

Sample Encrypted Wall Activity: Solving Absolute Value Equations

Spice up humdrum practice of solving absolute value equations with this Sample **Encrypted Wall Activity**. The Encrypted Wall Activity is similar to a scavenger hunt in that the problems students are asked to solve are posted around the room and the activity is "self-checking." Unlike a scavenger hunt, in the encrypted wall activity students can solve the problems in any order. Problems are designed to have integer solutions within a certain range. Students number their paper with these integer solutions before starting the activity, and each problem has a letter that students will record next to the corresponding solution. (See page 16 for an example of the student's notebook page.) This allows the teacher to monitor student progress as he/she moves around the room quickly checking this answer box as students work through the activity. Now with an easy message like "Happy Halloween," students would quickly unscramble the letters and skip all the math work (been there, done that). Therefore the message is ENCRYPTED, and the combination of letters will make NO SENSE to the students. At the end of the activity students are given the cipher and decode their message.

I need this activity NOW. Tell me what to do.

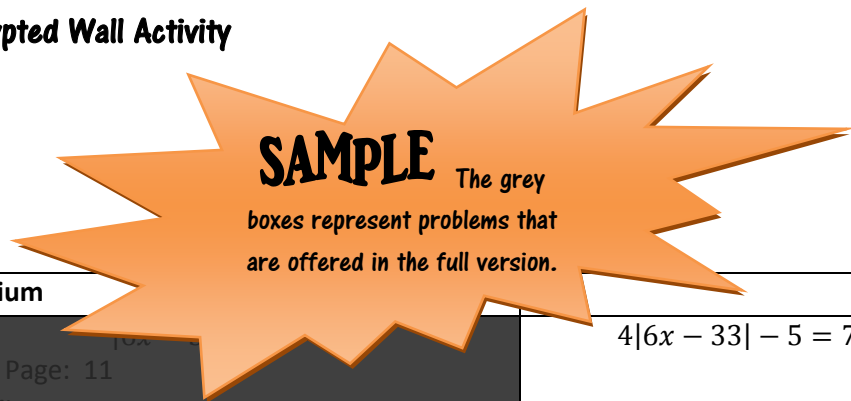
Quick Start

- 1) Print pages # 4-9
- 2) Either print out the cipher page (page 14) or decode together as a class when finished.
- 3) Cut apart cards and post around room.
- 4) See page 15-16 for an example of how students should set-up their notebook paper for the activity.
- 5) Go over these things with your kids before starting the activity:
 - How to solve absolute value equations (ha, ha).
 - Notebook Paper set-up (See page 15.)
 - Directions: With your partner, solve the absolute value equations posted around the room. Record the letter of each equation with the corresponding solutions on the front of your paper. All equations have two solutions; however, for four of the equations you will only find one of the solutions in the solution key. This is a part of the design. You will decode the message when finished.
 - Model one example. $|x + 1| = 8$ $x = \{-9, 7\}$ Letter: A While your work should show both solutions, only 7 can be found on our solution key. So we put the letter "A" next to "7" on the solution key. BY THE WAY "A" is not the right letter for 7; this is just an example.
 - "Do not try to figure out the message. The message is ENCRYPTED. It will not make sense to you until we decode at the end."
 - Expectations of activity... i.e. no socializing, stay with your partner, keep your voices within 3 feet.
- 6) Check student progress throughout activity. You know your students are right if their message is EXMMV EXiiLTBBK . Once the message is decoded it will read Happy Halloween. Find the answer key on page 4.

