic Controversy activity and rubric is located in the Supplemental Materials section.

*Opinion-Proof Paragraph (assignment)
When groups have finished the SAC and have come to a consensus viewpoint, assign an opinion-proof paragraph in the format outlined on the organizer. Students should use complete sentences and include at least one example as part of their proof. This will be due at the beginning of class the next day. Consensus paragraph assignment and rubric is located in the Supplemental Materials section.

Lesson 4 - Selected Response Formative Assessment (1 class period - 50 minutes) Differentiated components are indicated with an asterisk (*)

*Differentiated Assessment (as much time as needed w/in class period)
There are two forms of this quiz – version 1 is meant for students at or above grade level and version 2 is meant for students at or below grade level (see supplemental materials). Problems # 4, 6, 9, 11, 12, and 13 have been changed slightly on version 2 to reflect more basic math symbols. The answers for both versions will therefore be the same. Pass out the assessment and read the directions orally. Once students have finished the assessment, they should correct it using the answer key, and assess their understanding of the learning targets covered thus far by filling out the test analysis sheet. Students should then reflect on their performance by target, and complete the self-evaluation sheet. Allow students as much time as they need to complete all parts of this activity.
Once the assessment, test analysis, and self-evaluation sheets have been reviewed by the teacher, they should be handed back to the student. Each student is responsible for taking the action they committed to. Students are to have their parents sign to verify they have seen and agree with their child’s action plan—as one of the options is to come to school early for Study Club which involves parent transportation. The differentiated formative assessment, including test analysis and self-evaluation sheets, is located in the Supplemental Materials section.

*Tic-Tac-Toe Activity work time (remaining time)*
When students have finished their assessment, they should work on tic-tac-toe activities quietly so as to not disturb students who are still finishing up the assessment.

**Lesson 5 – Simplifying Expressions** *(1 class period - 50 minutes)*
Differentiated components are indicated with an asterisk (*)

*Conferencing RE: Formative Assessment Reflections* *(25 minutes)*
Briefly meet with each student to discuss their formative assessment reflections and action plan. Initial their action plan and remind them to get a parent signature. Students should be quietly working on their Tic-Tac-Toe board activities when not conferencing with the teacher.

Like Terms Instruction and Guided Practice *(10 minutes)*
Introduce concept of like terms and how to combine them – variable terms combining with other variable terms with the same variable and constant terms combining with other constant terms. Pose algebraic expression with multiple terms and have students practice simplifying the expressions using individual white boards. Once students have the answer, they should hold their board up so that the teacher can read their answer and give a “yay,” or “nay” response. Students should keep trying if at first they get the wrong answer.

*Flexible Grouping* *(15 minutes)*
Group students by ability, based on the informal assessment given in the above activity. Teacher should work with those students who are having difficulty in a small group. The remaining students should be quickly placed in groups of 3 based on ability. Students should make up problems on their white boards for their group-mates to solve. If the problem is simplified incorrectly by one of the group members, the others must analyze how the problem was simplified, determine the mistake, and explain the correct solution to their group-mate.

**Lesson 6 – Solving One –Step Algebraic Equations Using the Inverse Operation** *(2 class periods - 50 minutes each)*
Differentiated components are indicated with an asterisk (*)
Day 1 - Addition and Subtraction

Inverse Operation Strategy – Addition & Subtraction (15 – 20 minutes)
Have students solve several one-step problems involving addition/subtraction with larger numbers. Ask students to share their strategies. Students will invariably have used the inverse operation to find the solution. Introduce concept of solving one-step equations by using the inverse operation. Model several problems - showing each step in writing. It is very important that students follow the procedure for writing out each step, as this will be essential once we move to 2-step problems. Once the equation is solved and the solution for the variable is found, model how to check to see if the solution is correct by substituting the solution for the variable and checking to see if the result makes a true number sentence (incorporating benchmark 6.A.1). Again, it is imperative that students develop the habit of checking their solution back into the original equation as this will be important once they move beyond one-step equations.

*Partner Practice and Exit Card (30 minutes)
Pair students of mixed ability together. Have each student create 1-step problems for their partner to solve that involve the inverse operations of addition and subtraction. As students solve each problem they must show their work as modeled earlier for solving the equation and checking the solution. For the exit card, students should create a word problem that one could write a 1-step equation to solve. They should write the word problem, the equation, and the solution for the variable – with all work shown. Students should hang their exit card onto their numbered tag at the conclusion of class time for teacher review of student comprehension prior to day 2.

Day 2 - Multiplication and Division

Review /Informal Assessment (5 minutes)
Review how to solve 1-step equations that involve the inverse operations of addition and subtraction. Use white boards to informally assess understanding.

Inverse Operations Strategy - Multiplication & Division (10 minutes)
Pose several equations involving multiplication/division. Ask students to share their strategies. Students will invariably have used the inverse operation to find the solution. Review concept of solving one-step equations by using the inverse operation. Model several problems - showing each step in writing. It is very important that students follow the procedure for writing out each step, as this will be essential once we move to 2-step problems. Once the equation is solved and the solution for the variable is found, model how to check to see if the solution is correct by substituting the solution for the variable and checking to see if the result makes a true number sentence. Again, it is imperative that students develop the habit of checking their solution back into the original equation as this will be important once they move beyond one-step equations.

*Think Dots Activity (20 minutes)
Pair students up with a partner based on readiness as determined by the unit pre-assessment and previous classroom performance indicators. Distribute think dots
activity sheets - giving the appropriate cube to the appropriate pair. (*The Think Dots Activity is located in the Supplemental Materials section.*) The think dots activity sheet with the (*) in the upper left hand corner of each block is intended for below or at grade level. The think dots activity sheet without the (*) is intended for at or above grade level.

Explain directions: the first student will roll a die and complete the activity with the matching number. Partners will work together and discuss the answer, but both must record their answer on their recording sheet. Then, the second student will roll and the pair will complete the task. Continue until they have completed each task – students may pass on one activity.

Allow students time to complete this activity and remind them that when they are done they should work quietly on a tic-tac-toe activity until the class is ready to move on.

**Correct recording sheet and answer questions (10 minutes)**
After each pair has had time to complete the cubing activity, collect the dice and have students return to their seats. Show the answer key and discuss the answers that will vary (#3). Go over any questions the students might have.

**Lesson 7 – Solving Two Step Equations (2 class periods - 50 minutes each)**
Differentiated components are indicated with an asterisk (*)

**Day One**

**Two-Step Equation Instruction**  *(20 minutes)*
Review how to solve one-step equations through the use of inverse operations. Demonstrate the process for solving two-step problems. Model several problems using steps outlined in student handout *(see supplementary materials).*

***Tiered Practice Assignment**  *(30 minutes)*
Distribute and explain the tiered assignment *(see supplemental materials).* Use professional judgment based on observation and previous performance and to determine which students should receive which tier of this assignment. Tier one (form a) should be given to students who are performing at or below grade level, and tier two (form b) to students performing at or above grade level. Allow time for students to complete. *Tiered assignment is located in the Supplemental Materials section.*

Remind students that when they are done with this activity they should work quietly on a tic-tac-toe activity until the class is ready to move on.

When it is clear that all students have finished, correct tiered practice assignment together so that students can see how they did and correct any mistakes.

**Day Two**

**Two-Step Equation – Review and Q & A**  *(20 minutes)*
Do a quick review of solving 2-step equation. Do several problems together (of increased difficulty) on white board slates. Visually check for student understanding. When confident of student understanding, proceed to the Tri-Mind activity.

*Tri-Mind Activity  (15 - 30 minutes)
Remind students of the multiple intelligence surveys that they took earlier in the unit. Review the Triarchic Intelligence Survey result categories. Distribute the tri-mind activity, and go over the three options as well as the expectations. Students should work independently on the activity that best fits their survey results. Tri-Mind activity with rubric and scoring guide is located in the Supplemental Materials section.

*Tic-Tac-Toe Activity work time (remaining time)
When students have finished their Tri-Mind activity, they should work on their tic-tac-toe activities quietly so as to not disturb students who are still finishing up the Tri-Mind activity.

Lesson 8 – Application of Pre-algebra Learning
(3 class periods - 50 minute each)
Differentiated components are indicated with an asterisk (*)

Days One & Two
*Problem Based Learning (as much time as needed within the 2 class periods)
This activity encompasses the learning targets that have been covered since the differentiated formative assessment. As a result, this activity can be viewed/used by students and teacher as a formative assessment to determine student progress toward mastering the learning targets. Divide students into predetermined groups of 2 -3 based on their multiple intelligences survey results. Hand out PBL packets and introduce the project. Read the directions aloud while the students follow along silently. Answer any questions. Students will need to get working as quickly as possible both days in order to complete each of the tasks and get the necessary approval to continue on. Problem Based Learning packet is located in the Supplemental Materials section.

*Tic-Tac-Toe Activity work time (remaining time)
When students have finished their PBL project, they may continue with any remaining work that needs to be finished up on their tic-tac-toe board. They should work on these activities quietly so as to not disturb the progress of those students who are still working on their PBL project.

Day Three
*Modified Structured Academic Controversy (1 class period of 50 minutes)
Once students have completed the PBL project, they will have the necessary data/information to be able make a determination as to the feasibility of requiring students to type their written assignments. Students will work in a larger group of students who evaluated & graphed the data for the same grade as theirs – either 5th or 6th grade. Each group will then divide into two groups based on their opinion (backed up by data) as to whether or not it is feasible to require typed writing assignments at the
5/6 grade level. Following a modified SAC format, a consensus must be reached by each group and an opinion/proof paragraph written. *Modified SAC Activity and rubric is located in the Supplemental Materials section.*

**Pre-assessment Revisited (as time permits)**
When students have completed their opinion/proof consensus paragraph, students should work on reworking the problems on their pre-assessment (from lesson 1, day 2) that they answered incorrectly. This will provide another opportunity for students to monitor their progress in mastering the learning targets in this unit.

**Lesson 9 – Wrap-up and Review (1 class period - 50 minute)**
Differentiated components are indicated with an asterisk (*).

**Learning Target Review (10 - 15 minutes)**
Review each of the learning targets and an example of each. Go over proper solutions for each of the pre-assessment problems (see lesson 8, day 3), as needed.

**R.A.F.T. writing (35 minutes)**
Introduce the R.A.F.T. (Role, Audience, Format, and Topic) writing assignment and rubric. Go over each of the four writing options, explain the expectations, and clarify the format. Students may choose from the four options listed or they may make up their own, as long as it matches a learning target from the unit and they receive approval from the teacher. Students will spend the remaining class time on their writing.

**Tic-Tac-Toe Anchor Activity (as time permits)**
When students have finished their R.A.F.T. writing, they should work on completing their tic-tac-toe activities quietly so as to not disturb students who are still finishing up.

**Lesson 10 – Summative Assessment and Presentations**
(3 class periods - 50 minutes each)
Differentiated components are indicated with an asterisk (*).

**Day 1**

**Summative Assessment (as much time as needed)**
Pass out the final assessment and explain the directions. Allow students as much time as they need to complete the assessment. Upon completion, students should hang their assessment onto their numbered tags in the back of the room. *Final/summative assessment and answer key are located in the Supplemental Materials section.*

**Presentation Preparation (as time allows)**
Once students complete the assessment they may quietly work on preparing for their presentations which will begin tomorrow.

**Days 2 & 3**
*Presentations – Tic-Tac-Toe Activities/Independent Study* (100 minutes over 2 days)

Today students will present their tic-tac-toe anchor activities or their independent study project to the remainder of the class. Each presentation should last approximately 5 minutes.
Triarchic Intelligences Survey (Sternberg)

Mark each sentence T if you like to do the activity.

