

## HOW DO WE KNOW WHAT ANCIENT CIVILISATIONS KNEW ABOUT THE MOON?

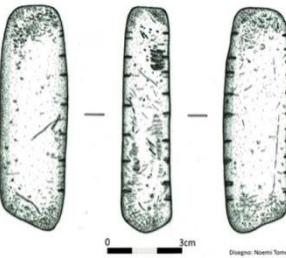
### INTRODUCTION

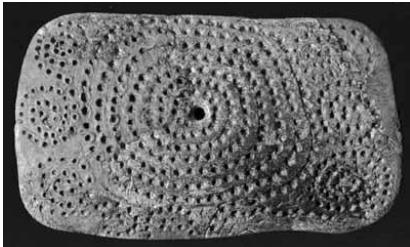
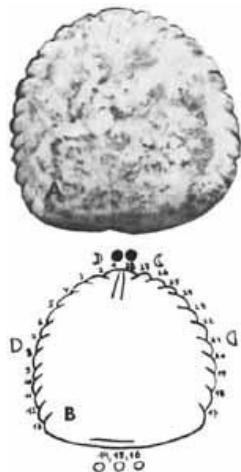
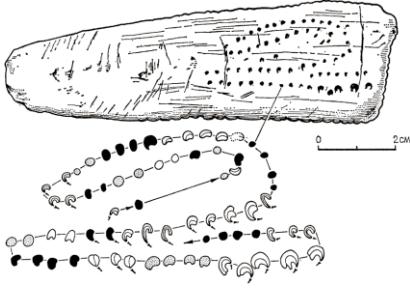
The objective of this didactic unit is twofold, on the one hand it is to bring the world of archeology closer to our students, and depending on the time we have available, a more comprehensive presentation on archeology can be made. It is a discipline that is important to highlight and that we cannot always refer to. Nevertheless it is of vital importance for the knowledge of the ancient pre-writing cultures, as well as of those cultures that had writing, archeology can equally illustrate other aspects.

The second objective is to know what was thought in antiquity about the universe and of the moon, how prehistoric cultures were drawn in the cosmos and its possible interpretations since the 21st century.

With this didactic unit, it is intended that our students become prehistoric men and women and carry out an archaeological study of the lunar calendars and other found elements, as well as studying the way in which researchers of today relate to lunar knowledge.

### 1ST SESSION: Divided into groups, analysis and research of the different objects

Image of object (more information by clicking on the image)	Interpretation:
	<p>"Research has revealed that the slots have been inscribed over time with multiple sharp stone tools, as if they were being used to count, calculate, or store the record of some type of information."</p> <p>The fact that the engravings present the same number of days of the synodic or sidereal lunar month represents a unique case among the supposed objects interpreted as "lunar calendars", which makes the Monte Alto specimen the oldest and most likely example of this category of artifacts in the prehistoric world.</p>
	<p>The great deer of Laxe dos Carballos, in Campo Lameiro (Galicia), looking to the right, towards a large circular motif. The number of antlers on its horns, and the way they are distributed, are a display of astronomical accounts. 12 is the number of lunar months in a solar year. <math>(12 + 3) \times 2 = 30</math> is the round number of days in a lunar month. The next step is somewhat more complicated. For this we have to take into account the three isolated stripes ("horns") (in yellow) next to the tip of the right horn that we postulate as the indicator mark of a three-year lunisolar cycle. This would be counted, starting with the point closest to the three stripes, such as <math>12 + (12 + 1) + 12 = 37</math> lunar months in 3 solar years. The isolated "horn" at the top of the left horn could be the intercalary month</p>

	mark (© Juan A. Belmonte).
	<p>Mal'ta (Irkutskaya Oblast, Russia) is a Siberian site located near Lake Baikal, in which an important collection of movable Palaeolithic representations (18,000-15,000 B.P.) has been documented. In addition, the archaeological record has provided an ivory plaque that Soviet archaeologist Boris Frolov interpreted as a lunar calendar. It is a rectangular plate in mammoth ivory in which a central spiral with seven growing coils has been drawn through the incision of holes. The set is closed with two groups of smaller spirals on the sides of the plate. 243 holes are observed in the central spiral, while the sum of the rest of the spirals denotes another 122 holes. An easy calculation of the total holes gives us the sum of 365, exactly the duration of one year. On the other hand, in the Siberian area of Mal'ta, the duration of winter lasts precisely for 243 days, for 122 in summer. An important aspect to consider and that reinforces the consistency of the calendrical interpretation of the Mal'ta plate is the gestation cycle of the reindeer, basic in the diet of the area due to its important caloric intake that helps to combat low temperatures, being 243 days.</p>
	<p>In Hungary, at the Bodrogkeresztur site, a limestone archaeological artifact was found whose excavators interpret it as a lunar calendar. The dating (by context) is around 20,000 years (Solutrean). The object has a round shape with notches on the edges, the side without marks is flattened. Two vertical lines are engraved on the upper part, flanked on the left by twelve marks and on the right by eleven other. The set is closed at the bottom with an engraved horizontal line. The vertical line on the left along with the other twelve notches are interpreted as the first thirteen days of the lunar cycle, the crescent, on days 14, 15, 16 would be represented by the lower horizontal line, the eleven notches on the right would represent the final part of the cycle, the waning quarter. Finally the vertical line on the right would represent the last day of the month.</p>
	<p>In the French Dordogne, in the Blanchard coat, a scapula was found with 69 circular markings that, according to the North American anthropologist A. Marschack, must be interpreted as the different moon phases. We would be before the representation of two lunar months and a half. In fact, the marks seem to be miniature drawings of the moon, some engraved in a completely round shape, and which would represent the full moon, the rest do not just take a fully rounded shape, so there is a clear interpretation of increasing and decreasing quarters , the rooms are drawn to the</p>

	<p>right or to the left. The representation begins at the center of the plate's surface, following a meandering line with cumulative and sequential markings that the first astronomers of humanity would assimilate to the continuity of the lunar changes observed in the sky. The archaeological levels in which this lunar calendar was recovered correspond to the Aurignacian, at the beginning of the Upper Paleolithic, so the dating of the plate dates back to 30,000 years.</p>
	<p>The object in question is an almost round bronze disc, about 32 centimeters in diameter and about 2 kilos in weight. Its surface is decorated with gold motifs, which represent the night dome and where you can find the moon, the stars, a circular star that can be a representation of the sun or the eclipse moon and a group of stars, in that the Pleiades can be clearly seen. A ship is also represented and, on the margin, two later superimposed arches. Nebra's disk is the oldest known representation of a particular cosmological image.</p>

## 2nd AND 3rd SESSION

They will proceed to their study and recreation, each group will have to choose the materials that best suit their representation, they will be as creative as they want and they will have to explain it. At the end of the third session they will make a museum-type poster with the basic information for their exhibition in the center.

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