

LETTER OF ACCEPTANCE

Valmiera, September 22nd, 2023

Vidzeme University of Applied Sciences cordially invites **Jakub Liptak** from **University of Presov, Slovakia** to participate in the **Vidzeme University of Applied Sciences organized Blended Intensive Program (BIP) on “Innovative Methods for Future Skills”**, from October 23 to 27 (virtual component October 31) in Valmiera, Latvia.

BIP ID: 2 0 2 1 - 1 - L V 0 1 - K A 1 3 1 - H E D - 0 0 0 0 8 4 8 5 – 1 (should be registered by the sending institution in the Beneficiary module).

During the Blended Intensive Program, the guest will be provided with the supervision necessary for carrying out the mobility activities.

The guest is expected to be on site for 5 full days from October 23 to October 27, and virtually on October 31. Participant is informed that Erasmus+ scholarship for travel, accommodation and daily expenses is provided by the sending institution of **University of Presov, Slovakia**.

All the cultural activities, such as excursions, welcome dinner and more will be covered by the receiving institution of **Vidzeme University of Applied Sciences**.

We look forward to welcoming **Jakub Liptak** to Vidzeme University of Applied Sciences.

Looking forward to meeting you at Vidzeme University of Applied Sciences!

Sincerely Yours,



Ance Cirša

International Coordinator in staff mobility

Vidzeme University of Applied Sciences



Augmented reality in mathematics education

BIP - INNOVATIVE METHODS FOR FUTURE SKILLS
23. 10. – 27. 10. 2023, Valmiera, Latvia

Jakub Lipták

Department of Mathematics Education, Faculty of Education,
University of Presov

Augmented reality

- Visual technologies that combine real-world sight experience with computer-generated visual information.
- It is characterised by anchoring the virtual model into the real world.
- The virtual model is retrieved from the program's database running by the operating device.

