III IYNT 2015

Task № 4
«Galton box»

Team *«MG 12»*

Problem

- In the Galton box, a regular 2D lattice of obstacles disperses a thin flow of falling particles. When falling on the bottom of the box, the particles show a normal distribution. Use various types or particles and different arrangements of the obstacles to find the conditions when the distribution is no longer normal.

Hypothesis

- If the probability distribution of the particles depends on the speed of their movement, it is possible to create conditions which will provide the deviation from the normal distribution of the particles on the Galton's board.

Purpose

- To create conditions affecting on the distribution of the particles which is different from normal.

Function of distribution

- dN – number of particles
- N – total number of particles
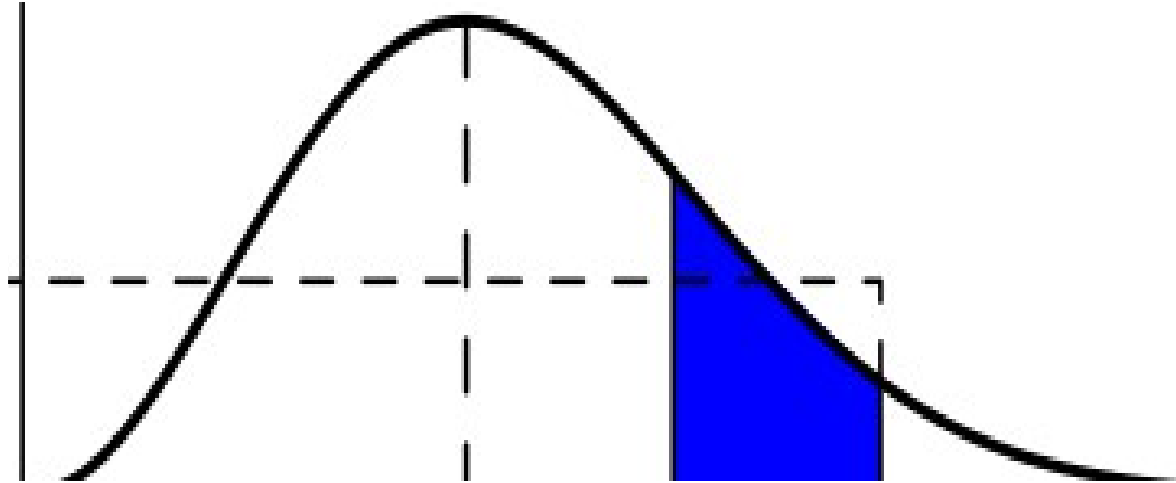- dc – infinitely small interval of velocity

In theory of probability:

тывается так: – probability of a random event
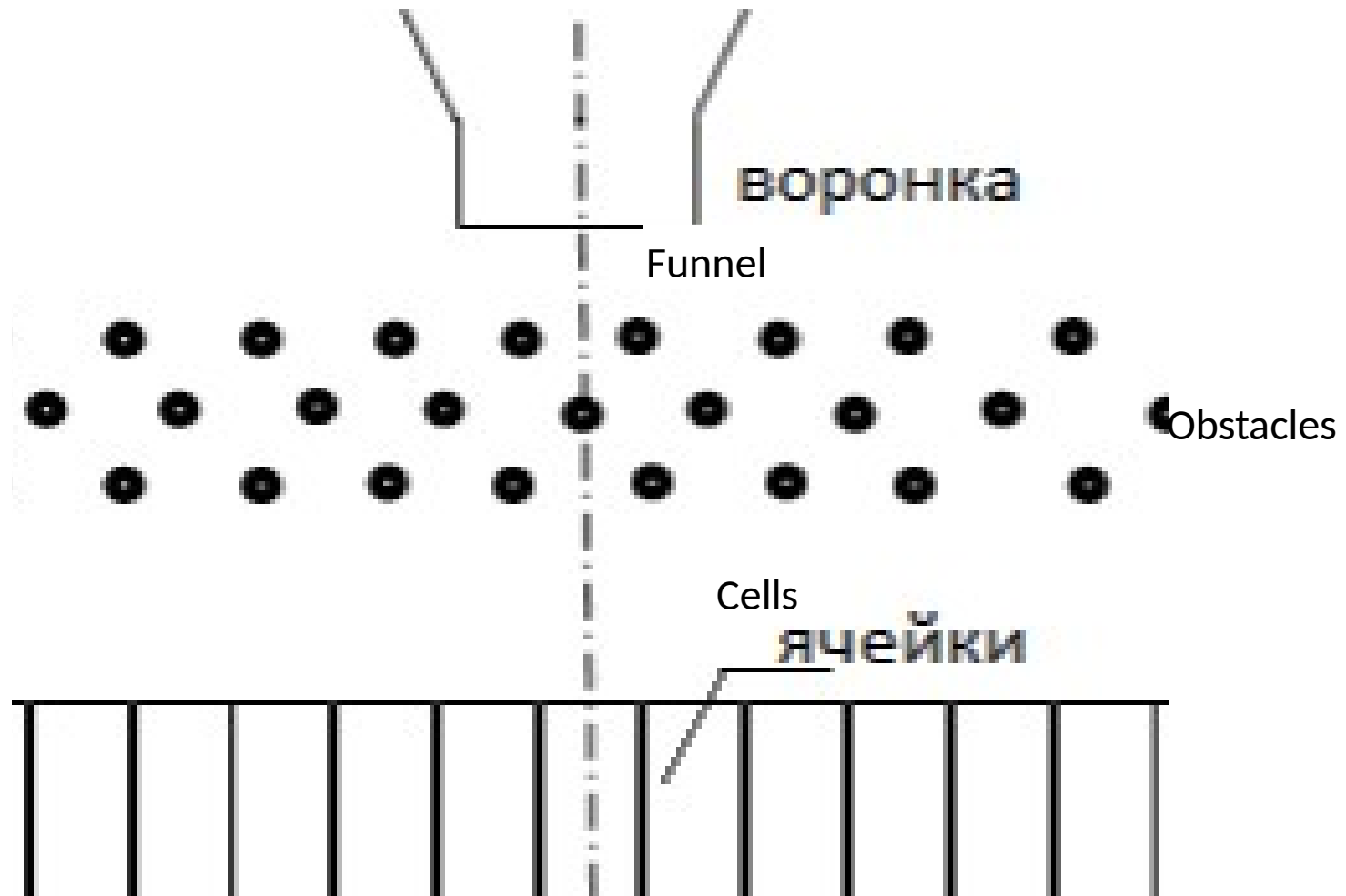
• f(c) – density of probability

