Equations - A Co-Teaching Lesson Plan

Co-Teaching Approaches

A “(Y)”in front of the following list items indicates the approach is outlined in the lesson. A“(N)”in front of the following list items indicates the approach is not outlined in the lesson.

- (N) Parallel Teaching
- (Y) Team Teaching
- (Y) Station Teaching
- (N) One Teach/One Observe
- (N) Alternative Teaching
- (Y) One Teach/One Assist

Subject

Solving one and two step linear equations

Strand/Reporting Category

Patterns, Functions, and Algebra

Topic/Lesson

Solving one and two-step equations.

Standards

7.12

Lesson Outcomes

The student will be able to solve one and two step equations using numbers, variables, and models.

Materials

- Model Match Equation Practice (attached)
- Equation Balance Mat
- Calculators

Vocabulary

Expression, Equation, Variable, Inverse Operations, Balance, One-step equation, Two-step equation

Co-Teacher Actions

Lesson Component	Co-Teaching Approach(es)	General Educator (GE)	Special Educator (SE)
Anticipatory Set	One Teach/One Assist	Present students with the following scenario as a Think-Pair-Share Activity: Joe and his friend Bob together have 17 games. If Joe has 6 games, how many does Bob have? Have students represent the scenario with an equation and solve it.	Assist students in developing an equation by walking around the classroom and providing general hints and/or guidance for getting started.
Lesson Activities/ Procedures	Team Teaching	1) Discuss the scenario and students' equations as a class, incorporating vocabulary when possible. 2) Provide students with foldable notes for solving one and two step equations. 3) Complete the one-step equation side of the foldable notes and work through examples on the board. 4) Ask students to do the one-step equation practice on the back of the foldable and check for correctness via board work or by checking each student as they finish. 5) Repeat Steps 1-4 and then proceed to activities listed below OR save two-step equations and activities listed below for a later date.	Special Educator to participate in team teaching approach by adding information to class discussion and presenting questions with general educator. Special Educator and General Educator may break away from team teaching and change to a one teach/one assist during note taking activity as necessary based on student/classroom needs and accommodations.
Guided/Independent Practice	Station Teaching	**Station Activity to last 20-30 minutes** 1) Use balance mat and examples (attached) to review solving equations, beginning with one step. Guide students through 2-3	**Station Activity to last 20-30 minutes** 1) Introduce the concept of using models (or pictures) to represent equations by providing 2-3 examples on the board or a small white board visible only to the

Lesson Component	Co-Teaching Approach(es)	General Educator (GE)	Special Educator (SE)
		examples using the balance mat prior to asking them to work independently on the balance mat worksheet. Monitor students for understanding and provide assistance/guidance as needed.	group. Encourage students to always read the key carefully when presented with model problems. *this will depend on the placement of each group and the availability of resources and/or space for station work. 2) Provide students with model sorting mat and cards (attached) and discuss letters A and B before allowing students to work alone. 3) Check sorting mat prior to providing students with worksheet to record their results and continue practicing.
Closure	Team Teaching	Student Exit Ticket: Write the steps/process for solving a one-step and a two-step equation.	Same as the GE
Formative Assessment Strategies	Team Teaching	General Educator to participate in team teaching approach by adding information to class discussion and presenting questions with special educator.	Pose the following questions to the class: 1) What is the primary difference between an equation and an expression? 2) When solving an equation, why is it important to perform the same operation(s) on both sides of the equal sign? What are the differences between solving one-step equations and solving two-step equations?
Homework	Team Teaching	This lesson has been designed to incorporate foldable notes for all students, which can be especially beneficial for students with disabilities. Some teachers prefer to teach one and	Same as GE

Lesson Component	Co-Teaching Approach(es)	General Educator (GE)	Special Educator (SE)
		two-step equations on the same day while others prefer to split into multiple days. The sorting activity provided with this lesson includes both one and two-step equations and should be used only after both types have been taught.	

Specially Designed Instruction

- When grouping students for stations, some students should be grouped together to allow for more assistance and specially designed instruction within the station activities.
- Provide worked examples for students and ask them to describe the process as a means to check for understanding.
- Students who may need additional support or assistance beginning a task such as the sorting mat may be provided with the correct solutions for each problem and asked to demonstrate the process in which the solution can be found.

