



Agrupamento de Escolas de Vila Nova de Poiares

ESCOLA E.B. 2,3/S Dr. DANIEL DE MATOS

School year 2014/2015

8th Grade

Worksheet

The mathematics of pine trees

Project Our Forest, Our Future

A figure is supposed to have **axial symmetry** or **reflection symmetry** if reflection is found at least in relation to the respective **reflection axis**, in which the figure is invariant, or if the final figure coincides with the initial figure.

Practical example



1. Bearing in mind the figure shown, determine the reflection of the original figure, according to the axis of symmetry.
2. Then, subdivide the figure into three polygons and classify them according to their sides.
3. Calculate the area of the pine tree as well as its perimeter.
4. With the help of a scissor, cut the pine tree you obtained out of the paper and create two similar figures in cardboard, so that you can build a Christmas tree afterwards.

Pine trees

In Portuguese forests there are two types of pine tree varieties: the maritime pine and the stone pine.

The **maritime pine** (*Pinus pinaster*) is a species of pine trees that originates from the Old World, more specifically from Europe and the Mediterranean region.

It is a medium-sized tree that can reach from 20 to 35 meters height. The crown of young trees is pyramidal and in the case of old trees the crown is round. The trunk has a thick rugged brownish-red deeply fissured bark. The Mediterranean subspecies tends to have a thicker bark, which may cover more than half the size of the trunk. Its leaves are stout, needle-shaped, grouped in pairs and with 10 to 25 centimetres length. Its branches are dense and circularly ramified and in the case of young trees they are sparse and large. The blossoming process begins in February and ends in March.

The pinecones are 8 to 22 cm long and 5 to 8 cm large, are symmetrical or almost symmetrical, light brown and bright when they are ripe. They ripen in the end of summer of their second year and release numerous seeds with a wing, usually known as pine nuts.

The maritime pine was originally a fast growing species in the coastal area in sandy soils North to Tejo, where the ideal phytogeographic conditions are found: humidity and Atlantic influence. Due to human influence it is currently spread all over the country, localized mostly in the extreme North and Centre of the country (Beira Alta, Beira Baixa, Beira Litoral and Ribatejo), where the 812 000 planted hectares represent 62,5% of the total area of pine trees in Portugal; it penetrates up to Trás-os-Montes and Beiras, as well as into the coastal line from Minho down to the Peninsula of Setúbal.

On the Island of Madeira, the maritime pine covers 70% of its planted area.

This forest species plays a significant economic role. It has been profusely planted as it is an important source of wood, protects the surrounding areas against wind, and due to its profound root it helps protect sand dunes besides supporting the recovery of poor eroded soils. The wood, which is resinous, light red or brownish-red coloured and full of knots, is durable, barely flexible and heavy and is therefore used in furniture, poles, formwork, boxes in general, wood shavings, carpentry, shipbuilding, combustible, and cellulose. The resin is extracted to be used in paint, varnishes and turpentine industries. The bark that covers the trunk is rich in tannin, which is used in the tanning of hides.

Teacher Fernanda Carvalho