

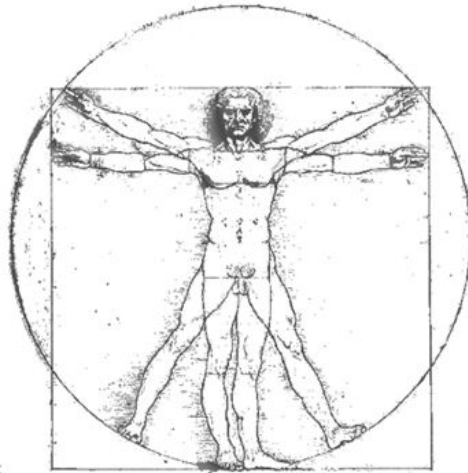
## Measurement Lab Activity

## Leonardo da Vinci's Vitruvian Man

### Background Information

Leonardo da Vinci, a famous Italian Renaissance inventor and painter, was greatly influenced by a man named Vitruvius. Vitruvius was a Roman engineer and architect during the first century B.C. Vitruvius discovered a formula to model what he thought were ideal proportions for a man. Leonardo da Vinci used this "ideal model" when drawing the Vitruvian Man around the year 1490.

The drawing shows a man standing in a square, which is inside a circle. The man has two pair of outstretched arms and two pair of outstretched legs.



With these proportions from Vitruvius, you should be able to measure portions of your body in reference to your total height and the results from these proportions should be the same for all human beings. In this laboratory exercise, you will see if this is true! In this activity you will explore the legitimacy of Vitruvius' theory by measuring and calculating your own proportions and comparing them to those used to sketch the Vitruvian Man.

### Vitruvius' theory states that:

\*The foot is \_\_\_\_\_ to the length from the wrist to the elbow.

### These are some of the additional proportions given for the Vitruvian Man:

- A) The span of the man's arms is \_\_\_\_\_ his height. (fingertip to fingertip)
- B) The width of his shoulders is \_\_\_\_\_ of his height.
- C) The distance from the elbow to the fingertips will be \_\_\_\_\_ of his height.
- D) The distance of the whole hand (wrist to fingertip) will be \_\_\_\_\_ of his height.
- E) The length of the foot (longest toe to heel) will be \_\_\_\_\_ of his height.
- F) The bottom of the chin to the beginning of the hairline (the face) is equal to \_\_\_\_\_ of the height.

### Laboratory Exercise Objective

The subject of this lab activity is Leonardo da Vinci's drawing titled "Vitruvian Man".

First predict the proportions based upon understanding of your body measurements. Then actually measure and calculate your proportions. Compare your findings with your lab partner, those at your table, and/ other students throughout the classroom. Compare your data with Vitruvius' proportions for the "ideal" human being.

### Laboratory Resources

Meter sticks, rulers

**Laboratory Procedure** Measurements are needed for both partners. Each will turn in their predictions, measurements, calculations, and conclusion on their separate lab sheets. \*\* Remember to use metric units (cm) and **actually** measure your height in the classroom using the meter sticks provided.

**DO NOT CONVERT YOUR HEIGHT YOU BELIEVE YOU ARE FROM FEET INTO “cm”.**

1. Observe body portions and record your predictions (in chart below) to the list of statements presented by Vitruvius listed on the front of the lab.
2. Remove your shoes and have your partner measure your height as you stand against a flat surface. Measure the distance from the top of your head to the floor. Record your measurement.
3. Working with a partner, measure your arm span by standing against a flat surface and spreading your arms out as far as possible. Have your partner measure the distance from the longest finger on one hand to the tip of the longest finger on the other hand. Record your measurement.
4. Calculate the proportion between your arm span and your height (arm span/height)
5. Measure additional body structures/locations and record data.
6. Calculate all proportions.
7. Compare your proportions to that of the Vitruvian Man.
8. Answer conclusion questions.

	Height (in cm)	YOUR Predicted Proportion (compared to height)	YOUR Predicted Percentage of Height (converted from proportion)	Actual Measured Distance	Actual Measured Percentage to Height	Published Vitruvian Percentage (converted from proportion)	Published Vitruvian Proportion
A	Wingspan						
B	Width of Shoulders						
C	Elbow to Fingertips						
D	Wrist to Fingertips						
E	Length of foot (heel to big toe)						
F	Hairline to Chin						
*	Elbow to wrist= _____ cm Length of foot= _____ cm	*Compared to foot			(*compared to foot)		

**TURN OVER FOR CONCLUSION QUESTIONS: ANSWER QUESTIONS FULLY!**

**Conclusion Questions: ANSWER QUESTIONS FULLY!**

Describe what your conclusions are concerning the validity of the Vitruvian man theory.

Explain, based on your data, why you and/or others in the classroom met or did not meet some or all of the proportions stated by Vitruvius.

