

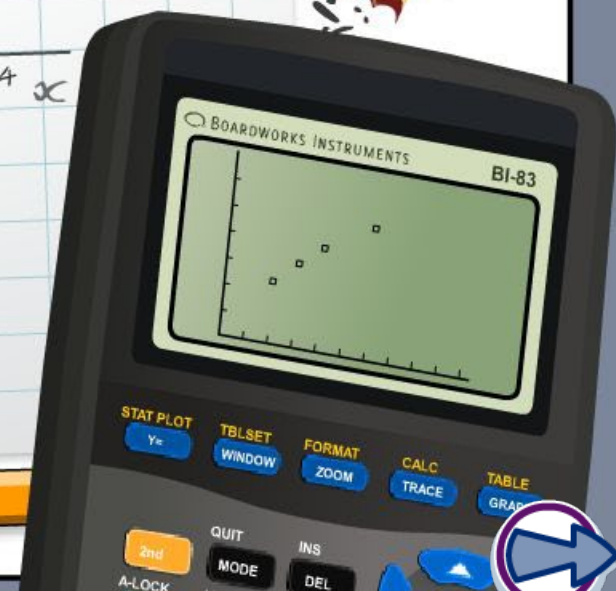
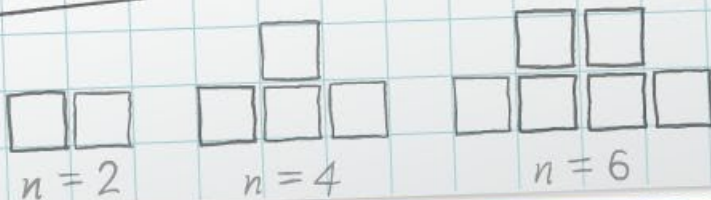
The median

x	-2	-1	0	1	2	3	4
y	5	0	-3	-4	-3	0	5

$$x^2 - 2x - 3 = 0$$

$$(x+1)(x-3) = 0$$

$$x = -1 \text{ or } x = 3$$



Common core icons



This icon indicates a slide where the Standards for Mathematical Practice are being developed. Details of these are given in the Notes field.



Slides containing examples of mathematical modeling are marked with this stamp.



This icon indicates an opportunity for discussion or group work.

The **Standards for Mathematical Practice** outlined in the Common Core State Standards for Mathematics describe varieties of expertise that mathematics educators at all levels should seek to develop in their students.

They are:

- 1) **Make sense of problems and persevere in solving them.**
- 2) **Reason abstractly and quantitatively.**
- 3) **Construct viable arguments and critique the reasoning of others.**
- 4) **Model with mathematics.**
- 5) **Use appropriate tools strategically.**
- 6) **Attend to precision.**
- 7) **Look for and make use of structure.**
- 8) **Look for and express regularity in repeated reasoning.**



This icon indicates that the slide contains activities created in Flash. These activities are not editable.



This icon indicates teacher's notes in the Notes field.

The **median** is the **middle number** of a data set when all numbers are in order.

A rodeo bull simulator competition is judged by the number of seconds spent on the bull before falling off.

Here are Al's best results from each of his 15 training sessions:

79	90	102	85	97	81	86	92
65	77	84	99	85	93	90	

Write the results in order to find the middle value:

65	77	79	81	84	85	85	86	
90	90	92	93	97	99	102		



median = 86

Al's brother, Pete, is also practicing for the rodeo competition. Here are Pete's best practice times (in seconds):

58	61	75	63	68	62	72	79	60
58	55	71	77	70	75	64	58	62

What is the median of Pete's results?

There are 18 numbers in the list, which is an even number, so there are **two** middle values:

55	58	58	58	60	61	62	62	63
64	68	70	71	72	75	75	77	79

The median is the mean of these values: **63.5**



Suppose that there are n values written in order of size.
The median will be the value in position:

$$(n + 1) \div 2$$

For example:

There are 100 numbers in an ordered list.

The median is the... $101 \div 2 = 50.5^{\text{th}}$ number in the list
(halfway between the 50^{th} and the 51^{st}).

There are 37 numbers in an ordered list.

The median is the... $38 \div 2 = 19^{\text{th}}$ number in the list.



The median

64 65 65 67 70 72 73 73 75 78 81

Number of terms (n):

$n + 1$:

Position $\left(\frac{n + 1}{2}\right)$:

Median:

next



3, 9, 8, 10, 3, 3, 4, 7, 6, 6, 6, 9, 10, 10, 2, 5, 4, 7

1, 8,

13, 10

6.1, 6.

1.5, 8

7, 5, 3

Match the medians
to the correct set of numbers.

Press **start** to begin.

start

5

6

5.5

7

6.5

8



Weight loss coach



A weight loss coach publishes her statistics in a local fitness magazine to promote her success.

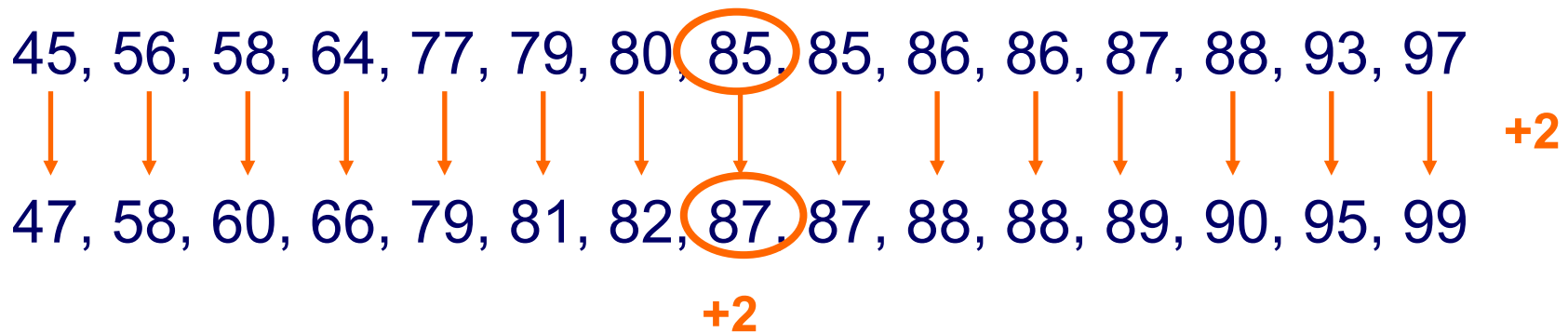
Press **play** to find out more.



A math class had a median score of 85 after the first two tests. On the next math test, each student improved their score by two points. How did this affect the median score of the class?

The median will also be increased by 2 points.

Let's test this with a pretend set of data:



If we perform the same operation on all values in a set of data, the median will undergo the same operation.



We can use a graphing calculator to check the median of a set of data. Let's use it to check that the median from 15 of AI's training sessions for the rodeo bull competition is indeed 86.

79 90 102 85 97 81 86 92 65 77 84 99 85 93 90

- Press "STAT" then select "Edit" to enter your list of values.
- On the "CALC" menu, select "1-Var Stats" (because we just have one list of values.)
- Make sure the correct list is selected, then scroll to "Calculate" and hit "ENTER".
- Scroll down to "Med =" to see the median value, which is confirmed to be 86.