Accommodations

- Students who require copies of classroom notes as an accommodation should be provided with notes that have the information and steps already typed in. They will still have the option of completing the examples for themselves/with the class.
- Use different types of manipulatives and online resources to assist students with solving equations.
- Have students model/draw each step of solving an equation on a separate balance mat.
- Reduce number of problems required during station work

Modifications

- For those students requiring a modified curriculum, content could be modified to solving one-step equations limited to adding and subtracting.

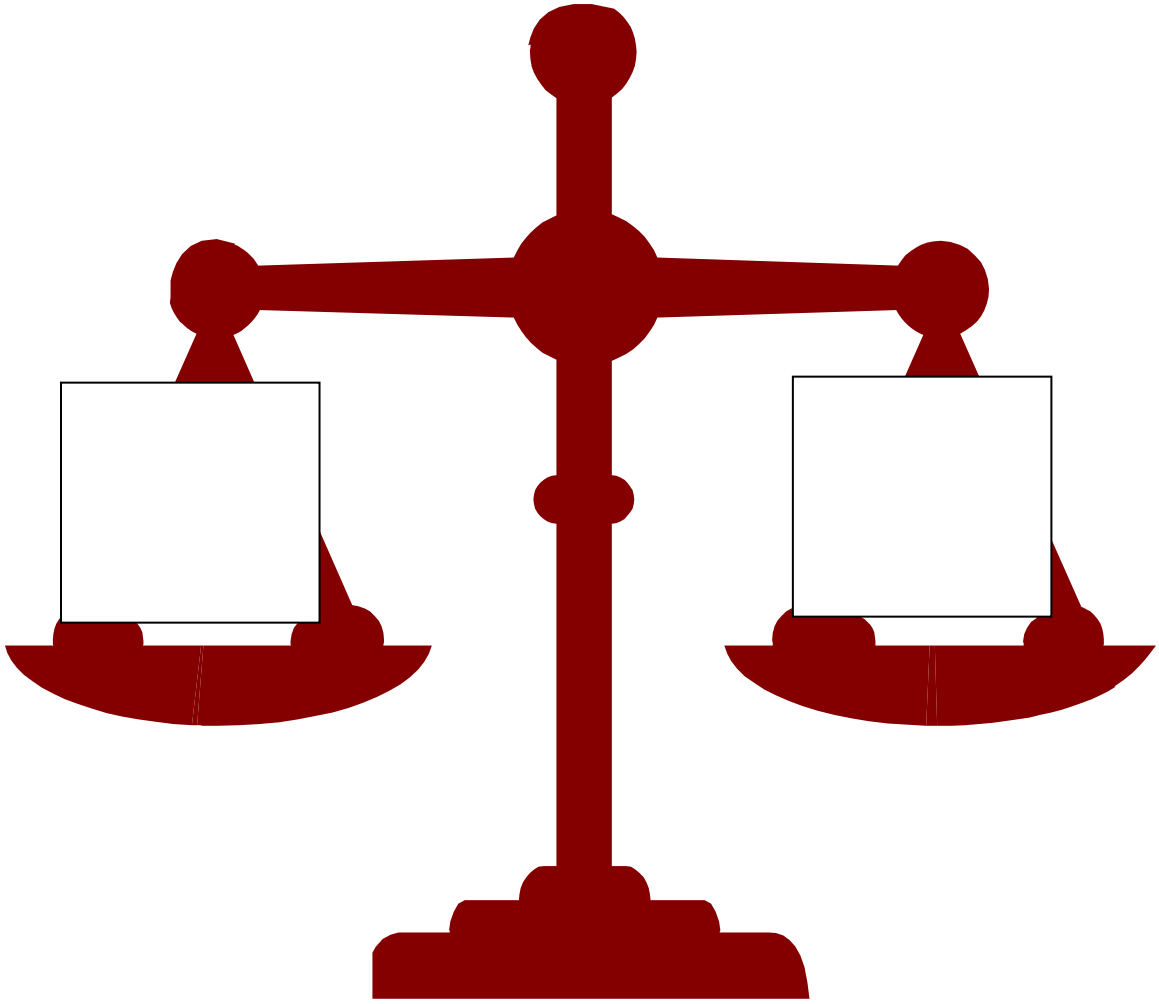
Notes

- “Special Educator” as noted in this lesson plan might be an EL Teacher, Speech Pathologist, or other specialist co-teaching with a General Educator.
- Foldable notes attached to this lesson plan are designed to be printed in a front/back format. Students should fold down to the bold line so that ‘one-step equations’ and ‘two-step equations’ is on the front. Students should cut up to the crease (along the

dotted line) to produce to flaps for each side. Notes are provided in fillable form or already completed.

