



ESCOLA E. B. 2,3/S Dr. DANIEL DE MATOS
10º Ano **Ano letivo 2014/2015**
Matemática A

October 2014



Worksheet nº 5

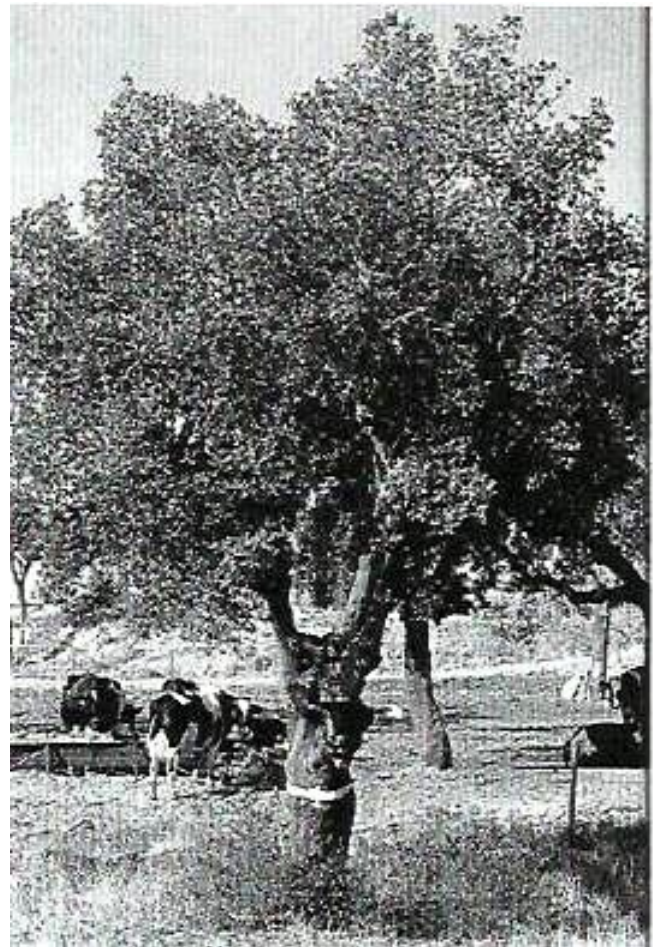
“Our forests, our future”

Worldwide, the cork oak forest fulfils an area of 2.2 million hectares, from which is extracted about 360.000 tons of cork per year.

This particular tree can be mainly found in a region that covers a vast part of the Iberian Peninsula (56%) and a strait zone of the western Mediterranean coast. Portugal is the favorite land for this type of tree (33% of the global area), followed by Spain (23%), North Africa (33% - Morocco, Algeria, Tunisia) and finally, Italy and France (last 11%).

With a forested area of 725.000 hectares of cork oak tree, Portugal has been taking important reforestation actions (between 1993 and 1997 more than 100.000 hectares were planted, which represents an increase of 16%) that make the future promising, having in mind that the rhythm of reforestation is 10.000 hectares per year.

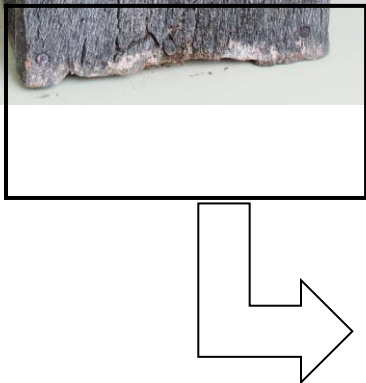
Consequently, is perfectly normal that Portugal is considered the best producer of cork at a global range, responsible for more than 51% of the world production – corresponding, on average, to a cycle of 9 years with 150.000 tons per year.



Within the activities proposed in the project “Our forests, our future”, the mathematics teacher of the class 10^oA, asked them to bring a piece of cork to school. Immediately, a student called Emília Duarte brought it ceded by Mr. Vítor Manuel Silva. The following pictures were taken.