Teacher Planning Guide: Solving Absolute Value Equations Encrypted Wall Activity

Decoded Message: Happy Halloween

Encrypted Message: EXMMV EXiILTBBK



	Super Easy	Easy	Medium	Hard
B $x = \{5,6\}$		$ 6x - 33 = 3$ Print Page: 10 Color:	$ 6x - 33 - 5 = 7$ Print Page: 11 Color:	$4 6x - 33 - 5 = 7$
E $x = \{-7,-1\}$		$ 3x + 12 = 9$ Print Page: 14 Color:	$ 3x + 12 - 3 = 6$ Print Page: 15 Color:	$2 -3x - 12 = 18$ Print Page: 17 Color:
		$ -3x - 12 = 9$ Print Page: 14 Color:	$ -3x - 12 + 1 = 10$ Print Page: 16 Color:	$4 3x + 12 = 36$ Print Page: 18 Color:
i $x = \{1,2\}$		$ -2x + 3 = 1$ Print Page: 21 Color:	$ 3 - 2x - 7 = -6$ Print Page: 22 Color:	$6 3 - 2x + 5 = 11$
K $x = \{-9,7\}$ We will only use the 7 solution for this activity.	$ x + 1 = 8$	$ -3x - 3 = 24$ Print Page: 25 Color:	$ -3x - 3 + 2 = 26$ Print Page: 27 Color:	$\frac{1}{3} -3x - 3 = 8$ Print Page: 29 Color:
		$\left \frac{x + 1}{2}\right = 4$ Print Page: 26 Color:	$-3\left \frac{x + 1}{2}\right = -12$ Print Page: 28 Color:	$\left \frac{x + 1}{2}\right - 5 = -1$ Print Page: 30 Color:
L $x = \{3,8\}$ We will only use the 3 solution for this activity.		$ 4x - 22 = 10$ Print Page: 33 Color:	$ 4x - 22 - 6 = 4$	$3 2x - 11 = 15$ Print Page: 37 Color:
		$ 2x - 11 = 5$ Print Page: 34 Color:	$ 8.8 - 1.6x - 1.2 = 2.8$ Print Page: 38 Color:	$0.5 8.8 - 1.6x + 3.5 = 5.5$ Print Page: 40 Color:
		$ 8.8 - 1.6x = 4$ Print Page: 35 Color:	$0.5 8.8 - 1.6x = 2$ Print Page: 39 Color:	$3 2x - 11 - 7 = 8$ Print Page: 41 Color:

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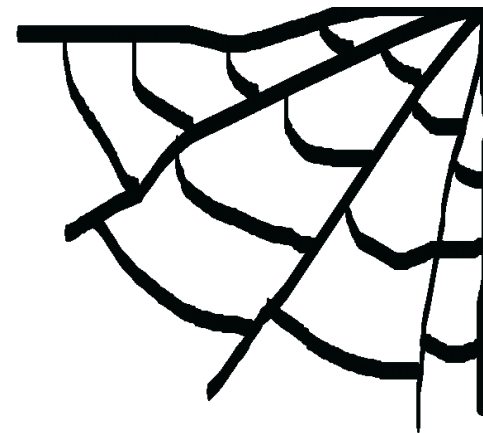
M $x = \{-5, -4\}$		$ 18 + 4x = 2$	$3 18 + 4x = 6$ Print Page: 43 <i>Color:</i>		$3 18 + 4x - 5 = 1$ Print Page: 44 <i>Color:</i>
T $x = \{-10, 4\}$ We will only use the 4 solution for this activity.	$ x + 3 = 7$ Print Page: 45 <i>Color:</i>	$ -x - 3 = 7$ Print Page: 46 <i>Color:</i>	$5 x + 3 = 35$ Print Page: 47 <i>Color:</i>		$4 x + 3 - 10 = 18$ Print Page: 50 <i>Color:</i>
			$ -x - 3 + 4 = 11$ Print Page: 48 <i>Color:</i>		$\frac{2}{7} -x - 3 - 10 = -8$
			$\frac{2}{7} -x - 3 = 2$ Print Page: 49 <i>Color:</i>		
V $x = \{-3, 10\}$ Only use the -3 solution for this activity.	$ x - 3.5 = 6.5$	$ 2x - 7 = 13$ Print Page: 53 <i>Color:</i>	$4 x - 3.5 = 26$ Print Page: 54 <i>Color:</i>	$ 2x - 7 - 5 = 8$ Print Page: 55 <i>Color:</i>	$3 2x - 7 - 10 = 29$ Print Page: 56 <i>Color:</i> $4 x - 3.5 - 5 = 21$ Print Page: 57 <i>Color:</i>
			X $x = \{-6, 0\}$	$ x + 3 = 3$	$ 2x + 6 = 6$ Print Page: 59 <i>Color:</i>
		$\frac{2}{3} x + 3 = 2$ Print Page: 61 <i>Color:</i>		$\frac{2}{3} x + 3 - 5 = -3$ Print Page: 63 <i>Color:</i>	

Alternate use of problems not used for the Encrypted activity: "Choose Your Poison"-- On the board place 3 same solution problems of varying difficulty. Since all students should arrive at the same answer, they can check with each other even while working at their ability level. I actually let students pick their problem, choosing their poison, and they can check their answer by doing a second problem if desired. For example, there are 7 problems for T; choose three problems you will not use for the activity to use for "Choose Your Poison." I would encourage a few sets of Choose Your Poison before starting the Encrypted Wall Activity.

Set off to the side so that you can carry this paper around folded hotdog style as a quick reference during the activity.