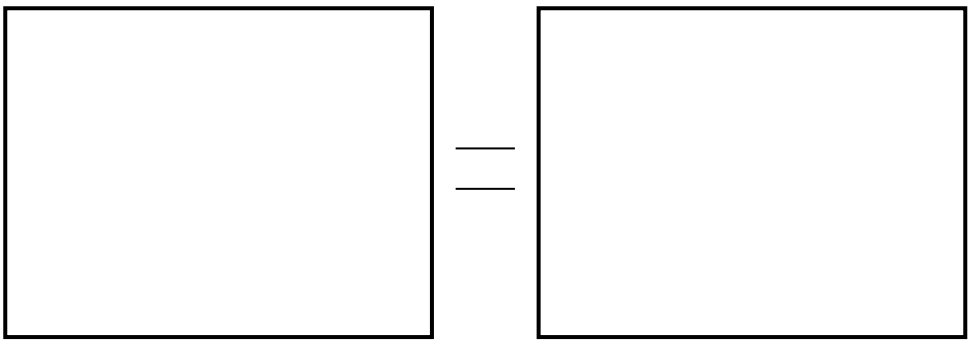
Note: The following pages are intended for classroom use for students as a visual aid to learning.

Sample Balance



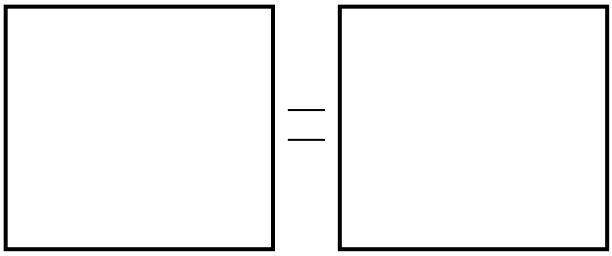
Sample Balance Mat

Name _____ **Date** _____

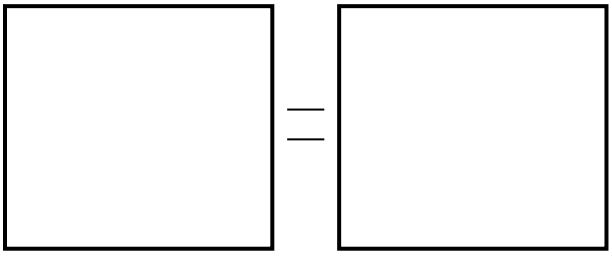


One-Step Equations to Balances

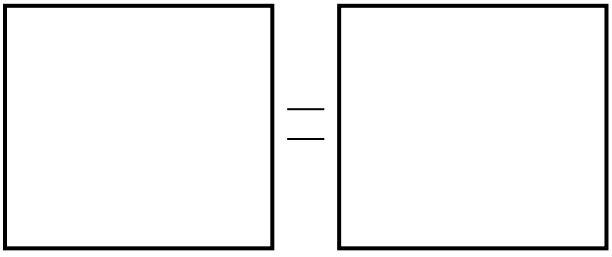
$p + 5 = 13$



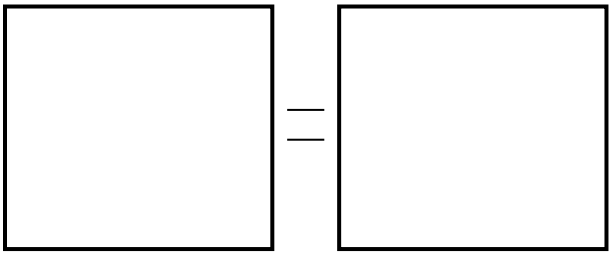
$7p = 21$



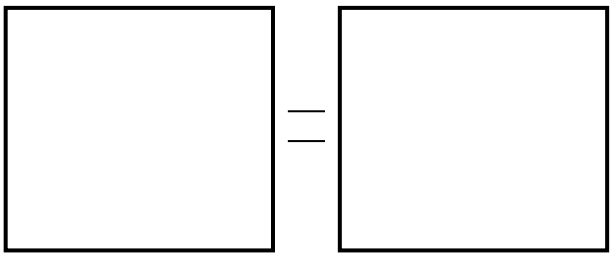
$p + 2 = 8$



