

## AMITY EDUCATIONAL RESOURCE CENTRE

YRoNS 2019,

Amsterdam, Netherland

### PROJECT DETAILS FORM

**School Name: Nikolaus-Von-Kues-Gymnasium Bernkastel, Kues, Germany**

S.No	Team Members	Team Leader	Project Title	Abstract (Max 200 words)	Teacher Advisor
1 2 3	Paul Alberts, Inga Thees, Fabian Geisen		You Eat With Your Eyes! - Natural Dyeing Substances and Their impact on The Taste of Our Food	<p>To get natural dyeing substances of different fruits and vegetables we extracted green and red peppers, blueberries, carrots and further vegetable products with the help of the solvents water or a nonpolar solvent like heptane, which is needed for example to extract carotenoid from carrots. Investigating the usually aqueous solutions of the different dyeing substances we found out that capsanthin is responsible for the colour of peppers while the blue/violet colour of blueberries and red cabbage is caused by anthocyanin.</p> <p>We used these natural dyeing substances we had extracted to colour white eggshells and wool to show that natural dyeing substances are actually an alternative to dyeing things with synthetical pigments.</p> <p>As we know that especially red cabbage is a good indicator for the pH value, we also cooked some leaves of red cabbage in boiling water to make our own indicator in order to investigate dependence of the colour on different pH values.</p>	Mr. Christian Franzen

				<p>To find out whether colour has any impact on the taste of our food, we used food colourant to dye yogurt. To prevent the identification of the yogurts' different flavours by their typical colours, we stained strawberry yogurt green, peach yogurt blue and the vanilla one red. After that we gave them to over 80 respondents. In a further experiment we stained sugared plain yogurt with the colours green, red, yellow and blue and again gave it to our respondents. Most of them associated the dyed food with flavours different from what it actually had, e.g. the red yogurt was mostly associated with strawberry or cherry. That is because our brain mixes up different sensations and automatically combines a certain colour with a certain flavour which is why colours actually do have an impact on the taste of our food.</p>	
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1 2 3	Jacqueline Jakoby, Nikita Reichert, Joelle Arnoldi		Hair colour that can change within seconds	What about dying your hair with a colour that you can change to a different one when ever you feel like it? We have found out that it is possible by using the technique of so called "Magic Markers", which change their colour when they are exposed to the "Magic Pen". With the help of paper chromatography we could see that these markers each contain a mixture of colourants. Some of these colourants react to an alkaline solution by changing their colour. We could find such a solution inside the "Magic Pen" by determining the solution's pH value. In further experiments we also found out that the solution in the "Magic Pen" contains sulfite ions a reducer. To produce our hair tinting lotion we used curcumin, the colourant of curcuma giving the spice its yellow colour. Like the colourants of the "Magic Markers" curcumin is a colourant that is sensitive to the change of the pH value and changes to red when being exposed to an alkaline solution while changing back to yellow when getting into contact with an acid solution. So we made a shampoo containing curcumin as a colourant, resulting in a hair tinting lotion which can change to red by using a pen that contains an alkaline solution and to yellow again by using a pen containing an acid solution.	Mr. Christian Franzen

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1 2	Julian Thomas, Le Bao Tran Vu		On the Traces of Cave Painting	<p>Cave art is the oldest evidence of the use of pigments and binders. It originates in the Stone Age by the end of the Ice Age. The oldest cave paintings in the world can be found in the cave Spanish El Castillo (approximately 40,000 B.C.). These rock paintings can keep their high luminosity for a very long time.</p> <p>In that time modern paint boxes did not exist. Consequently the Stone Age people had to find another way to produce their paintings.</p> <p>We asked ourselves which pigments the people of that time had used and after a short time we discovered that they had used earthy mineral pigments. In our project we had produced mineral pigments ourselves. After that we studied their chemical composition, the reason of their colorfulness and how they can change their color by chemical reactions.</p> <p>We also wondered why cave paintings are so durable and do not get washed away by rain. We asked ourselves how the Stone Age Man had produced the paintings, which kind of binders had been needed and whether modern people could still create such comparable art.</p> <p>Additionally, we wanted to know whether cavemen in our area, the Mosel, could have produced similar art and</p>	Ms. Maria Weimar

				<p>whether the required earth pigments could be possibly available in the Hunsrück as well.</p> <p>To answer these questions, we started to collect stones from the region and tested whether they contained pigments. We tested whether the collected stones could be used to manufacture earth pigments; we examined their characteristics and compared them to synthetic inorganic paints.</p> <p>Afterwards, we mixed them with various binders, such as eggs, cheese, oil and chalk suspension and tested which binder was the best.</p>	
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