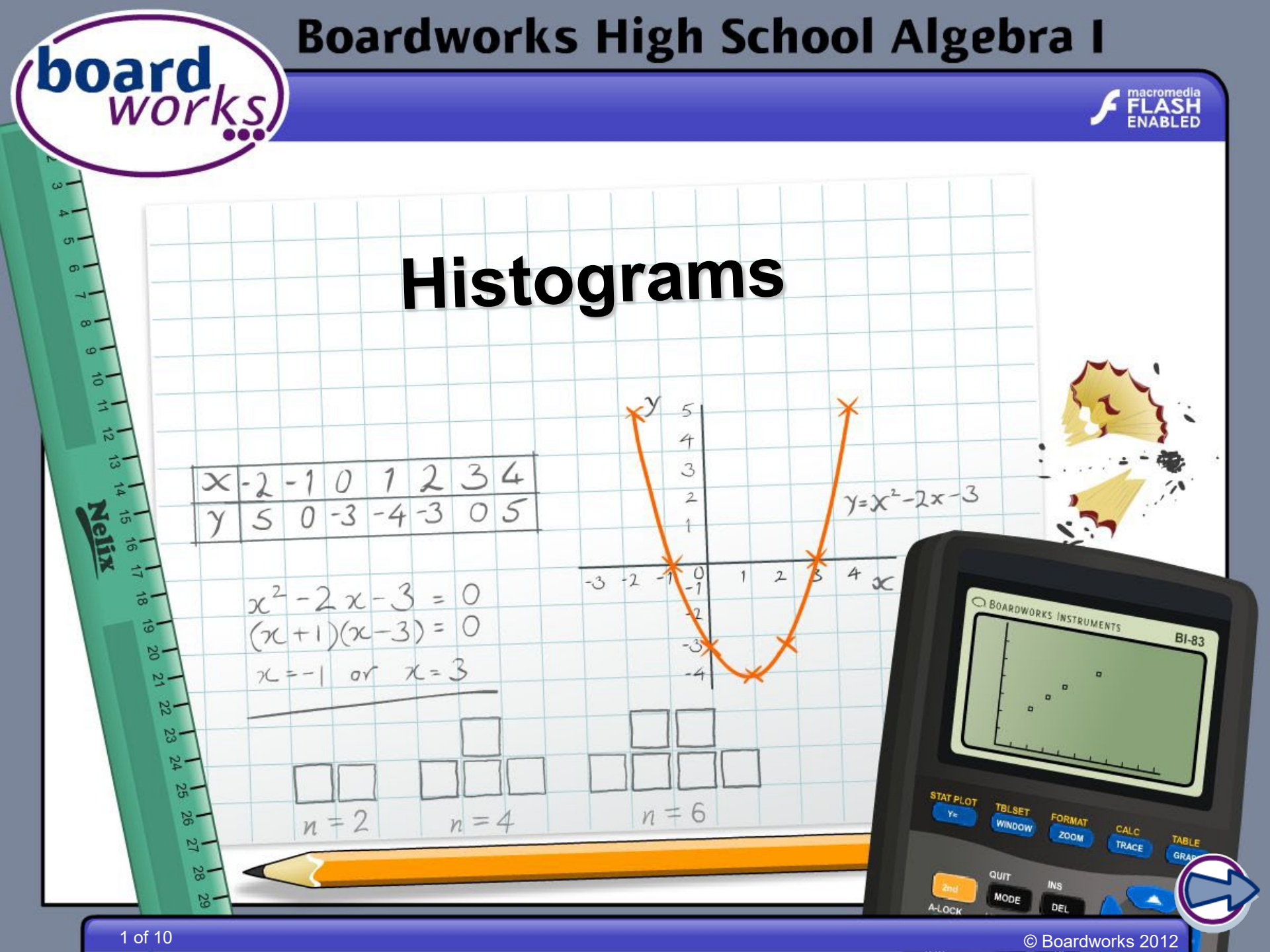
Histograms



Information

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.