1. Analyzing characters when I’m reading or listening to a story
2. Designing new things
3. Taking things apart and fixing them
4. Comparing and contrasting points of view
5. Coming up with ideas
6. Learning through hands-on activities
7. Criticizing my own and other kids’ work
8. Using my imagination
9. Putting into practice things I learned
10. Thinking clearly and analytically
11. Thinking of alternative solutions
12. Working with people in teams or groups
13. Solving logical problems
14. Noticing things others often ignore
15. Resolving conflicts
16. Evaluating my own and other’s points of view
17. Thinking in pictures and images
18. Advising friends on their problems
19. Explaining difficult ideas or problems to others
20. Supposing things were different
21. Convincing someone to do something
22. Making inferences and deriving conclusions
23. Drawing
24. Learning by interacting with others
25. Sorting and classifying
26. Inventing new words, games, approaches
27. Applying my knowledge
28. Using graphic organizers or images to organize your thoughts
29. Composing
30. Adapting to new situations
## Triarchic Intelligences Survey (Sternberg) Data Results

Transfer your answers from the survey to the key. The column with the most “True” responses is your dominant intelligence.

<table>
<thead>
<tr>
<th>Analytical</th>
<th>Creative</th>
<th>Practical</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>2.</td>
<td>3.</td>
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<tr>
<td>4.</td>
<td>5.</td>
<td>6.</td>
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<td>7.</td>
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<td>10.</td>
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<td>12.</td>
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<tr>
<td>16.</td>
<td>17.</td>
<td>18.</td>
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<tr>
<td>19.</td>
<td>20.</td>
<td>21.</td>
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<tr>
<td>22.</td>
<td>23.</td>
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<td>25.</td>
<td>26.</td>
<td>27.</td>
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<tr>
<td>28.</td>
<td>29.</td>
<td>30.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Total Analytical</th>
<th>Total Creative</th>
<th>Total Practical</th>
</tr>
</thead>
<tbody>
<tr>
<td>____________</td>
<td>________________</td>
<td>________________</td>
</tr>
</tbody>
</table>
Multiple Intelligences Inventory (Gardner)

Part I  Complete each section by placing a “1” next to each statement you feel accurately describes you. If you do not identify with a statement, leave the space provided blank. Then total the column in each section.

Section 1
____ I enjoy categorizing things by common traits.
____ Ecological issues are important to me.
____ Classification helps me make sense of new data.
____ I enjoy working in a garden.
____ I believe preserving our National Parks is important.
____ Putting things in hierarchies makes sense to me.
____ Animals are important in my life.
____ My home has a recycling system in place.
____ I enjoy studying biology, botany and/or zoology.
____ I pick up on subtle differences in meaning.
____ TOTAL for Section 1

Section 2
____ I easily pick up on patterns.
____ I focus in on noise and sounds.
____ Moving to a beat is easy for me.
____ I enjoy making music.
____ I respond to the cadence of poetry.
____ I remember things by putting them in a rhyme.
____ Concentration is difficult for me if there is background noise.
____ Listening to sounds in nature can be very relaxing.
____ Musicals are more engaging to me than dramatic plays.
____ Remembering song lyrics is easy for me.
____ TOTAL for Section 2

Section 3
____ I am known for being neat and orderly.
____ Step-by-step directions are a big help.
____ Problem solving comes easily to me.
____ I get easily frustrated with disorganized people.
____ I can complete calculations quickly in my head.
____ Logic puzzles are fun.
____ I can't begin an assignment until I have all my "ducks in a row."
____ Structure is a good thing.
____ I enjoy troubleshooting something that isn't working properly.
____ Things have to make sense to me or I am dissatisfied.
____ TOTAL for Section 3
**Section 4**

- It is important to see my role in the “big picture” of things.
- I enjoy discussing questions about life.
- Religion is important to me.
- I enjoy viewing art work.
- Relaxation and meditation exercises are rewarding to me.
- I like traveling to visit inspiring places.
- I enjoy reading philosophers.
- Learning new things is easier when I see their real world application.
- I wonder if there are other forms of intelligent life in the universe.
- It is important for me to feel connected to people, ideas and beliefs.

TOTAL for Section 4

**Section 5**

- I learn best interacting with others.
- I enjoy informal chat and serious discussion.
- The more the merrier.
- I often serve as a leader among peers and colleagues.
- I value relationships more than ideas or accomplishments.
- Study groups are very productive for me.
- I am a “team player.”
- Friends are important to me.
- I belong to more than three clubs or organizations.
- I dislike working alone.

TOTAL for Section 5

**Section 6**

- I learn by doing.
- I enjoy making things with my hands.
- Sports are a part of my life.
- I use gestures and non-verbal cues when I communicate.
- Demonstrating is better than explaining.
- I love to dance.
- I like working with tools.
- Inactivity can make me more tired than being very busy.
- Hands-on activities are fun.
- I live an active lifestyle.

TOTAL for Section 6
Section 7
____ Foreign languages interest me.
____ I enjoy reading books, magazines and web sites.
____ I keep a journal.
____ Word puzzles like crosswords or jumbles are enjoyable.
____ Taking notes helps me remember and understand.
____ I faithfully contact friends through letters and/or e-mail.
____ It is easy for me to explain my ideas to others.
____ I write for pleasure.
____ Puns, anagrams and spoonerisms are fun.
____ I enjoy public speaking and participating in debates.

____ TOTAL for Section 7

Section 8
____ My attitude effects how I learn.
____ I like to be involved in causes that help others.
____ I am keenly aware of my moral beliefs.
____ I learn best when I have an emotional attachment to the subject.
____ Fairness is important to me.
____ Social justice issues interest me.
____ Working alone can be just as productive as working in a group.
____ I need to know why I should do something before I agree to do it.
____ When I believe in something I give more effort towards it.
____ I am willing to protest or sign a petition to right a wrong.

____ TOTAL for Section 8

Section 9
____ Rearranging a room and redecorating are fun for me.
____ I enjoy creating my own works of art.
____ I remember better using graphic organizers.
____ I enjoy all kinds of entertainment media.
____ Charts, graphs and tables help me interpret data.
____ A music video can make me more interested in a song.
____ I can recall things as mental pictures.
____ I am good at reading maps and blueprints.
____ Three dimensional puzzles are fun.
____ I can visualize ideas in my mind.

____ TOTAL for Section 9
**Part 2:** Put the total number each section in the chart below.

<table>
<thead>
<tr>
<th>Section</th>
<th>Total From Above</th>
<th>Learning Preference</th>
<th>Rank 1 - 9</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td>Naturalist</td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>Musical</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td>Logical</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td>Existential</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td></td>
<td>Interpersonal</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td></td>
<td>Kinesthetic</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td></td>
<td>Verbal</td>
<td></td>
</tr>
<tr>
<td>8</td>
<td></td>
<td>Intrapersonal</td>
<td></td>
</tr>
<tr>
<td>9</td>
<td></td>
<td>Visual</td>
<td></td>
</tr>
</tbody>
</table>

My top 3 learning preferences:

1. ______________________
2. ______________________
3. _______________________

This survey was adapted from the following source:
© 1999 Walter McKenzie, The One and Only Surfaquarium [http://surfaquarium.com](http://surfaquarium.com)
This survey may be printed, used and/or modified by educators as long as the copyright tag remains intact.
# Learning Targets Chart

<table>
<thead>
<tr>
<th>Learning Target</th>
<th>Example</th>
<th>Got It!</th>
<th>Revisit</th>
</tr>
</thead>
<tbody>
<tr>
<td>#1 I can convert an algebraic expression into an English sentence.</td>
<td></td>
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<tr>
<td>#2 I can convert an English sentence into an algebraic expression or equation.</td>
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<tr>
<td>#3 I can solve an algebraic expression using a given value for the variable.</td>
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<td>#4 I can simplify an algebraic expression or equation by combining “like” terms.</td>
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<tr>
<td>#5 I can solve a one-step equation by adding or subtracting the same number from both sides of the equation.</td>
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<tr>
<td>#6 I can solve a one-step equation by multiplying or dividing the same number from both sides of the equation.</td>
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<tr>
<td>#7 I can determine the value of a variable in a two-step algebraic equation such as: 3y + 2 = 11.</td>
<td></td>
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</tbody>
</table>
# Pre-Algebra Pre-Assessment

**Directions:**
Show your work in the space provided. Write your final answer in the oval.

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>3. Write this expression in words: $54 + k$</td>
<td>4. Write this expression in words: $m / 5 - 3$.</td>
</tr>
<tr>
<td>5. Translate this phrase into an algebraic expression: <em>The quotient of 48 divided by 6 increased by seven</em></td>
<td>6. Translate this phrase into an algebraic expression: <em>The product of eight and six decreased by 12.</em></td>
</tr>
<tr>
<td>7. Simplify: $5x + 2y - x + 7y + 4$</td>
<td>8. Simplify: $14r + 8 - 4s + 6r - 2s + 2$</td>
</tr>
<tr>
<td>11. Solve for $d$: $12d = 96$</td>
<td>12. Solve for $k$: $\frac{k}{5} = 12$</td>
</tr>
<tr>
<td>13. Solve for $y$: $6y + 2 = 44$</td>
<td>14. Solve for $w$: $\frac{w - 6}{3} = 5$</td>
</tr>
</tbody>
</table>
# Pre-Algebra Pre-Assessment

**Directions:**
Show your work in the space provided. Write your final answer in the oval.

<p>| | | | | | | | |</p>
<table>
<thead>
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<tbody>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3. Write this expression in words: $54 + k$</td>
<td>4. Write this expression in words: $m / 5 - 3$.</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Fifty-four increased by $k$</td>
<td>$m$ divided by 5 decreased by 3</td>
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<td></td>
<td></td>
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<td></td>
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<td></td>
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</tr>
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<td></td>
<td></td>
<td></td>
<td></td>
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</tr>
<tr>
<td>$48 / 6 + 7$</td>
<td>$8 * 6 - 12$</td>
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</tr>
<tr>
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<td>8. Simplify: $14r + 8 - 4s + 6r - 2s + 2$</td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>$4x + 9y + 4$</td>
<td>$20r - 6s + 10$</td>
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<tr>
<td>$b = 14$</td>
<td>$n = 84$</td>
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<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>11. Solve for $d$: $12d = 96$</td>
<td>12. Solve for $k$: $k = 12 / 5$</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>$d = 8$</td>
<td>$k = 60$</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
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<td></td>
</tr>
<tr>
<td>$y = 7$</td>
<td>$w = 33$</td>
<td></td>
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<td></td>
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<td></td>
</tr>
</tbody>
</table>
# Tic-Tac-Toe
Pre-Algebra Unit – Choice Board

<table>
<thead>
<tr>
<th>Choice Activity</th>
<th>Classifications</th>
</tr>
</thead>
<tbody>
<tr>
<td>Create a <strong>song/jingle</strong> that will remind your classmates of how to follow the “order of operations” to solve algebraic expression/equations.</td>
<td><strong>(Musical – Rhythmic)</strong></td>
</tr>
<tr>
<td>In the form of a <strong>cartoon</strong>, give a frame by frame, step by step demonstration on how to combine like terms.</td>
<td><strong>(Visual/Spatial)</strong></td>
</tr>
<tr>
<td><strong>Interview</strong> a high school junior or senior math student for tips on organizing/showing their work solving longer equations. Give an oral report of your findings.</td>
<td><strong>(Interpersonal)</strong></td>
</tr>
<tr>
<td>Create a <strong>poster using natural elements</strong> to demonstrate how a given variable can stand in for an unknown value.</td>
<td><strong>(Naturalist)</strong></td>
</tr>
<tr>
<td>Create a <strong>review game</strong> that your fellow classmates could play that will review/practice each of the learning targets contained in this unit.</td>
<td><strong>(Interpersonal)</strong></td>
</tr>
<tr>
<td>Write a <strong>poem</strong> about an algebra topic.</td>
<td><strong>(Linguistic)</strong></td>
</tr>
<tr>
<td>As a <strong>reporter at the scene</strong> of an equation, describe to your viewers why addition and subtraction and multiplication and division are inverse operations.</td>
<td><strong>(Verbal-linguistic)</strong></td>
</tr>
<tr>
<td>Write and act out a play about variables and their uses in algebra.</td>
<td><strong>(Bodily-Kinesthetic)</strong></td>
</tr>
<tr>
<td>Create a <strong>sequence chart</strong> for the steps to follow to solve 2-step equations.</td>
<td><strong>(Logical-Math)</strong></td>
</tr>
</tbody>
</table>

