

# TECHNOLOGIES IN STEM EDUCATION

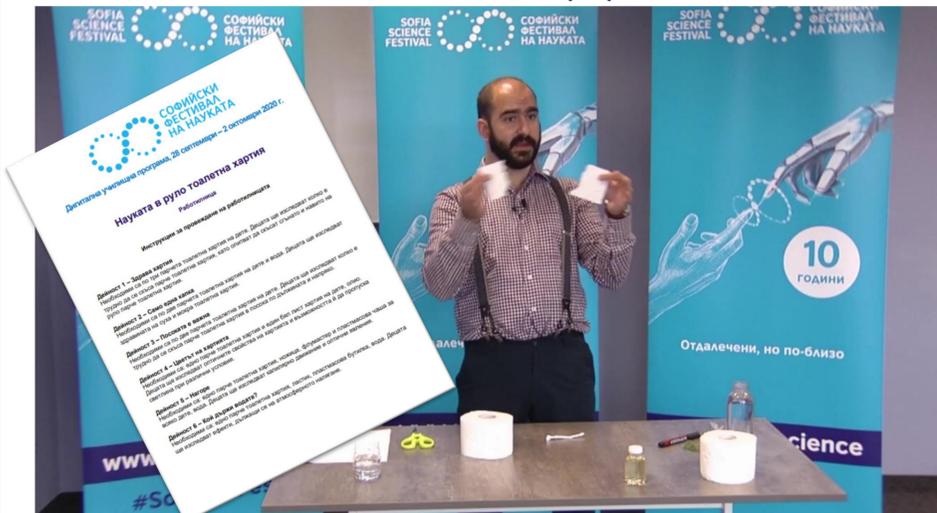
Nasko Stamenov | National High School of Science and Mathematics | Sofia | Bulgaria

## Distance learning – when the kitchen is the lab

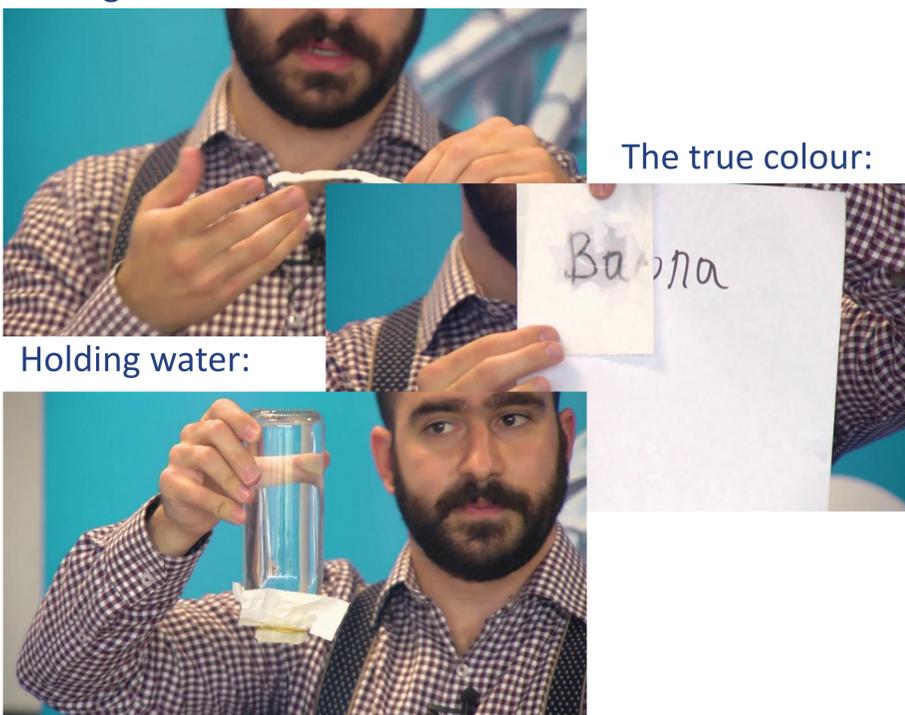
### Summary:

In times of a pandemic we need to improvise. If the school is closed does that mean that we need to forgo the classroom experiment? Of course not! The experiment just need to be modified to accommodate what every student has at home. This project shows two types of experiments done in two different age groups.

