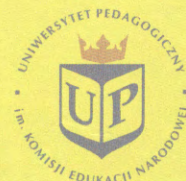


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EARTH: A SOMEWHAT BIGGER LABORATORY FOR SCHOOL PHYSICS

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New requirements for Polish secondary school curricula, introduced by the Ministry in 2007 and getting fully operative in next year, removed physics, geography and biology from upper years of lyceum, leaving only very generally defined "Science". This is, as compared for example to the United Kingdom, an "upside-down" system. In the UK "Science" is a part of the lower secondary school and well defined physics + biology (or any chosen by students combination of 2 or 2 ½ subjects) is a part of the upper secondary school.

In present paper we show, that respecting the requirements legally in act, the "Science" in the upper secondary school can, in spite of the above mentioned difficulties, become an important vector of the qualified, nationally-important education. The proposed way of resolving of this important educational task can be a "bottom-up" action – of defining inter-subject cognitive packages, comprising different sciences – geography-in-between-physics, biology-in-between-chemistry and so on. These packages, following the EU educational and scientific requirements must be interdisciplinary, intersectorial, scientifically challenging, pedagogically significant, socially useful.

Present paper concentrates on some geography-in-between-physics packages. Recent progresses in ultra-sensitive isotope analysis of "exotic" species like Y or Zr allowed to establish the age of Earth to 4.567 billion years. The novel, low-orbit satellite "Goce", allowed to define the topology of geoid with cm precision. The present, globe-wide net of seismic stations allows to distinguish the type of tectonics according to the angle (and speed) of plates subduction. The depth of Moho surface defines well the age of continents. How to translate these most recent scientific discoveries into a simple-language teaching in narrow limits of secondary-school hours, with pupils dis-interested in science? We illustrate globe-range phenomena with simple experiments to be done in class, to be seen in science centers [1] or to be copied from Didactics of Physics UMK web site [2]. Geostrophic winds, seen above Azory Islands in January are due to Coriolis force; the upstreaming in subtropical hurricanes is due to the fast rotation of air. We bring portable experiments that allow to link the present, somewhat phenomenologic didactics with cognitive reasoning, respecting interdisciplinary requirements and the most recent scientific discoveries.

References

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