$5p = 30$

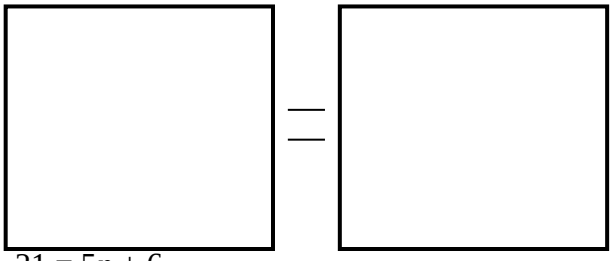


$p + 6 = 9$

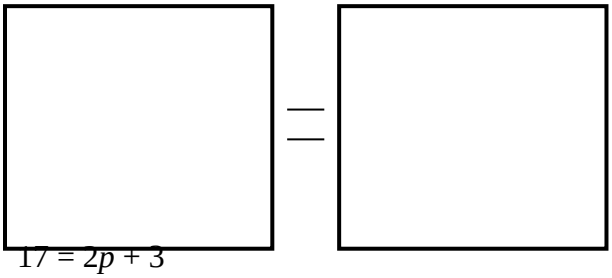


Two-Step Equations to Balances

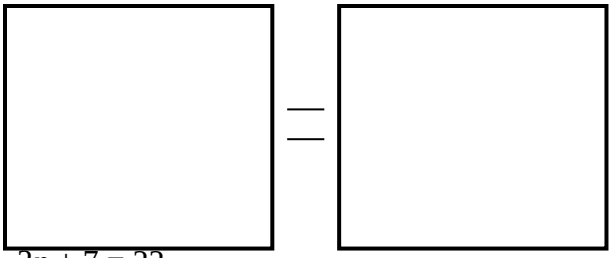
$4p + 3 = 11$



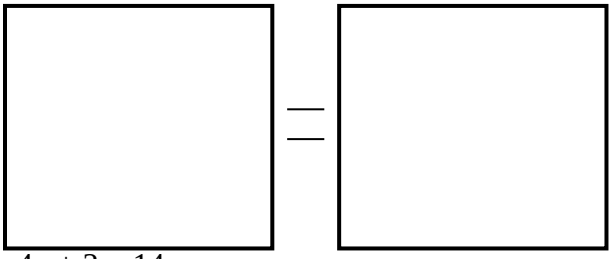
$21 = 5p + 6$



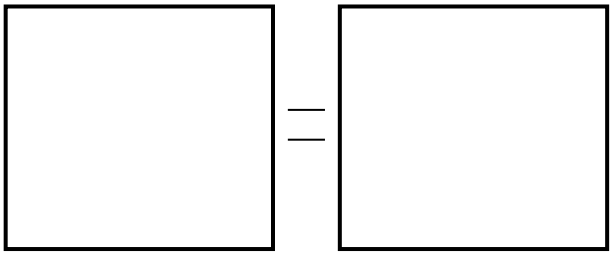
$17 = 2p + 3$



$3p + 7 = 22$



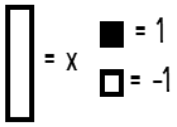
$4p + 2 = 14$



Model Madness

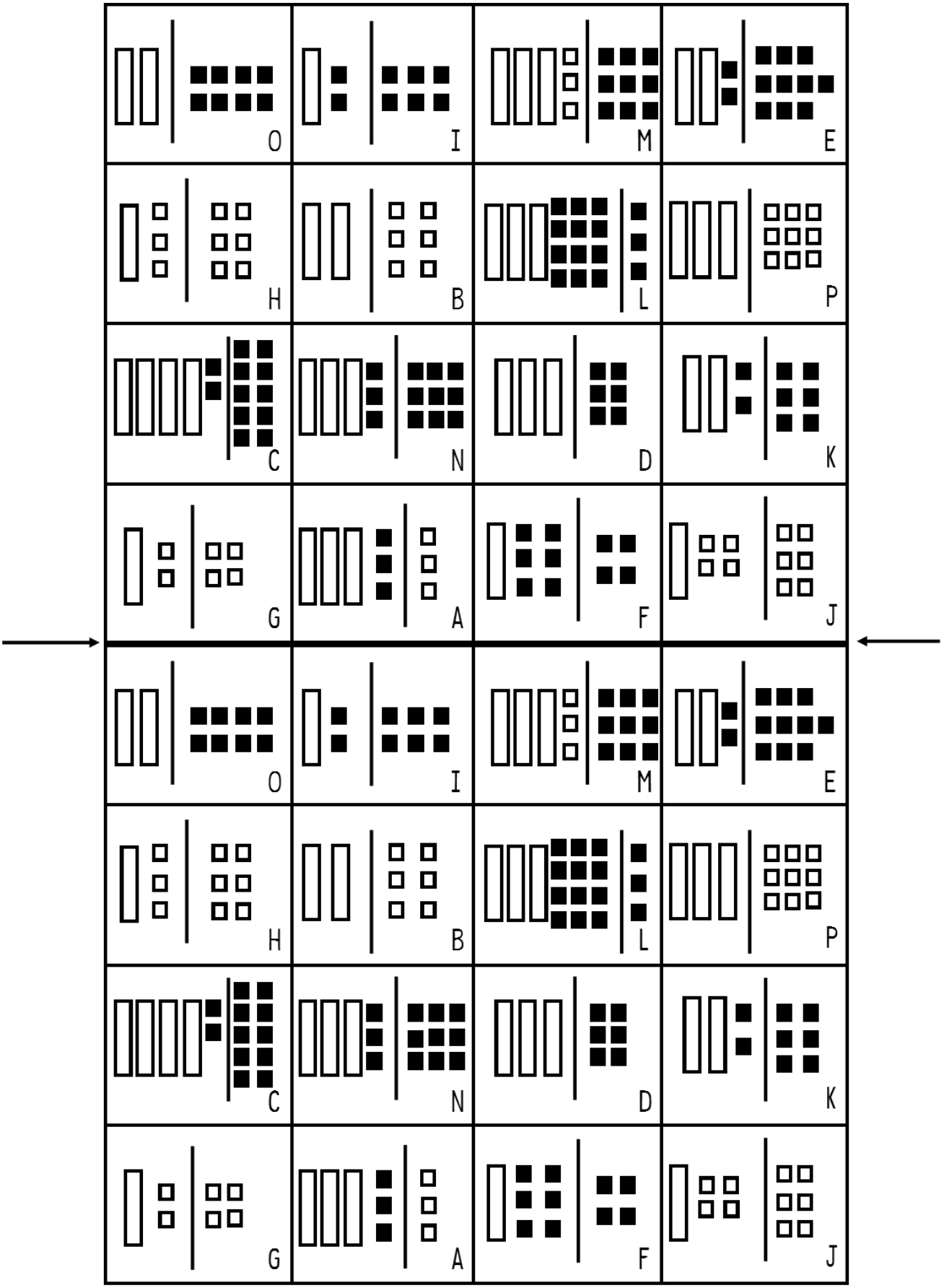
Sorting Mat

