

The consultant task	Season	01
	Episode	06
	Time frame	1 period

Prerequisites :**Objectives :**

- Use statistics to make a decision.

Materials :

- *Slideshow.*
- *Info sheets in enveloppes with selected infos about the situation.*

For this activity, the class is divided in groups of (ideally) 6 pupils.

1 – The cast

5 mins

The pupils in each group of 6 have to act as administrators of a large school :

- 1 headmaster ;
- 1 deputy headmaster ;
- 1 school accountant ;
- 1 teacher ;
- 1 representative of the regional council ;
- 1 representative of the parents.

2 – The situation

10 mins

The teacher explains the situation with a slideshow, emphasizing the decision that has to be made.

To improve students' test scores on state assessments, administrators from a large school require students to take practice exams. Two outside consultants create and score the open-ended questions from these exams. Although both consultants use the same general scheme to score student responses, the administrators suspect that the two consultants do not interpret and apply the scheme in the same way, resulting in differences in scores between the exams scored by the two consultants. The consultants' contracts with the school are up for renewal, and the administrators are trying to decide if they should be renewed. They decide to use the most recent practice exam to compare the scores assigned from each consultant and to decide whether there is a difference in the way the exams are scored. The administrators select 50 exams scored by the first consultant and 50 exams scored by the second consultant. They find that the average score for the 50 exams scored by the first consultant is 9.7 (out of a possible 15 points), while the average score for the 50 exams scored by the second consultant is 10.3 (out of a possible 15 points). What should the administrators conclude about the scores assigned by these two consultants?

3 – The discussion

Remaining time

Each group of students have to discuss the situation together.

When they need additional information, they ask the teacher who's playing the parts of the two consultants. He sends the additional info as a letter in an envelope. If a group doesn't ask for information the teacher can nevertheless send a letter to help the discussion move forwards.

The comity has to come to a decision at the end of the hour.

Additional information are, in the order they should be handed out :

- the standard deviations of the two sets of exams (with a mistake);
- the dot plots for the two sets of exams (with a mistake);
- the standard deviations and dot plots of the two sets of exams (corrected);
- the raw data - this one should only be given at the end.

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Standard deviations

While the *mean* is a statistical measure of central tendency, the *standard deviation* is a measure of dispersion. Even though the computation itself is a bit complicated, intuitively it gives an idea of how the values are spread. It shows how much variation there is from the mean. A low standard deviation indicates that the data points tend to be very close to the mean, whereas high standard deviation indicates that the data is spread out over a large range of values. With scores out of a possible 15 points, a standard deviation close to 1 would be considered very small, while a standard deviation equal to 5 or more would be very high.

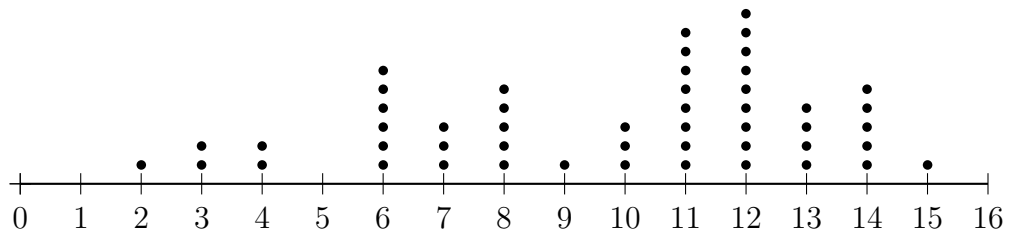
	Consultant 1	Consultant 2
First quartile	7	6
Median	11	7.5
Third quartile	12	8
Mean	9.7	10.3
Standard deviation	3.376	20.205

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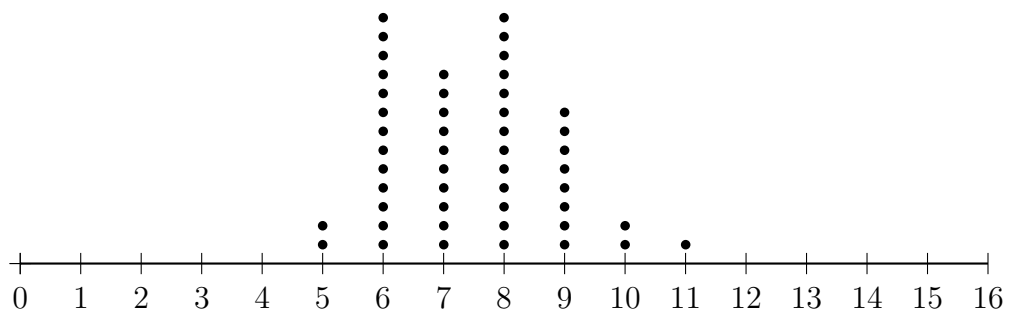
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Document	Info sheet #2

Dot plots

Consultant 1



Consultant 2



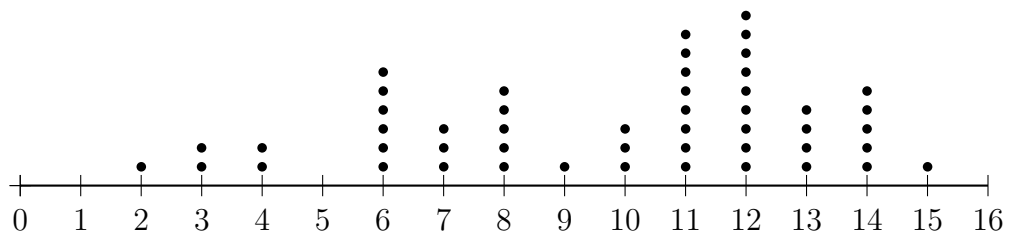
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Document Info sheet #3

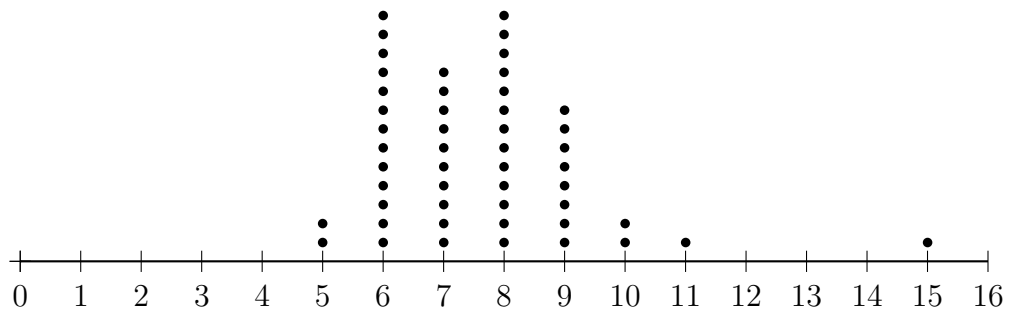
Corrected standard deviations and dot plots

	Consultant 1	Consultant 2
First quartile	7	6
Median	11	7.5
Third quartile	12	8
Mean	9.7	7.6
Standard deviation	3.376	1.726

Consultant 1



Consultant 2



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Raw data

Consultant 1		Consultant 1	
Score	Frequency	Score	Frequency
0	0	0	0
1	0	1	0
2	1	2	0
3	2	3	0
4	2	4	0
5	0	5	2
6	6	6	13
7	3	7	10
8	5	8	13
9	1	9	8
10	3	10	2
11	8	11	1
12	9	12	0
13	4	13	0
14	5	14	0
15	1	15	1