Function of the particles velocity

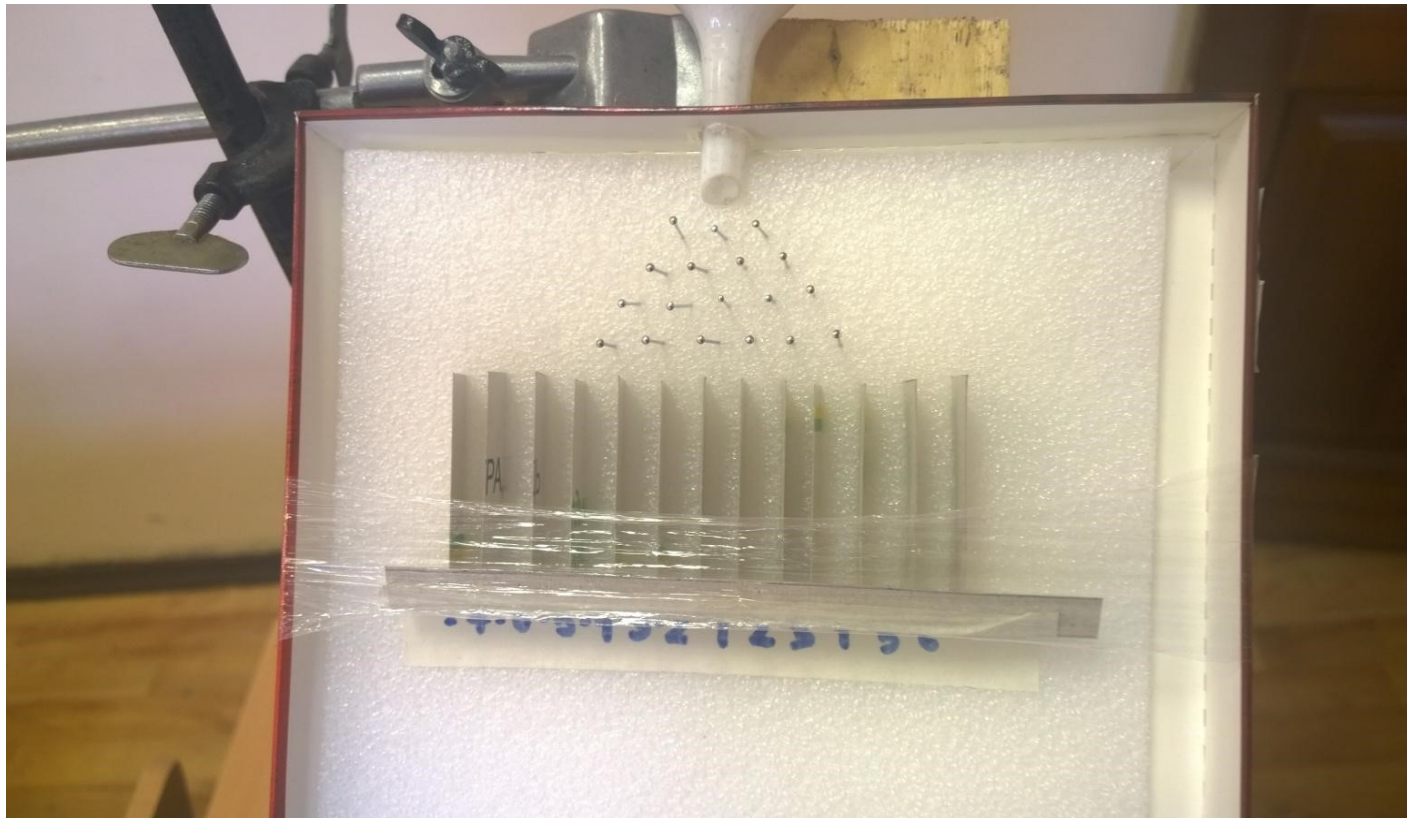- the number of particles (ΔN) with finite range of speed's values

