By: Derry Jackson

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Rev Level -

Mr. Jackson's Box N Wedge and the Alge-4 Moves

Lecture No.A3: Box N Wedge and the Alge-4 Moves

"Mathematics is the most powerful tool we have. It controls our world. We can use it to put men on the moon. We use it to calculate how much insulin a diabetic should take. **It is hard to get right**." [Houston, *How To Think Like A Mathematician*, 2009]

"The highest form of pure thought is in Mathematics." - Plato

Common Core Standards: X-REF1

Lecture No.A3: Box N Wedge and the Alge-4 Moves

'Listen, don't trip! Math boils down to four moves. You probably just now figured it out." – Derry Jackson, philosopher

Math is a difficult subject to master. But remember, it is not entirely impossible to master, especially if you incorporate the tools and approaches to math we will be discussing here in this lesson and others in the Reference Series. This is the second and third ones Mr. Jackson has in store for you. These will make the work much easier, thereby enhancing your chance at scoring A's.

Now the complicated part is figuring out which of the four moves is my first, my second, and so on. Understanding that is truly the skill behind problem solving. Be sure to catch those lessons right here in the Reference series. But first, how you work is next. How you document your work aids or inhibits your success.

AGENDA/Learning Goals: A3 Box N Wedge and the Alge-4 Moves

Learning Objectives: (Students will study and learn the following)

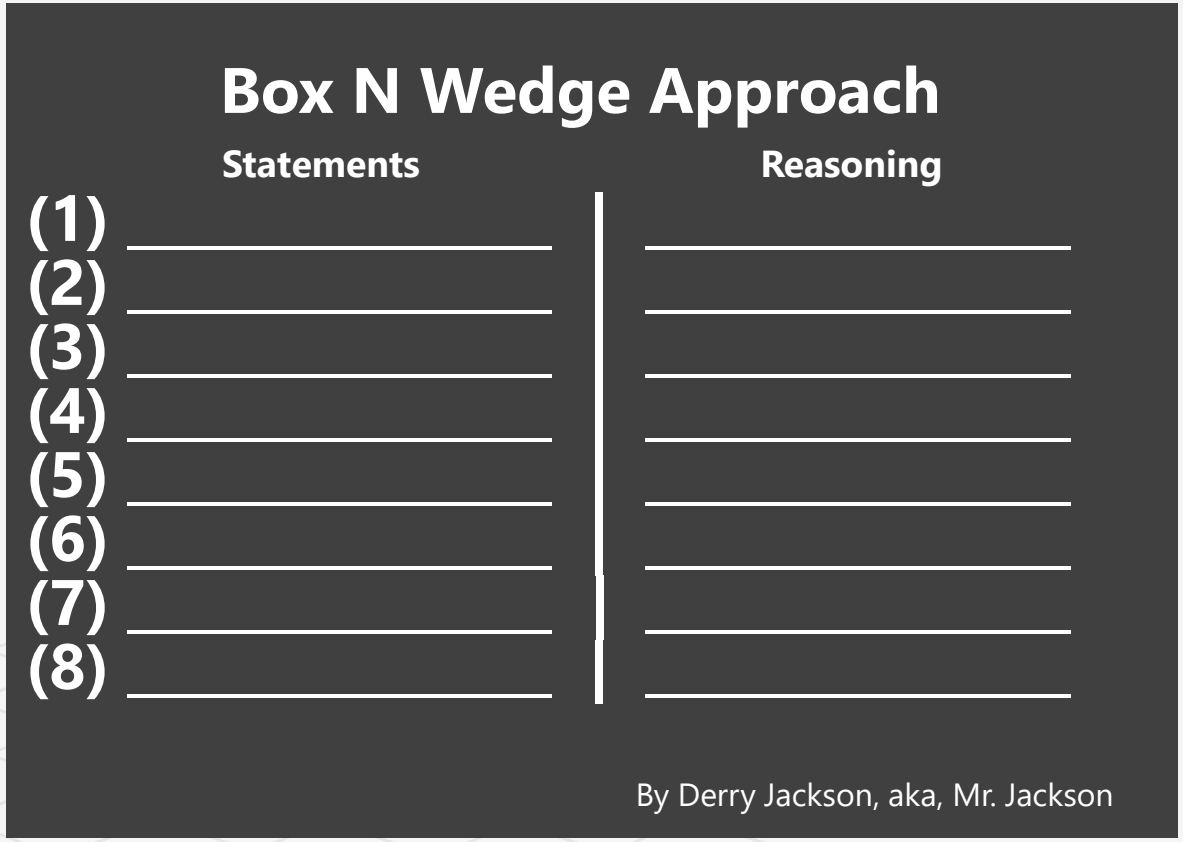
Intended audience: Mature audiences (gr 8 and up)

1. **Box N Wedge Approach**: Math falls under four broad categories, Arithmetic, Algebra, Number Theory and Geometry. Through Primary school (PK to 5) it is Arithmetic that remains the focus, by and large, however, Common Core pull in early exposure to Algebra, Number Theory and Geometry.