My **three** choice activities are:

_____________________, _______________________, _______________________

Due Date: _____________________
## Tic-Tac-Toe Grading Rubric
### Pre-Algebra Unit Choice Board

<table>
<thead>
<tr>
<th></th>
<th>Song/Jingle</th>
<th>Cartoon</th>
<th>Oral Report of Interview</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>• Follows song criteria card ____/5</td>
<td>• Follows cartoon criteria card ____/4</td>
<td>•Follows oral report criteria card ____/6</td>
</tr>
<tr>
<td></td>
<td>• Demonstrates knowledge of order of operations ____/5</td>
<td>• Demonstrates understanding of combining like terms ____/4</td>
<td>• Questions for interview written out ahead of time ____/4</td>
</tr>
<tr>
<td></td>
<td>Total: ____/10</td>
<td></td>
<td>Total: ____/10</td>
</tr>
<tr>
<td></td>
<td>Posters</td>
<td>Review Game</td>
<td>Poem</td>
</tr>
<tr>
<td></td>
<td>• Follows poster criteria card ____/4</td>
<td>• Follows game criteria card ____/3</td>
<td>• Follows poem criteria card ____/4</td>
</tr>
<tr>
<td></td>
<td>• Demonstrates understanding of substituting a value in for a variable ____/4</td>
<td>• Game activities represent unit learning targets ____/3</td>
<td>• Demonstrates understanding of chosen algebra topic ____/4</td>
</tr>
<tr>
<td></td>
<td>• Use of natural elements ____/2</td>
<td>• Demonstrates understanding of unit learning targets ____/4</td>
<td>• Includes an example ____/2</td>
</tr>
<tr>
<td></td>
<td>Total: ____/10</td>
<td></td>
<td>Total: ____/10</td>
</tr>
<tr>
<td></td>
<td>TV Reporter</td>
<td>Write/Act a Play</td>
<td>Sequence Chart</td>
</tr>
<tr>
<td></td>
<td>• Follows TV reporter criteria card ____/4</td>
<td>• Follows play criteria card ____/4</td>
<td>• Follows sequence chart criteria card ____/4</td>
</tr>
<tr>
<td></td>
<td>• Demonstrates understanding of inverse operations ____/4</td>
<td>• Demonstrates understanding of the purpose and uses of variables ____/4</td>
<td>• Demonstrates understanding of solving 2-step equations ____/4</td>
</tr>
<tr>
<td></td>
<td>• Includes an example ____/2</td>
<td>• Includes an example ____/2</td>
<td>• Includes an example ____/2</td>
</tr>
<tr>
<td></td>
<td>Total: ____/10</td>
<td></td>
<td>Total: ____/10</td>
</tr>
</tbody>
</table>

Total: ____________/30
Independent Study Project

Wow! Your performance on the unit pretest shows that you have mastered the concepts we are going to cover in our pre-algebra unit. You may remain in the classroom with the rest of the class and practice problems you already know how to do, or you may do an in independent study project on your own to learn something new.

Your task is to learn how algebra is used in everyday life. You will want to start by making a list of questions about algebra that you are interested in finding out the answers to, and then narrowing your list down to a specific question or problem that you want to learn more about. You may choose from the following sample questions or come up with your own: When is algebra used? Where is algebra used? Why is algebra used? What is algebra used for? What careers use algebra? Why is it important for students to learn algebra? Again, these are just some sample questions. You may choose any topic about algebra that interests you.

First, you will need to read through this packet to fully understand what this project will entail. Next, you need to take the packet home and reread it through with your parents. Should you decide to complete the independent study (and I hope you do! 😊), you will need to have your parent’s signature of approval. It is important that they know what you are doing here at school and support your participation in the independent study project.

Once you and your parents agree to your participation in this project, you will need to get started! Every day for the next three weeks you will stop in the classroom for attendance, and then you will head down to the media center to do your research. You will be able to use the computers as well as any books you can find related to the information you are looking for. Remember to fill in the work log and follow the learning and working conditions that you agreed to! At the end of each class please come back in time to check in with me and be dismissed.

Finally, you will need to put together a presentation to share with the class about what you have learned. You may choose whatever format you’d like to use to display/present your research – poster, picture postcards, radio or TV report, song, poem, drama, PowerPoint, or any other creative medium. Be sure to play to your strengths and use your multiple intelligence results to help guide your choice. On the last day of the unit everyone in the class will be presenting a project they have been working on, and you will join in with your own special project!
Independent Study Agreement

Write your initials beside each condition to show that you understand what it says and that you agree to abide by the stated condition.

**Learning Conditions:**

- [ ] I will not have to complete the assigned activities from the regular class as long as I am working on an independent project.
- [ ] I will participate in designated whole-class activities as the teacher indicates them—without arguing.
- [ ] I will keep a Daily Log of my progress.
- [ ] I will work on an independent project and complete an Evaluation Contract to describe the grade I will choose to earn.
- [ ] I will share a presentation about my independent project with the class by day 17 of the unit. My report will be 5–7 minutes long and will include a visual aid.

**Working Conditions:**

- [ ] I will be present in the classroom at the beginning and end of each class period.
- [ ] I will not bother anyone or call attention to the fact that I am doing different work than others in the class.
- [ ] I will work on my project for the entire class period on designated days.
- [ ] I will carry this paper with me to any room in which I am working on my project, and I will return it to my classroom at the end of each session.

Student’s Signature: ____________________________________________

Parent’s Signature: ____________________________________________

Teacher’s Signature: ____________________________________________

* modified from ideas of Susan Winebrenner
Independent Study Evaluation Contract

I am choosing a grade for my project based on the following criteria.

For a grade of B:

1. I will use secondary sources. This means that I will locate what information I can from several existing sources.

2. I will prepare a traditional product. I will present it using a traditional reporting format.

3. I will be learning on the lower levels of the Taxonomy of Thinking: Knowledge and Comprehension. This means that I will find information and be able to describe what I’ve learned.

For a grade of A:

1. I will use primary sources. This means that I will gather first-hand information myself through surveys, interviews, original documents, and similar methods.

2. I will produce an original type of product. I will present it to an appropriate audience using a unique format.

3. I will be learning on the higher levels of the Taxonomy of Thinking: Application, Analysis, Evaluation, and/or Synthesis.

This is the project I will do: __________________________________________
_______________________________________________________________
_______________________________________________________________
_______________________________________________________________

This is the grade I intend to earn: ______

Student’s Signature: ______________________________________________

Parent’s Signature: ______________________________________________

Teacher’s Signature: ______________________________________________

*modified from ideas of Susan Winebrenner
Independent Study Timeline

1. Brainstorm ideas - Select a topic *(Days 1 & 2)*

__________________________________________________________________
__________________________________________________________________
__________________________________________________________________

2. Narrow down your ideas to a single question or problem to research *(Day 3)*

__________________________________________________________________
__________________________________________________________________
__________________________________________________________________

3. Develop a plan of action *(Days 4)*

__________________________________________________________________
__________________________________________________________________
__________________________________________________________________

4. Gather information *(Days 5 - 9)* – use separate paper.

5. Analyze information *(Days 10 - 12)* – use separate paper.

7. **Report your findings (Day 17) – present to the class what you learned.**

*modified from ideas of Beth Bradley*
# Independent Study Work Log

**Student’s Name:** ___________________________________________

**Project Topic:** _____________________________________________

<table>
<thead>
<tr>
<th>Today’s Date</th>
<th>What I Plan to Do During Today’s Work Period</th>
<th>What I Actually Accomplished Today</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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<td></td>
<td></td>
</tr>
</tbody>
</table>

*modified from ideas of Susan Winebrenner*
## Word Phrase Correlation to Math Operations

<table>
<thead>
<tr>
<th>Operation</th>
<th>Word Phrase</th>
<th>Operation</th>
<th>Word Phrase</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Addition</strong></td>
<td>the sum of</td>
<td><strong>Subtraction</strong></td>
<td>the difference of</td>
</tr>
<tr>
<td></td>
<td>plus</td>
<td></td>
<td>minus</td>
</tr>
<tr>
<td></td>
<td>added to</td>
<td></td>
<td>subtracted from</td>
</tr>
<tr>
<td></td>
<td>increased by</td>
<td></td>
<td>decreased by</td>
</tr>
<tr>
<td></td>
<td>a total of</td>
<td></td>
<td>less than</td>
</tr>
<tr>
<td><strong>Multiplication</strong></td>
<td>the product of</td>
<td></td>
<td>the quotient of</td>
</tr>
<tr>
<td></td>
<td>times</td>
<td></td>
<td>shared among</td>
</tr>
<tr>
<td></td>
<td>multiplied by</td>
<td></td>
<td>divided by</td>
</tr>
<tr>
<td></td>
<td>doubled</td>
<td></td>
<td>halved</td>
</tr>
<tr>
<td></td>
<td>tripled</td>
<td></td>
<td>split evenly</td>
</tr>
</tbody>
</table>

Taken from EDM Interactive Teacher’s Lesson Guide – Grade 6
### Profiler Activity

**Learning Target:** I can convert written words into an algebraic expression or equation.

**Directions:**
Pick ONE activity based on your preferred multiple intelligence. Complete the activity to demonstrate your understanding of the learning target. You may work in groups of up to 3. Final products will be shared with the class. Each activity is worth 10 points.

<table>
<thead>
<tr>
<th>Activity</th>
<th>Description</th>
<th>Scoring Criteria</th>
</tr>
</thead>
</table>
| **Algebra Artist**     | Visually (picture, poster, cartoon, etc.) represent how to convert written words into algebraic expressions. Be sure to visually portray all four operations. | 1. Neat and colorful ___/2  
2. Includes an accurate example ___/3  
3. Demonstrates mastery of learning target ___/5  
________/10 |
| **Algebra Commentator**| Create a script of step-by-step directions to walk a classmate through converting written words into algebraic expressions. Be sure to demonstrate all four operations. | 1. Easy to follow step-by-step directions ___/2  
2. Includes an accurate example ___/3  
3. Demonstrates mastery of learning target ___/5  
________/10 |
| **Algebra Actor**       | Write and perform a skit or drama demonstrating how to convert written words into algebraic expressions. Be sure to demonstrate all four operations. | 1. Each member played an active part ___/2  
2. Includes an accurate example ___/3  
3. Demonstrates mastery of learning target ___/5  
________/10 |
| **Algebra Musician**    | Write and perform a song about converting written words into algebraic expressions. You can make up a new melody or use an old tune. Be sure to demonstrate all four operations. | 1. Each member played an active part ___/2  
2. Includes an accurate example ___/3  
3. Demonstrates mastery of learning target ___/5  
________/10 |
| **Algebra Writer**      | Write a paragraph explaining how to convert written words into algebraic expressions. Be sure to demonstrate all four operations. | 1. Follows paragraph structure ___/2  
2. Includes an accurate example ___/3  
3. Demonstrates mastery of learning target ___/5  
________/10 |
**Profiler Activity**

**Learning Target:** I can convert written words into an algebraic expression or equation.

**Directions:**
Pick **ONE** activity based on your preferred multiple intelligence. Complete the activity to demonstrate your understanding of the learning target. You may work in groups of up to 3. Final products will be shared with the class. Each activity is worth 10 points.

