

USING THE METHOD OF INTERDISCIPLINARY CONNECTION - A FACTOR OF INCREASING THE EFFECTIVENESS OF THE LESSON

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ABSTRACT

This article highlights the fact that interdisciplinary connection is a guarantee of the quality of the lesson.

Keywords: Interdisciplinarity, sky coordinates geographic coordinate system, geographic longitude, geographic latitude, illuminant deviation and correctness.

INTRODUCTION

The subject of astronomy has its own characteristics, knowledge of each astronomical process and phenomenon, the physical processes involved in them, the structure, emergence and development of the universe, skills, mainly through observation.

Therefore, teaching the lessons using modern pedagogical technologies on the basis of educational tools increases the quality and effectiveness of teaching. The use of didactic materials is especially important in explaining the content of the training. In particular, the purpose of the department of practical and spherical astronomy is to provide students with knowledge, skills and abilities to determine the positions and daily movements of the starry sky, constellations, to create astronomical calendars and tables based on them, and to measure time.

The stars, creating their tables and creating skills in their use are considered to be the main issues of practical and spherical astronomy. This problem is solved by introducing the concepts of coordinate systems in astronomy. In order for students to have a correct idea of the coordinates of the sky, it is necessary to first arm them with information about the basic circles, lines and points based on the model of the celestial sphere.

In order to ensure the understanding of astronomical educational content for students, it is necessary to pay great attention to methods such as analogy, imagery, interdisciplinary connection and thought experiment during the lesson.

For example, when introducing students to the main points, lines and circles of the celestial sphere, as well as celestial coordinate systems, the conventionally accepted, main lines and circles of the Earth studied in the geography course (equator, parallels, Earth's axis and poles, meridians and hakazo) recall and analogy work well (Table 1).

Table 1

Geographic coordinates and expressions	Astronomical coordinates and expressions
φ – geographical extension, $\varphi=0^{\circ} \div 90^{\circ}$ Arc length of Earth's equator	d-deviation angle, $d=0^{\circ} \div 90^{\circ}$ distance from the celestial equator
π – geographic longitude, $\pi=0^{\text{h}} \div 24^{\text{h}}$ Distance from the Greenwich meridian on the Earth's surface (Fig. 4)	t is the hour angle, $t=0^{\circ} \div 360^{\circ}$ a – right exit angle, $0^{\text{h}} \div 24^{\text{h}}$ from the vernal equinox to the deviation circle past the illuminator h-height, $0^{\circ} \div \pm 90^{\circ}$ (from horizon to illuminant) A-azimuth, $0^{\circ} \div 360^{\circ}$ or $(0^{\circ} \div \pm 180^{\circ})$ The horizon plane from the S-south point to the intersection of the vertical circle with the horizon (Figures 1-2-3)
Earth's equator	Celestial Equator
The north pole of the earth	The North Pole of the Universe
The South Pole of the Earth	The South Pole of the Universe
axis of rotation	The axis of the universe
Earth parallels	Daily parallels
Earth's meridians	Deviation Circles of the Celestial Sphere
Meridian of Greenwich	γ deviation circle passing through the point

By making a model of the northern or southern hemisphere of the celestial sphere and representing the mathematical horizon plane and the dream line, students will have an idea of what the celestial sphere would look like to an observer on the mathematical horizon plane.

It is appropriate to use a black globe to reinforce the concepts introduced above. The reason is that the main circles and points reflected on the black globe are in color images, and according to their appearance, the illuminants of their reflection seem to be at the same distance to the observer, and it is known that it is enough to use two coordinates to determine their positions in the sky. Iadi As a result of long observations, it was found that the relative positions of the luminaries do not change, but the daily and annual visibility conditions change, the coordinates are two different, i.e. h - height, A - azimuth (Fig. 1) and t - hour shows the change of the angles, d - deviation, a - the correct output angle does not change. It will be shown that they can be used for different purposes.

Horizontal coordinates (h,A) in the study of the diurnal movements of the lights and from the hour angle (t) (Fig. 2) , and the second system of equatorial coordinates (Fig. 3) (d – deviation and a – correct exit) when making the table astronomical calendar and maps of the stars from it is emphasized that it should be used.

Appropriate use of the above-mentioned didactic materials in each training session of practical and spherical astronomy develops students' spatial imagination, abstract thinking skills, acquires new mathematical concepts, and ensures the foundations of interdisciplinary communication. The acquired knowledge is important in forming the scientific outlook of students.

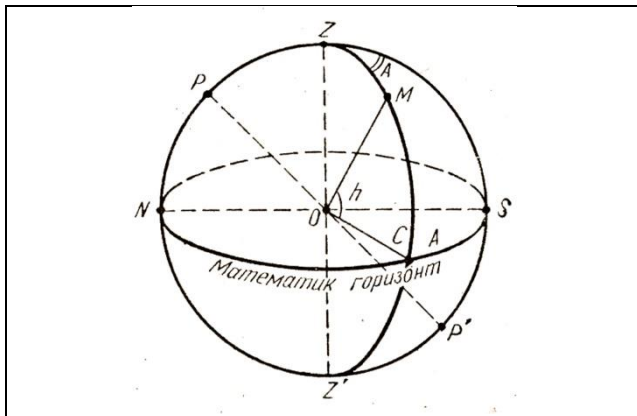


Figure 1. Horizontal coordinate system

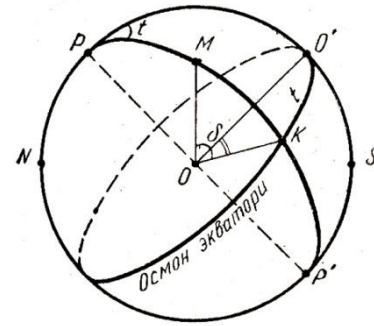


Figure 2. The first system of equatorial coordinates

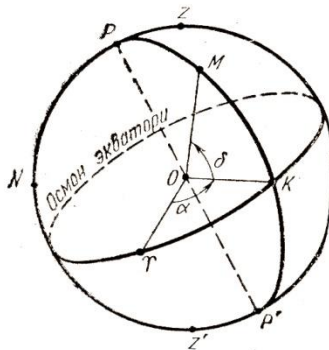


Figure 3. The second system of equatorial coordinates

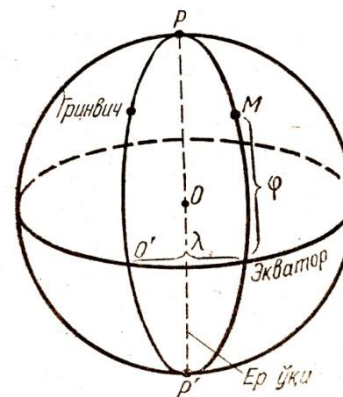


Fig. 4 Geographic coordinate system

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