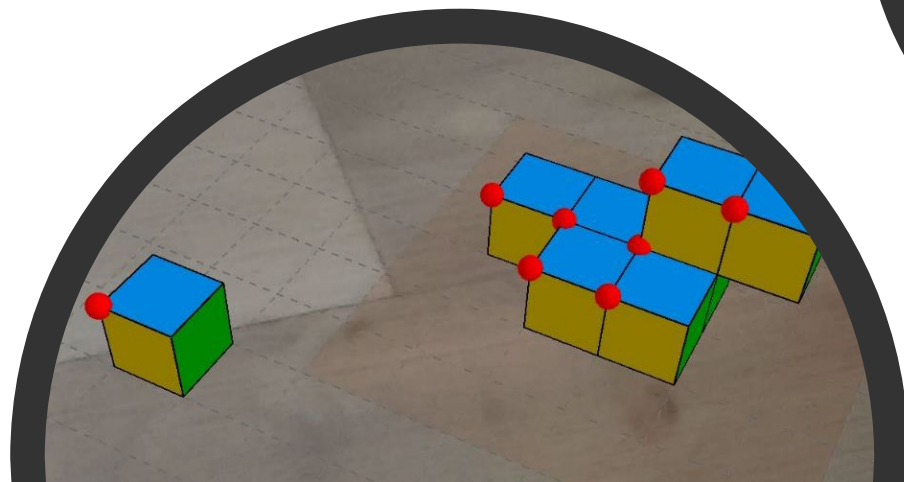
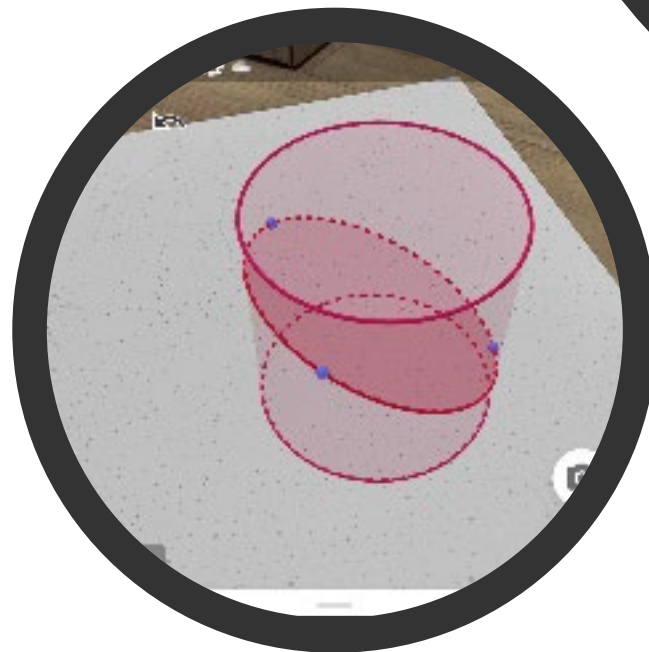
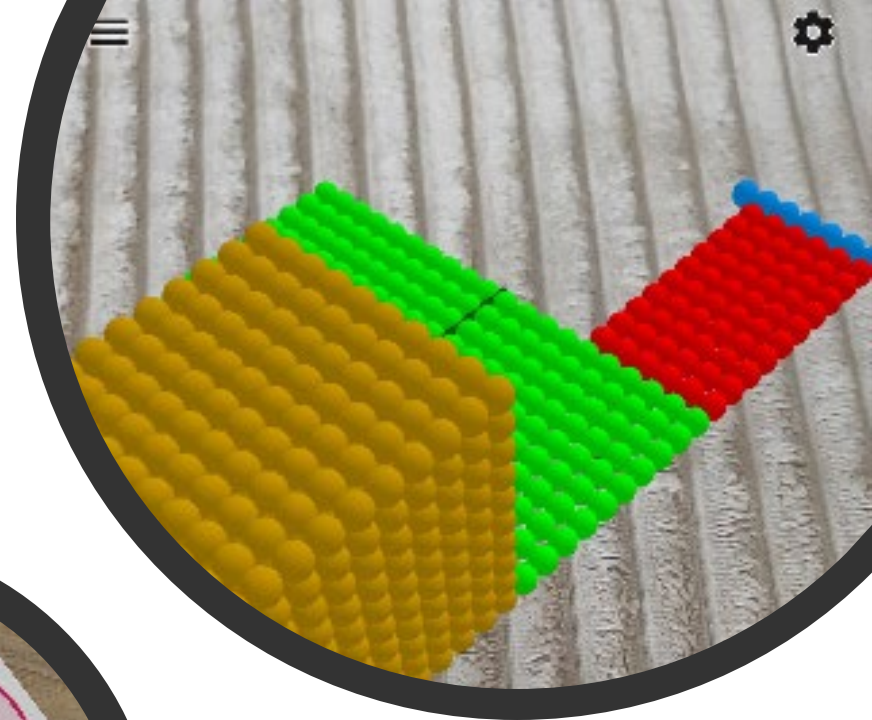
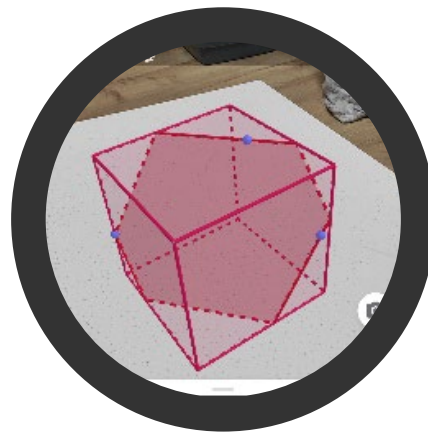
Augmented reality in education

- Working with AR goes hand in hand with constructivism by empowering students to gain new experiences based on manipulation.
- The basic educational method is learning by doing.
- Visualisation of abstract concepts