### Algebra Artist
- Neat and colorful: ___/2
- Includes accurate examples: ___/3
- Demonstrates mastery of learning target: ___/5
  ______/10

### Algebra Commentator
- Easy to follow step-by-step directions: ___/2
- Includes accurate examples: ___/3
- Demonstrates mastery of learning target: ___/5
  ______/10

### Algebra Actor
- Each member played an active part: ___/2
- Includes accurate examples: ___/3
- Demonstrates mastery of learning target: ___/5
  ______/10

### Algebra Musician
- Each member played an active part: ___/2
- Includes accurate examples: ___/3
- Demonstrates mastery of learning target: ___/5
  ______/10

### Algebra Writer
- Follows paragraph structure: ___/2
- Includes accurate examples: ___/3
- Demonstrates mastery of learning target: ___/5
  ______/10

*Structure and wording adapted from Beth Bradley.*
Structured Academic Controversy

**Topic:** Evaluating an Algebraic Expression for a Given Variable - Order of Operations

**Instructions:**

1.) You and your partner will be given a point of view (X or Y). You will have 10 minutes to make a list of reasons (including examples) why you agree with the point of view stated.

2.) The two of you will have 3 minutes to state your case to a pair of classmates assigned the opposing side.

3) The opposing pair of classmates will have 3 minutes to state their case.

4) You and your partner will have 1 minute to defend your point of view.

5.) The opposing pair will have 1 minute to defend their point of view.

6.) You will change sides and have 10 minutes to make a list of reasons why you agree with the second point of view.

7.) Repeat steps 2-5.

**Expectations:**

Active participation in developing your group’s case. _____/5

Productive use of time. (Task completed in allotted time.) _____/5

Completed notes including examples to prove your case. _____/5

Total: _____/15
**Side X: The order of operations IS essential when evaluating expressions.**

Best arguments/evidence to support this point of view:

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

Notes and important points after hearing the opposing view:

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

Best arguments/evidence to support opposing viewpoint:

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

Group consensus & explanation:

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________
**Side Y: The order of operations is NOT essential when evaluating expressions.**

Best arguments/evidence to support this point of view:

____________________________________________________________________
____________________________________________________________________
____________________________________________________________________
____________________________________________________________________
____________________________________________________________________
____________________________________________________________________
____________________________________________________________________

Notes and important points after hearing the opposing view:

____________________________________________________________________
____________________________________________________________________
____________________________________________________________________
____________________________________________________________________
____________________________________________________________________

Best arguments/evidence to support opposing viewpoint:

____________________________________________________________________
____________________________________________________________________
____________________________________________________________________
____________________________________________________________________
____________________________________________________________________

Group consensus & explanation:

____________________________________________________________________
____________________________________________________________________
____________________________________________________________________
SAC Group Consensus
(to be completed independently)

As a result of our discussion, our opinion of this topic is____________________
______________________________________________________________

Three reasons/proofs to back up our position are (be sure to include at least one example as proof):

1. ____________________________________________________________
   __________________________________________________________________
   __________________________________________________________________
   __________________________________________________________________
   __________________________________________________________________
   __________________________________________________________________

2. ____________________________________________________________
   __________________________________________________________________
   __________________________________________________________________
   __________________________________________________________________
   __________________________________________________________________
   __________________________________________________________________

3. ____________________________________________________________
   __________________________________________________________________
   __________________________________________________________________
   __________________________________________________________________
   __________________________________________________________________
   __________________________________________________________________

In conclusion, ________________________________
_____________________________________________________________________
_____________________________________________________________________

(Double check... did you include an example?)
Structured Academic Controversy
Scoring Guide

Name ______________________________________ Date _______ # _____

SAC | Consensus Paragraph
---|---
Active Participation _____/5 | Stated opinion _____/5
Finished in time allotted _____/5 | 3 reasons/proofs _____/5
Completed notes _____/5 | Example Provided _____/5
Total _____/15 | Total _____/15

Name ______________________________________ Date _______ # _____

SAC | Consensus Paragraph
---|---
Active Participation _____/5 | Stated opinion _____/5
Finished in time allotted _____/5 | 3 reasons/proofs _____/5
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Total _____/15 | Total _____/15

Name ______________________________________ Date _______ # _____

SAC | Consensus Paragraph
---|---
Active Participation _____/5 | Stated opinion _____/5
Finished in time allotted _____/5 | 3 reasons/proofs _____/5
Completed notes _____/5 | Example Provided _____/5
Total _____/15 | Total _____/15
Algebraic Expressions and Equations Assessment – Version 1

Please follow along as I read this page aloud to the class.

Objective: During this week, we have been discussing what makes up an algebraic expression versus an equation. This test is designed to see how much you know about these key concepts including writing algebraic expressions from words, and converting algebraic expressions and equations into written words.

There are four different sections to this assessment:
- Section 1: Fill-in/Matching (4 questions x 1 point each = 4 points total)
- Section 2: Multiple Choice (5 questions x 1 point each = 5 points total)
- Section 3: True/False (4 questions x 1 point each = 4 points total)
- Section 4: Short Answer (6 questions x 1 point each = 6 points total)

This test is worth a total of 20 points. Each of the four sections will have specific instructions. Please be sure to read the instructions carefully. After each question, you will be asked whether you are sure or unsure of your answer. Make sure to mark an “X” in the blank to indicate if you are sure or unsure of the answer to each question. An example is given in section 1.

If you have any question about the wording of the test, please raise your hand and I will come to your desk to assist you. If I am helping another student, please move onto the next question or section and continue working until I am able to assist you. You will have the remainder of our class time to work on this test.

When you have completed all four sections of this assessment, be sure to go back and reread the instructions, the test questions, as well as your answers. Ask yourself, “Did I follow the directions?” “Are my answers legible?” “Do my answers make sense?” Once you are sure you can answer “yes” to each of these questions, please hang your assessment on your numbered tag on the back wall, and work on your tic-tac-toe board activities. Please remember to be respectful of your fellow classmates who are still working on the assessment by keeping our classroom environment as quiet as possible.

Before you begin, please take a moment to write your name, date, and number in the top right hand corner of this test in the box provided.

Section 1: Fill-in-the Blank/Matching. (1 point each) This section will help you determine if you understand the basic vocabulary used in algebra. After each numbered question, there is an example of one of the terms listed in the “word bank” box. Choose the term that matches the example and write it in the blank to the left of the term it matches. *Note: The word bank words will not be used more than once. Please be sure to put an “X” in the blank to indicate if you are sure or unsure about your answer.

WORD BANK

<table>
<thead>
<tr>
<th>expression</th>
<th>variable</th>
<th>like terms</th>
</tr>
</thead>
<tbody>
<tr>
<td>equation</td>
<td>formula</td>
<td>coefficient</td>
</tr>
<tr>
<td>replacement</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

EXAMPLE:

__Formula__ 0. \( A = \frac{1}{2}(b \times h) \)  
Sure ___X___  Unsure ___

________________ 1. \( 4n + 6 \)  
Sure _______  Unsure _______

________________ 2. the letter “x” in x miles  
Sure _______  Unsure _______

________________ 3. \( 2(x - 3) = 14 \)  
Sure _______  Unsure _______

________________ 4. the number “2” in \( 2x + 5 \)  
Sure _______  Unsure _______

Yahoo! You’ve finished the first section!  
Turn the page and keep going!
Section 2: Multiple Choice. (1 point each) This section will help you see if you understand the language of math by interpreting algebraic expressions/equations and converting them into words. Print the capital letter of the correct answer on the blank provided for each question. Don’t forget to mark if you are sure or unsure of each answer.

5. The equation $x + 15 = 18$ is understood to mean:
   A. $x$ plus 15 is equal to 18
   B. 15 more than 18 is equal to $x$
   C. 18 minus 15 = $x$
   D. $x$ plus 18 equals 15

   Answer ___________________  Sure _________  Unsure __________

6. The expression $(6/y) + x$ is understood to mean:
   A. six divided by the sum of $y$ plus $x$
   B. six divided by $y$ plus $x$
   C. six times $y$ plus $x$
   D. the quotient, 6 divided by $y$, added to $x$

   Answer ___________________  Sure _________  Unsure __________

7. The equation $212 - x = 67$ is understood to mean:
   A. 67 more than $x$ is equal to 212
   B. 212 minus $x$ is equal to 67
   C. the difference between 67 and $x$ equals 212
   D. 212 less than $x$ is equal to 67

   Answer ___________________  Sure _________  Unsure __________

8. The expression $5n + 3$ is understood to mean:
   A. five more than $n$ plus 3
   B. five times $n$ plus 3
   C. the product, 5 times $n$, plus 3
   D. $n$ plus 3 times 5

   Answer ___________________  Sure _________  Unsure __________

9. The equation $2(x + 6) = 22$ is understood to mean:
   A. 2 times $x$ plus 6 equals 22
   B. 2 divided by the sum of $x$ plus 6 is equal to 22
   C. 2 plus $x$ plus 6 equals 22
   D. 2 times the sum of $x$ plus 6 is equal to 22

   Answer ___________________  Sure _________  Unsure __________

Two sections down! You’re almost halfway done! Turn the page and keep going!
Section 3: True or False. (1 point each) This section will help you understand if you know how to evaluate an equation to determine if it is true or false. Read each equation carefully. Substitute the stated value for x into the equation. If the value makes the equation true, write the word “TRUE” in the blank. If the value makes the equation false, write the word “FALSE” in the blank. Make sure that you write the entire word and NOT just “T” or “F.” Also, please remember to mark if you are sure or unsure of your answer.

10. \(2x + 6 = 22\), where \(x = 8\)  
Sure _______ Unsure _______

11. \(2(x + 6) = 22\), where \(x = 4\)  
Sure _______ Unsure _______

12. \(3(13 - x) = 15\), where \(x = 6\)  
Sure _______ Unsure _______

13. \((24 / x) + x = 11\), where \(x = 8\)  
Sure _______ Unsure _______

Section 4: Short Answer. (1 point each) This section will help you understand if you can write an algebraic expression to represent a written expression. Convert each word phrase into an algebraic expression. Write the algebraic expression in the blank to the right of the word phrase. Please mark if you are sure or unsure of your answer.

14. \(p\) increased by 8  
___________________  
Sure _______ Unsure _______

15. 7 less than \(g\)  
___________________  
Sure _______ Unsure _______

16. the product of \(w\) and 4  
___________________  
Sure _______ Unsure _______

17. \(m\) shared equally by 6 people  
___________________  
Sure _______ Unsure _______

18. twice the sum of \(y\) and 2  
___________________  
Sure _______ Unsure _______

You’re just about finished! Just two more short answer questions remain. Please turn the page to finish this test.
Short Answer continued: Complete each of the following statements with an algebraic expression. Use the variable suggested in the picture to the right of the problem.

19. The weight of 8 bags of candy is ________________ pounds.

A bag of candy weighs \( p \) pounds

20. If a large pizza cost $3.25 more than a small pizza, then a large pizza costs ________________ dollars.

A small pizza costs \( d \) dollars.

You’re almost done! Don’t forget to go back over your test to double-check your answers. Did you follow the directions? Are your answers legible? Do your answers make sense?

