

Construction of flying machines as introduction to basic physics for young students

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Abstract. Who hasn't wondered how something as big as an airplane can stay in the sky? Why does a balloon float in the sky? Curiosity about the world is a natural feature for children, but the trick is not to make it disappear when we teach them scientific knowledge. During summer camps at the Aviation Education Center, we put (not only) physical knowledge into a construction scenario. Through elements of competition and fun, we tried to provide students not only with knowledge, but also with the method of inquiry through discovery and experimentation.

Introduction

Children are curious about the world and ask many questions, looking for answers [1]. At the same time, the school reality, requiring rules and principles of learning, often discourages children from exploring the world through experimenting and inquiry [2, 3]. We tried to arouse this curiosity in children during the "Become a Constructor" winter camps at the Kraków Airport Aviation Education Center. The camps lasted 5 days, during which participants learned about new machines every day, their properties and how they work from the point of view of physics. Day by day participants cognize: balloons, helicopters, aircrafts, gliders and unmanned aerial vehicles. Thus, through play, they asked questions and looked for answers - they learned not only about science, but also about scientific methods.

Camps at Aviation Education Centre

During the winter holidays, the Kraków Airport Aviation Education Center invites children and teenagers aged 7-14 to thematic winter camps. Every day pupils constructed different flying machines, learned about its structure and principles of operation. They acquired knowledge through various activities: art, competitions, quizzes, games and experiments. The classes are aimed at developing logical thinking, learning through, stimulating creativity and creative thinking, and covering aviation topics. Seventy one children participated in two sessions. Every day they received an order for a new flying machine waiting in the mailbox. To build it well, they had to know its history, purpose, structure and physics of operation. During the camp, kids will also learn about procedures, airport infrastructure and the spaces of the Aviation Education Center (CEL). CEL is a separate organizational unit of the Krakow Airport and a unique center for popularizing and disseminating knowledge in the field of civil aviation.

What will be presented

The poster will show how the entire camp week was planned and organized. We will show how each day they learned about another machine by asking questions. How we designed the discovery process by asking questions. We will clearly indicate what scientific knowledge children have learned and at what stage, with particular emphasis on physics. We will also present several unusual experiments that explain how individual machines work. On the poster we will bring out our activities related to physics – among others forces allowing the flying process, i.e. bounce, lift, drag and gravity forces as well as Bernoulli's law. Examples of workshops and examinations done

by children during the process of constructing flying machines, for example measuring of hardness, microstructure or temperature resistance, will be also added.

References

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