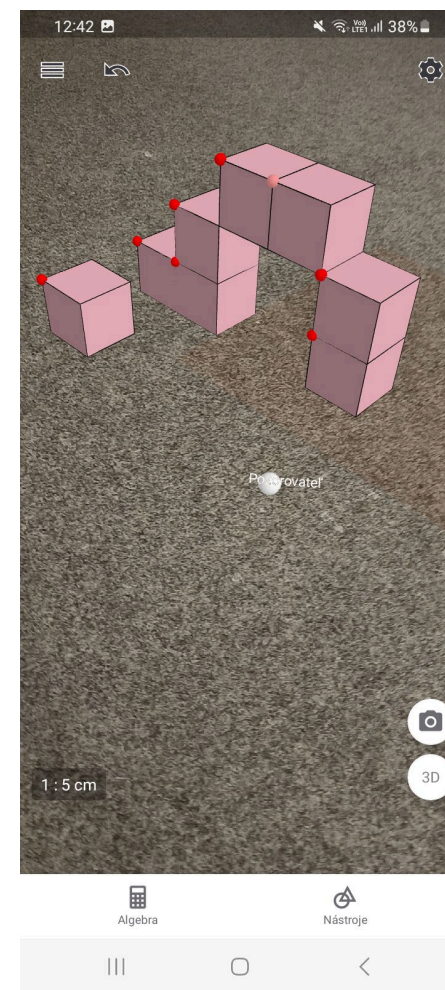
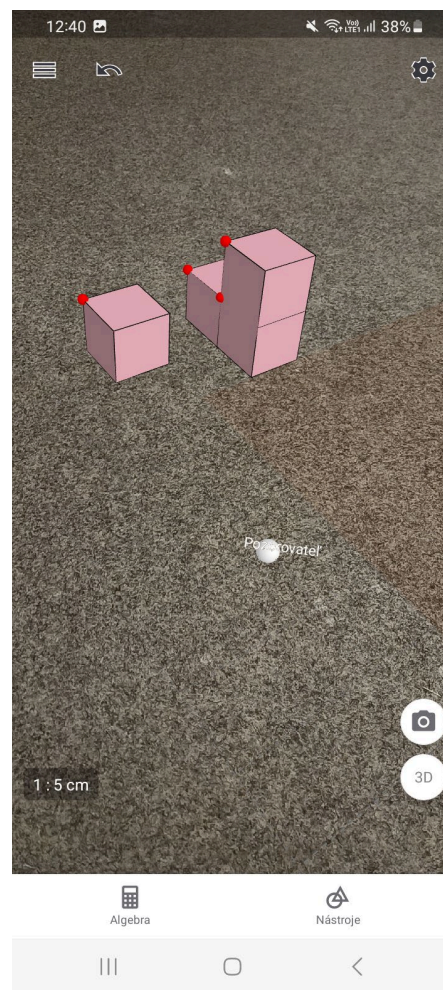
Applets and Apps

- GeoGebra 3D Calculator
- Author's apps

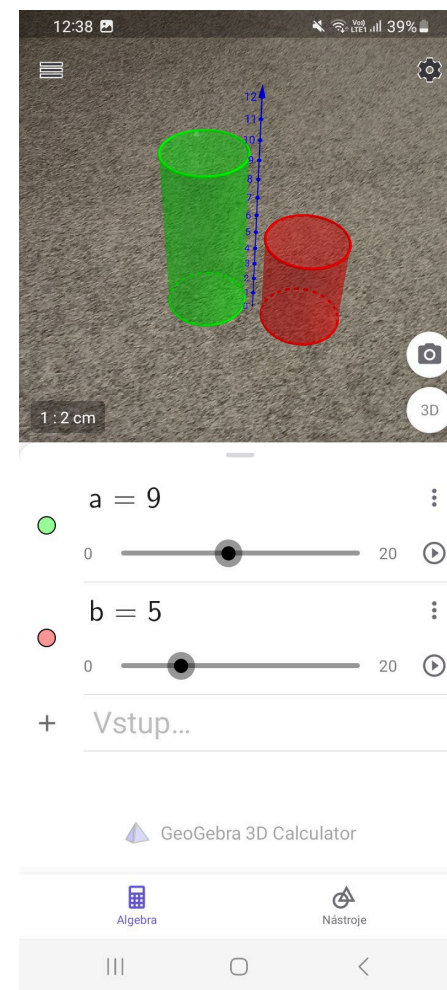
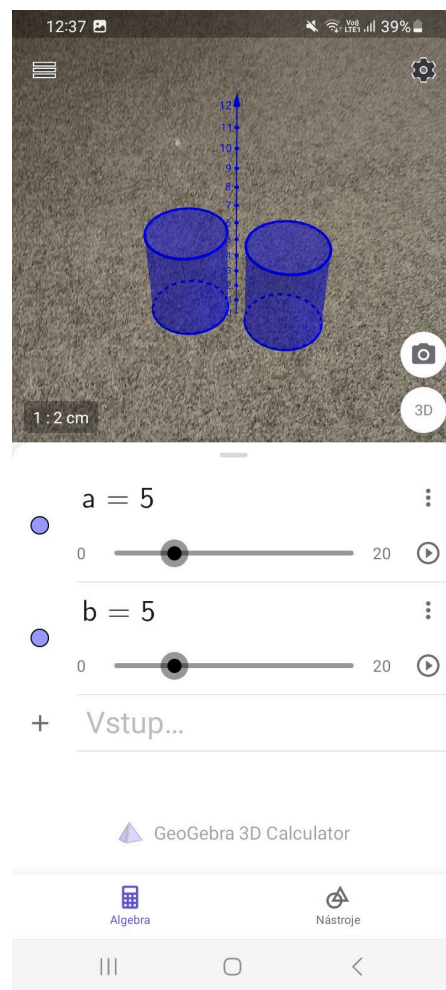
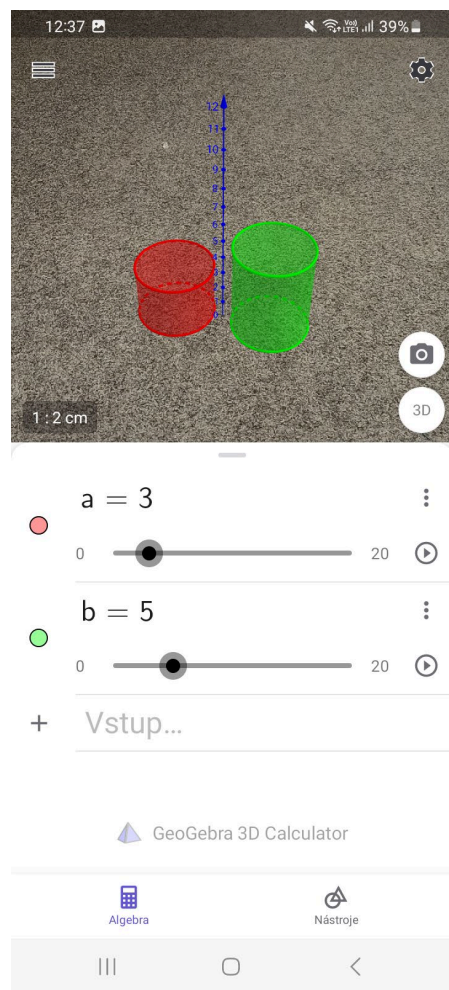