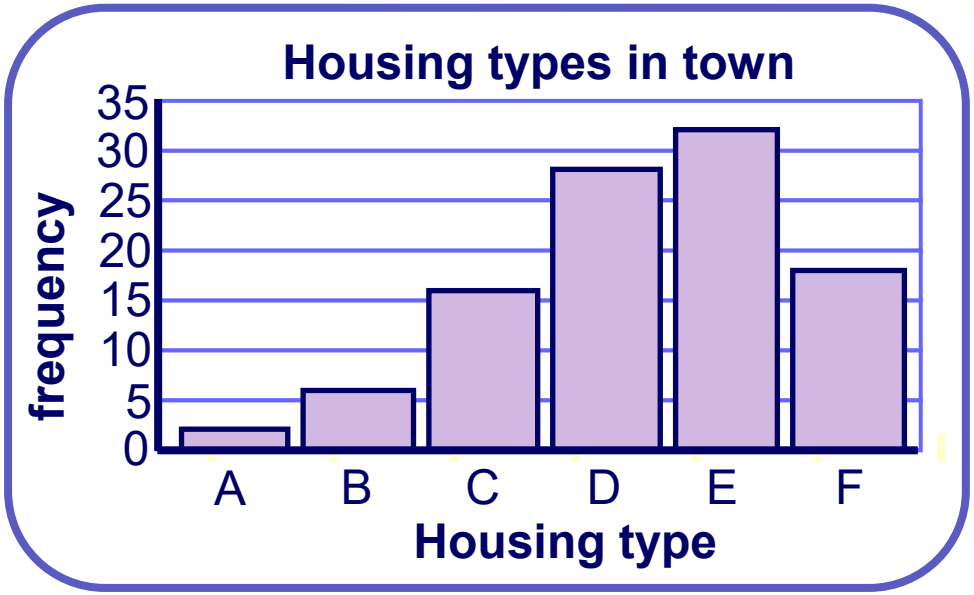
7) Look for and make use of structure.

8) Look for and express regularity in repeated reasoning.

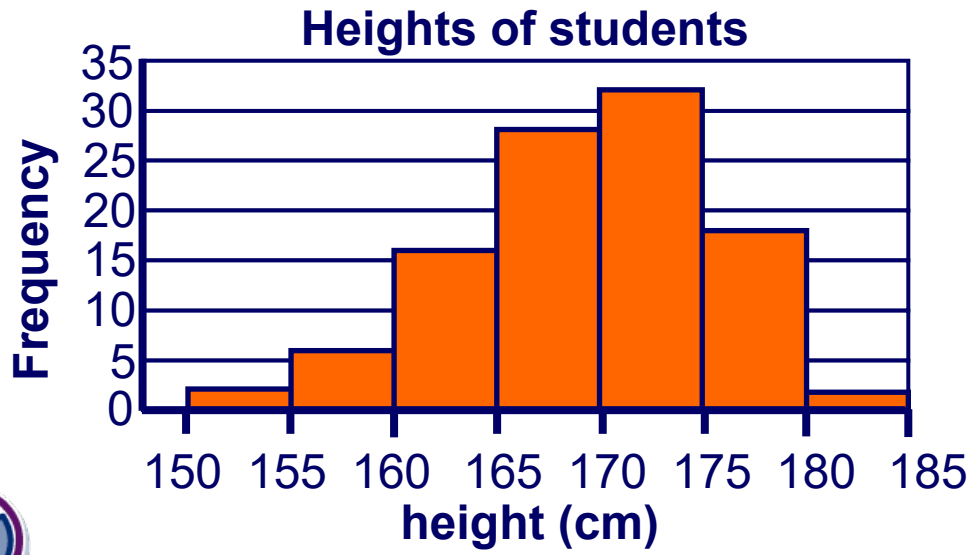
This icon indicates that the slide contains activities created in Flash. These activities are not editable.

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

What is a histogram?



You might recognize this type of graph. It is a **bar graph**. The height of each bar corresponds to the frequency of the given category.



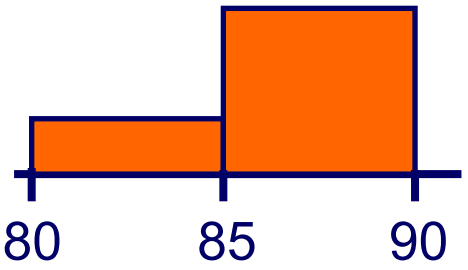
This graph is a **histogram**.

What differences do you notice about this type of graph?

