Equipment Room

Coach's Corner Solutions

Unit 6: Statistics Lesson 6.1

Coach's Corner – I

1. The heights of 20 people from each of four sections of a choir are listed in the table below. The soprano and alto members of the choir are women and the tenor and bass members are men.

Singer Heights (in)			
Soprano	**Alto**	**Tenor**	**Bass**
64	65	69	72
62	62	72	70
66	68	71	72
65	67	66	69
60	67	76	73
61	63	74	71
65	67	71	72
66	66	66	68
65	63	68	68
63	72	67	71
67	62	70	66
65	61	65	68
62	66	72	71
65	64	70	73
68	60	68	73
65	61	73	70
63	66	66	68
65	66	68	70
62	66	67	75
65	62	64	68
Source: *http://lib.stat.cmu.ed/DASL/Datafiles/Singers.html*			

a. Describe any patterns you see in the table.

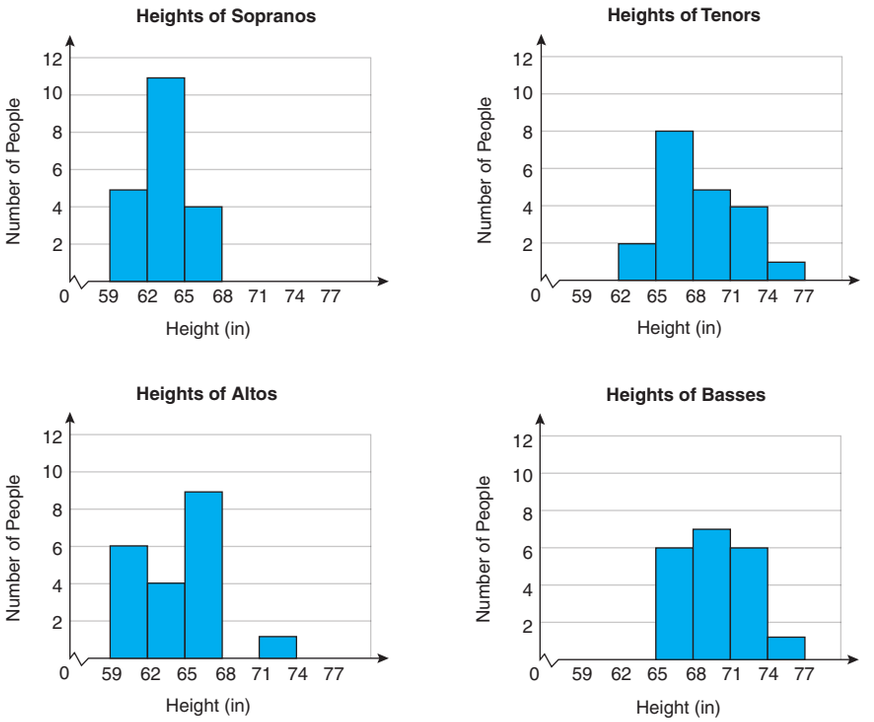
It looks like the tenor and bass sections tend to have taller members than the soprano and alto sections. It is difficult to see other patterns without sorting the data somehow.

b. Make a frequency distribution table showing each section separately.

Class sizes may vary. A sample table is shown.

Singer Heights (in)				
Height	**Soprano**	**Alto**	**Tenor**	**Bass**
59-62	5	6	0	0
62-65	11	4	2	0
65-68	4	9	8	6
67-71	0	0	5	7
71-74	0	1	4	6
74-77	0	0	1	1

c. Use the axes provided to sketch a histogram for each section of singers.



d. Compare the distribution of heights for the four sections.

The heights of the sopranos and altos are generally less than the heights of the tenors and basses. The heights of the altos and tenors appear to be more spread out than the heights of the sopranos and basses.

e. Predict how the mean and standard deviation for the four sections will compare. Use technology to determine the mean and standard deviation of each choir section to check your predictions.

Because the heights of the sopranos and altos are generally less than the heights of the tenors and basses, their means should be smaller. The tenor and alto heights are more spread out, so their standard deviations should be larger.

	Soprano	Alto	Tenor	Bass
Mean	64.2	64.7	69.2	70.4
Standard Deviation	1.99	2.88	3.13	2.24

2. Make four data sets of 10 points each to complete the table.

Data sets will vary.

Large μ Large σ	**Large μ Small σ**	**Small μ Large σ**	**Small μ Small σ**
105	200	1	10
109	202	3	10
157	202	8	11
202	203	15	12
225	205	22	12
249	205	35	12
329	207	45	14
335	209	51	15
359	209	59	17
408	209	60	17
$\mu = 247.8$ $\sigma = 101.4$	$\mu = 205.1$ $\sigma = 3.1$	$\mu = 29.9$ $\sigma = 21.9$	$\mu = 13$ $\sigma = 2.5$

3. Obi is researching cell phone use. He collected the following data from his classmates.

Number of cell phones in household	**Frequency**
0	5
1	4
2	7
3	12
4	17
5	9
6	2
7	0
8	1

a. Use technology to determine the mean and standard deviation of the data.

$\mu = 3.28$
$\sigma = 1.67$

b. Suppose the new student joins the class. Describe how the mean and standard deviation would change if the new student's household has

i. 3 cell phones

The value 3 is slightly below the mean, so the new mean would be slightly lower. The value is close to the mean, so the standard deviation will decrease.

ii. 8 cell phones

The value 8 is higher than the mean, so the mean will increase. The value is far away from the mean, so the standard deviation will also increase.

c. Could you have answered parts a. and b. if the survey information was presented as follows? Explain.

Number of cell phones in household	Relative Frequency (%)
0	9
1	7
2	12
3	21
4	30
5	16
6	4
7	0
8	2

Yes, the questions can still be answered. The mean and standard deviation may be differ slightly from those obtained from the frequency distribution table due to rounding. In this relative frequency distribution table, the effect of the new student's data will be of the same effect, but the magnitude of that effect is unknown because the size of the class is not given in this table.

4. The coach of a basketball team has two players for the centre position. The coach has determined the following information from previous games in the season.

	Mark	André
Mean number of points per game	22.1	21.6
Standard deviation of points per game	4.6	1.4

a. Explain how the two players compare.

The mean number of points per game is similar for each player. However, Mark has a much higher standard deviation, meaning Mark is less consistent and has good games and bad games. On the other hand, André scores about the same number of points each game.

b. Describe a scenario where the coach would pick each player.

The coach might choose to use Mark when the team is losing. Mark may have an exceptional game and help the team to win.

The coach might choose André when the team is winning. André is less likely to have a bad game and will help his team maintain the lead.

Please complete *Lesson 6.1 Game On!* located in *Workbook 6A* before proceeding to *Lesson 6.2*.