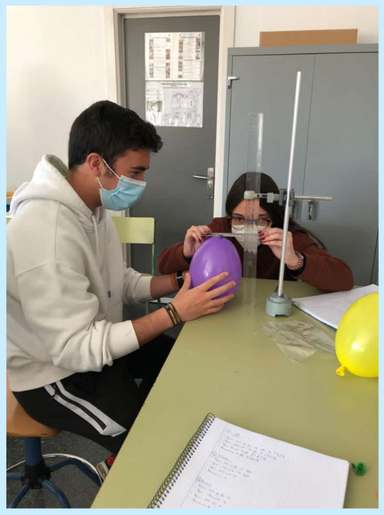
STUDY OF LUNG CAPACITY

M. Martí[1], D. Porras[1], E. León[2]

[1] Students of the IES Fidiana Córdoba
[2] Teacher of the IES Fidiana Córdoba



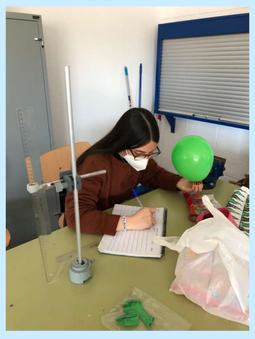
INTRODUCTION

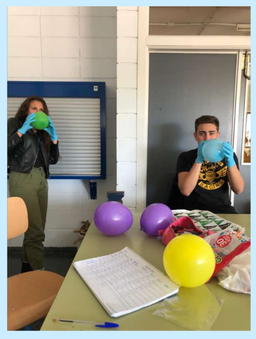
Lung capacity is the volume of air that the lungs obtain when we inhale. A person can store to almost 5 liters of air inside.

The **chosen subject** is interesting, useful and simple since it can be measured with simple instruments. It also affects all of us closely.

The **main practical application** of this experiment is to know what the lung capacity of each person depends on (sex, weight and physical activity), and with it and the results, to know if is needed to be improved his capacity through exercises, since it is a fundamental mainstay in our health.

Our **goal** is to measure the lung capacity of our classmates, to discover who has more capacity and who has less, knowing why.





RESULTS

Subject data:					
Individuals:	Weight:	Sex:	Physical activity:	Balloon diameter:	Vital capacity:
Individual 1:	74	Male	Yes	19,87	3000
Individual 2:	56	Female	Yes	18,17	3500
Individual 3:	77	Male	Yes	22,87	2200
Individual 4:	72	Male	Yes	23,30	4900
Individual 5:	57	Female	No	19,07	3600
Individual 5:	75	Male	No	23,94	4500
Individual 6:	75	Male	Yes	21,70	6000
Individual 7:	61,1	Female	Yes	20,73	6200
Individual 8:	61,5	Female	No	18,87	7000
Individual 9:	50	Female	Yes	15,93	5400

Independent and controlled variables: weight, sex and physical activity.

Dependent variable: lung capacity of each person, which will be related to the diameter of the balloon.

In the table we can see the measures obtained after each student has done the three repetitions. It can be seen how in general the boys have achieved a higher average than the girls, however, we deduce that it is due to the difference in weight. We can also observe that people who perform physical activity have higher averages, independently of their sex.

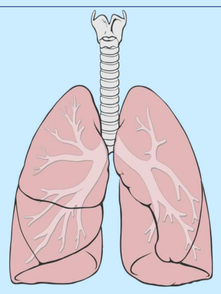
- **Coordinating IES professor**: Dra Elena León Rodríguez
email: eleorod661@iesfidiana.es
- **High School**: IES Fidiana
Address: Calle Saturno, s/n, 14014, Córdoba España

MATERIALS AND METHODS

<u>30 balloons, a ruler, paper and a pen</u>

How to measure lung capacity?

1. Inhale and exhale as much as you can and blow inside the ballon.
2. Make a knot to the balloon to prevent that the air from beaking.
3. Measure the diameter of the balloon with the ruler.
4. Deflate it and repeat this process twice.

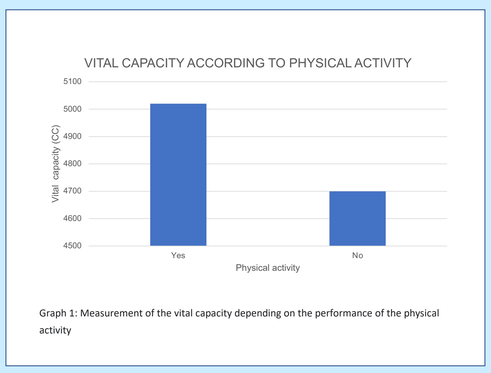


Which factors did we have in mind?

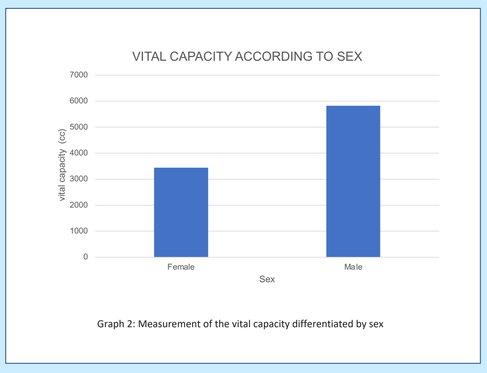
- **Sex :** Men's lung capacity is often higher than women's capacity. The same occurs with muscular performance and development.

- **Physical activity:** Exercising regularly can improve the respiratory efficiency. In addition, it helps to improve oxygen absorption when the air passes inside the lungs. It also improves the oxygen transport capacity of the blood.

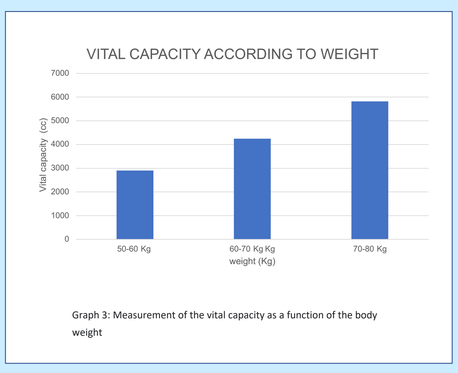
- **Body weight:** The more i the bodyweight, the more air that can be breathed out.



Graph 1: Measurement of the vital capacity depending on the performance of the physical activity



Graph 2: Measurement of the vital capacity differentiated by sex



Graph 3: Measurement of the vital capacity as a function of the body weight

- In the first graph we can see how the people who do exercise normally have a 6% more of vital capacity.
- The second graph shows how the male gender has a higher lung capacity compare to women. It has grown in a 42%.
- Finally, the last graph shows the increase in relation with body weight.

CONCLUSIONS

1) Boys got a bigger balloon diameter than girls. For that reason, they have a better lung capacity. A factor that is also determinant is that they have more strength to inhale and exhale.

2) Physical activity is also a decisive fact and it doesn't depend on the person is sex.

3) Body weight is one of the most decisive facts because the more you weight, the more air you can exhale. So, if you exhale much air, you might be able to supply more cells with oxygen in your body.

BIBLIOGRAPHY:

- Text book
- https://www.riojasalud.es
- https://www.medigraphic.com
- https://www.consalud.es

ACKNOWLEGMENTS:

- To the coordinating teacher: Elena León
- To the teacher, Mª Ángeles Gutiérrez.
- To the IES Fidiana center.
- To the R + D + i Department
- To the Fidiciencia Educational Innovation Project and the Consejería de Educación.