If you have answered “yes” to the above questions, please hang your test up on your numbered tag. Remember to do so as quietly as possible so other students can finish without being distracted.
ANSWER KEY – Version 1

Algebraic Expressions and Equations Assessment

Section 1

1. Expression
2. Variable
3. Equation
4. Coefficient

Section 2

5. A
6. D
7. B
8. C
9. D

Section 4

14. \( p + 8 \)
15. \( g - 7 \)
16. \( 4w \)
17. \( 3x - 24 \)
18. \( 2(y + 2) \)

(Turn the page)

Section 3

10. True
11. False
12. False
13. True

20. \( d + \$3.25 \)
Algebraic Expressions and Equations Test Analysis

Directions: Now that you have taken the test, it’s time to look over each question and determine which of the learning targets you hit and which ones you missed. This process will help you see what material you and I need to spend more time on. Your task is to put an “X” in the box below next to the number of the test question indicating if you got that question right or wrong, and then if you were sure or unsure at the time of the assessment. Example:

<table>
<thead>
<tr>
<th>Question</th>
<th>Right</th>
<th>Wrong</th>
<th>Sure</th>
<th>Unsure</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td>X</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>2</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Use the table you have filled in above, to tally your results below. Based on the total number of right/wrong responses for each target, decide whether you’re on target or if you need to review some more or seek extra help on each learning target. You will use the information below to help you answer the questions on the next page.

<table>
<thead>
<tr>
<th>Learning Target</th>
<th>Questions</th>
<th>Right</th>
<th>Wrong</th>
</tr>
</thead>
<tbody>
<tr>
<td>I can identify the parts of an algebraic expression.</td>
<td>2, 4</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I can identify an algebraic expression and equation.</td>
<td>1, 3</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I can determine if a number sentence is true or false when given the value of the variable.</td>
<td>10, 11, 12, 13</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I can convert an algebraic expression into words.</td>
<td>5, 6, 7, 8, 9, 10</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I can write an algebraic expression from words.</td>
<td>14, 15, 16, 17, 18</td>
<td></td>
<td></td>
</tr>
<tr>
<td>I can use a variable in place of an unknown value.</td>
<td>19, 20</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

I’m on target! Need to review. Silly mistake? I need help!
Self Evaluation:

1. **What I know and can do well! 😊**
   What was the target(s) you hit? Why do you think you did so well? Explain.

2. **Things I need to review a little: 😃**
   What target(s) did you make silly errors on or perhaps you were unsure of your answers? Explain your mistake or what you struggled with.

3. **What I need to study and work on: ☹️**
   What were the targets you struggled with? Explain why you did poorly with this target(s)? Some reasons might include: “I forgot to study,” “I thought I understood the material,” etc.

4. **My Action Plan:**
   What will you do to hit the targets you missed on the test? Mark as many answers as apply to your action plan.
   - __________ I will come see Mrs. Peneycad at Study Club. Which morning? __________
   - __________ I will come in to see Mrs. Peneycad during lunch. When? __________
   - __________ I will complete similar problems from my math journal. Which problems? __________
   - __________ Other: Please explain. ________________________________________________

---

Parent Signature: _____________________________ Date: __________
Algebraic Expressions and Equations Assessment – Version 2

Please follow along as I read this page aloud to the class.

Objective: During this week, we have been discussing what makes up an algebraic expression versus an equation. This test is designed to see how much you know about these key concepts including writing algebraic expressions from words, and converting algebraic expressions and equations into written words.

There are four different sections to this assessment:
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If you have any question about the wording of the test, please raise your hand and I will come to your desk to assist you. If I am helping another student, please move onto the next question or section and continue working until I am able to assist you. You will have the remainder of our class time to work on this test.

When you have completed all four sections of this assessment, be sure to go back and reread the instructions, the test questions, as well as your answers. Ask yourself, “Did I follow the directions?” “Are my answers legible?” “Do my answers make sense?” Once you are sure you can answer “yes” to each of these questions, please hang your assessment on your numbered tag on the back wall, and work on your tic-tac-toe board activities. Please remember to be respectful of your fellow classmates who are still working on the assessment by keeping our classroom environment as quiet as possible.

Before you begin, please take a moment to write your name, date, and number in the top right hand corner of this test in the box provided.

Section 1: Fill-in-the Blank/Matching. (1 point each) This section will help you determine if you understand the basic vocabulary used in algebra. After each numbered question, there is an example of one of the terms listed in the “word bank” box. Choose the term that matches the example and write it in the blank to the left of the term it matches. *Note: The word bank words will not be used more than once. Please be sure to put an “X” in the blank to indicate if you are sure or unsure about your answer.

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EXAMPLE:

Formula 0. A = ½(b*h )

Sure X 

Unsure ___

__________ 1. 4n + 6

Sure ______  

Unsure ______

__________ 2. the letter “x” in x miles

Sure ______  

Unsure ______

__________ 3. 2x - 3 = 14

Sure ______  

Unsure ______

__________ 4. the number “2” in 2x

Sure ______  

Unsure ______

Yahoo! You’ve finished the first section! Turn the page and keep going!
Section 2: Multiple Choice. (1 point each) This section will help you see if you understand the language of math by interpreting algebraic expressions/equations and converting them into words. Print the capital letter of the correct answer on the blank provided for each question. Don’t forget to mark if you are sure or unsure of each answer.

5. The equation $x + 15 = 18$ is understood to mean:
   E. $x$ plus 15 is equal to 18
   F. 15 more than 18 is equal to $x$
   G. 18 minus 15 = $x$
   H. $x$ plus 18 equals 15

   Answer ______________   Sure _________   Unsure __________

6. The expression $(6 ÷ y) + x$ is understood to mean:
   E. six divided by the sum of $y$ plus $x$
   F. six divided by $y$ plus $x$
   G. six times $y$ plus $x$
   H. the quotient, 6 divided by $y$, added to $x$

   Answer ______________   Sure _________   Unsure __________

7. The equation $212 - x = 67$ is understood to mean:
   E. 67 more than $x$ is equal to 212
   F. 212 minus $x$ is equal to 67
   G. the difference between 67 and $x$ equals 212
   H. 212 less than $x$ is equal to 67

   Answer ______________   Sure _________   Unsure __________

8. The expression $5n + 3$ is understood to mean:
   E. five more than $n$ plus 3
   F. five times $n$ plus 3
   G. the product, 5 times $n$, plus 3
   H. $n$ plus 3 times 5

   Answer ______________   Sure _________   Unsure __________

9. The equation $2 * (x + 6) = 22$ is understood to mean:
   E. 2 times $x$ plus 6 equals 22
   F. 2 divided by the sum of $x$ plus 6 is equal to 22
   G. 2 plus $x$ plus 6 equals 22
   H. 2 times the sum of $x$ plus 6 is equal to 22

   Answer ______________   Sure _________   Unsure __________

Two sections down! You’re almost halfway done! Turn the page and keep going!
Section 3: True or False. (1 point each) This section will help you understand if you know how to evaluate an equation to determine if it is true or false. Read each equation carefully. Substitute the stated value for \( x \) into the equation. If the value makes the equation true, write the word “TRUE” in the blank. If the value makes the equation false, write the word “FALSE” in the blank. Make sure that you write the entire word and NOT just “T” or “F.” Also, please remember to mark if you are sure or unsure of your answer.

10. \( 2x + 6 = 22 \), where \( x = 8 \)  
Sure ________ Unsure ________

11. \( 2 \times (x + 6) = 22 \), where \( x = 4 \)  
Sure ________ Unsure ________

12. \( 3 \times (13 - x) = 15 \), where \( x = 6 \)  
Sure ________ Unsure ________

13. \( (24 \div x) + x = 11 \), where \( x = 8 \)  
Sure ________ Unsure ________

Section 4: Short Answer. (1 point each) This section will help you understand if you can write an algebraic expression to represent a written expression. Convert each word phrase into an algebraic expression. Write the algebraic expression in the blank to the right of the word phrase. Please mark if you are sure or unsure of your answer.

14. \( p \) increased by 8  
___________________  
Sure ________ Unsure ________

15. 7 less than \( g \)  
___________________  
Sure ________ Unsure ________

16. the product of \( w \) and 4  
___________________  
Sure ________ Unsure ________

17. \( m \) shared equally by 6 people  
___________________  
Sure ________ Unsure ________

18. two times the sum of \( y \) and 2  
___________________  
Sure ________ Unsure ________

You’re just about finished! Just two more short answer questions remain. Please turn the page to finish this test.
Short Answer continued: Complete each of the following statements with an algebraic expression. Use the variable suggested in the picture to the right of the problem.

19. The weight of 8 bags of candy is _________________ pounds.

A bag of candy weighs $p$ pounds

20. If a large pizza cost $3.25 more than a small pizza, then a large pizza costs ________________ dollars.

A small pizza costs $d$ dollars.

large pizza

You’re almost done! Don’t forget to go back over your test to double-check your answers. Did you follow the directions? Are your answers legible? Do your answers make sense?

If you have answered “yes” to the above questions, please hang your test up on your numbered tag. Remember to do so as quietly as possible so other students can finish without being distracted.
ANSWER KEY – Version 2

Algebraic Expressions and Equations Assessment

Section 1

1. Expression
2. Variable
3. Equation
4. Coefficient

Section 2

5. A
6. D
7. B
8. C
9. D

Section 4

14. \( p + 8 \)
15. \( g - 7 \)
16. \( 4w \)
17. \( 3x - 24 \)
18. \( 2 \times (y + 2) \)

(Turn the page)

Section 3

10. True
11. False
12. False
13. True

20. \( d + $3.25 \)
Algebraic Expressions and Equations Test Analysis

Directions: Now that you have taken the test, it’s time to look over each question and determine which of the learning targets you hit and which ones you missed. This process will help you see what material you and I need to spend more time on. Your task is to put an “X” in the box below next to the number of the test question indicating if you got that question right or wrong, and then if you were sure or unsure at the time of the assessment. Example:

<table>
<thead>
<tr>
<th>Question</th>
<th>Right</th>
<th>Wrong</th>
<th>Sure</th>
<th>Unsure</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td>X</td>
<td></td>
<td>X</td>
</tr>
<tr>
<td>2</td>
<td>X</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Use the table you have filled in above, to tally your results below. Based on the total number of right/wrong responses for each target, decide whether you’re on target or if you need to review some more or seek extra help on each learning target. You will use the information below to help you answer the questions on the next page.

<table>
<thead>
<tr>
<th>Learning Target</th>
<th>Questions</th>
<th>Right</th>
<th>Wrong</th>
<th>Sure</th>
<th>Unsure</th>
</tr>
</thead>
<tbody>
<tr>
<td>I can identify the parts of an algebraic expression.</td>
<td>2, 4</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I can identify an algebraic expression and equation.</td>
<td>1, 3</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I can determine if a number sentence is true or false when given the value of the variable.</td>
<td>10, 11, 12, 13</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I can convert an algebraic expression into words.</td>
<td>5, 6, 7, 8, 9, 10</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I can write an algebraic expression from words.</td>
<td>14, 15, 16, 17, 18</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>I can use a variable in place of an unknown value.</td>
<td>19, 20</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

I’m on target! Need to review. Silly mistake? I need help!
Self Evaluation:

1. **What I know and can do well! 😊**
   What was the target(s) you hit? Why do you think you did so well? Explain.

2. **Things I need to review a little: 😓**
   What target(s) did you make silly errors on or perhaps you were unsure of your answers? Explain your mistake or what you struggled with.

3. **What I need to study and work on: 😓**
   What were the targets you struggled with? Explain why you did poorly with this target(s)? Some reasons might include: “I forgot to study,” “I thought I understood the material,” etc.

4. **My Action Plan:**
   What will you do to hit the targets you missed on the test? Mark as many answers as apply to your action plan.
   - I will come see Mrs. Peneycad at Study Club. Which morning? 
   - I will come in to see Mrs. Peneycad during lunch. When?
   - I will complete similar problems from my math journal. Which problems?
   - Other: Please explain.

Parent Signature: ___________________________________________ Date: _____________
Exit Card

This is the word problem I created, the algebraic equation that fits the situation, as well as the solution...