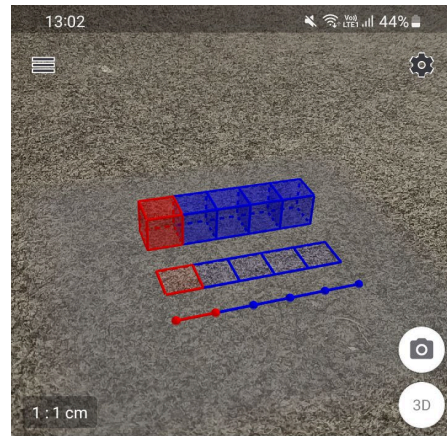
GeoGebra applets



GeoGebra applets



GeoGebra applets



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1 : 1 cm

$a = 1$

0 5

$b = 5$

1 20

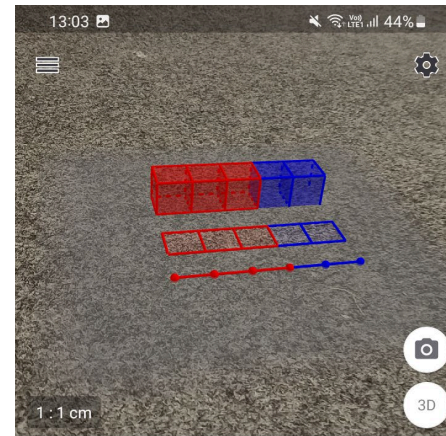
+ Vstup...

GeoGebra 3D Calculator

Algebra Nástroje

III O <

This screenshot shows the GeoGebra 3D Calculator applet with parameters $a = 1$ and $b = 5$. The 3D view displays a rectangular prism with a red front face and blue back face, a corresponding 2D grid below it, and a line with 6 points. The scale is 1:1 cm.



13:03 44%

1 : 1 cm

$a = 3$

0 5

$b = 5$

1 20

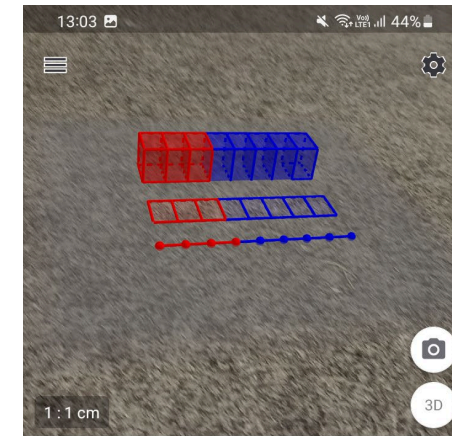
+ Vstup...