Galton's board

воронка
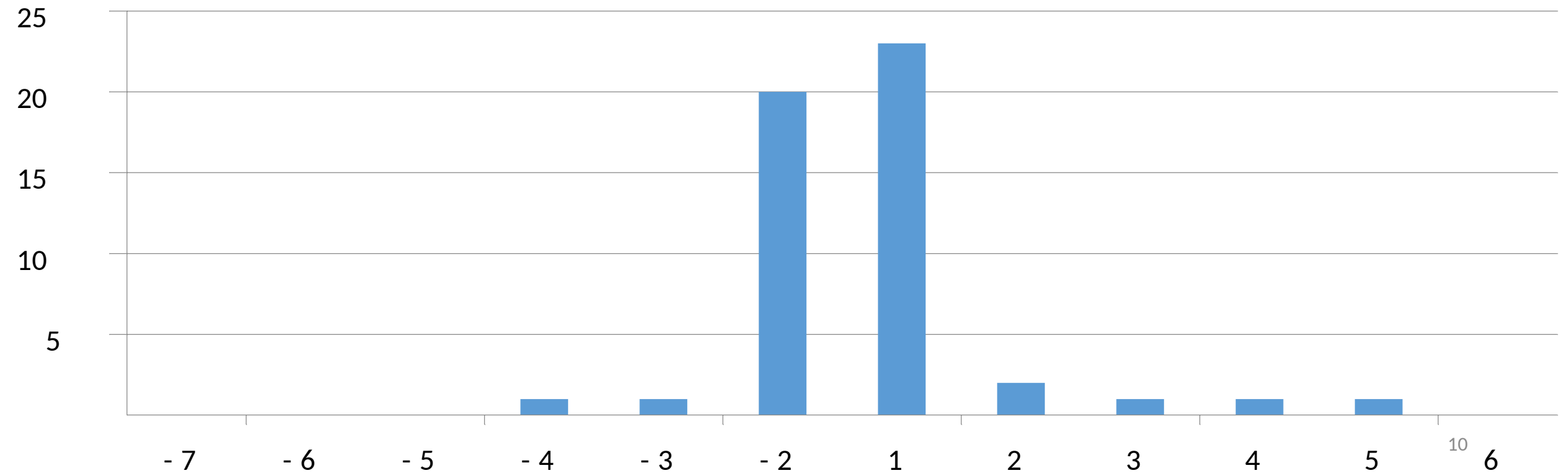Funnel

Obstacles
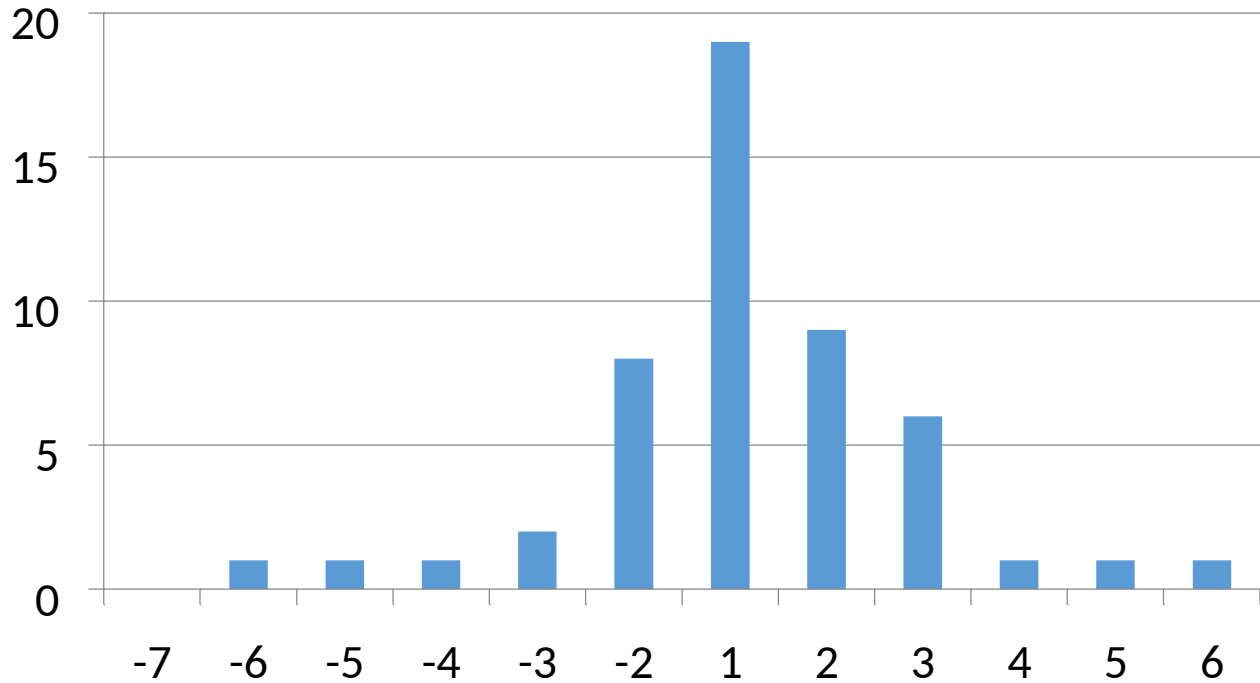