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

Name ____________________________________ Date _______ # ______

Exit Card

This is the word problem I created, the algebraic equation that fits the situation, as well as the solution...

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

Name ____________________________________ Date _______ # ______
Think Dots Activity
Roll your die and complete the corresponding activity. You may “pass” one time.

<table>
<thead>
<tr>
<th>*</th>
<th>*</th>
<th>*</th>
</tr>
</thead>
<tbody>
<tr>
<td>[ ]</td>
<td>[ ]</td>
<td>[ ]</td>
</tr>
</tbody>
</table>

What is the inverse operation for each operation?

Addition: ____________
Multiplication: __________
Subtraction: __________
Division: ____________

Solve for \( x \):
Show all work!

\[ x + 55 = 70 \]

\( x = ________ \)

Explain why is it important to show your work when solving algebraic equations?

Write an algebraic equation to represent the following scenario, using \( p \) for the # of pennies:

Sam & Robert have 200 pennies all together. If Robert has 149 pennies, how many does Sam have?

\( 120 = 2x \)

\( x = ________ \)

\( p = ________ \)

Solve for \( x \):
Show all work!

\[ x \div 20 = 4 \]

\( x = ________ \)
Think Dots Activity

Roll your die and complete the corresponding activity. You may “pass” one time.

<table>
<thead>
<tr>
<th>1</th>
<th>Solve for ( x ): Show all work!</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>( 4x = 920 )</td>
</tr>
<tr>
<td>3</td>
<td>( x = )</td>
</tr>
</tbody>
</table>

What is the inverse operation for each operation?

- Addition: ____________
- Multiplication: __________
- Subtraction: ___________
- Division: ______________

\( x = \) ___________

<table>
<thead>
<tr>
<th>4</th>
<th>Solve for ( x ): Show all work!</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>( 79550 - x = 1 )</td>
</tr>
<tr>
<td>6</td>
<td>( x = )</td>
</tr>
</tbody>
</table>

Write an algebraic equation to represent the following scenario, using \( p \) for the # of pennies:

Robert has four times as many pennies as Sam. If Robert has 112 pennies, how many does Sam have?

\[ equation: \] __________

\( x = \) __________

\( p = \) __________

<table>
<thead>
<tr>
<th>7</th>
<th>Solve for ( x ): Show all work!</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td>( 24000 \div x = 10 )</td>
</tr>
<tr>
<td>9</td>
<td>( x = )</td>
</tr>
</tbody>
</table>

\( x = \) __________

Name: __________________________

Date: __________ # ______
Simplifying and Solving Equations

1. Eliminate parentheses.
   - Use distributive property – example: \(4(x + 3)\)
     \[
     4X + 12
     \]
   - Combine like terms - example: \((6 - 3) \times 5\)
     \[
     3 \times 5
     \]

2. Combine like terms on each side of the equal sign.
   example: \(4X - 2X + 3 = -9 + 18\)
   \[
   2X + 3 = 9
   \]

3. Isolate the variable term by removing the constant terms to one side of the equal sign by using the opposite operation.
   \(2X + 3 = 9\), then -3 from both sides of the equation
   \[
   2X + 3 - 3 = 9 - 3
   \]
   \[
   2X = 6
   \]

4. Isolate the variable by removing the coefficient using the opposite operation.
   \[
   2X = 6
   \]
   Since 2x is the same as \(2 \times X\), the opposite operation would be dividing by 2.
   \[
   \frac{2X}{2} = \frac{6}{2}
   \]
   \[
   1X = 3
   \]
   \[
   X = 3
   \]

5. Check your answer by substituting the value for \(X\) back into the equation.
   \[
   2X + 3 = 9
   \]
   \[
   2 \times 3 + 3 = 9
   \]
   \[
   6 + 3 = 9
   \]
   \[
   9 = 9 \sqrt
   \]
### Solving Equations A

**Directions:**
Solve the following problems using the steps outlined in class and provided on the handout. Don’t forget to check your answer by putting the value for $x$ back into the equation and solving. Write your final answer in the oval.

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>15. $7 + 4x = 7$</td>
<td>16. $4x + 2 = 22$</td>
</tr>
<tr>
<td>17. $6x + 2 = 26$</td>
<td>18. $4x - 8 = -32$</td>
</tr>
<tr>
<td>19. $3x + 7 = -5$</td>
<td>20. $2x + 3 = -9$</td>
</tr>
<tr>
<td>21. $4x - 4 = -24$</td>
<td>22. $4x - 10 = -10$</td>
</tr>
<tr>
<td>23. $5x + 10 = 20$</td>
<td>24. $2x + 3x + 5 = 35$</td>
</tr>
</tbody>
</table>
**Solving Equations B**

**Directions:**
Solve the following problems using the steps outlined in class and provided on the handout. Don’t forget to check your answer by putting the value for $x$ back into the equation and solving. Write your final answer in the oval.

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>1. $-4(-1x - 8) = 0$</td>
<td>2. $-4(-1x + 8) = -4$</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>3. $3(4x + 3) = -75$</td>
<td>4. $4(2x - 2) = 48$</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>5. $7(2x + 6) = 84$</td>
<td>6. $3(4x + 5) = 135$</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>7. $-5 = 3x + 6x - 5$</td>
<td>8. $-1 = 3x - 2x - 5$</td>
</tr>
<tr>
<td></td>
<td></td>
</tr>
<tr>
<td>9. $-x + 7 + 2x = 12$</td>
<td>10. $x - 10 + x = -16$</td>
</tr>
</tbody>
</table>
Problem-Based Learning

**Objective:** Thus far in our unit we have learned how to convert written words into an algebraic equation and how find the solution to the equation given an input value. In a previous unit we learned how to construct proper graphs and how to correctly plot points. Over the next two days, we are going to apply our knowledge to a real life situation. You will use your knowledge to write equations, create in/out charts, and graph points from the chart when given a general rule about a situation. Your task to take this newly learned material and apply it to the information that our principal, Mrs. McKinney, has given us from the latest UltraKey progress checks completed at the end of the first semester. From these tasks, Mrs. McKinney will be seeking our input as to the feasibility of requiring students to word process their assignments of varying lengths. This will require an explanation of the equations, charts, and graphs that we will be giving her.

Your group (2 – 3 students) will have approximately **40 minutes of class time each day** for the next two days to complete the task that has been presented to us. If you use your time wisely, this should be plenty of time. Should you need more time please see me and I will assist you in finding additional time to complete this task. While this is a small group activity, each student must complete their own packet. It will be important to use your notes from previous lessons along with the collective knowledge that you and your partner bring to the activity. I will be available to answer clarifying questions only. **Calculators may be used; however, only for the purpose of checking your work.** It is very important that you keep this packet in your math folder when not in use, and that you bring it to class each day!

**The Task:**
All students at Central Woodlands 5/6 School have had 20 minutes of typing instruction and practice using the UltraKey program each week for the past 18 weeks. Over this time all students were able to complete skill checks covering every key on the keyboard using the two paragraph format. After printing out the report of student performance for both 5th and 6th grades, a general rule emerged. The 5th graders, on average, typed 20 words per minute with 95% accuracy, while the 6th graders typed 25 words per minute with 95% accuracy. Mrs. McKinney would like to know, about how long it would take students to type assignments of varying lengths of words. She would like you to use this information to create equations, in/out charts, and graphs that she will use to determine (with our assistance) the feasibility of requiring students to type assignments and stay within our school’s suggested homework time allotment. Space will be provided for you to work through your solution throughout this project.
Mrs. McKinney's Question:
Based on the average rate of 20 wpm for 5th graders and 25 wpm for 6th graders, how long should it take a student to type assignments containing the following number of words: 125, 200, 350, 600, 850 and 1000 words per assignment?

What you are being evaluated on:
- your ability to write an equation given a written general rule (average # of wpm typed).
- your solution to the equation given input values through the use of an in/out chart.
- your graph that you created using the data from your in/out chart.

What you will hand in to be graded as part of this project:
- the equations for the 5th and 6th grade UltraKey results.
- the answer you give Mrs. McKinney along with your explanation of how to evaluate the equation.
- the in/out chart representing data from your equation.
- the graph representing data from your equation.

Overview of Daily Expectations:
Below is a checklist for each day’s assignment. This checklist is repeated in the work space for each day’s assignment. You will use a rubric to evaluate your work. I encourage you to read through the rubrics before you start your work each day, so you know what is expected of you. This will also help you stay on the right track. The rubric will be a 5-3-1 rubric similar to the ones we have used before. If you feel your work falls between two of the categories, you may choose a 4 or a 2. At the end of each day’s learning, you will need to meet with me to have me sign off on your progress, and discuss your self evaluation before moving ahead in the project.

Day One:
Equation Writing
- Determine your variables and define them for Mrs. McKinney. She will have no idea what your variables stand for unless you tell her!
- Write two equations - one for the 5th grade results (20 wpm), and the other for the 6th grade results (25 wpm).
- Do they make sense to the situation? Compare your work against the rubric.
- Get your work checked and initialed by Mrs. Peneycad to ensure that you are ready for the next task.
Day One (cont’d.):

Evaluating your equation and filling in an in/out chart.

- You will only evaluate one of the equations you wrote in the first task. To determine which equation you will use, roll a die. (Roll a 1, 3, or 5: 5th grade; roll a 2, 4, or 6: 6th grade.)
- Evaluate the equation by organizing your data in an in/out chart that you create. Be sure to label each heading so that others can understand what the values stand for. Use the rubric as a guide.
- Answer the question Mrs. McKinney has asked you. *How long should it take for 5th or 6th grade students to type an assignment given the following number of words per assignment: 125, 200, 350, 600, 850 and 1000 words per assignment? (Based on the average rate of wpm, with all answers given in minutes.)*
- Explain to Mrs. Mc Kinney (in a short written paragraph) how to find more data if she wants to know the time needed to complete other assignments.
- Use the rubric below to assess your equation evaluating skills.
- Use the rubric again to assess your in/out chart making skills and give yourself a score.
- Get your work checked and initialed by Mrs. Peneycad to ensure that you are ready for day two.

Day Two:

Using your in/out chart to create a graph.

- Use 1/4” graph paper. Draw your x and y axes. You will want to use an appropriate scale for each axis so that your graph will fill the page. Be sure that your graph is not so small that it is difficult to read. On the contrary, be sure that it is not so big that it cannot fit all the data.
- Label the x and y axes of your graph and give it a title.
- Use all of the data in your in/out chart to create your graph. Draw a straight line through your graphed points. (Hint: If all points are graphed correctly, they should all be on the line).
- Staple your graph to this packet.

Procedural Reminders:
Before you begin, please take a moment to write your name, date, and number in the top right hand corner of this packet in the space provided, if you haven’t done so already.

Once you have finished each task, including meeting with Mrs. Peneycad, you may work on your tic-tac-toe activities. Please remember to be respectful of your fellow classmates who are still working on their project by not disrupting their progress.

Store this packet in your math folder at the end of each class session. It is imperative that you remember to bring it to class each day!

Relax! You are well prepared for this task, so let’s begin!
Day One: Equation Writing

- **Determine your variables** and define them for Mrs. McKinney. She will have no idea what your variables stand for unless you tell her!
- **Write two equations.** One for the 5th grade results (20 wpm), and the other for the 6th grade results (25 wpm).
- **Do they make sense** to the situation? **Compare your work against the rubric.**
- **Get your work checked and initialed** by Mrs. Peneycad to ensure that you are ready for the next task.