Histograms

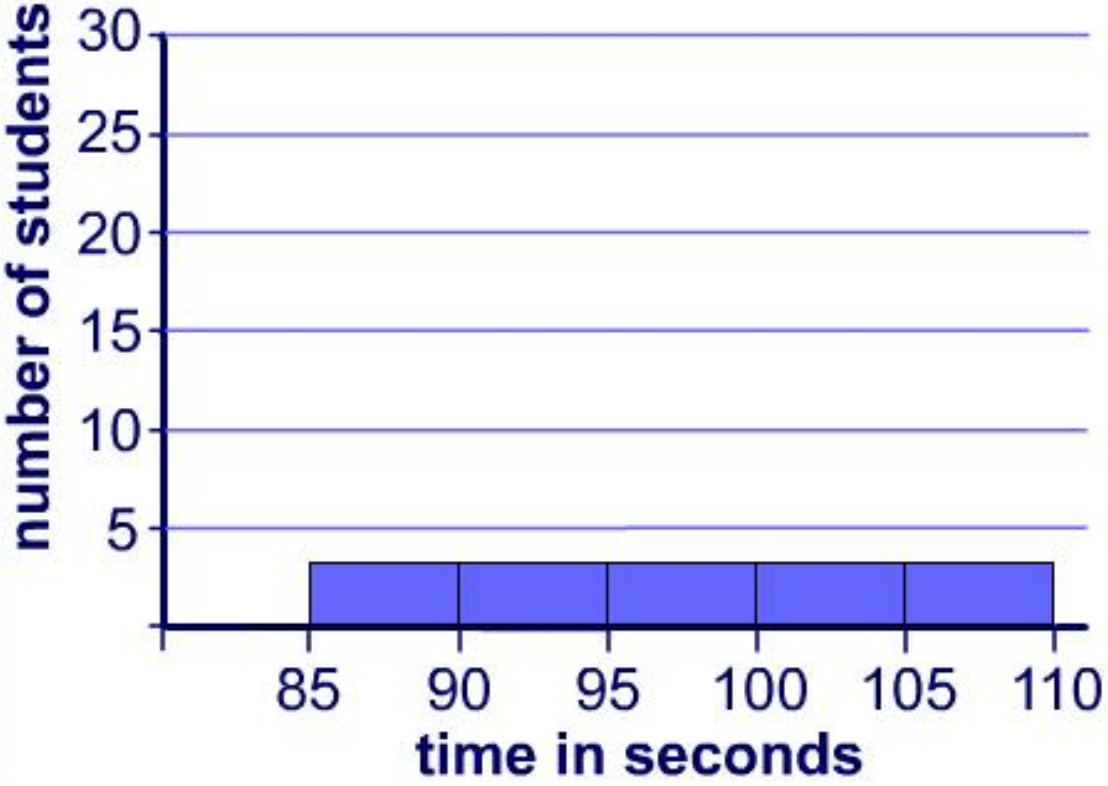
Histograms are used to display **grouped continuous** data.

- The frequencies go on the vertical axis.
- The class intervals go on the horizontal axis.
- The class intervals should all be the same width.
- There are **no gaps** left between the bars, to show that the data is continuous.
- The highest and lowest possible values in each interval go at either end of the bar:
- The axes should always be labelled.



Histograms

Complete the histogram using the table of data about the number of seconds that students can hold their breath.

