

Natural Phenomena and Meanings in Pre-school

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Abstract: The approach and understanding of the concepts and phenomena of Natural Sciences by preschool children was and is the purpose of teachers and mine to form models of mental development and their comprehensive development. For this purpose I try to create the appropriate learning environment with an interest in experiments and explorations of natural phenomena such as “Air”. The issue is accessible but not understandable. So I describe how I designed, organized and created the right conditions for infants to participate and interact in the experiment, but also in the activities performed to understand the concept of air.

The result was positive and fun. The infants had new experiences and acquired new knowledge that will be useful in the next levels of education, but also in their own lives.

Key words: classroom, air, experiment, exploration, reflection, new knowledge, environment, energy, sustainability, new life

1. Introduction

In the field of science in pre-school, we can observe a great interest the last few years. It is commonly accepted that Sciences at an early age can wholly help children’s growth, enriching the world before their eyes, developing their observing, assuming and resolution skills. Finally, they can build up a foundation of scientific knowledge that will help them understand the various meanings. At an early age, before even going to school, children arouse an interest in various things, gain experiences and have the ability to form an opinion on natural phenomena. This point of view is not always in accordance with scientific facts. Meanings, show cases and phenomena have been presented in real life but they are not fully understood. It is vital to know what children think about these natural phenomena that we are about to teach. School, as an educator, and we ourselves as teachers should explain all the possible meanings of natural phenomena which are difficult for preschoolers. We should organize teaching through suitable activities that will lead their development of ideas step by step and help them think from the scientific point of view. We should create a cooperative environment, interacting through a pleasant way that will arise the interest. We teach them critical thinking, encouraging them to express themselves. We must embrace their thoughts and urge them to prove them true. Before carrying out any kind of experiment, it is vital to ask the children to predict the result. In this way, they can express various ideas and review their false statement. When they go through their experiment, they will face an unpredictable result. Approaching the explanation of a phenomenon, will definitely require scientific terminology and complex meanings. We have to make it simpler, to make it more understandable to children of this age, without changing the meaning. Knowledge will be shared through simple, ordinary cases, organized in a way that it will accommodate their needs

and will address to their level of knowledge and mental development. In order to introduce preschoolers into the world of Physics, we should primarily start learning about their interests and their queries. After that, we can use the example of weather conditions referring to every single season or natural phenomenon. Sometimes the weather is so severe that it can cause feelings of fear. The feeling of fear after an earthquake or a thunder or the feeling of joy after seeing a rainbow can be studied and through them we set the basic goals of attaining knowledge. This can be achieved through observation, through various activities and other supporting materials used.

2. The Main Topics of Interest Are the Following

- weather
- weather phenomena
- water and its forms
- light
- air
- sound
- our body
- our body and gravity-magnets
- day and night
- earth and other planets
- climate-climate change

Their first reactions should be taken into consideration (e.g., water-rain, water-snow, and water-ice). All these activities should be done through experiencing and must be visible. Through these show-cases (water-changing) children can understand their meaning and attain knowledge. Teaching Natural Sciences in pre-school is conducive to the attempt to pass through primary experiencing to a more higher level of perception, in a more processed way of thinking.

In a recent study (1998), it is noted that students often misinterpret the phenomenon. But this is only due to their well-established beliefs. Meanings evolve from intuitive models to more advanced ones. Judging by how important teaching Natural Sciences is, the starting point should be pre-school. The starting point at this age is experiencing. You can create the solid ground of a learning model that later on can be developed into a more complex scientific level of knowledge as they advance in their educational level. We, as educators, should create and organize activities through troubleshooting in order to lead our students to more revised ideas and learn meaningful data. The information they gain is a structure of data that they will evolve over time through their learning ability. Therefore, when referring to Natural Sciences in pre-school, one should pursue the joy of exploration, the use of imagination, the ability of observing and recognizing what is needed to be explored. This gradual attainment of new meanings in a more complex way will become a more substantial structure that can be modified by the schooling environment. In this way, they understand their surroundings and can approach Natural Sciences through describing, focusing on the distinct characteristics of the phenomenon they perceive around them. After observing all these phenomena, children's answers include a lot of explaining. This is how they can rationalize natural phenomena. These primary perceptions can be approached through a reorganized method and create the basis for further illustration later on and refer to more complex processes as they grow older.

3. Mental Solid Grounds Are Built for Further Education

In the early levels of education in pre-school we teach natural sciences in collaboration with children and we encourage them to contemplate, express their points of view, predict and experiment. When they have carried out the experiment, they will face an unpredictable result. This will lead them to reconsider their personal experiences and realizations. Thus, we choose a whole new project using suitable activities and experiments to serve the aforementioned goals.

In our school, I have chosen air as a natural phenomenon in order to track it, experiment, reconsider and after understanding it, attain its meaning.

