Supporting the continuation of teaching STEM subjects during the COVID-19 Pandemic through project-based online practices

Mathematics of soap bubbles

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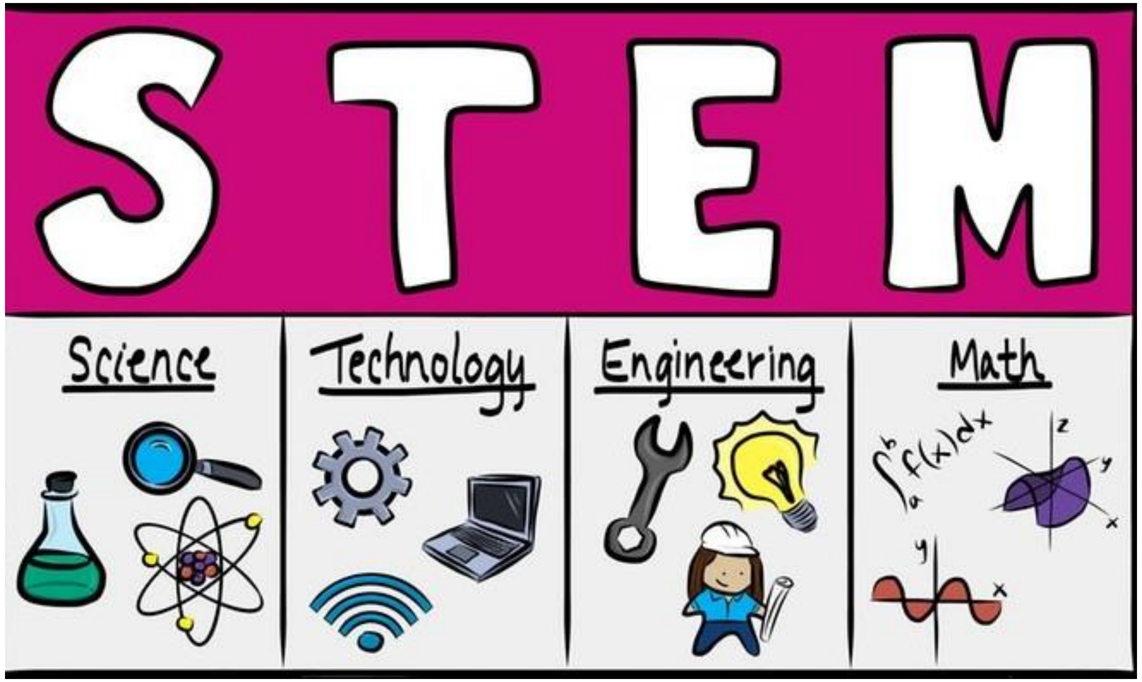
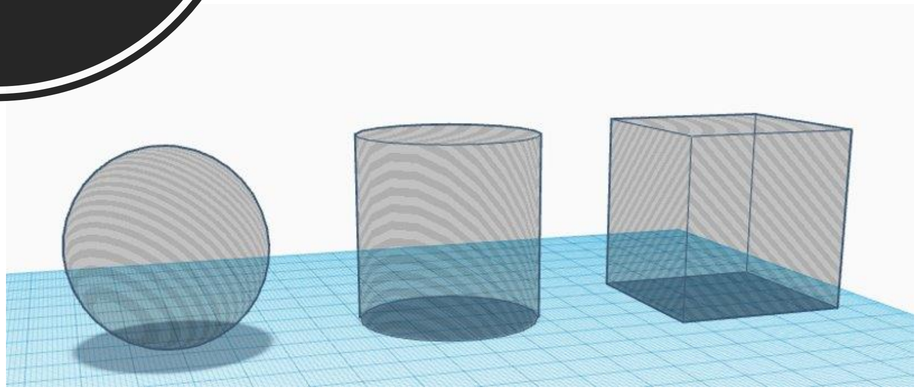
Presentation plan:

1. Aims of the project
2. Open Educational Resources use
3. Project implementation

Aims of the project

Surface area with constant volume





Which body would have the smallest surface area given a constant volume?