Cells
ячейки

Experimental part

Equipment

- 12 cells

1st experiment

- 50 peas

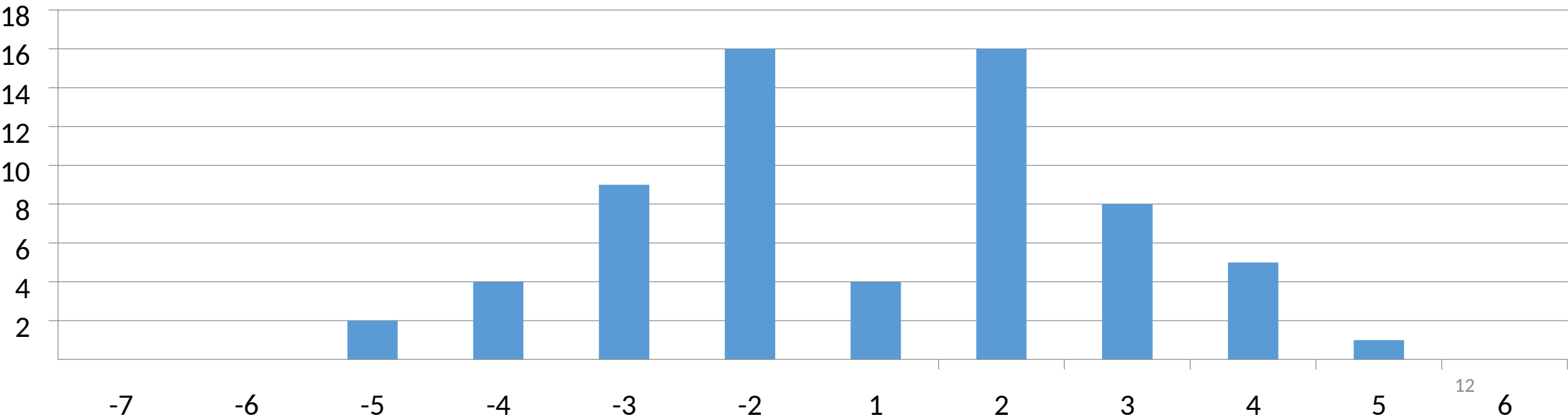# 