Directions: Use a separate sheet of paper to find the solution for each model provided then place the model(s) in the appropriate box on the mat.

Key: 

x = 2	x = -2
x = -3	x = 4

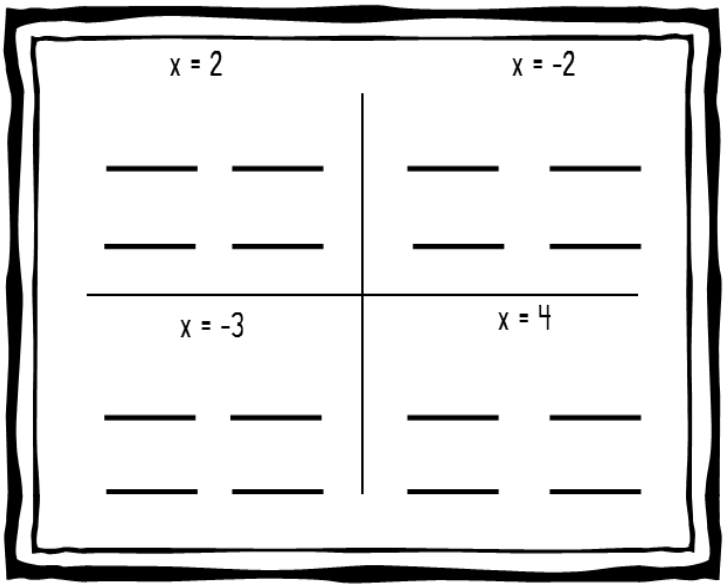
Sorting Cards



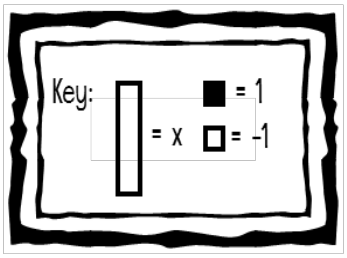
Name: _____

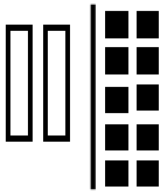
Model Madness

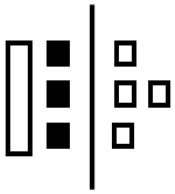
Directions: Transfer the letter of each answer from the sorting mat to the appropriate box below (# 1-16).