Open Educational Resourses

Mural

GeoGebra
for Learning Mathematics

artsteps

edpuzzle

Mentimeter

Canva

Project implementation – experiment preparation

1) soapy water
2) rings made from cream/yogurt cups
3) tape measure, ruler, graph paper
4) background adjustment

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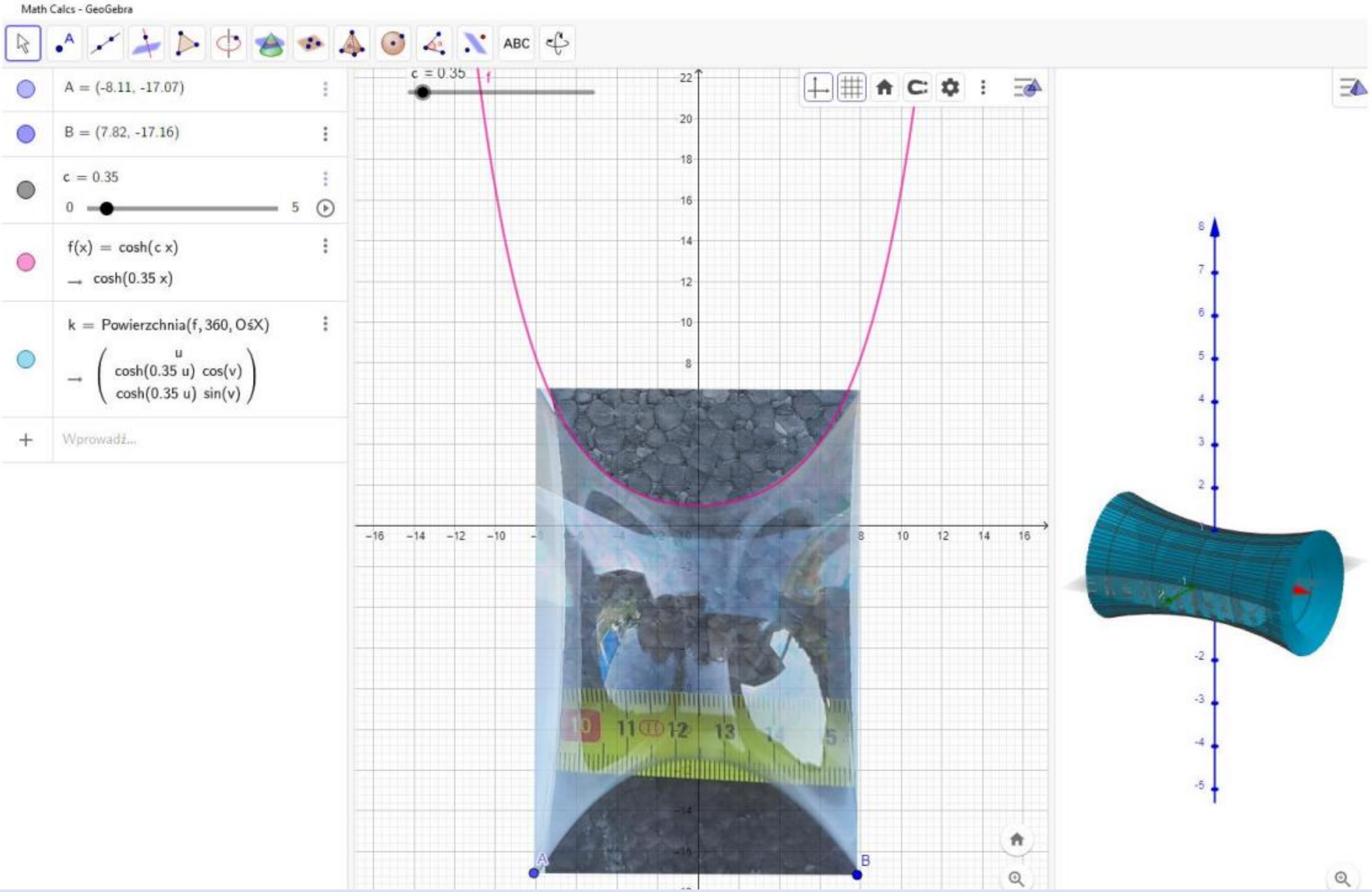
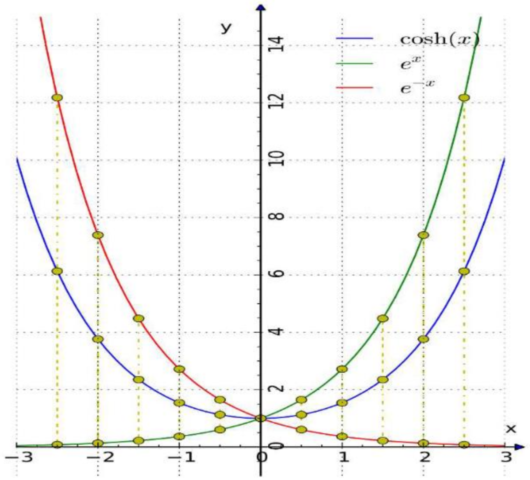
Project implementation – curve matching in GeoGebra