Work Space:

My Results:

**5th Grade:**

Variables used and what they stand for: ____________________________

________________________________

________________________________

Equation that represents the scenario:

________________________________


**6th Grade:**

Variables used and what they stand for: ____________________________

________________________________

________________________________

Equation that represents the scenario:

________________________________
Written Equation Rubric
Up to 5 points for each equation, 10 points total.

<table>
<thead>
<tr>
<th>Score Level</th>
<th>Strategic Knowledge:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>(How many points do you earn?)</td>
</tr>
<tr>
<td>5</td>
<td>I defined my variables and chose letters that make sense given the scenario.</td>
</tr>
<tr>
<td></td>
<td>I used my variables correctly and made sure that I kept the “output” variable alone on one side of the equation (example: y = mx or y = m + x).</td>
</tr>
<tr>
<td></td>
<td>My equation is correct given the scenario. I have used the correct mathematical operation and connected it to the correct variable.</td>
</tr>
<tr>
<td>3</td>
<td>I defined my variables but chose letters that don’t fit or make sense given the scenario.</td>
</tr>
<tr>
<td></td>
<td>I used my variables correctly but did not keep the “output” variable alone on one side of the equation (example: my = x or m+y = x).</td>
</tr>
<tr>
<td></td>
<td>My equation uses the correct mathematical operation but I switched the variables or I used the correct variables and the wrong mathematical operation.</td>
</tr>
<tr>
<td>1</td>
<td>I used variables but forgot to define them for the reader.</td>
</tr>
<tr>
<td></td>
<td>I did not understand the relationship between the numbers and variables but I tried to write an equation that used the correct numbers and variables.</td>
</tr>
<tr>
<td></td>
<td>My equation does not use the correct mathematical operation or isn’t an equation at all.</td>
</tr>
<tr>
<td>0</td>
<td>I didn’t write an equation or expression to solve the problem.</td>
</tr>
</tbody>
</table>

Equation Writing - Self Analysis:
Please review your results, compare them to the rubric above, and give yourself a score (0 - 5) for each equation. See Mrs. Peneycad to review and initial your work prior to moving onto the next task.

I gave myself a _______ out of 5 for the 5th grade equation because ____________________________

I gave myself a _______ out of 5 for the 6th grade equation because ____________________________

Total Score: _______ out of 10.

Teacher's initials to move on: _______
Evaluating your equation and filling in an in/out chart.

- You will only evaluate one of the equations you wrote in the previous task. To **determine which equation you will use, roll a die.** (Roll a 1, 3, or 5: 5th grade; roll a 2, 4, or 6: 6th grade.)
- Evaluate the equation by organizing your data in an in/out chart that you create. Be sure to label each heading so that others can understand what the values stand for. Use the rubric as a guide.
- Answer the question Mrs. McKinney has asked you. **How long should it take for 5th or 6th grade students to type an assignment given the following number of words per assignment: 125, 200, 350, 600, 850 and 1000 words per assignment? (Based on the average rate of wpm, with all answers given in minutes.)**
- Explain to Mrs. McKinney (in a short written paragraph) how to find more data if she wants to know the time needed to complete other assignments.
- Use the rubric below to **assess your equation evaluating skills.**
- Use the rubric again to **assess your in/out chart making skills** and give yourself a score.
- **Get your work checked and initialed** by Mrs. Peneycad to ensure that you are ready for day two.

Mrs. McKinney’s Question:

**How long should it take for 5th or 6th grade students to type an assignment given the following number of words per assignment: 125, 200, 350, 600, 850, and 1000 words per minute?** What if I need to know how long it will take a student to type a different number of words for an assignment, how do I solve the equation for myself?

______________________________________________________________________________

______________________________________________________________________________

______________________________________________________________________________

______________________________________________________________________________

______________________________________________________________________________

______________________________________________________________________________

______________________________________________________________________________
Evaluating Equations & Creating an In/Out Chart Rubric
Up to 5 points for each category, 10 points total.

<table>
<thead>
<tr>
<th>Score Level</th>
<th>Mathematical Knowledge: (Do you know it?)</th>
<th>Explanation: (Can you explain it?)</th>
</tr>
</thead>
</table>
| 5           | I correctly set up the in/out chart and labeled the input and output headings in the correct columns.  
              All of my calculations are done correctly for each given value.  
              I transferred all the data from my calculations into the correct rows and columns in the in-out chart. | I clearly expressed my answer to Mrs. McKinney’s question.  
              I thoroughly write what I did and explain how I did it so Mrs. McKinney will know exactly what to do. |
| 3           | I set up the in/out chart and labeled the input and output headings.  
              Most of my calculations are done correctly for each given value.  
              I transferred all the data from my calculations onto the in-out chart but put the numbers in the incorrect columns. | I expressed my answer to Mrs. McKinney’s question.  
              I write mostly about what I did but little about how I did it. Mrs. McKinney might get confused by my instructions and reasoning. |
| 1           | I set up the in/out chart but left the headings blank.  
              Only a few of my calculations are done correctly.  
              I transferred some of the data from my evaluations and/or put the numbers in the incorrect columns. | My answer to the question is not very clearly stated.  
              I write little about what I did.  
              I write little about why I did it. |
| 0           | I didn’t evaluate the expression at all. I don’t know what to do. | I didn’t explain anything in writing. |

Evaluating Equations - Self Analysis:
Give yourself a score (0 – 5) on each of the two categories being evaluated and give a brief explanation as to why you chose the score you did for each category. See Mrs. Peneycad to review and initial your work prior to day two’s task.

I gave myself a _______ out of 5 in the “Mathematical Knowledge” category because ________________________________

I gave myself a _______ out of 5 in the “Explanation” category of because ________________________________

Total Score: _______ out of 10.

Teacher’s initials to move on: _______
Day Two: Using your in/out chart to create a graph.

- Use 1/4” graph paper. **Draw your x and y axes.** You will want to use an appropriate scale for each axis so that your graph will fill the page. Be sure that your graph is not so small that it is difficult to read. On the contrary, be sure that it is not so big that it cannot fit all the data.
- Label the x and y axes of your graph and **give it a title.**
- Use all of the data in your in/out chart to create your graph. **Draw a straight line through your graphed points.** (Hint: If all points are graphed correctly, they should all be on the line).
- Staple your graph to this packet.

**Graph Creation Rubric**

Up to 5 points total.

<table>
<thead>
<tr>
<th>Score Level (pts. earned)</th>
<th>Graph Creation Skills</th>
</tr>
</thead>
</table>
| 5                         | I drew the x and y axes and used an appropriate scale in order to fill at least 2/3 of the graph paper.  
I labeled the x and y axes appropriately and descriptively.  
I included the appropriate units as applicable.  
I gave the graph a clear, understandable, and appropriate title.  
I correctly used the data from my in/out chart to plot all the points without error – when I connected the points, a straight line emerged. |
| 3                         | I drew the x and y axes but used scales that resulted in either a graph that was too small or did not completely fit on the page.  
I labeled the x and y axes with good descriptors but put them on the wrong axes.  
The units I used did not fit the data.  
I gave the graph a title that was not clear or did not fit the scenario.  
I used all the data from my in/out chart to plot all the points with few errors. |
| 1                         | I incorrectly marked scales on the axes.  
I did not label the x and y axes with a descriptive label.  
I did not remember to use units with my x and y axes labels.  
I did not give the graph a title.  
I used some of the data from my in/out chart to plot the points on my graph. My results did not produce a straight line. |
| 0                         | I did not graph the solution. |

Creating a Graph from an In/Out Chart - Self Analysis:

Give yourself a **score (0 – 5) using the rubric above** and give a brief explanation as to why you chose the score you did.

I gave myself a ______ out of 5 because ____________________________________________
Report to Mrs. McKinney:

**Topic:** Is it feasible to require students to type assignments and stay within CW’s suggested homework time allotment?

**Instructions:**

1. You and your partner will be meet with all the other students in our class who analyzed and graphed results for the same grade - 5th or 6th. You will then break into a subgroup of students who either feel that: a) assignments should be required to be typed or b) assignment should not be required to be typed.

2. Each group will have 10 minutes to make a list of reasons (based on data from the project) why you feel that either a) assignments should be required to be typed or b) assignments should not be required to be typed.

3. The group of you will have 3 minutes to state your case to a your classmates who hold the opposing view.

4. The opposing group of classmates will have 3 minutes to state their case.

5. You and your group will have 1 minute to defend your point of view.

6. The opposing group will have 1 minute to defend their point of view.

7. As a result of your discussion, your overall group must come to a consensus in order to make a report to Mrs. McKinney.

**Discussion Expectations:**

Active participation in developing your group’s case. ____/2

Productive use of time. (Task completed in allotted time.) ____/2

Completed notes w/data from your project to prove your case. ____/3

Total: _____/7

**Consensus Paragraph Expectations:**

Your opinion is stated in a complete sentence. ____/2

3 reasons/proofs are given to support your opinion. ____/3

Data is provided to support/prove your opinion. ____/3

Total: _____/8
Side A: Yes, it is a reasonable to require assignments at CW to be typed.

Best arguments/evidence to support this point of view:

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

Notes and important points after hearing the opposing view:

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

Best arguments/evidence to support opposing viewpoint:

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

Group consensus & explanation:

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
Side B: No, it is not feasible to require assignments at CW to be typed.

Best arguments/evidence to support this point of view:

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

Notes and important points after hearing the opposing view:

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
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________________________________________________________________________

Best arguments/evidence to support opposing viewpoint:

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

Group consensus & explanation:

________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________
Group Consensus
(to be completed independently)

As a result of our discussion, our opinion of this topic is__________________________

___________________________________________________________________

Three reasons/proofs to back up our position are (be sure to include data from your project for each of your 3 reasons/proofs):

1.  _________________________________________________________________
    ___________________________________________________________________
    ___________________________________________________________________
    ___________________________________________________________________
    ___________________________________________________________________
    ___________________________________________________________________

2.  _________________________________________________________________
    ___________________________________________________________________
    ___________________________________________________________________
    ___________________________________________________________________
    ___________________________________________________________________
    ___________________________________________________________________

3.  _________________________________________________________________
    ___________________________________________________________________
    ___________________________________________________________________
    ___________________________________________________________________
    ___________________________________________________________________
    ___________________________________________________________________

In conclusion, _________________________________________________________

___________________________________________________________________

___________________________________________________________________

(Double check... did you use data from you your project for each of the 3 reasons?)
## Consensus Activity Scoring Guide

<table>
<thead>
<tr>
<th>Name ______________________________________</th>
<th>Date _______ # _____</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Discussion</strong></td>
<td><strong>Consensus Paragraph</strong></td>
</tr>
<tr>
<td>Active Participation: _____/2</td>
<td>Stated opinion: _____/2</td>
</tr>
<tr>
<td>Finished in time allotted: _____/2</td>
<td>3 reasons/proofs: _____/3</td>
</tr>
<tr>
<td>Completed notes: _____/3</td>
<td>Data Provided: _____/3</td>
</tr>
<tr>
<td>Total: _____/7</td>
<td>Total: _____/8</td>
</tr>
</tbody>
</table>

Total: _____/15

<table>
<thead>
<tr>
<th>Name ______________________________________</th>
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Total: _____/15

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</tr>
<tr>
<td>Total: _____/7</td>
<td>Total: _____/8</td>
</tr>
</tbody>
</table>

Total: _____/15
Pre-Algebra RAFT Writing

Directions:
Select one of the following prompts.

- The “Role” is the character you will become, and from whose perspective that you will write.
- The “Audience” is to whom that character will be writing.
- The “Format” is the form in which the concept will be expressed.
- The “Topic” is just that – your topic!