GeoGebra 3D Calculator

Algebra Nástroje

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This screenshot shows the GeoGebra 3D Calculator applet with parameters $a = 3$ and $b = 5$. The 3D view displays a rectangular prism with a red front face and blue back face, a corresponding 2D grid below it, and a line with 8 points. The scale is 1:1 cm.



13:03 44%

1 : 1 cm

$a = 3$

0 8

$b = 8$

1 20

+ Vstup...

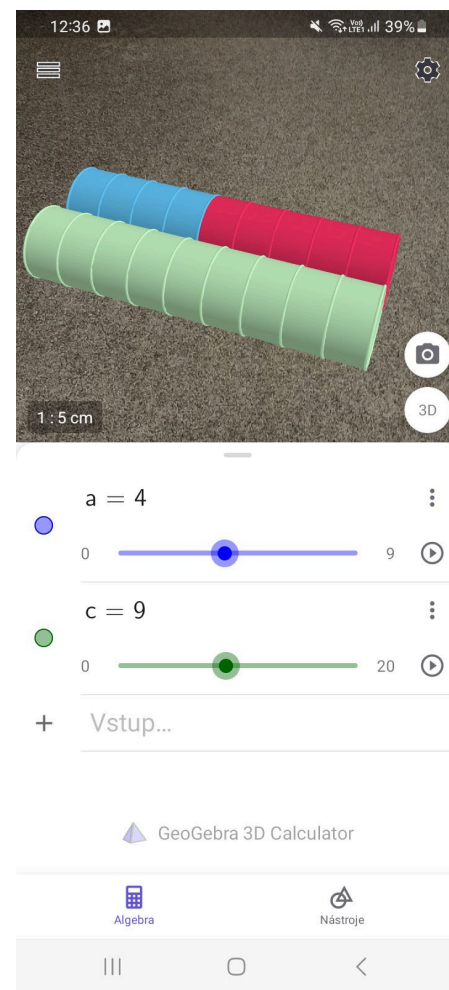
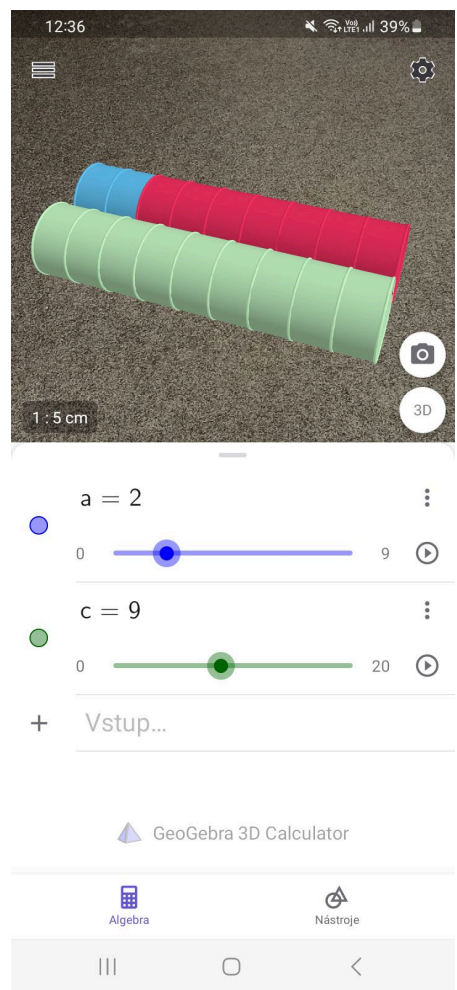
GeoGebra 3D Calculator

