Algebra 1   5.5
Solve and graph absolute value inequalities

inequality
absolute value   distance
less than   from zero
greater than
number line & distance
whiteboards

bubble

$|3| \rightarrow 3$

$|-3| \rightarrow 3$

| ???| = 5

$$|5| = 5$$

$$|-5| = 5$$

absolute value = distance (from zero)

Number line
stand 3 steps away

inside
closer

farther

$|-3| = 3$ $|3| = 3$
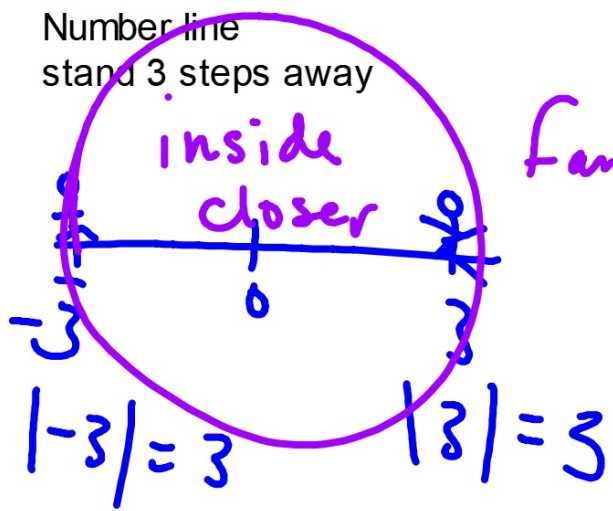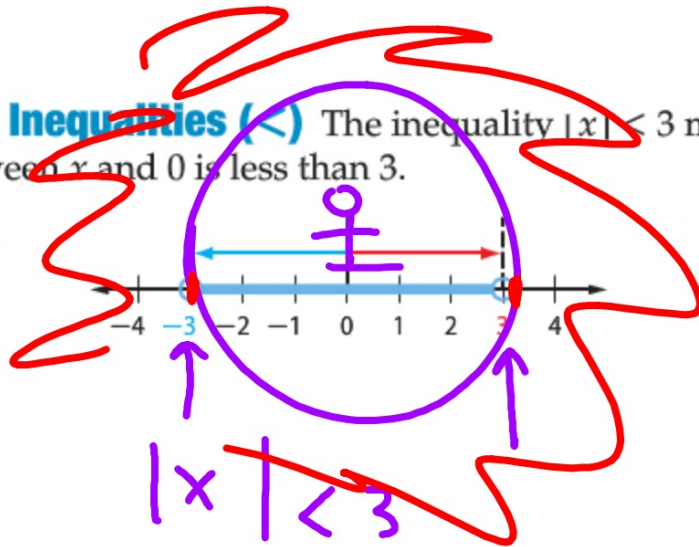
Where is 3 away?
Where is closer than 3?
Where is farther than 3?

1 Absolute Value Inequalities ($<$)

The inequality $|x| < 3$ means that the distance between x and 0 is less than 3.

$|x| > 3$

$|x| < 3$

$|\quad| = 5$

$|\quad| = 8$

$|\quad| = 13$

$|\quad| = -2$

Example 1 Solve Absolute Value Inequalities ($<$)

Solve each inequality. Then graph the solution set.

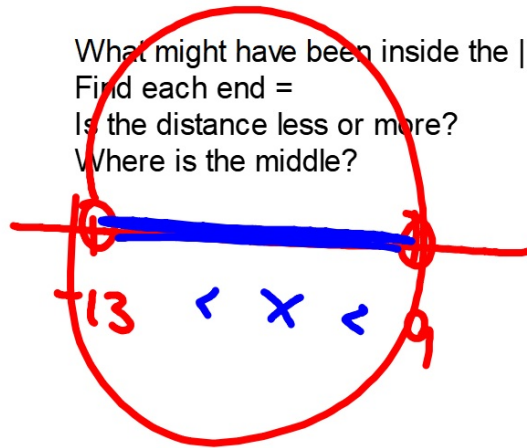a. $|m + 2| < 11$

Distance = 11

What might have been inside the $|\ |$ originally?
Find each end =
Is the distance less or more?
Where is the middle?

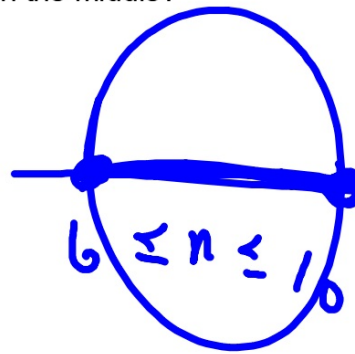$\begin{array}{c} m+2 \\ \underline{-2 \quad -2} \\ m = -13 \end{array} = -11$

$\begin{array}{c} m+2 \\ \underline{-2 \quad -2} \\ m = 9 \end{array} = 11$

$-13 < x < 9$

1A. $|n - 8| \leq 2$

What could have been inside?
Find each end
Is the distance less or more?
What is in the middle?

$n - 8 = -2$
$+8 \quad +8$
_____
$n = 6$

$n - 8 = 2$
$+8 \quad +8$
_____
$n = 10$

$6 \leq n \leq 10$

WB
Sk.
1-3

7~17

b. | [ ] | [ ]−2

What could have been inside? :(
Find each end
Is the distance less or more?
What is in the middle?

INTERNET A recent survey showed that 65% of young adults watched online video clips. The margin of error was within 3 percentage points. Find the range of young adults who use video sharing sites.

GuidedPractice

2. **CHEMISTRY** The melting point of ice is 0°C. During a chemistry experiment, Jill observed ice melting within 2°C of this measurement. Write the range of temperatures that Jill observed.

2 **Absolute Value Inequalities (>)** The inequality $|x| > 3$ means that the distance between x and 0 is greater than 3.
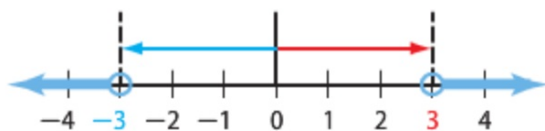
Example 3 Solve Absolute Value Inequalities (>)

Solve | ⬚ | ⬚ 12. Then graph the solution set.

distance = 12

What could have been inside?
Find each end
Is the distance less or more?
What is in the middle?

Solve each inequality. Then graph

3A. $|| \square 7$

What could have been inside?
Find each end
Is the distance less or more?
What is in the middle?

3B. | | □−5

What could have been inside? :(
Find each end
Is the distance less or more?
What is in the middle?