

## Performance Assessment Task – Open-Ended

### The Footprint

A computer was stolen from the school office. The police have three suspects, but very little evidence. The only evidence they have is a footprint in the snow. The footprint is from a boot that is either a size 11 men's boot, or a size 13 women's boot. Conduct an investigation comparing shoe size and height, for men and women, using data collected from your classmates. Each of you will be responsible for measuring the height of at least one other person. (Optional data has been provided, if needed.) Graph this data to help you prepare a mathematical analysis that uses linear relations to predict the height of the culprit from the single footprint. Prepare a report for the police that explains your calculations and findings.



For this activity, you will prepare a report for the police, explaining how you determined the predicted height of the thief. The report will include:

- any relevant graphs, charts, and data.
- all your calculations, including the equations of two lines (one for men and one for women).
- a discussion of any sources of error and assumptions you made.

## Optional Student Data: The Footprint

The following data was obtained when two classes measured their height and compared it to shoe size.

Females		Males	
Shoe Size	Height (Inches)	Shoe Size	Height (Inches)
8	65	11	68
9	64	10.5	66
7	65	10.5	72
8	67	8.5	65
7	65	9	72
7.5	68	9.5	67
7	61	8.5	66
9	64	8	62
8.5	65	10	67
5	59	11	75
9	68	12	72
7	61	12	73
7	63	10	66
7.5	67	10	70
6	62	10.5	69
6.5	63	9.5	65
7	64	12.5	71
6	61	8	69
7	65	10	72
6	63	7	63
6	61	8	63
		13	73
		11	72
		12	71
		9	70
		10.5	71
		7.5	67

## Rubric: The Footprint

Student \_\_\_\_\_ Date \_\_\_\_\_

Criteria	Specific Requirements	Yes	Not Yet	
<b>Collect data</b> (Measurement 1) [PS, V]	Uses measurement strategies to collect <b>accurate</b> data.			Note: If students are using the given data chart, this criterion will not be addressed.

Level \ Criteria	Excellent	Proficient	Adequate	Limited *	Insufficient/ Blank *
<b>Draw a graph from a set of ordered pairs</b> (Relations and Functions 4) [C, CN]	Constructs graphs that <b>precisely</b> reflect the collected data.	Constructs graphs that <b>credibly</b> reflect the collected data.	Constructs graphs that <b>partially</b> reflect the collected data.	Constructs graphs that <b>inaccurately</b> reflect the collected data.	No score is awarded because there is insufficient evidence of student performance based on the requirements of the assessment task.
<b>Determine equations of linear relations</b> (Relations and Functions 5 and 7) [PS, R]	Uses graphed data to determine <b>correct</b> equations of your lines.	Uses graphed data to determine <b>substantially correct</b> equations of your lines.	Uses graphed data to determine <b>partially correct</b> equations of your lines.	<b>Not yet able</b> to use graphed data to determine the equations of your lines.	
<b>Solve problem</b> (Measurement 1, Relations and Functions 5 and 7) [CN, PS, R, V]	Uses the equations to make a <b>perceptive</b> prediction of the suspect's height.	Uses the equations to make a <b>reasonable</b> prediction of the suspect's height.	Uses the equations to make a <b>simplistic</b> prediction of the suspect's height.	Prediction of suspect's height is <b>unsupported</b> by equations.	
<b>Communicate findings</b> [C, CN]	Prepares an <b>insightful</b> report, communicating mathematical strategies, sources of error, and assumptions.	Prepares a <b>credible</b> report, communicating mathematical strategies, sources of error, and assumptions.	Prepares a <b>rudimentary</b> report, communicating mathematical strategies, sources of error, and assumptions.	The report is <b>unfocused, irrelevant or confusing</b> .	

\* When work is judged to be limited or insufficient, the teacher makes decisions about appropriate intervention to help the student improve.