2nd experiment

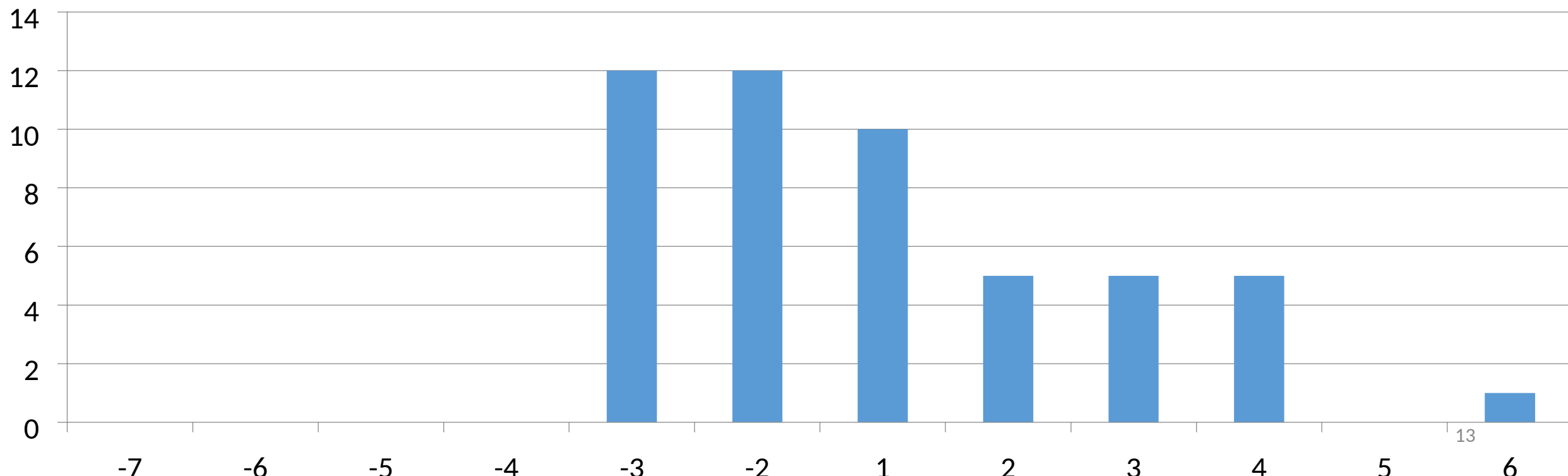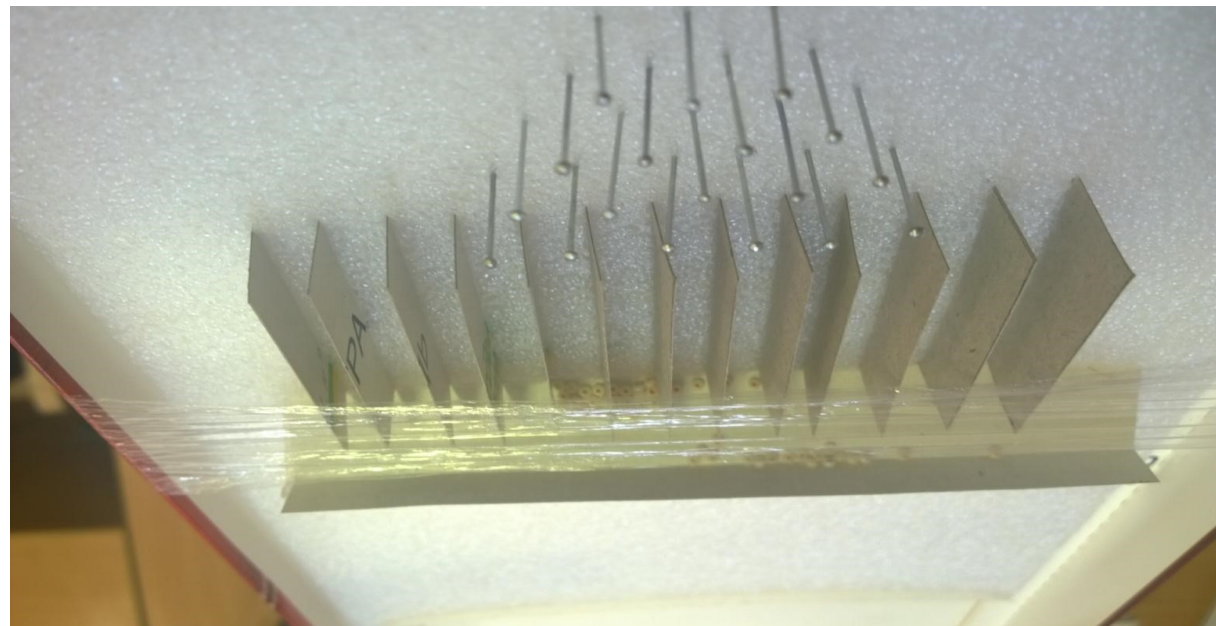- 50 peas