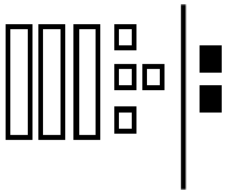


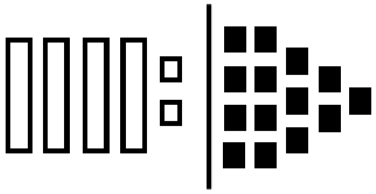
Directions: Use the keys provided for each set of questions to solve the model problems.

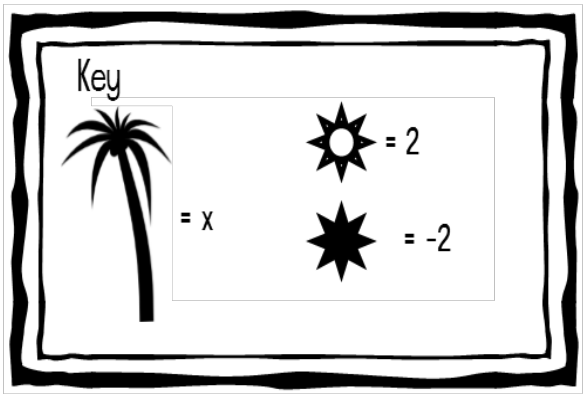


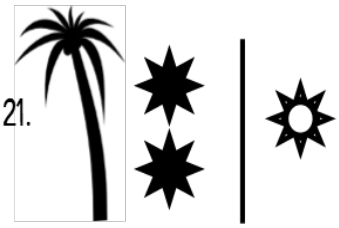
17. 

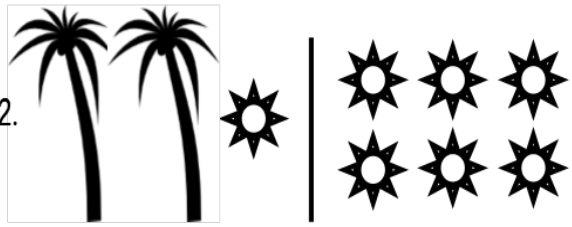
18. 

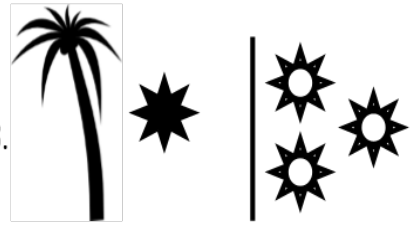
19. 

20 

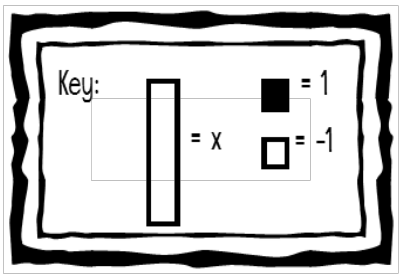


21. 

22. 

