Grades 5 - 8

Duration: 20 min

Tools: one 16 pcs Set / 1 to 4 students, Ruler, Precision scale

Individual / Pair / Group work

Keywords: Area, Precision scale

Pressure of Faces

PHYSICS

LOGIFACES METHODOLOGY

Erasmus+

TEACHER

Logifaces

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DESCRIPTION

Based on your previous measurements in the exercise Density, Volume, the students calculate the pressure acting on each block side.

SOLUTIONS / EXAMPLES

1. Calculate the force exerted by the object.

Measure the mass and then convert the mass to force. (100 g = 1 N)

Block	Mass (g)	Force (N)
111	10	0.1
222	20	0.2
333	29	0.29
112	14	0.14
122	17	0.17
223	23	0.23
233	27	0.27
113	17	0.17
133	23	0.23
123, 132	20	0.2

2. The students calculate the areas of the faces of the blocks (see exercise 408 - Area Formulas for Polygons for the formulas and Parameters of the logifaces blocks for the results).

3. Students calculate the pressure p using the formula $p = \frac{F}{A}$, where F is force and A is the area of the surface that is in contact with the desk. Remember to convert square centimetres to square metres. Some example results are listed in the table below.

Block	Face	Force (N)	Area of the face	Pressure (Pa)
111	base triangle	0.1	10.83 cm^2 = 0.1083 m^2	0.923
111	vertical face	0.1	6.25 cm^2 = 0.0625 m^2	0.16
133	base triangle	0.23	10.83 cm^2 = 0.1083 m^2	2.124
133	top triangle	0.23	12.5 cm^2 = 0.125 m^2	1.84
133	rectangular face	0.23	18.75 cm^2 = 0.1875 m^2	1.227

4. Note that the smaller the surface, the greater the pressure when the force is the same.

PRIOR KNOWLEDGE

Mass, Force, Area, Pressure

RECOMMENDATIONS / COMMENTS

Exercises 408 - Area Formulas for Polygons and 517 - Heights and Volumes are recommended before this exercise to familiarise the students with the formulas used to calculate the areas of the faces and the volumes of the blocks.

Exercise Density, Volume is recommended before this exercise as a related exercise in Physics.