Air, for children, represents something that exists but nobody can see or touch. Children do not recognize the presence of air in a place. One would say that, in their little minds, air is not a material. Children consider based on their experience that you can see a material and you can handle it. It can be resistant and it can be weighed. I have created a project through which I would like to motivate children and understand that air exists. It can put strain on other materials, it can have resistance and it takes up space as it can be weighed. My goal is to reverse their wrong realization. Air is not a material. I can help them in their transition to a more scientific way of thinking. Air is matter.

I helped children wonder:

- 1) What do they know about air?
- 2) Where does it exist?
- 3) Can we feel it?
- 4) Does it move? Does it make other objects move?
- 5) Does it create power when it moves?
- 6) Is it useful to humans and why?
- 7) Can it be weighed?
- 8) Can we create art through it and what kind? (e.g., music, singing, painting, dancing)

Proposed activities:

A) Goal: perceive air through senses.

Sensing the air:

- 1) Have a conversation.
- 2) Check your breathing (inhale-exhale) to explain its necessity to live.
- 3) Get out in our school playground. Urge the children to run with their hands wide-open and describe the feeling or the air.
- 4) Put water on your cheeks and then we can feel it more intensely as air touches our face.
- 5) Try to move air with your hands.
- 6) Produce air through a hand fan.

4. Where Can Air Be Found?

B) Goal: Perceive that air is everywhere.

Activities: Through the children's answers we had to search where air exists. Afterwards, I gave every single child a plastic bag and asked them to trap air. Truthfully, it turned out to be a very interesting and entertaining

game in the form of exploration. Children feel great amazement when they find out that air is in places that they couldn't have imagined. Under a table, in the bathroom. They were impressed that they could define air!

C) Moving air can produce movement towards other objects.

Activities:

- 1) Making sailing boats with a piece of cloth that will sail across a transparent basin filled with water.
- 2) Making mills.
- 3) they blew the mills and they moved.
- 4) We have made a discovery. We placed the mill under the tap. Tap water made the mill revolve.

Conclusion: Children understood that not only the air but also water can produce movement.

D) Is air a moving power, even when it is not moving? Can it push other objects like water or other solid material?

5. Experimenting

1) A basin, a plastic bag, a cube of sugar stuck at the bottom of the glass. We deep the cube but it doesn't dissolve. The air cannot push the water down to the bottom and make the sugar dissolve. What if we opened up a hole on the bottom of the glass? The air would come out and the water would fill the glass, dissolving the sugar. Water is the winner of the game.

2) A transparent tube and two cork caps.

We secure the tube with the two cork caps on both sides and push the one cap. We see that the one cap moves the other one. What has happened? The one cap pushes the air within and it in its turn pushes the other cap outwards. We understand that air, like water, has the power to move even a solid material such as a cork cap. We can also blow up balloons and go out in our playground when it is windy. The air blows away the balloons. When it is Carnival time, we fly a kite that we have fashioned on a windy day. It goes up, up and away.

E) Air takes up space.

Goal: Children realize that air, even if it is not visible, occupies space. We carry out an experiment using a bottle, a funnel, plasticine and a jar of water.

Activity: We try to pour the water through the funnel and into the bottle. We have already covered all the possible gaps on the bottle spout with plasticine. Water overflows but it does not pass through the bottle. All the kids told me that I have pulled a trick on them. The bottle was empty! Why couldn't water be poured? Is there anything that prevents it from the inside? Or is there something invisible? We come to the conclusion that the empty bottle is filled with air. Air can be invisible but it takes up mass.

F) Can air be weighed?

Activity: We build a handmade scale with tins, a stick, a pencil and two balloons. After setting the scale, we blow up the balloons and we tie them up on both sides of the stick. I want to make the children aware of the way it works by weighing different things. We note that the blown up balloons are of the same weight. What if we blew up only the one balloon? We receive many answers-predictions. Why does this happen? The blown up balloon is filled with air making it heavy. We put the blown up balloon on the other side of the stick too and then it balances.

Conclusion: Even though air is invisible, it can be weighed.

G) The air can sing: We played various games using air.

- 1) Mimic air (gently, hard, through whistling, through sounds.)

- 2) We blow into bottles of different sizes and shapes, each one making different sounds. We repeat it after putting water into the bottles. The sound becomes louder. The children told me that the bottles were singing.
- 3) We played wind instruments such as the flute. It was easier for us. A child brought his harmonica and we played music. We talked about other musical instruments that can be played by using air. They are called wind instruments. Last but not least, we danced to the music after making drums and we played the flute and the harmonica.

6. Air - Sound – Rhythm – Music

This is a quotation of my experience as a teacher. I have tried to create a new learning environment, using research, promoting collaboration, interacting through the use of equipment and materials needed. I have also tried to create arguments, possibly teach some new codes through activities that have led us to new conclusions. These new conclusions have made us think over our existing theories of experiencing. This is the new era of modeling a student in Natural Sciences.

All of the aforementioned are beneficial to our community and will have a positive effect on the sustainability, the environment and to the whole new life that everyone is dreaming of.