Answer Key

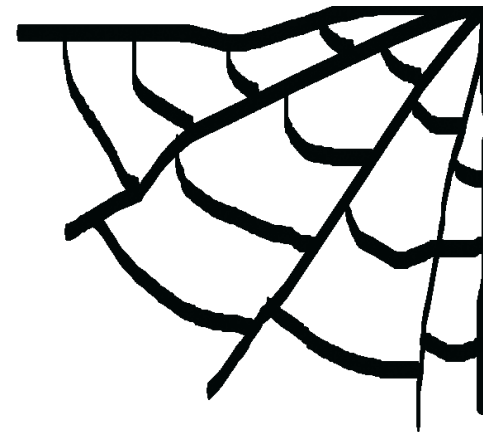
-7	E	Increase by 3 letters to decode.	H
-6	X		A
-5	M		P
-4	M		P
-3	V		Y
-2			
-1	E		H
0	X		A
1	i		L
2	i		L
3	L		O
4	T		W
5	B		E
6	B		E
7	K	N	



Solve

$$4|6x - 33| - 5 = 7$$

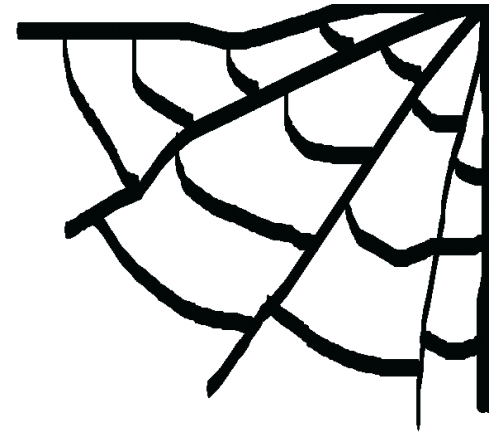
B



Solve

$$|3x + 12| = 9$$

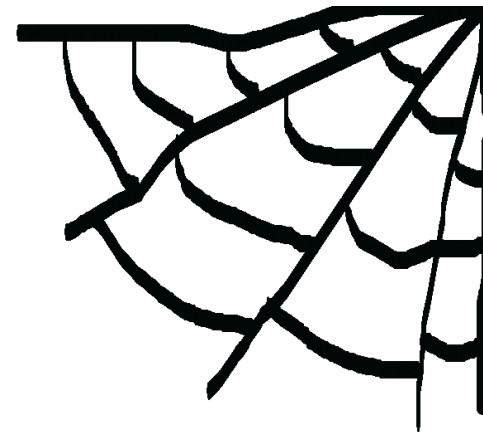
E



Solve

$$6|3 - 2x| + 5 = 11$$

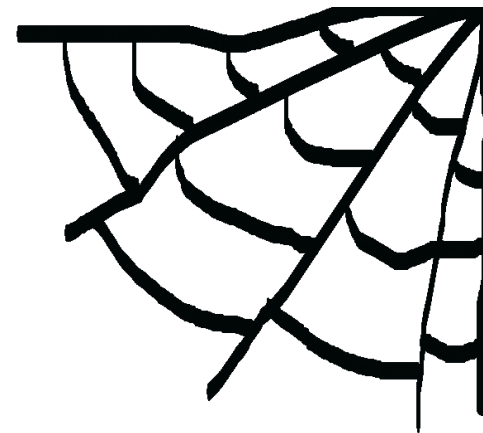
i



Solve

$$|x + 1| = 8$$

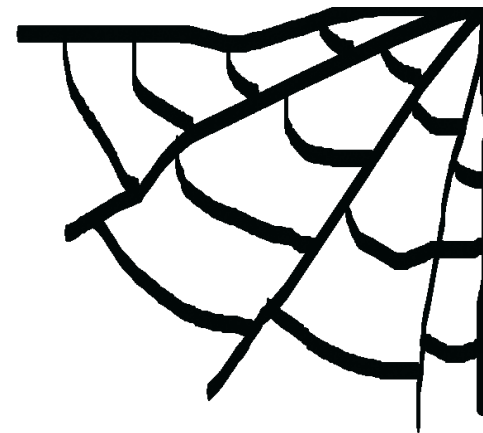
K



Solve

$$|4x - 22| - 6 = 4$$

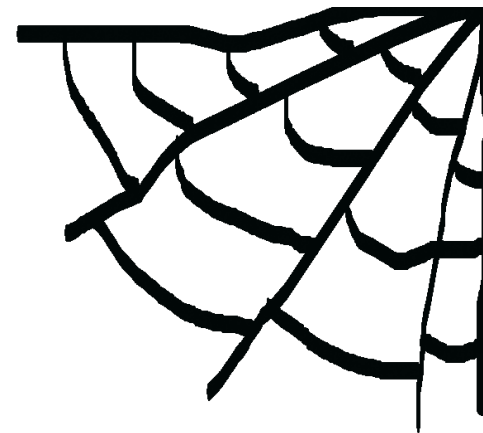
I



Solve

$$|18 + 4x| = 2$$

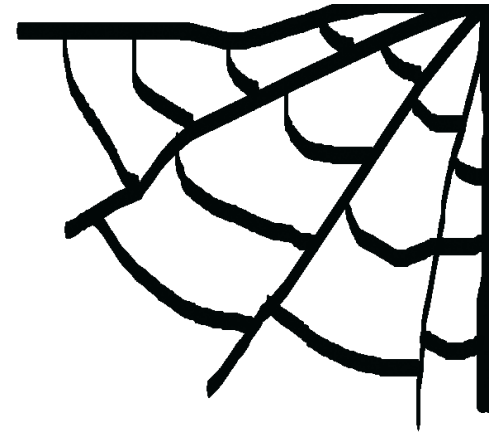
M



Solve

$$\frac{2}{7} |-x - 3| - 10 = -8$$

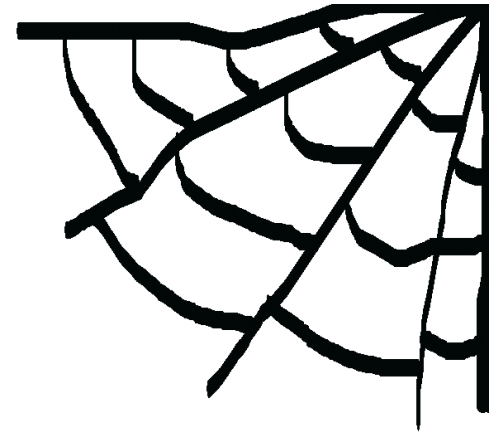
T



Solve

$$|x - 3.5| = 6.5$$

V



Solve

$$|x + 3| = 3$$

X

Cut apart to hand to students as they finish the activity. One cipher can be use by more than one pair of students.

Caesar Cipher shift of 3

Increase by 3 letters

B = E

E = H

I = L

K = N

L = O

M = P

T = W

V = Y

X = A

Caesar Cipher shift of 3

Increase by 3 letters

B = E

E = H

I = L

K = N

L = O

M = P

T = W

V = Y

X = A

Caesar Cipher shift of 3

Increase by 3 letters

B = E

E = H

I = L

K = N

L = O

M = P

T = W

V = Y

X = A

Caesar Cipher shift of 3

Increase by 3 letters

B = E

E = H

I = L

K = N

L = O

M = P

T = W

V = Y

X = A

Caesar Cipher shift of 3

Increase by 3 letters

B = E

E = H