Pic.1



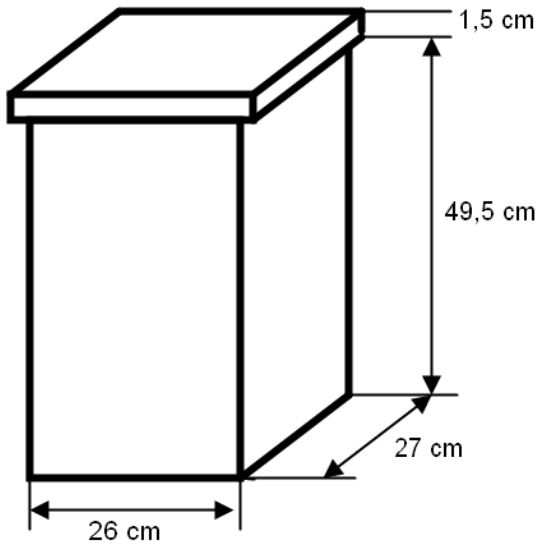
Pic.2



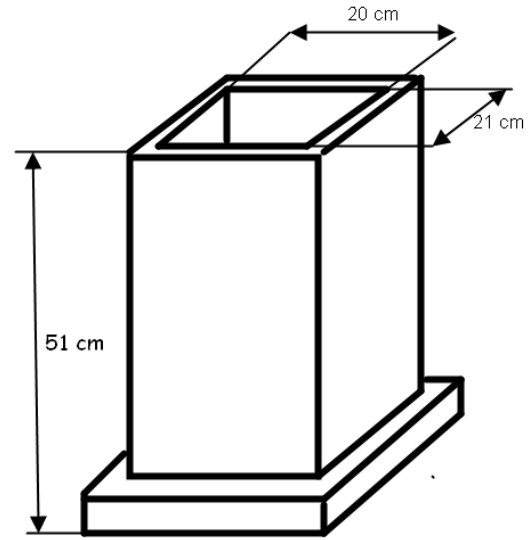
Pic. 3

Note: Bee's entry

Then, this portion of cork with a parallelepiped form was measured.



Pic.4



Pic.5

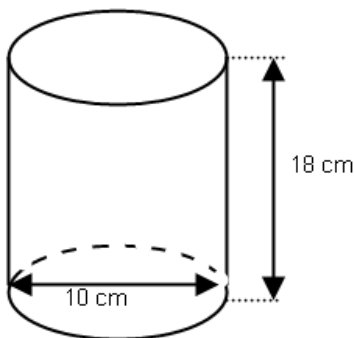
Note: These pictures are not in scale.

1. Find

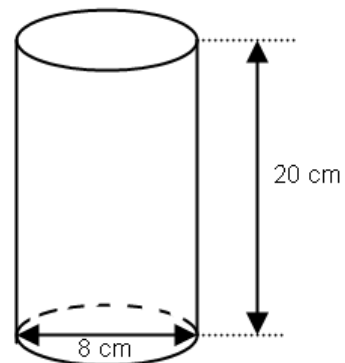
- 1.1. the outside lateral area
- 1.2. the internal lateral area
- 1.3. the area of the base
- 1.4. the volume of the cover/ top

2. If we could completely fill this object with honey, how many liters would it take? (show the result approximate to the unit, tenth and hundredth)

3. That honey is going to be placed in cylindered bottles. They have this measures:



Bottle A



Bottle B

3.1. Calculate:

3.1.1. the volume of bottle A;

3.1.2 the volume of bottle B.

3.2 Mr. Vítor wants to sell his honey in bottles that make it possible to storage 1 liter of honey. Which bottle should he use?

4- Mr. Vítor wants to substitute the sticks represented in the picture nr 6.



Pic.6

Find the length of those sticks, knowing that they need to enter 1cm in the cork.

Cork oak trees, in Portugal, capture to 14.7 tons of CO₂ per hectare

Font: Agência Lusa

Santa Maria da Feira, September 30 (Lusa) – Portuguese cork oak trees can annually absorb up to 14.7 tons of CO₂ per hectare, as it is said by the first study that can quantify that quantity of gas, quoted by the president of Associação Portuguesa da Cortiça (APCOR).

Stated by Lusa, João Rui Ferreira referred an investigation from Instituto Superior de Agronomia showing that a healthy amount of cork oak trees produced an annual amount of 400 grams of carbon per square meter (14.7 tons of CO₂ per hectare).

The president of APCOR admitted that this fact was not surprising, but it was the first time a study made by Portuguese investigators allowed the demonstration and quantification of this ability, as well as the factors that can influence them.

Having in mind that the forest certification and the increase density of cork oak trees have a positive impact on the capture of CO₂, João Rui Ferreira announced that APCOR is trying to find new methods to make this two realities grow.

The study results are seen as very relevant. Indeed, last week, in the context of Cimeira do Clima das Nações Unidas, it was insisted that the increase of greenhouse gases lead to climate changes. So the storage of carbon in medium term on the forests will help to mitigate the emission of CO₂ (with fossil origin).

“The cork oak trees have a really slow growth. They can reach to 200 years and the lower fire incidence than others species, makes the storage of carbon for longer periods of time”, said João Rui Ferreira.

He also assumed that “the forest certification guarantees the fact that these trees are managed according to projects that enhance biodiversity, conservation of soils, hydrologic regulation, promotion of an unique cultural heritage available for the community and the defense of a huge social value, which creates work in low income areas.”

Moreover this certification is going to be “a massive factor of differentiation between our cork products and other countries products”, he added.

“Therefore, cork is going to be reinforced as a global trend”, concluded the president of APCOR.

The European Union created, in 2008, ICOS – Integrated Carbon Observation System, in which Portugal has been working on quantifying the capacity of annual retention of carbon by the cork oak trees.

According to APCOR, for example in Évora, even if there is a low density of cork oak trees (with a tree coverage of 30%), this trees can annually seize up to 179 grams of carbon per square meter – 6.56 tons of CO₂ per hectare.

If the Instituto Superior de Agronomia proved that areas with a bigger arboreal density can retain up to 14.7 annual tons of this gas per hectare of forest, APCOR estimates that in a wider geographic perspective, the western Mediterranean cork oak trees have the ability to absorb a quantity of 30 million tons of CO₂ per year.

Teacher Ana Maria S. L. Baptista