   Middle School: By now the focus switched to heavy on Algebra and Number Theory, while pulling more Geometry.

   High school: Now the focus is heavy on functions and their graphs. There is a full year of nothing by Geometry, closing for some with Elementary Calculus..

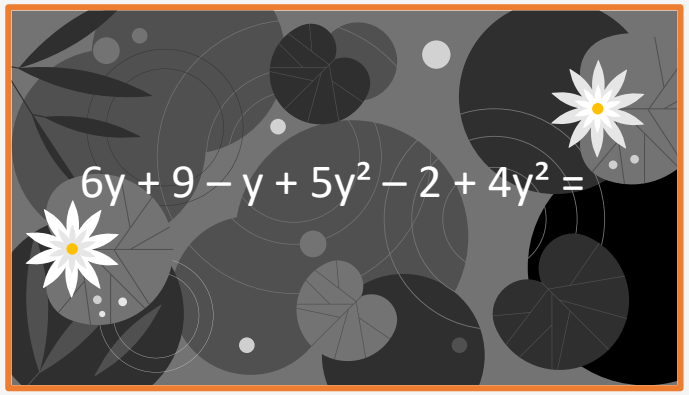
2. **The Alge-4 Moves**: Again, another one of Mr. Jackson's tools for jump-starting your problem solution exercises, here we discover the only four moves in math you'll need to know, although, most times you are required to use a combination.



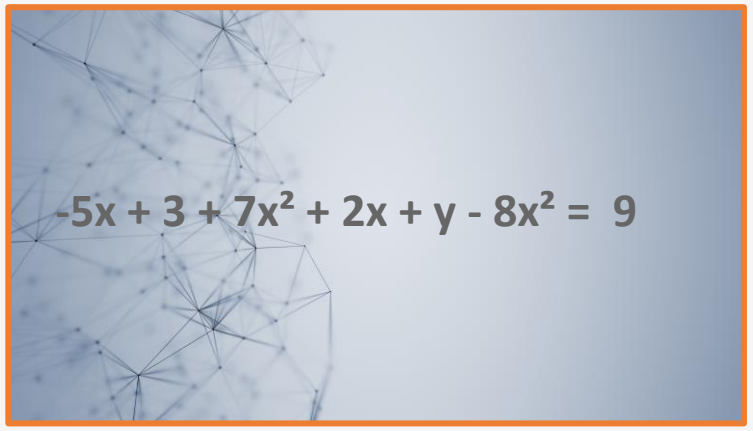
But First: No.A4: Pre-Test PoP-3 (need two of the three to advance)

Problem 1

Problem 2



Problem 3



ANSWER KEY: See next slide.

SCORE: You want to get at least two of the three PoP-3 (Problems of the Day).

HONOR SYSTEM: Why fool self?

Answer Key: Pre-Test (PoP-3)

No.1 **Answer = 13** (5 + 8 **could only but equal 13**)

No.2 **Answer = $9y^2 + 5y + 7$** (**$5y^2 + 4y^2 + 6y - 1y + 9 - 2$**)

No.3 **Answer : $y = x^2 + 3x + 6$** (**$y = +8x^2 - 7x^2 + 5x - 2x + 9 - 3$**)

If you **MISSED ONE** or **MORE**, you might want to return to this lesson, and studying it once again. If this make twice, revisit the Foundation skills. Revisit lecture A2: Or Statements.

Exploratory Stage: (Got to get your hands dirty!) Student-centered

Experiment 1: **Open statement, one or more variable study** (1) Create five problems, having six or more terms, including two terms in two variables, balance as constants. (2) Simplify all five. (4) Score yourself. (5) Reflect on the exercise.

SUPPLIES: (A3 Experiment 1)

1. Paper and pen/pencil
2. Calculator (okay)

Experiment 2: **Closed statement, one variable study** (1) Recycling the problems in Experiment 1. (2) Keep one of the variable sets and drop the second. (3) Close each expression with an equal sign and a double-digit number of your choice. (4) Now, simplify and solve. (5) Score yourself. (5) Reflect on the differences and similarity to others.

