



AIR AND WATER IN NATURAL SCIENCE EDUCATION – SELECTED TASKS AND ACTIVITIES FOR REVISION LESSONS

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Annotation

A need to combine school knowledge with everyday life knowledge, skill of understanding of natural world already exists during lessons of science nature at elementary school. To show to pupils, which information, news, skills are particularly important, useful and indispensable for far education, revision lessons be led. Teachers know that these lessons play an important role in process of teaching. All exercises should have definite content-related and didactic value. Taking into account the natural children's knowledge, the amazing curiosity of world, spontaneity, passion for asking, teachers should prepare exercises in a proper way. Child's creative abilities from literary, artistic, theatrical ones and its actual knowledge should be also used to prepare some selected activities.

Key words: *natural science education, revision lesson, teaching process, didactic materials.*

Introduction

The reform of education, which was introduced in 1999, changed the entire concept of teaching at a primary level. During the first three years at primary school we deal with so called integrated teaching. At the second stage of primary schooling (grades IV to VI) some subjects are now taught in a block system. New integrated subject appears within the nature studies block – natural science. The natural science contains elements of previously specialist subjects: geography, physics, biology and chemistry. There occurred a significant shift in teaching aims from presenting numerous encyclopaedic details and facts to giving the insights into the fascinating, beautiful, varied and multiple world of nature. The main goal of that subject is to make pupils interested in surrounding world, its diversity, richness and beauty, as well as acquisition of skills like: observation of nature and its describing (MEN, 1999). Activities are now being designed to meet newly defined standards and objectives. Pupils should have an opportunity to discover dynamic interplay between elements as well as continuous processes and phenomena taking place in the environment. The tasks must show that science is directly related to pupils' ordinary life. The key point of departure for presenting all themes will be the aspect of wholeness. The holistic concept of the natural world, with all interrelationships especially between the man and the Earth should generate an attitude of reverence and responsibility in young people. This in turn will later allow to shape youngsters' ecological aspect of education including environment protection, recycling and all pro-ecological projects. Ecological education means both the actual knowledge and changes in pupils' way of thinking and every day habits.

All modes of teaching should as a matter of fact be suited to development capacities of the 10-11- or 12-year-olds.

I would like to present examples of work schemes (tasks and activities) designed for the purpose of revising two scientific issues: water and air. The themes of water and air are constantly recycled in primary curriculum (Szpiliska, Kluz, Poźniczek, Wojciechowska, 2000). This allows pupils to fully utilise acquired knowledge at the next educational stages. As for revision lessons, they undoubtedly play an important part in the learning process. It is then that

separated chunks of knowledge are recalled, structured and consolidated. Only after revision do pupils sit a test and their performance is marked accordingly.

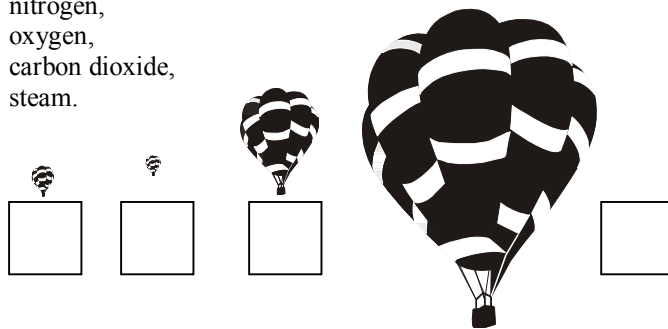
To be effective, a revision lesson should necessarily contain tasks that are based on group work (Reid, Forrestal, Cook, 1996). Teamwork creates a relaxed, playful (play is a favourite activity for children at this age) and stress-free learning atmosphere. In such an atmosphere pupils are not anxious about receiving a bad mark for making a mistake. A decision can be made not to give bad marks for teamwork at all. In a group there is a space for choice making, discussion and exchanging ideas. Social benefits of such a method cannot be underestimated. The group work teaches the skills of negotiation, active listening, competition and creative thinking. In terms of personal development it can strengthen one's self-esteem and give a chance to defend ones own ideas. And finally pupils have a genuine opportunity to ask –why it is so? And that is the whole point.

Some selected activities and tasks are illustrated below.

Chapter: AIR

1. Complete the balloons with the numbers which correspond to the components of the air. Why do the balloons differ in size?

- 1- nitrogen,
- 2- oxygen,
- 3- carbon dioxide,
- 4- steam.



2. Which cloud shows the mixture of gases that is:

- inhaled,
- exhaled.



oxygen, nitrogen,
carbon dioxide



oxygen, nitrogen approx. 0.03%
approx. 4 % carbon dioxide

3. Complete:

- current state of the atmosphere is called ...

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- is one the air characteristics

--	--	--	--	--	--	--	--

- the weight of the air exerted on the earth surface is called ...

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- the air does not take any particular

--	--	--	--	--	--

- air is a ... of gases

--	--	--	--	--	--	--

- a mass of watery vapour floating in the atmosphere

--	--	--	--	--	--

- during frost water fog changes in ...