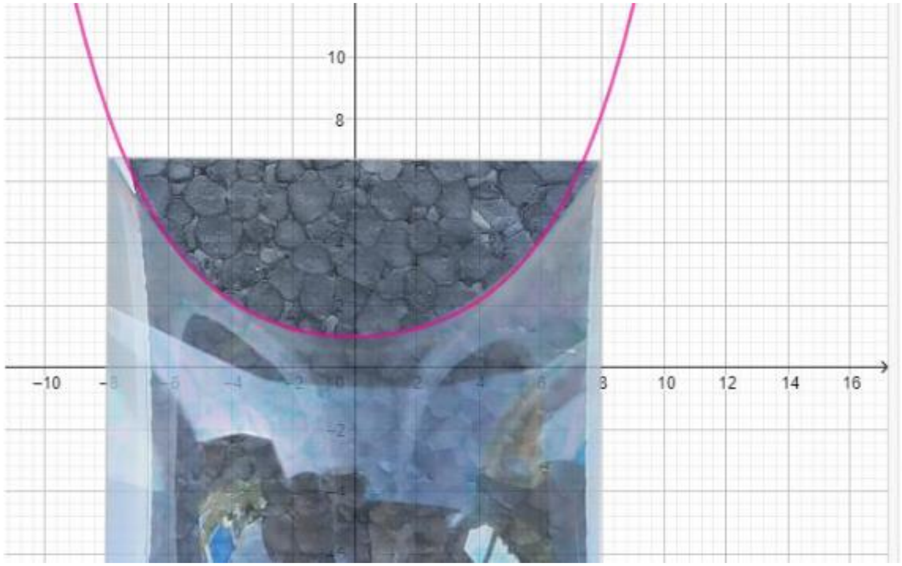


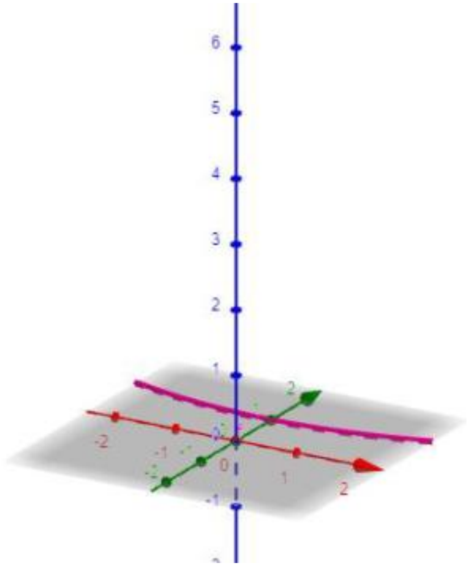
Project implementation – catenoid's surface area calculation

$$S = \frac{\pi}{c^2}\left(2csinhca + ln\left|\frac{\sqrt{1+c^2sinh^2ca}+csinhca}{\sqrt{1+c^2sinh^2ca}-csinhca}\right|\right)$$

