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Experimental synthesis of two polymers (Nylon and Plastic from starch)

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The education for sustainable development can help to build more sensitive people which are responsible for our future and can contribute with lectures and practical work on sustainability. We have to change our thoughts regarding environment protection, biodiversity and natural resources. Education has a vital role to play in developing the knowledge, skills, attitudes and values that enable people to contribute to and benefit from an inclusive and sustainable future.
Different ecological problems have reached the critical point - among them are also plastic products. While plastic has many valuable uses, we have become addicted to single-use or disposable plastic - with severe environmental consequences. A lot of it is throw away and will stay in garbage dumps of thousands of years. It's time for a change. We use a number of different plastics in our day-to-day lives. Plastics are substances called polymers which are formed from many smaller molecules referred to as monomers. Recent time we are aware of the great world problem that is a plastic pollution.
Plastic can be produced from fossil sources or from biodegradable sources.
During the project work students discovered the use of the most common household plastics e.g. polyethene-PE, polypropene-PP, polyvinylchloride-PVC, polystyrene-PS, polytetrafluoroethene-PTFE, polyethylene terephthalate-PET. Among them we know also nylon 6,6. Nylon was first synthesized in 1935. It is an example of polyamide polymer, which was originally intended as a synthetic silk replacement. Today is used in clothing, guitar strings and fishing lines. My students prepared a simple chemistry experiment in which they synthesised nylon and discovered its properties.
On the other hand we discussed also about bioplastics, which are made from plants or other living things. 'Bioplastic' does not mean the same thing as 'biodegradable plastic'. Some biodegradable plastics are made from oil and some bioplastics are not biodegradable. My students decided to prepare a biodegradable plastic which can decompose and become part of the soil. Potato starch was the main source for it. Potato starch is a polymer made of long chains of glucose units joined together. It actually contains two polymers: amylose and amylopectin.The propan-1, 2, 3-triol was added as a plasticiser to change the properties of the polymer.
Conclusion: Students play an active part in all dimensions of our life. For that reason it is important to give them experimental and scientific knowledge. Young people can create new opportunities and solutions that can enrich our lives.