### 1. Science in a toilet paper roll:



### Strength test:

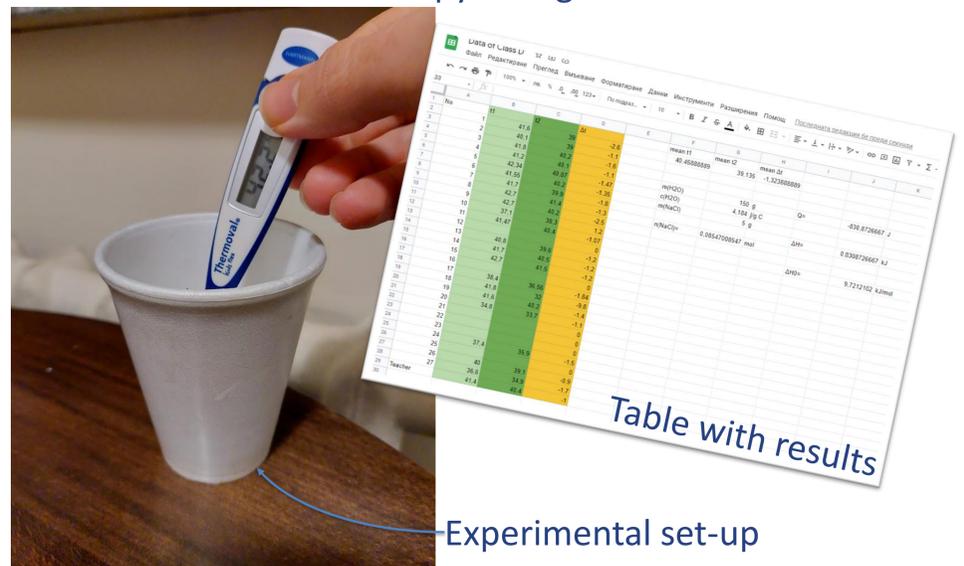


The true colour:

Holding water:

A full 40 minute workshop, that was done at the same time in more than 10 schools with 5<sup>th</sup> graders, as part of the Sofia science festival. It contains six experiments which show interesting properties of paper.

### 2. Enthalpy changes:

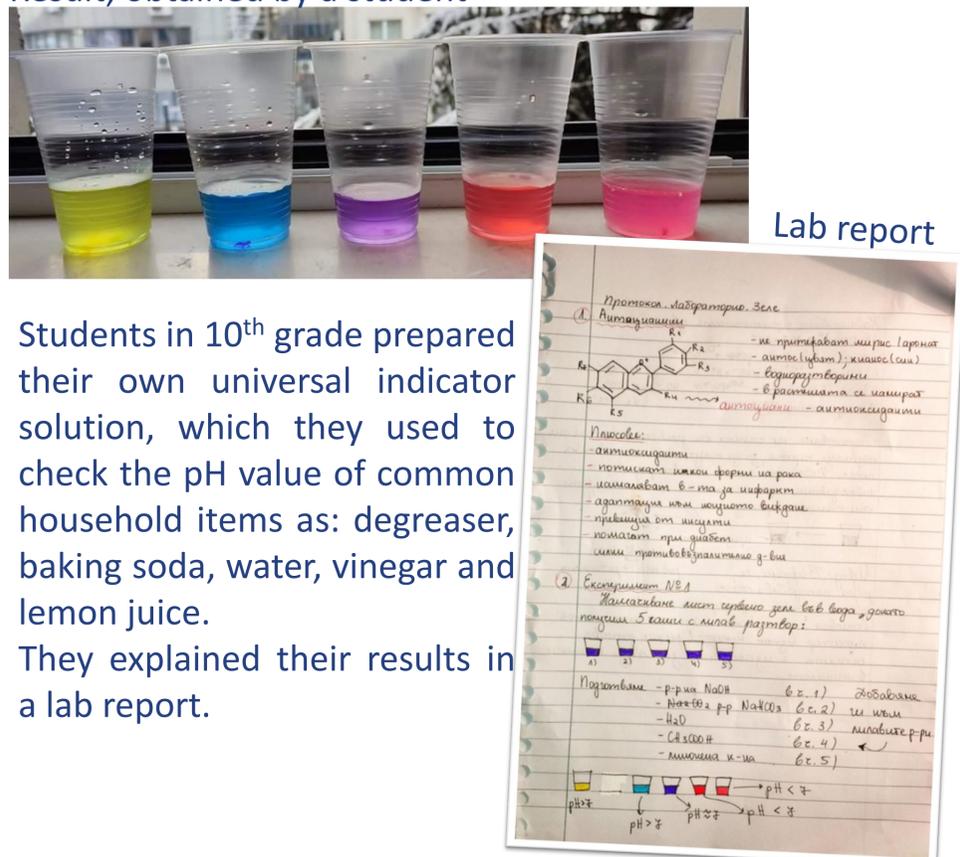


Experimental set-up

Students in 11<sup>th</sup> grade dissolved salt in warm water. They have measured the temperature at the beginning and in the end and together we calculated the enthalpy change. All students were in their homes and measured with home thermometers.

### 3. pH and cabbage indicator:

#### Result, obtained by a student



Lab report

Students in 10<sup>th</sup> grade prepared their own universal indicator solution, which they used to check the pH value of common household items as: degreaser, baking soda, water, vinegar and lemon juice. They explained their results in a lab report.