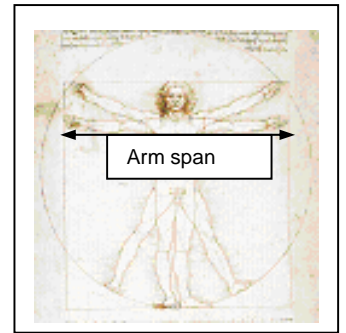# The Vitruvian theory—does it apply to you?

Arm span

Leonardo da Vinci (1452–1519) was a scientist and an artist, one of the greatest painters of the Italian Renaissance. He left only a handful of completed paintings, one of which is the *Mona Lisa*. He was so secretive that he wrote backwards to disguise his ideas.

In 1492, Leonardo drew a picture of a man standing inside a circle and a square. This is known as the 'Vitruvian Man'. It was a study of the proportions of the human body as described by Vitruvius, a Roman architect from the first century B.C. Based on his observations of European people of his day, Leonardo believed that arm span was equal to height in a perfectly proportioned body.

Why do you think he was interested in working out body proportions?

Do you think the Vitruvian theory illustrated by Leonardo would work today?

Problem

Is the Vitruvian theory that height is equal to arm span true for Irish students today?

Plan

Before you begin your investigation, what answer do you predict? Why? _____

_____

Now test your prediction using data from your class.

Data

Enter the data for 10 students from your class in this table.

How will you select the students for your sample?

Do not simplify the fraction for the arm span / height ratio.

Student	Gender	Arm span	Height	Ratio: arm span / height	
	M or F	cm		fraction	decimal
Student A					
Student B					
Student C					
Student D					
Student E					
Student F					
Student G					
Student H					
Student I					
Student J					

Student worksheet

Analysis

1. Have a look at the table of data. What does each row represent? What do you notice about the data?

_____

_____

2. Which students most closely fit Leonardo's theory?_____

3. How do you know that a student fits this theory? _____

4. Graph the information from the table, using graph paper. You might have to draw different kinds of graphs to show all the information.

5. Look at the graphs you have drawn. What words could you use to describe the shapes, range and spread of the information?

_____

_____

6. Not everybody has an arm span / height ratio that is equal to 1. Why do you think this is?

_____

_____

Conclusion

You are now ready to answer the question we asked at the beginning of the worksheet:

Is the Vitruvian theory that height is equal to arm span true for Irish students today?_____

Using some of the words below, give reasons based on what you found in your investigation:

_____

_____

_____

_____

_____

_____

_____

analysis	gradient	ratio
arm span	height	row
biased	investigate	sample
bivariate	justify	scatterplot
cluster	measure	selection
conclusion	middle	skew
data	outlier	slope
distribution	predict	spread
equal	problem	systematic
frequent	random	table