$$y = f(x) = coshx = \frac{e^x+e^{-x}}{2}$$







surface area of a catenoid is smaller than that of a cylinder

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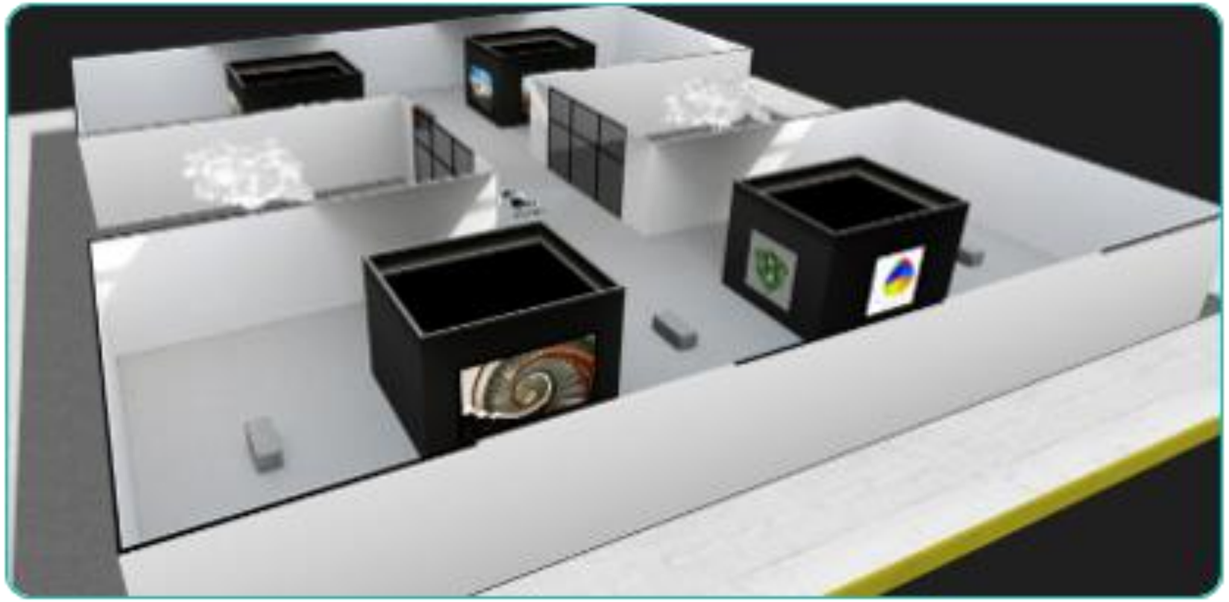
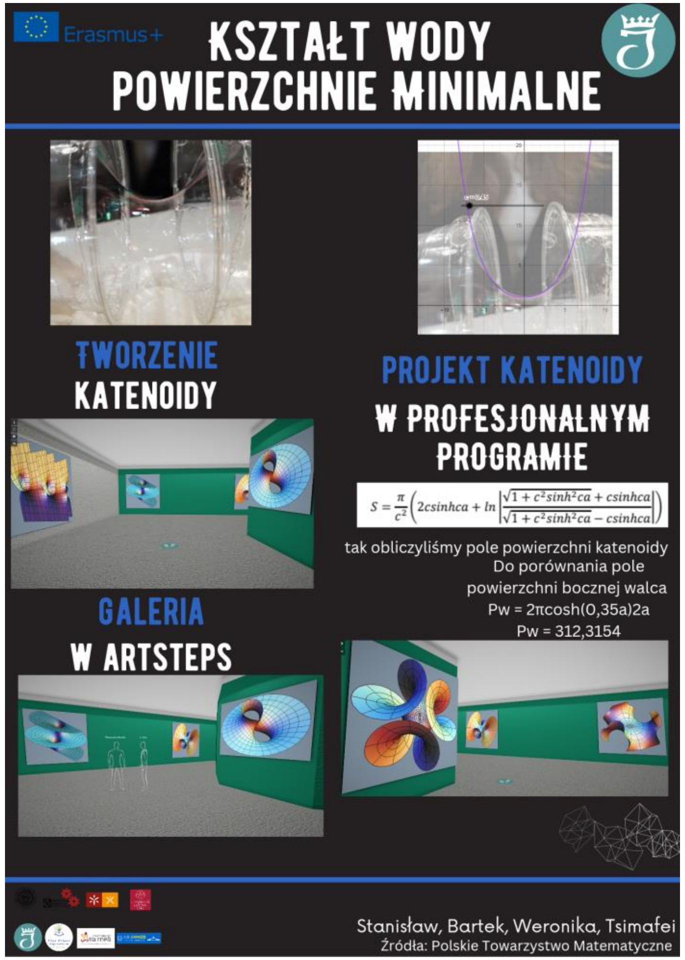