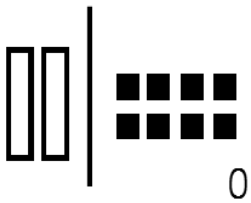
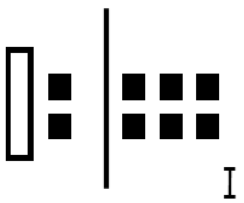
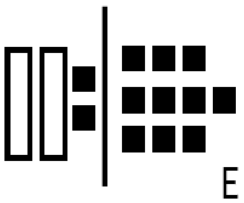
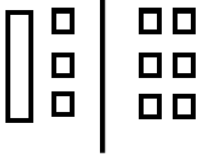
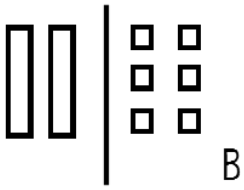
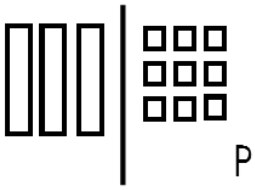
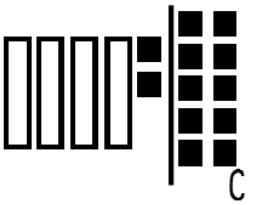
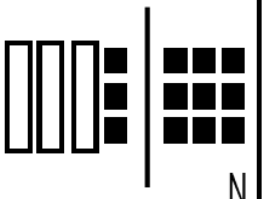
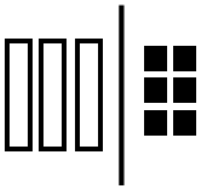
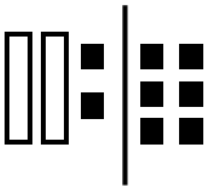
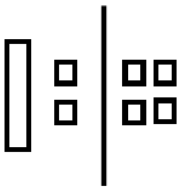
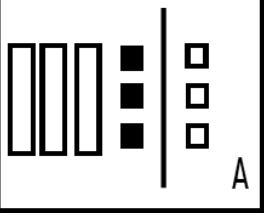
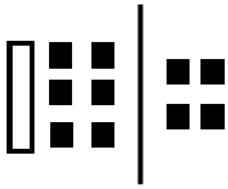
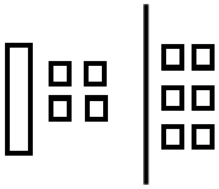
23. 

Directions: Using the key provided, draw a model to represent the equations provided.



24. $2x + 3 = 7$	25. $x + 4 = -2$

Model Madness

 O	 I	 M	 E	= 4
 H	 B	 L	 P	= -3
 C	 N	 D	 K	= 2
 G	 A	 F	 J	= -2

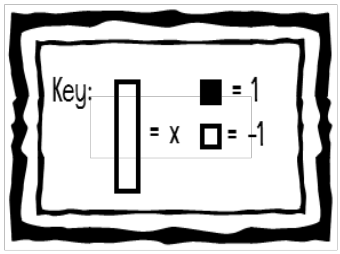
Name: _____

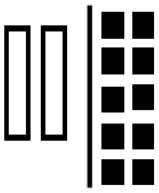
Model Madness

Directions: Transfer the letter of each answer from the sorting mat to the appropriate box below (# 1-16).

x = 2		x = -2	
C	D	A	F
K	N	G	J
x = -3		**x = 4**	
B	H	E	M
L	P	I	O

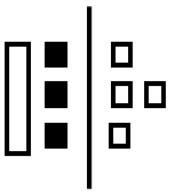
Directions: Use the keys provided for each set of questions to solve the model problems.



17. 

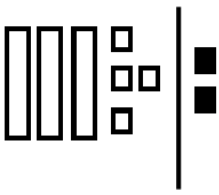
$2x=10$

$x = 5$

18. 

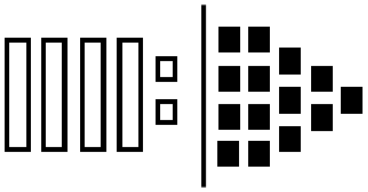
$x + 3 = -4$

$x = -7$

19. 

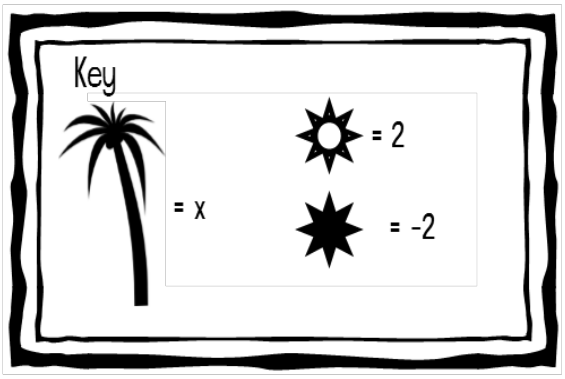
$3x + (-4) = 2$

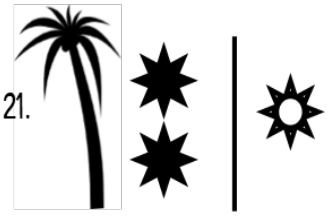
$x = 2$

20 

$4x + (-2) = 14$

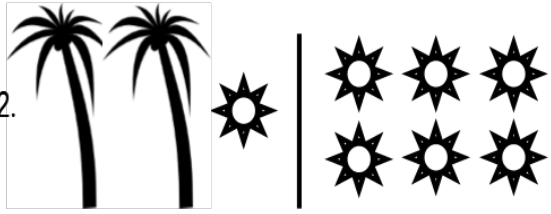
$x = 4$



21. 