<table>
<thead>
<tr>
<th>Role</th>
<th>Audience</th>
<th>Format</th>
<th>Topic</th>
</tr>
</thead>
<tbody>
<tr>
<td>Algebraic Equation</td>
<td>The Public</td>
<td>Wanted Poster/Warning Ad</td>
<td>Don’t settle for less! An expression is only part of me!</td>
</tr>
<tr>
<td>Variables in an Algebraic Expression</td>
<td>Given Values</td>
<td>Invitation</td>
<td>Come Take Our Place!</td>
</tr>
<tr>
<td>Algebraic Expression</td>
<td>Like Terms</td>
<td>Public Service Announcement</td>
<td>For the sake of simplicity, please get together!</td>
</tr>
<tr>
<td>Dr. Phil</td>
<td>Equation</td>
<td>Advice Talk Show</td>
<td>How to stay balanced.</td>
</tr>
<tr>
<td>*Free Choice</td>
<td>Free Choice</td>
<td>Free Choice</td>
<td>Free Choice</td>
</tr>
</tbody>
</table>

*Free Choice requires prior approval. Please write down the proposed Role, Audience, Format, and Topic to be discussed as well as the learning target your writing will address.
Pre-Algebra RAFT
*Free Choice Approval Form

Role _________________________________________________

Audience ______________________________________________

Format _______________________________________________

Topic _________________________________________________

Unit Learning Target __________________________________

Teacher initials ________

Name: __________________
Date: ______ #_____
# Pre-Algebra RAFT Writing Rubric

<table>
<thead>
<tr>
<th>Role</th>
<th>Evaluation Criteria</th>
</tr>
</thead>
</table>
| **Algebraic Equation**| ____/5 - Demonstrates mastery of what constitutes an algebraic equation vs. an algebraic expression.  
                        | ____/5 - Written as a wanted ad/poster                                               
                        | ____/5 - Includes an example                                                          
                        | ____/5 - Proper conventions - grammar, punctuation, capitalization, etc.              |
|                       | ____/20                                                                               |
| **Variables**         | ____/5 - Demonstrates mastery of a variable standing in for an unknown value.        
                        | ____/5 - Written as an invitation to given variable values                             
                        | ____/5 - Includes an example                                                          
                        | ____/5 - Proper conventions - grammar, punctuation, capitalization, etc.              |
|                       | ____/20                                                                               |
| **Algebraic Expression**| ____/5 - Demonstrates mastery of simplifying expressions by combining like terms       
                          | ____/5 - Written as a public service announcement to like terms in the equation.       
                          | ____/5 - Includes an example                                                          
                          | ____/5 - Proper conventions - grammar, punctuation, capitalization, etc.              |
|                       | ____/20                                                                               |
| **Dr. Phil**          | ____/5 - Demonstrates mastery of solving equations by using the inverse operation     
                        | ____/5 - Written as advice to the equation.                                           
                        | ____/5 - Includes an example                                                          
                        | ____/5 - Proper conventions - grammar, punctuation, capitalization, etc.              |
|                       | ____/20                                                                               |
| **Free Choice**       | ____/5 - Demonstrates mastery of a learning target from this unit                    
                        | ____/5 - Written for a specific purpose                                               
                        | ____/5 - Includes an example                                                          
                        | ____/5 - Proper conventions - grammar, punctuation, capitalization, etc.              |
|                       | ____/20                                                                               |
TriMind Activity

**Learning Target:** I can determine the value of a variable in an algebraic equation such as: \(3y + 2 = 1\).

**Directions:**
Pick ONE of the following activities based on your thinking preference: creative, practical, or analytical. Complete the activity on a piece of lined paper to demonstrate your understanding of the learning target. Each activity is worth 10 points.

**Creative**
Create a scenario for which you could use an equation to help you find the solution to an unknown variable. Write out the scenario, write out the equation, and then solve the equation for the unknown variable.

\[____/10\]

**Practical**
The phone company charges $1.35 to connect your call and then $0.03 per minute. If your call cost $7.80, how many minutes did you talk? Write an equation (using the variable \(m\) for the number of minutes) for the given situation and then solve it to arrive at the answer.

\[____/10\]

**Analytical**
Your classmate solves the following equation \(5x + 25 = 50\) and gets the solution \(x = 15\). Solve the equation to find the correct solution for \(x\). Describe what your classmate did incorrectly. Make a list of step-by-step directions that he/she can follow.

\[____/10\]
Name: ____________________
Date: __________ #_____
TriMind Activity - Answer Key

Learning Target: I can determine the value of a variable in an algebraic equation such as: 3y + 2 = 1.

Directions:
Pick ONE of the following activities based on your thinking preference: creative, practical, or analytical. Complete the activity on a piece of lined paper to demonstrate your understanding of the learning target. Each activity is worth 10 points.

Creative

• Scenario is valid and clearly written. (3 points)
• Equation fits the scenario and is written accurately. (3 points)
• Equation is solved algebraically. (2 points)
• Solution for the variable is correct. (2 points)

Practical

Equation: 1.35 + 0.03m = 7.80
or (0.03 * m) + 1.35 = 7.80 (5 points)
Solution: m = 215 minutes (5 points)

Analytical

Correct Solution: x = 5 (3 points)

Classmate error: subtracted 25 from the left side of the equation and added 25 to the right side instead of subtracting 25 from both sides. (3 points)

Directions: First, subtract 25 from both sides of the equation to get 5x by itself. Since 25 - 25 = 0 and 50 - 25 equals 25, this leaves 5x = 25. Next, divide both sides of the equation by 5. Since 5 / 5 = 1 and 25 / 5 = 5, the result is x = 5. (4 points)
# Pre-Algebra Final Assessment

Directions:
Show your work in the space provided. Write your final answer in the oval.
Each question in this section is worth two points – one point for the correct answer, and one point for showing each step of your work. Relax, take a deep breath and begin!

<table>
<thead>
<tr>
<th>Question</th>
<th>Expression/Equation</th>
<th>Final Answer</th>
</tr>
</thead>
<tbody>
<tr>
<td>1.</td>
<td>Evaluate $y + 17$ for $y = 8$</td>
<td></td>
</tr>
<tr>
<td>2.</td>
<td>Evaluate $x - y$ for $x = 20$ and $y = 7$</td>
<td></td>
</tr>
<tr>
<td>3.</td>
<td>Write this expression in words: $6y + 5$</td>
<td></td>
</tr>
<tr>
<td>4.</td>
<td>Write this expression in words: $\frac{h - 30}{5}$</td>
<td></td>
</tr>
<tr>
<td>5.</td>
<td>Translate this phrase into an algebraic expression: the product of 3 and $y$ increased by 2</td>
<td></td>
</tr>
<tr>
<td>6.</td>
<td>Translate this phrase into an algebraic expression: 50 minus the sum of 6 and $z$</td>
<td></td>
</tr>
<tr>
<td>7.</td>
<td>Simplify: $5 + 1b + 3b + 3 + 1 - 2b$</td>
<td></td>
</tr>
<tr>
<td>8.</td>
<td>Simplify: $2w - 6z + 4w - 2z - 8w - 12w$</td>
<td></td>
</tr>
<tr>
<td>9.</td>
<td>Solve for $y$: $12 + y = 28$</td>
<td></td>
</tr>
<tr>
<td>10.</td>
<td>Solve for $b$: $b - 11 = 15$</td>
<td></td>
</tr>
</tbody>
</table>
11. Solve for $x$:
   $$x + 5 = 55$$

12. Solve for $m$:
   $$m - 4 = 35$$

13. Solve for $a$:
   $$7a = 42$$

14. Solve for $x$:
   $$8x = 64$$

15. Solve for $b$:
   $$\frac{b}{8} = 6$$

16. Solve for $y$:
   $$\frac{y}{5} = 9$$

17. Solve for $c$:
   $$3c + 7 = 34$$

18. Solve for $n$:
   $$6b - 2 = 40$$

19. Solve for $h$:
   $$\frac{h + 2}{2} = 42$$

20. Solve for $x$:
   $$\frac{x + 4}{4} = 24$$

Great job! You're almost done!

There's just the extended written response question remaining.

**Remember:** When you've finished, hang your assessment onto your numbered tag and quietly work on finalizing your presentation.
Extended Written Response Question (Worth up to 15 points.)

Directions: In class we have learned the importance of keeping equations balanced in order to determine the value of the variable. Carefully read the question below. Then read the scoring rubric on the next page to understand how your response will be graded. Write your response on the lines provided below.

Mrs. Peneycad purchased and planted the Szechwan birch tree in her front yard several years ago. At the time she purchased the tree, it was only 6 feet tall and fit in the back of her van. This species of tree grows 4 feet a year. Currently, the tree is 5 times its original height. Mr. Peneycad says that the tree was purchased 8 years ago while Mrs. Peneycad seems to think it was not quite that long ago. Do you agree with Mr. Peneycad? Why or why not? Write an equation to fit the scenario above using the variable y to represent the unknown number of years. Solve the equation and show all your work in the work space below. Be sure to justify your answer in your written response. (Remember: to justify means you explain why you agree or disagree with Mr. Peneycad using evidence from your calculations.)

Work Space

Written Response:

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________

________________________________________________________________________
### Extended Written Response Question - Scoring Rubric

<table>
<thead>
<tr>
<th>Score Level</th>
<th>Mathematical Knowledge: (Do you know it?)</th>
<th>Strategic Knowledge: (How do you plan?)</th>
<th>Explanation: (Can you explain it?)</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>• My calculations are done correctly.</td>
<td>• I write an equation that fits the scenario.</td>
<td>• I state whether I agree or disagree and use my calculations to justify my answer.</td>
</tr>
<tr>
<td></td>
<td>• I get the right answer and label it correctly.</td>
<td>• I show all the steps and calculations I used to solve the problem in the workspace.</td>
<td>• I thoroughly write what I did and explain why I did it.</td>
</tr>
<tr>
<td>3</td>
<td>• I make small mistakes in my calculations.</td>
<td>• I write an equation that fits the scenario.</td>
<td>• I state whether I agree or disagree but I don’t thoroughly justify my answer with my calculations.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• I show some of the steps and calculations I used to solve the problem in the workspace.</td>
<td>• I write mostly about what I did.</td>
</tr>
<tr>
<td>1</td>
<td>• I try to calculate the answer but I don’t really understand what to do.</td>
<td>• I try to write an equation that fits the scenario.</td>
<td>• I didn’t state whether I agree or disagree.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• I show almost none of the steps/calculation I used to solve the problem.</td>
<td>• I write little about what I did.</td>
</tr>
<tr>
<td>0</td>
<td>• I don’t try to answer the problem.</td>
<td>• I don’t write an equation.</td>
<td>• I don’t explain anything in writing.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>• I don’t show any steps or calculations.</td>
<td></td>
</tr>
</tbody>
</table>

**Review/Self-Analysis:** Please re-read your response and then use the rubric above to evaluate your response. Where does your response match up on the rubric? Are you satisfied with that grade or do you now see where you can make some improvements? Make revisions as necessary and then give yourself a score (0 – 5) on each of the three areas being evaluated. Record the sum of the three scores below along with a brief explanation.

I would give my response a _______ out of 15 possible points because________________________________________
________________________________________________________________________
________________________________________________________________________
________________________________________________________________________

Mrs. Peneycad’s score: ______ out of 15 possible points.
**ANSWER KEY**

**Short Answer**

1. 25  
2. 13  
3. six times $x$ increased by five  
4. $h$ divided by 5 decreased by thirty  
5. $3y + 2$  
6. $50 - (6 + z)$  
7. $2b + 9$  
8. $-14w - 8z$  
9. $y = 16$  
10. $b = 26$  
11. $x = 50$  
12. $m = 39$  
13. $a = 6$  
14. $x = 8$  
15. $b = 48$  
16. $y = 45$  
17. $c = 9$  
18. $b = 7$  
19. $h = 88$  
20. $x = 80$

**Extended Written Response Question**

**Equation** that fits the scenario:  
$4y + 6 = 30$

**Correct Answer:**  
The tree would have been purchased 6 years ago, so you should have disagreed with Mr. Peneycad.