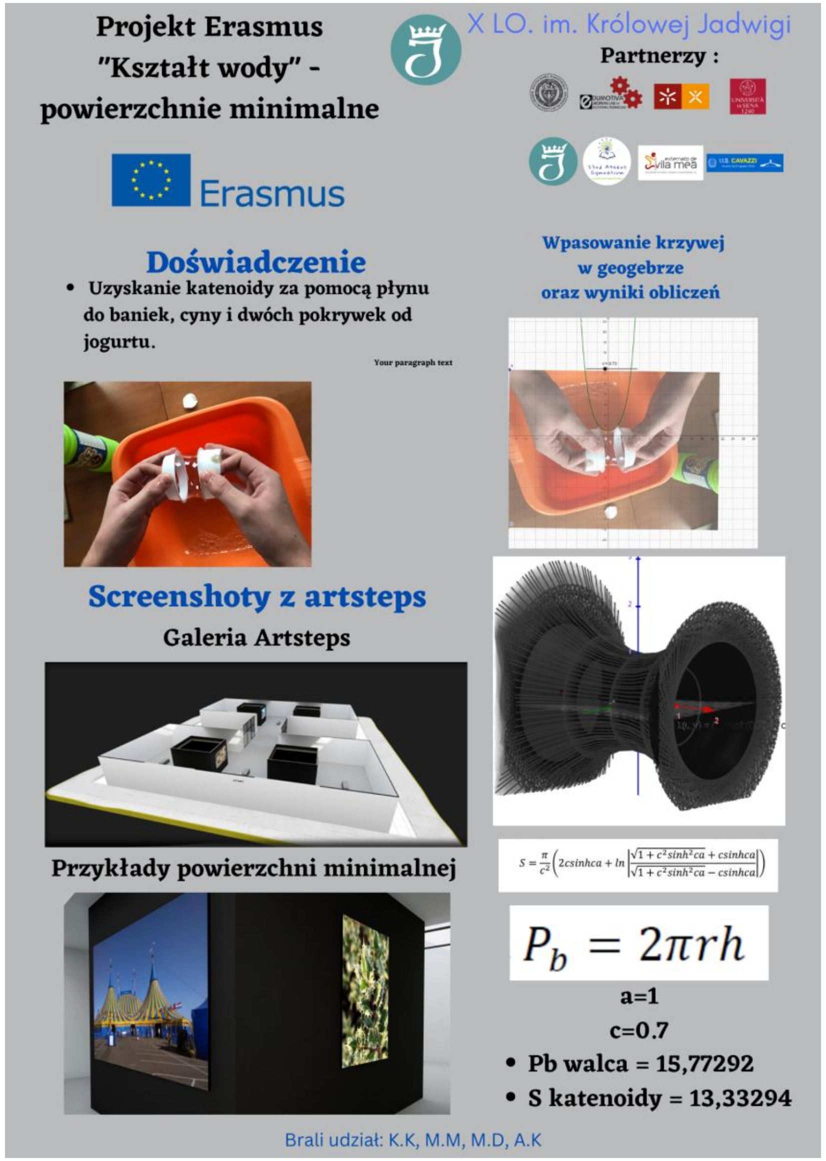
Project implementation – minimum surface in everyday life



Project implementation – students' output





The BeReady partnership

Get in touch

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