Algebra Nástroje

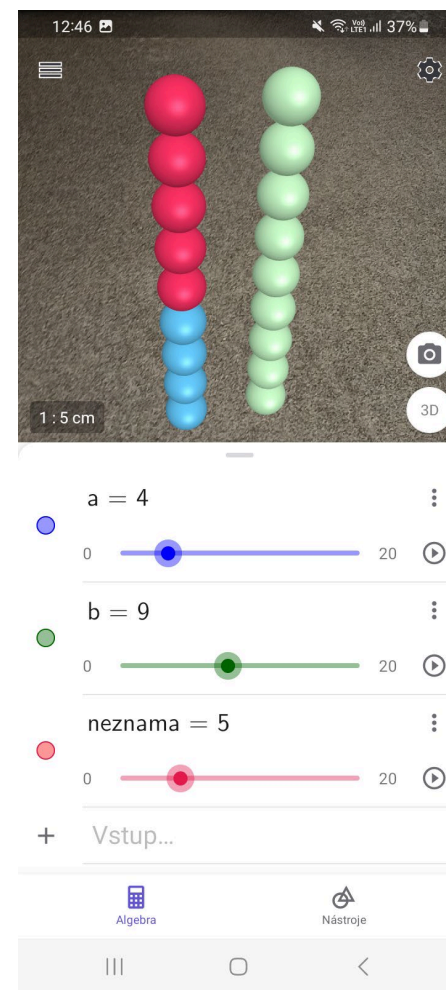
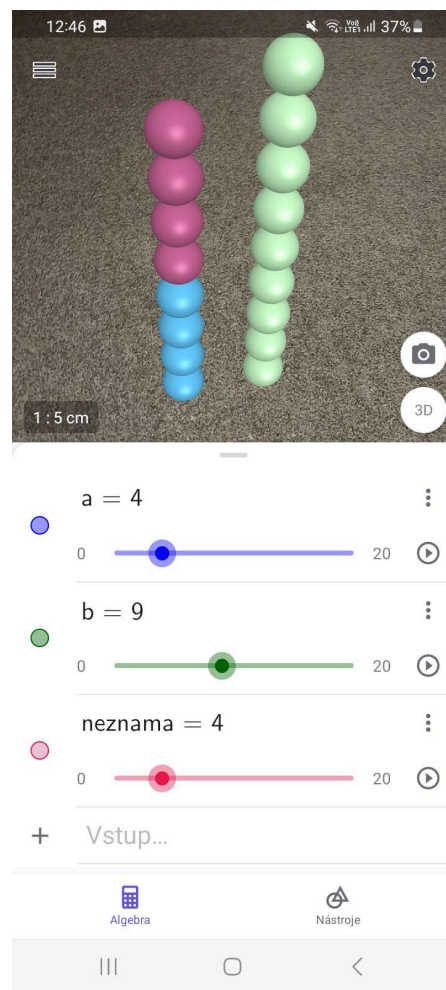
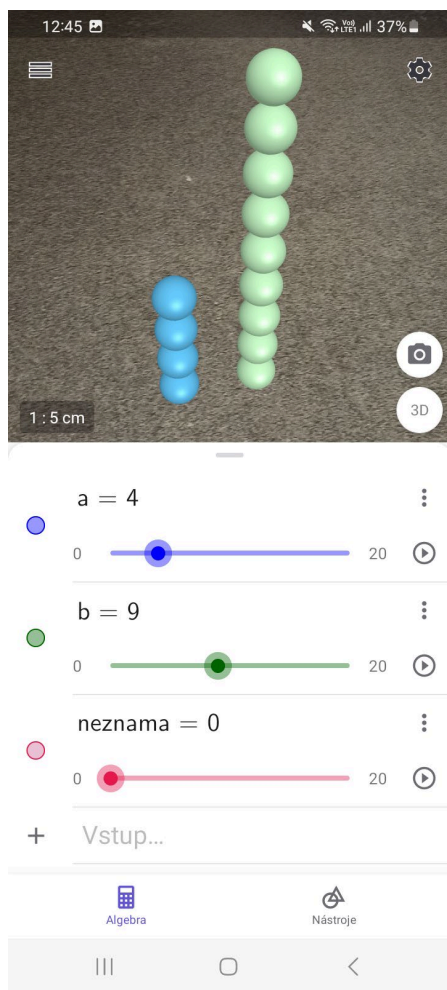
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This screenshot shows the GeoGebra 3D Calculator applet with parameters $a = 3$ and $b = 8$. The 3D view displays a rectangular prism with a red front face and blue back face, a corresponding 2D grid below it, and a line with 11 points. The scale is 1:1 cm.

GeoGebra applets



GeoGebra applets





Videos

Measurement

<https://www.youtube.com/watch?v=PSWtMeAVzdQ>

Spatial shapes

<https://www.youtube.com/watch?v=yPbnm1KX43Q>

Modelling numbers

<https://www.youtube.com/watch?v=XYSc5hR2g38&t=53s>

Contacts

The presentation was supported by *KEGA 036PU-4/2021 Augmented reality technology into the professional mathematical training of prospective teachers of elementary stages* researched at the Faculty of Education, University of Presov.

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