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Letter in the dark fields – read in turn – create a password.

The found word is Explain it.

4. Match the words with their description:

*atmosphere, a change in atmospheric pressure,
wind, cloud, humidity, precipitation*

rain, snow, hail

**when it is high,
it is going to rain**

**protects us from
scorching sunlight and
ice-cold nights**

**gets formed when
humid air rises up**

**air which moves from place to place
up – when it warms
and down – when cools**

**driving up the mountain
road we can feel**

5. Working in groups, collect photos, pictures from magazines or draw pictures and make a poster about air impurities and their sources. Discuss this problem. Describe the influence of air pollution on living organisms and nature. How can it be reduced? Write it down.

6. Write “yes” or “not”

- Thermometer is used to measure air temperature.
- Barometer is used to measure atmospheric pressure.
 - Manometer is used to measure velocity of wind.
- Barometer is also called manometer.

7. Colourful fan (windmill) turned 15 times in 2 minutes. Calculate the speed of wind that is the number of turns per second.

Chapter: WATER

1. a) Match the pictures with the word:



melting

vaporization

solidification

condensation

b) draw line between two related elements:

water boils at 100⁰C

the freezing point

the melting point of ice is 0⁰C

condensation

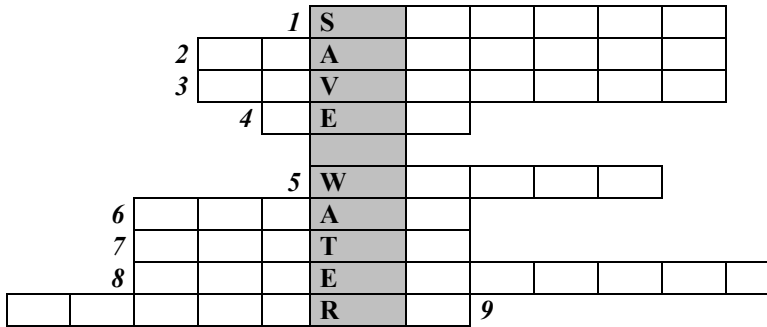
the change of the liquid to the solid state

the temperature at which ice melts

the temperature at which water freezes

the boiling point

3. Complete the logogrigh:



- 1- the place where the river starts is called ...
- 2- not-moving water in lakes
- 3- rivers carry sand and mud that can form in places where water gets shallow
- 4- a huge amount of salty water
- 5- sustains life of people, animals and plants
- 6- one of air component
- 7- in high temperature ice easily
- 8- water is led to your home through
- 9- the place where the river meets the sea is called ...

Letter in the dark fields – read in turn – create a password.

3. Your Mum has put a bottle of Coke in the freezer and has not removed the cap. What will happen to the bottle? Explain it.

4. Complete the text:

Water falling to the ground as rain, snow, sleet or hail is partly by rivers and flows into the sea, partly into the ground (as underground water), and partly (raising up into the air and making clouds to eventually fall back to earth).
 Water drops in air form Clouds are moved by far into the earth.

5. Draw 5 pictures which show everyday activities connected with the right way of saving water and the bad way of saving water. Put your ideas in a table like this. Report your ideas to the class.

The right way of saving water	The bad way of saving water

6. Below there are factors which determine the existence of life forms in water. Complete the missing elements. Colour in blue the factors that you consider are the most important.

..... water density

..... amount of oxygen in water

..... temperature fluctuations

..... water transparency

..... insolation

7. There is 10 cm^3 water in a glass box. The capacity of 1 water drop is 0.04 cm^3 . How many drops are there in the glass box? If you know that the mass of 10 cm^3 of water is 10 g, what is the mass of 1 water drop?

All proposed exercises have been used in school practice. This form of revision lesson permits progress of these skills, which take place in natural science curriculum e.g. the effective communicating in different situations, presentation of one's own point of view and taking into consideration opinions of other children, science correctness, ability to correct express, correct diction, preparation to public speech, public appearance. Pupils become fine decorators, painters, strategists and also actors.

All activities of pupils, all thinking operation which are carried out by pupils are controlled by the teacher. In the open study process the teacher's role changes. The teacher has to master a series of new skills more often. Teacher becomes the guide of classes, expert – consultant, feedback provider, observer of actions of pupils and arbiter in controversial situations. Pupils gradually make analyses, compare facts, discuss them, and go through the process of decision-making and application.

This procedure is an integral part of science teaching. These activities help create and prefer the required pupils' learning style.

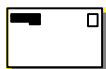
References

MEN (1999). Podstawa programowa kształcenia ogólnego dla szkół podstawowych i gimnazjum z dnia 15 lutego 1999. Dz.U. Nr 14.

Reid, J., Forrestal, P., Cook, J. (1996). *Uczenie się w małych grupach w klasie*. WSiP, Warszawa.

Szpilska, A., Kluz, Z., Poźniczek, M., Wojciechowska, H. (2000). *Poznajemy tajemnice przyrody. Poradnik dla nauczycieli przyrody*. Wydawnictwo UJ, Kraków.

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