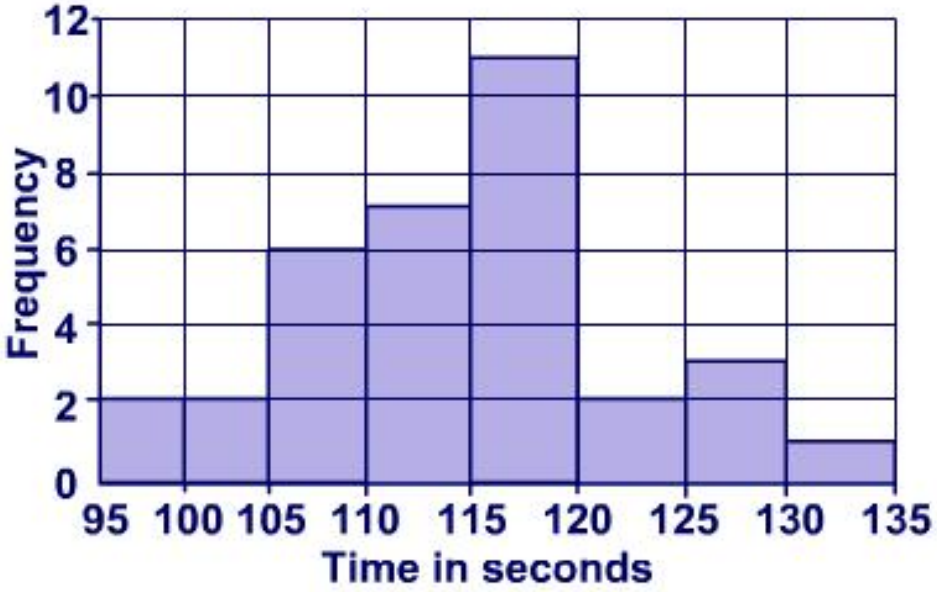


time in seconds	frequency
$85 \le t < 90$	1
$90 \le t < 95$	5
$95 \le t < 100$	28
$100 \le t < 105$	19
$105 \le t < 110$	7

Reading histograms

Use the histogram to answer the following questions.

Q1/5: How many people are there are in the $130 \leq t < 135$ interval?



4	3
1	2

Skew

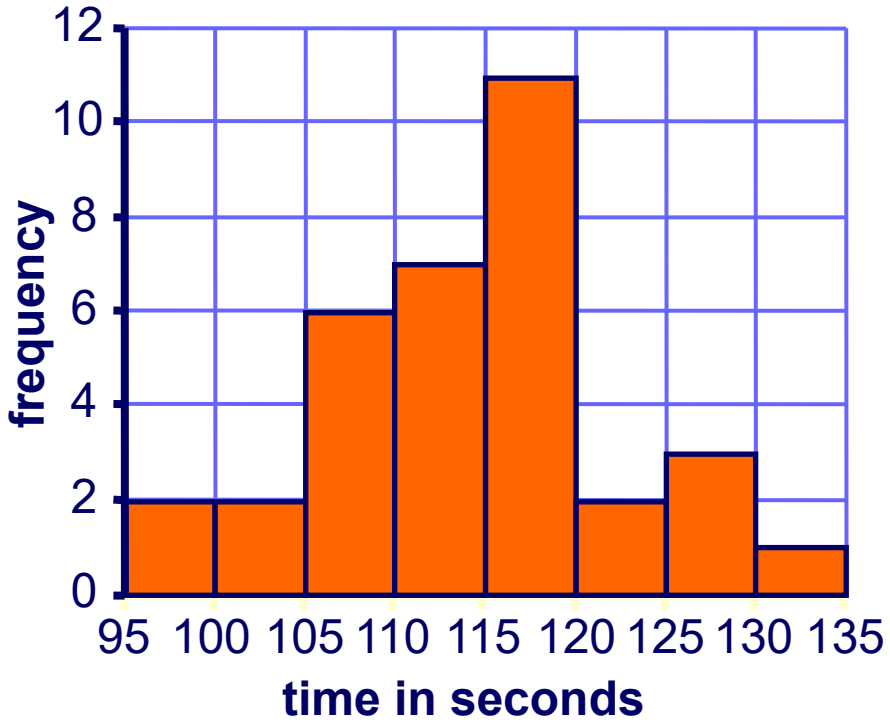
Roughly symmetrical | Positively skewed | Negatively skewed

The distribution shape of a histogram can be described using certain terms.

Press on each of the tabs above to see what kind of distribution each term refers to.

Interpreting histograms

The histogram shows the track times of some 10th grade girls.



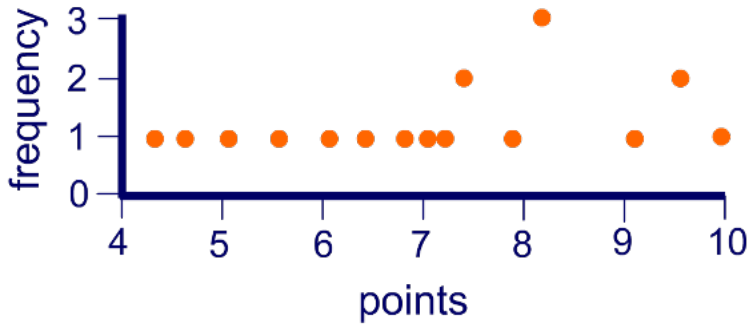
Discuss what the histogram shows.