I = L

K = N

L = O

M = P

T = W

V = Y

X = A

Caesar Cipher shift of 3

Increase by 3 letters

B = E

E = H

I = L

K = N

L = O

M = P

T = W

V = Y

X = A

Set-up of Student Notebook Paper for Encrypted Wall Activity

Name
Date

Encrypted Wall: Solving Absolute Value Equations

Solutions

Work

-7

-6

-5

-4

-3

-2

-1

0

1

2

3

4

5

6

7

Hotdog fold to
separate Solutions
from Scrap work

Set-up of Student Notebook Paper for Encrypted Wall Activity

Abby
10/30/13
Pd 1

Encrypted Wall: Solving Absolute Value Equations

Solutions

Work

-7 E H

M $3|18 + 4x| = 6$

-6 X A

$$|18 + 4x| = 2$$

-5 M P

$$18x + 4x = 2 \quad -(18x + 4x) = 2$$

-4 M P

$$4x = -16 \quad 18x + 4x = -2$$

-3 V Y

$$x = -4 \quad 4x = -20$$

-2

$$x = \{-5, -4\} \quad x = -5$$

-1 E H

0 X A

1 i L

2 i L

3 L O

4 T W

5 B E

6 B E

7 K N

Hotdog fold to
separate Solutions
from Scrap work

Thank you for downloading!

I hope you find success with this sample activity. If you liked the sample, you may find the full version even more helpful:

[Halloween Algebra - Absolute Value Equations Encrypted Wall](#)



The reasonably priced full version includes a worksheet alternative (great for absent students) and 53 absolute value equations of varying difficulty from which to choose. This allows one to hand-pick the ability level or easily differentiate with this activity.

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