SUPPLIES: (A3 Experiment 2)

1. Paper and pen/pencil
2. Calculator (okay)

Intervention Stage: (Terms Introduction phase) Teacher-centered

See **A3: Box-N-Wedge and Alge-4 Moves** lecture notes below. Click the links to pull up the details.

A3 – 1: Box-N-Wedge and Alge-4 Models to tame any math problem.

Box-N-Wedge – Document Work-outs for success

Learning Objectives: (Students will study and learn the following)

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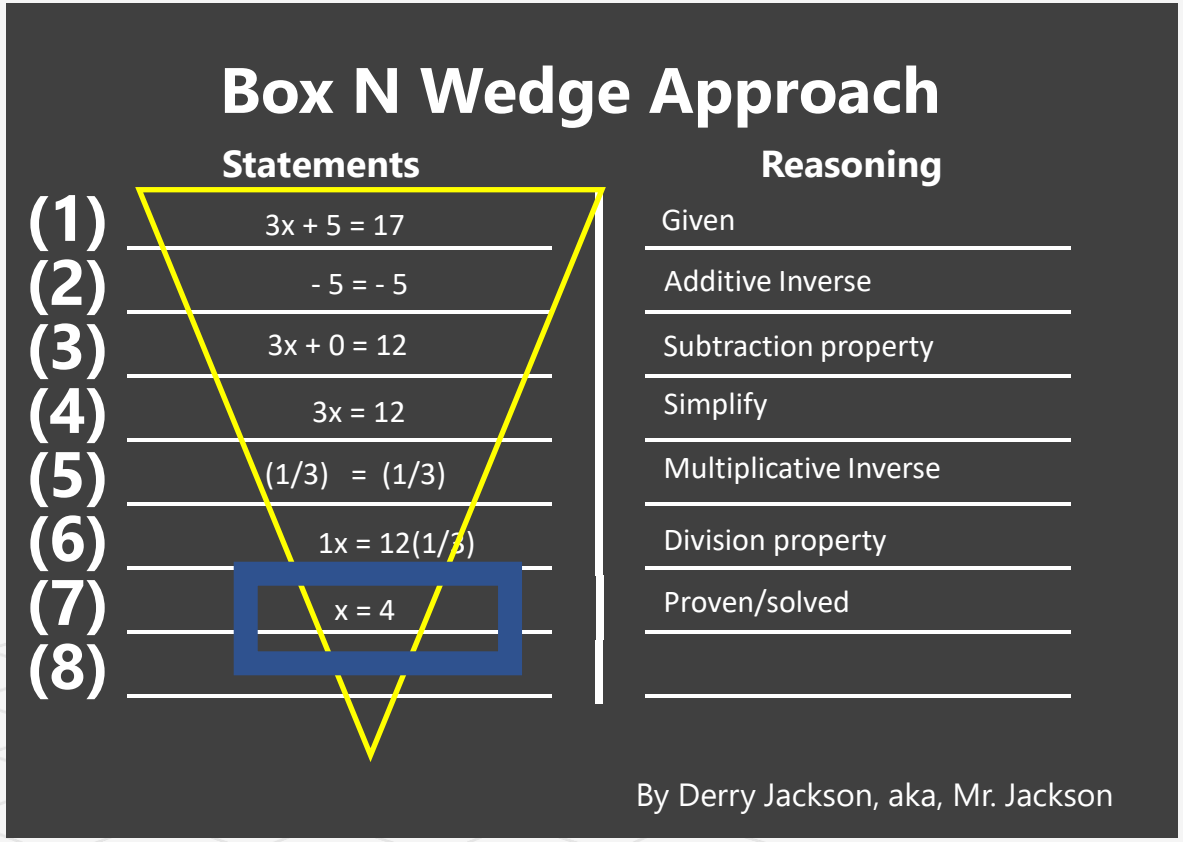


