

## Samples & Populations: Homework Examples from ACE

Investigation 1: *Making Sense of Samples*, ACE #1-2

Investigation 2: *Choosing a Sample From a Population*, ACE #5-8

Investigation 3: *Using Samples to Draw Conclusions*, ACE #3-4

Investigation 1: *Making Sense of Samples*

ACE #1-2

For Exercises 1 and 2, use the table below.

### Diving Scores

Diver	Dive 1	Dive 2	Dive 3	Dive 4	Dive 5
Jarrold	8.5	8.1	6.4	9.5	10.0
Pascal	9.3	7.5	8.0	8.5	9.2

- Find the mean and the median of Jarrold's diving scores. Compare the mean and the median.
    - Find the mean and the median of Pascal's diving scores. Compare the mean and the median.
    - Use measures of center to compare Jarrold's and Pascal's diving results. What can you say about their performances?
  - Find the range and the MAD of Jarrold's scores.
    - Find the range and the MAD of Pascal's scores.
    - Use measures of spread to compare Jarrold's and Pascal's diving results. What can you say about their performances?
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- Mean = 8.5; Median = 8.5. The mean and median are identical.
    - Mean = 8.5; Median = 8.5. The mean and median are identical.
    - Both sets of measures of center are identical; students can only say that Jarrold's and Pascal's performances appear to be the same.
  - Range = 3.6; MAD = 1.0.
    - Range = 1.8; MAD = 0.6.
    - Jarrold's scores vary more than Pascal's scores. Jarrold's range is twice Pascal's; whereas his MAD is 123 times Pascal's MAD. Jarrold's performance is less consistent than Pascal's, so we can say that Pascal performs better overall.

Investigation 2: *Choosing a Sample From a Population*  
ACE #5-8

A middle school has 350 students. One math class decides to investigate how many hours a typical student in the school spent doing homework last week. Several students suggest sampling plans. For Exercises 5–8, name the type of sampling plan. Then tell whether you think the sampling plan would give a representative sample.

5. Zak suggests surveying every third student on each homeroom class list.
6. Kwang-Hee suggests putting 320 white beans and 30 red beans in a bag. Each student would draw a bean as he or she enters the auditorium for an assembly. The 30 students who draw red beans will be surveyed.
7. Ushio suggests that each student in the class survey everyone in his or her English class.
8. Kirby suggests putting surveys on a table at lunch and asking students to return completed questionnaires at the end of the day.

5. Systematic selection; Systematic selection from class lists would probably give a representative sample, provided the lists include the names of all students in the school.

6. Random selection; Based on the assumption that 350 students attend the assembly, selection by choosing red and white beans could produce a representative sample because every student has an equal chance of being in the sample.

7. Convenience sampling; Selection by surveying all members of particular classes would probably not give a representative sample because all students do not have an equally likely chance of being surveyed. It may be that students in these classes are assigned more homework on average and thus spend more time doing homework.

8. Voluntary response; This voluntary-response method would not give a representative sample because it depends on people's willingness to complete and return the surveys. Not everyone will complete a survey, and those who do might not place it in the box at the end of the day. Those who complete surveys may have some special reason for responding.

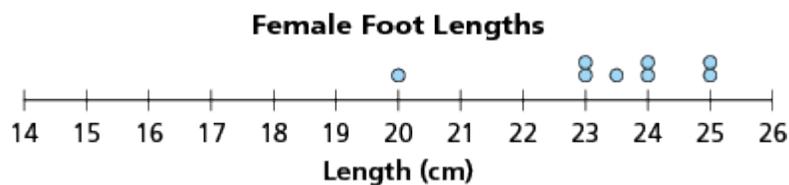
Investigation 3: *Using Samples to Draw Conclusions*  
 ACE # 3-4

A sample of students measured their heights, arm spans, and foot lengths. Use the table below for Exercises 3–4.

Gender	Height (cm)	Arm Span (cm)	Foot Length (cm)
F	160	158	25
M	111	113	15
F	160	160	23
F	152	155	23.5
F	146	144	24
F	157	156	24
M	136	135	21
F	143	142	23
M	147	145	20
M	133	133	20
F	153	151	25
M	148	149	23
M	125	123	20
F	150	149	20

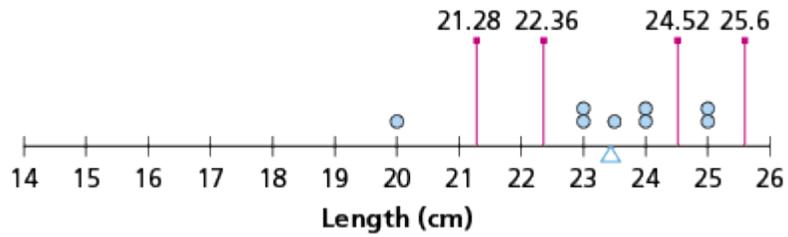
3.
  - a. Make a line plot displaying the foot lengths of the female students.
  - b. What is the mean of the data? The MAD?
  - c. On your line plot, mark the locations of one MAD and two MADs less than and greater than the mean.
  
4.
  - a. Make a line plot displaying the foot lengths of the male students.
  - b. What is the mean of the data? The MAD?
  - c. On your line plot, mark the locations of one MAD and two MADs less than and greater than the mean.

3.
  - a.



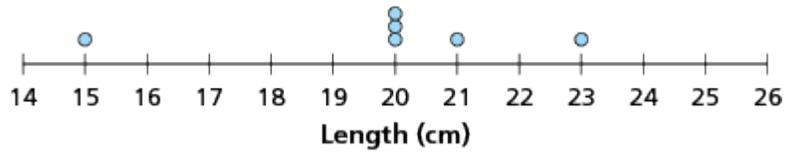
- b. The mean is about 23.44; the MAD is about 1.08.
- c.

**Female Foot Lengths**



4.  
a.

**Male Foot Lengths**



b. The mean is about 19.83, the MAD is about 1.61.  
c.

**Male Foot Lengths**