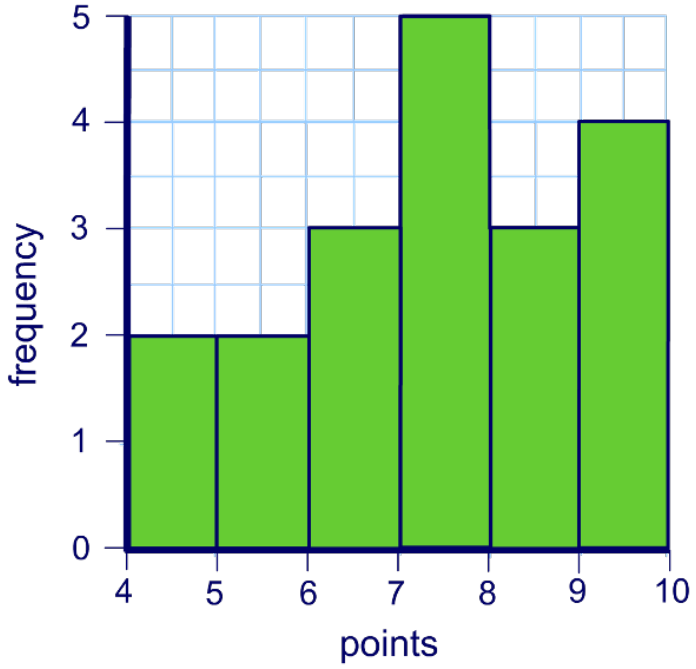
Dot plots

Here are the points scored by students on a math test:
4.2, 4.4, 5.1, 5.6, 6.1, 6.4, 6.8, 7.1, 7.2 7.4, 7.4, 7.9, 8.2, 8.2, 8.2, 9.1, 9.6, 9.6, 10.0

Draw a histogram of the data.

We can plot this data on another type of diagram called a **dot plot**:



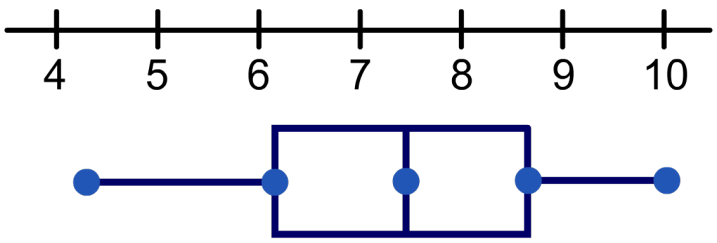


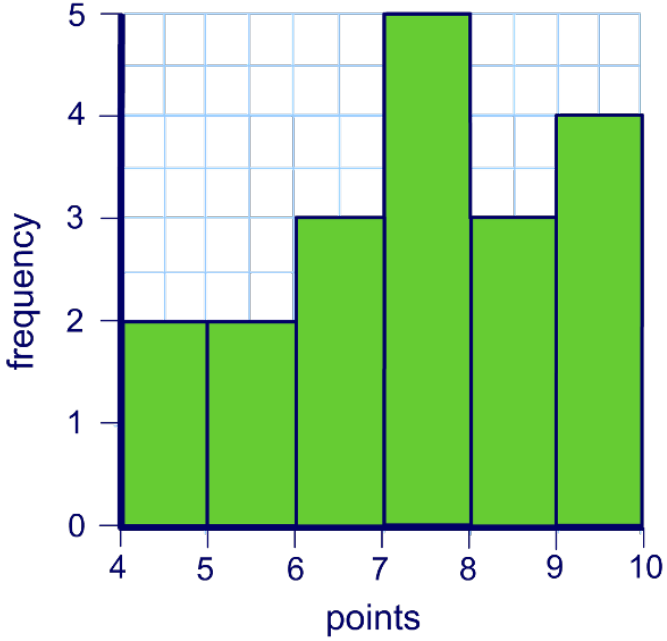
Compare the diagrams and discuss the advantages of each type.

Comparing to box plots

The points scored by students on the math test are: 4.2, 4.4, 5.1, 5.6, 6.1, 6.4, 6.8, 7.1, 7.2, 7.4, 7.4, 7.9, 8.2, 8.2, 8.7, 9.1, 9.6, 9.6, 10.0

Draw a box plot of the data.
Compare the two diagrams.





- Both diagrams show that the data is negatively skewed.
- The distribution is a lot clearer in the histogram.
- The box plot provides exact values for the maximum and minimum values.