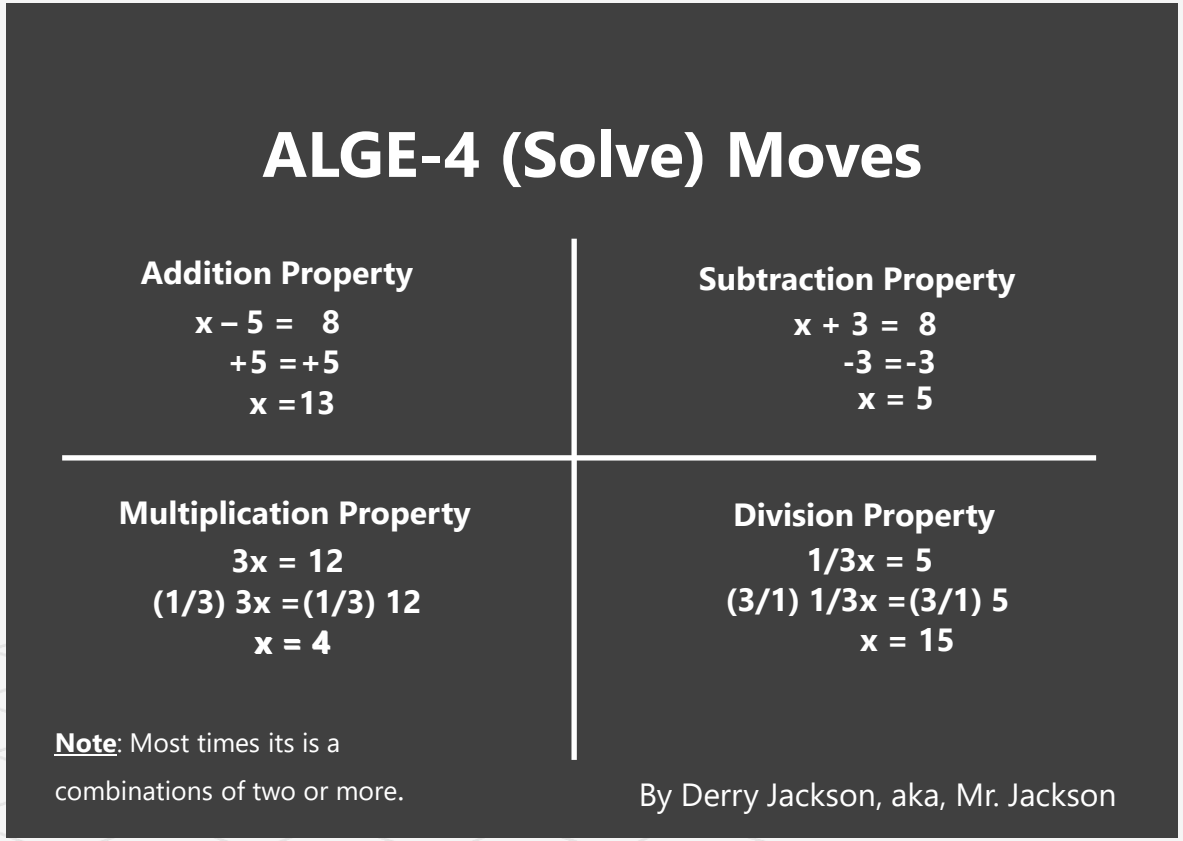
Alge-4 Moves – Reduce Mathematics to the Core

It as simple as **Four Simple Lines of Code,** but with it, you can tame any/all Math problems at but a glance..

If the problem is open, but no variables, or if closed with one variable you can **Solve** is always essential to understanding; or **Simplify,** if open statement, one variable, or two variable problem: which often next you will have to **Graph,** if given two or more variables, e.g. independent ("X'") and dependent ("Y") variables. **Draw, ,** if given Geometry.

Next, you will likely have to breakdown **(deconstruct) OR simplify (construct)** aka "Mash-up" the numbers.

The last two lines, first **there are only four things you do in Math,** add, subtract, multiply and divide. **THAT'S IT!.** Just follow **PEMDAS,** and remember Mr. Jackson's **PEDMAS logic**..



YOU HEARD THAT? **Math only has four actions** to take, the rest is reasoning.

Discovery Stage: (Try your hands at the following)

Experiment 3: **Closed statement, one variable study** (1) Create five problems, having four or more terms, including one variable term ("x"). Be sure to vary the digits used and the pluses (adds) and subtracts (minuses). (2) Simplify all five and solve. (4) Score yourself. (5) Reflect on the exercise.

SUPPLIES: (A3 Experiment 3)

1. Paper and pen/pencil
2. Calculator (okay)

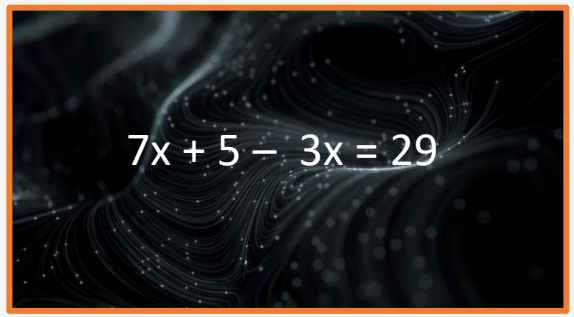
Experiment 4: **Closed statement, two or more variable study** (1) Recycling the problems in Experiment 3. But add two more terms, both introducing a second variable ("y") to the problem. (2) Simplify all five, solving for the variable "y." (3) Score yourself. (4) Reflect on the differences and similarity to others conducted thus far.