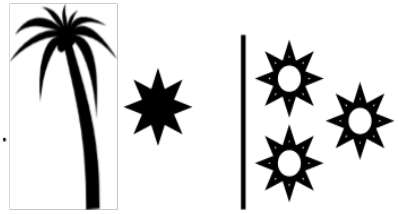
$x + (-4) = 2$

$x = 6$

22. 

$2x + 2 = 12$

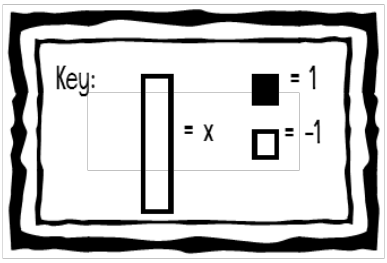
$x = 5$

23. 

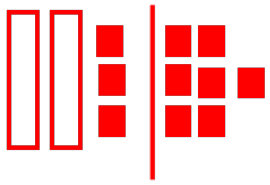
$x + (-2) = 6$

$x = 8$

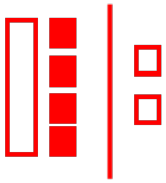
Directions: Using the key provided, draw a model to represent the equations provided.



24. $2x + 3 = 7$



25. $x + 4 = -2$



Solving Two-Step Equations

Two-Step Equation Practice Problems
Solve AND Check on your own…

1) $25x - 3 = 97$

2) $10 = -2c + 22$

3) $3a - 5 = -14$

4) $8x—6 = 10$

5) $7x + 3 = 18$

Solving One-Step Equations

One-Step Equation Practice Problems
Solve AND Check on your own...

1) $x + 12 = 24$

2) $3(x) = 15$

3) $10 = x + 12$

4) $-4 = x - 18$

5) $\frac{x}{5} = 9$

Steps to Solving one-step equations

1) Draw _____ _____ to separate the problem

2) Get the variable by itself by using the _____ (opposite) operation

3) Apply the _____ _____

4) Put in proper math etiquette (variable on the _____)

Steps to Solving two-step equations

1) Draw _____ _____ to separate the problem

2) Circle the "_____" couple

3) Apply the golden rule to the _____ couple by using the inverse operation

4) Apply the golden rule to the married couple using the inverse operation

5) Put in proper _____ _____ (variable on the left)

1) x - 7 = 6	2) a + 8 = -4
3) 8x= 24	4) $\frac{x}{14} = 7$

1) 2d - 12= 14	2) 3x + 9 = 17
3) $\frac{d}{2}$ - 6= 12	4) -4 = 2x - 13

- An _____ is a mathematical sentence that contains an equal (=) sign
- _____: What you do to one side you MUST do to the other.
- _____: the opposite of (+) is (-) and the opposite of (x) is (÷)

Solving Two-Step Equations

Two-Step Equation Practice Problems
Solve AND Check on your own…

1) $25x - 3 = 97$

2) $10 = -2c + 22$

3) $3a - 5 = -14$

4) $8x—6 = 10$

5) $7x + 3 = 18$

Solving One-Step Equations

One-Step Equation Practice Problems
Solve AND Check on your own...

1) $x + 12 = 24$

2) $3(x) = 15$

3) $10 = x + 12$

4) $-4 = x - 18$

5) $\frac{x}{5} = 9$

Steps to Solving one-step equations

1) Draw railroad tracks to separate the problem

2) Get the variable by itself by using the inverse (opposite) operation

3) Apply the Golden Rule

4) Put in proper math etiquette (variable on the left)

Steps to Solving two-step equations

1) Draw railroad tracks to separate the problem

2) Circle the "married" couple

3) Apply the golden rule to the NON married couple by using the inverse operation

4) Apply the golden rule to the married couple using the inverse operation

5) Put in proper math etiquette (variable on the left)

1) $x - 7 = 6$	2) $a + 8 = -4$
3) $8x = 24$	4) $\frac{x}{14} = 7$

1) $2a - 12 = 14$	2) $3x + 9 = 17$
3) $\frac{a}{2} - 6 = 12$	4) $-4 = 2x - 13$

- An <u>equation</u> is a mathematical sentence that contains an equal (=) sign
- <u>Golden Rule for Equations</u>: What you do to one side you MUST do to the other.
- <u>Inverse Operations</u>: the opposite of (+) is (-) and the opposite of (x) is (÷)