Alg 3.2 Balancing and Solving

Lesson Summary: In this lesson students practice and check all of the steps involved in solving complex equations—variables on both sides, distributive property, etc.
Utah Core Standards: Algebra Content Standard 2.2 Process Standards 1-5
Broad Understanding: Manipulating equations using the Addition and Multiplication Properties enables us to restate what we don't know in terms of what we do know in order to find missing information.
Essential Questions:

- Why is balance absolutely essential in solving an equation?
- How do the Addition and Multiplication Properties help us in solving for unknown values?
- Why would we want to rewrite equations in terms of one variable?

Knowledge and Skills:

- Using the distributive, addition and multiplication properties.
- Solving equations for an unknown value or in terms of other variables.
- Solving word problems.
- Solving inequalities

Assessment Evidence:

- Group presentations for Using the addition and multiplication properties
- Solving a Multi Step Equation. Have students work in pairs in a test taking setting.
- A traditional test

Learning Plan

Materials: Calculators, Worksheets
Time: 2 days
Lesson Type: Teacher directed learning, Student problem solving, Students work in groups or teams.
Directions: Have students work in groups of 3 or four students. Each student may receive a different problem or the entire group can receive one problem. Either way, students do one step of the problem and pass it on. Each student checks the work of the previous student for accuracy and then performs the next step.

This could be a contest in which the group with all the problems correct receives a prize. The winner would would be judged for both quality in showing the steps as well as accuracy.

3.2 Using the Addition and Multiplication Properties #1

STEPS:

1. Distribute
2. Collect like terms
3. Variables on one side
4. Constants on other side
5. Coefficient of 1

----- Check Answer -----

Names_____
_____
_____
_____

2(4x + 1) - 2x = 9x - 1

Rate from 0 to 4 (high) Clear Communication_____ Correctness_____

Evaluated by_____

Using the Addition and Multiplication Properties
#2

STEPS:

1. Distribute
2. Collect like terms
3. Variables on one side
4. Constants on other side
5. Coefficient of 1

----- Check Answer -----

Names_____
_____
_____
_____

3 – (2x + 2) = 2(x + 3) + x

Rate from 0 to 4 (high) Clear Communication_____ Correctness_____

Evaluated by_____

Using the Addition and Multiplication Properties
#3

STEPS:

1. Distribute
2. Collect like terms
3. Variables on one side
4. Constants on other side
5. Coefficient of 1

----- Check Answer -----

Names_____
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_____
_____

3(x – 6) = 4(x + 2) – 21

Rate from 0 to 4 (high) Clear Communication_____ Correctness_____

Evaluated by_____

Using the Addition and Multiplication Properties
#4

STEPS:

1. Distribute
2. Collect like terms
3. Variables on one side
4. Constants on other side
5. Coefficient of 1

----- Check Answer -----

Names_____
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_____
_____

7(5x – 2) = 6(6x – 1) – 4

Rate from 0 to 4 (high) Clear Communication_____ Correctness_____

Evaluated by_____

Using the Addition and Multiplication Properties
#5

STEPS:

1. Distribute
2. Collect like terms
3. Variables on one side
4. Constants on other side
5. Coefficient of 1

----- Check Answer -----

Names_____
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_____
_____

2a + (5a – 13) = 47 – (2a – 3)

Rate from 0 to 4 (high) Clear Communication_____ Correctness_____

Evaluated by_____

Using the Addition and Multiplication Properties
#6

STEPS:

1. Distribute
2. Collect like terms
3. Variables on one side
4. Constants on other side
5. Coefficient of 1

----- Check Answer -----

Names_____
_____
_____
_____

3a + 5(a – 2) = 6(a + 4)

Rate from 0 to 4 (high) Clear Communication_____ Correctness_____

Evaluated by_____

Using the Addition and Multiplication Properties
#7

STEPS:

1. Distribute
2. Collect like terms
3. Variables on one side
4. Constants on other side
5. Coefficient of 1

----- Check Answer -----

Names_____
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_____

13 – (2c + 2) = 2(c + 2) + 3c

Rate from 0 to 4 (high) Clear Communication_____ Correctness_____

Evaluated by_____

Using the Addition and Multiplication Properties
#8

STEPS:

1. Distribute
2. Collect like terms
3. Variables on one side
4. Constants on other side
5. Coefficient of 1

----- Check Answer -----

Names_____
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_____
_____

3(y + 7) = 2(y + 9) - y

Rate from 0 to 4 (high) Clear Communication_____ Correctness_____

Evaluated by_____

2.2 Assessment Solving a Multi Step Equation

Name_____

You are playing a board game. You land on a railroad and lose half your money. Then you must pay $1,000 in taxes. Finally you pay half the money you have left to get out of jail. If you now have $100, how much money did you start with?