SUPPLIES: (A3 Experiment 4)

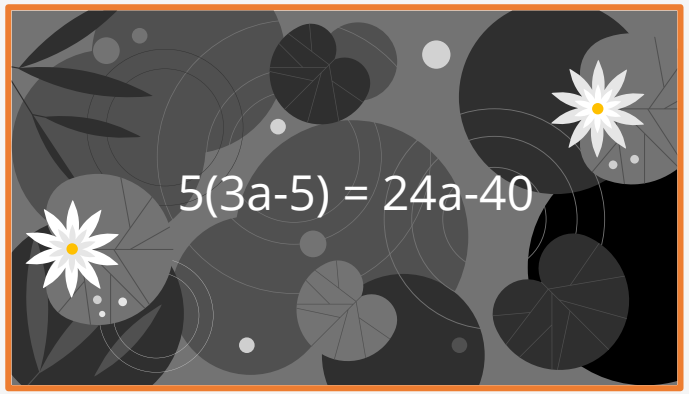
1. Paper and pen/pencil
2. Calculator (okay)

Finally: No.A1: Post-Test PoP-3 (need three of the three to advance)

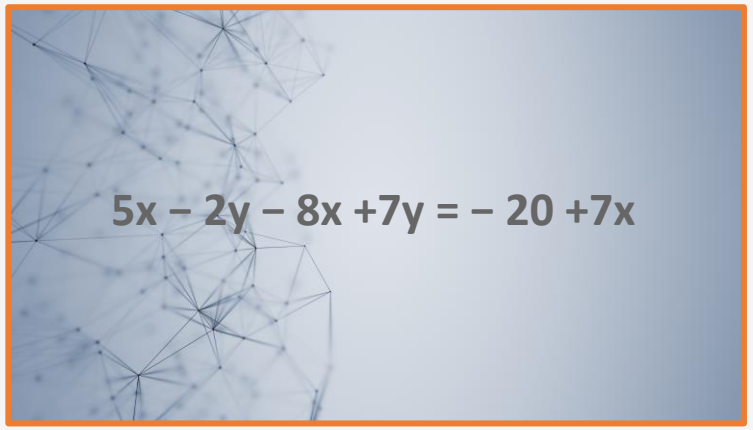
Problem 1



Problem 2



Problem 3



ANSWER KEY: See next slide.

SCORE: You want to get at least two of the three PoP-3 (Problems of the Day).

HONOR SYSTEM: Why fool self?

Answer Key: Post-Test (PoP-3)

No.1 **Answer : x = 6** (4x = 24, 7x + 5 – 3x = 29)

No.2 **Answer : a = 5/3** (**-9a = -15, 15a – 25 = 24a - 40**)

No.3 **Answer : y = 2x - 4** (**5y = 10x – 20, - 3x + 5y = 7x – 20**)

If you **MISSED ONE** or **MORE**, you might want to return to this lesson, and studying it once again. If this make twice, revisit the Foundation skills. **Revisit this lecture again.**

Extensions and Extended Study

https://www.storyofmathematics.com/simplifying-expressions read **Simplifying Expressions – Tricks and Examples**

Vocabulary/Definitions

Addition property of Equality: modeled if a = b, then a + c = b + c.

Additive Identity: modeled a + 0 = a.

Additive Inverse: modeled a – a = 0, or a + (-a) = 0.

Alge-4 Moves: The four basic moves in Algebra..

Box-N-Wedge Model: A strategy or format to use to document work-outs.

Compatible number: A number close to but easier to use than the actual no.

Cross the Fence: A concept barrier lies on equal sign separating both sides.

Division property of Equality: modeled if a = b, then a/c = b/c.

Don't Kill babies: A concept triggering a state of mind, alertness to sloppy math.

HACK: An alert! Next is a work-around or fix that makes the work easier.

Mash-up: The concept of crunching numbers, simplifying.

Multiplication property of Equility: modeled if a = b, then ac = bc.

Multiplicative Inverse: modeled a (1/a) = 1, or a/a = 1..

One-dimension: A expression containing one variable.

Subtraction property of Equality: modeled if a = b, then a - c = b - c.

Two-dimension: A expression containing two variables.

Three-dimension: An expression containing three variables.

Turing: Learning by studying patterns present in the problem.

The END! Any questions?

Ready for Next Cookie? Click here: **A4: The Symbols of Math and Sets**

"Remember your PO, and always do good work."

- Mr. Jackson