Where tomorrow's scientists meet.

Problems for the 1st SYNT 2017

A) Apples
Why do apple slices turn brown after being cut? Investigate the speed of this process and test methods to prevent browning of apple slices.

B) Growing through asphalt
Can a little plant grow straight up through concrete or asphalt?

C) Tonic water in UV light
Tonic water glows brightly when exposed to an ultraviolet black light bulb. It is however easy to quench the glow of tonic water by adding salt. Investigate this effect. What other common substances glow under UV light and how can one influence their glow?

D) Salt production
Solar evaporation of seawater or salt mining are common methods to produce common salt (NaCl). Propose a method to extract salt from a natural source and determine both productive capacity of your method and purity of the product. Demonstrate an amount of salt produced by your method.

E) Rijke's tube
If air inside a vertical cylindrical tube open at both ends is heated, the tube produces sound. Study this effect.

F) Grow light
Investigate how different types of artificial lights affect plant growth. What is the role of light spectrum?

G) Milk
Develop simple methods allowing determination of some of the important properties of milk. Suggest an investigation requiring comparison of various milk samples.

H) Allometry
How do length and thickness of bones scale with overall size and weight of animal?

I) Routers and garden cress
In 2013, five young students claimed a sensational discovery that garden cress (Lepidium sativum) won't germinate when placed near two Wi-Fi routers. Reproduce their experiments under controlled conditions to support or dismiss their conclusions.

J) Water from the air
Design and construct a device allowing collection of water by condensing moisture from air. Determine if the water obtained with your device is suitable for drinking. What amount of water is possible to collect during one Science Fight?

K) Paper wrinkles
When a piece of paper dries after being wet, it can get wrinkled. Investigate and explain this phenomenon.

L) Tornado machine
Build a machine to produce an indoor air tornado. Investigate the properties and stability of the tornado. Is the machine portative enough to be demonstrated at a Science Fight room of the 1st SYNT?

The problems are selected from the official set of problems for the 5th IYNT 2017.

The official IYNT problems are authored by Andrei Klishin, Ilya Martchenko, and Evgeny Yunosov and can be found on the IYNT homepage: http://iynt.org/IYNT_Problems_2017.pdf