- Pins

11

3rd experiment

- 65 pins
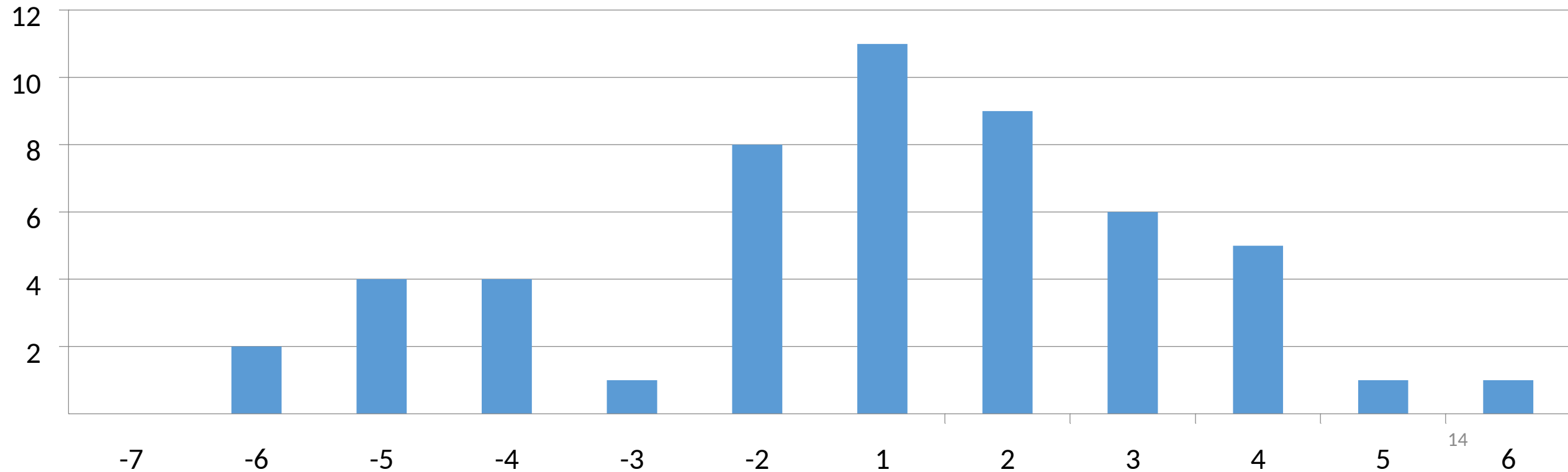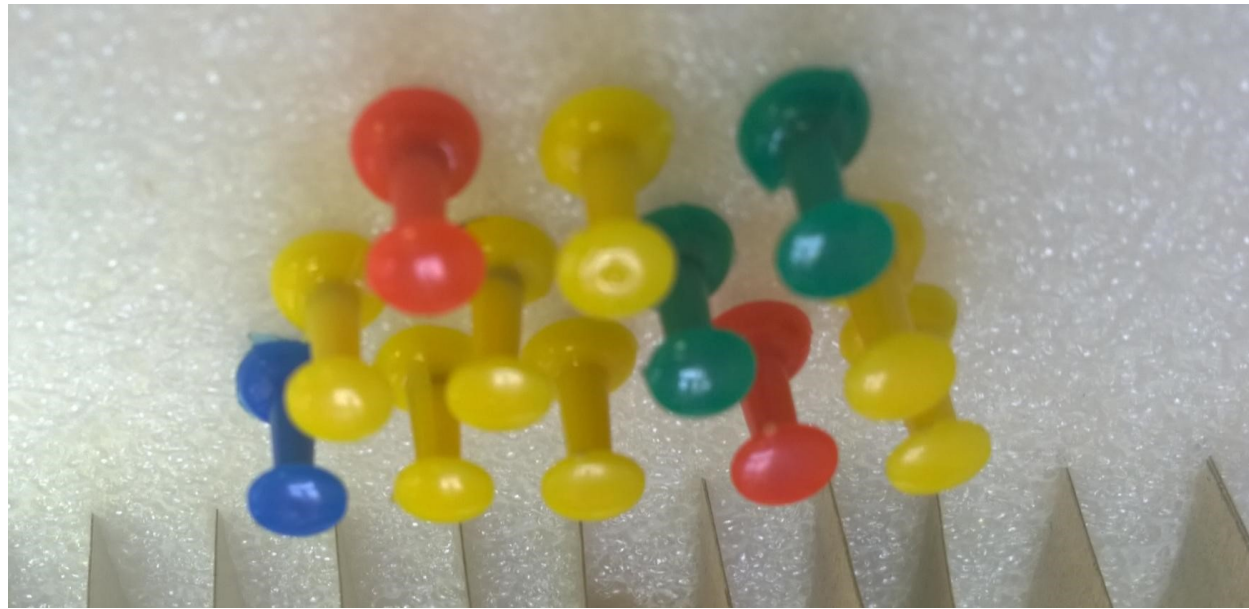- Buttons

4th experiment
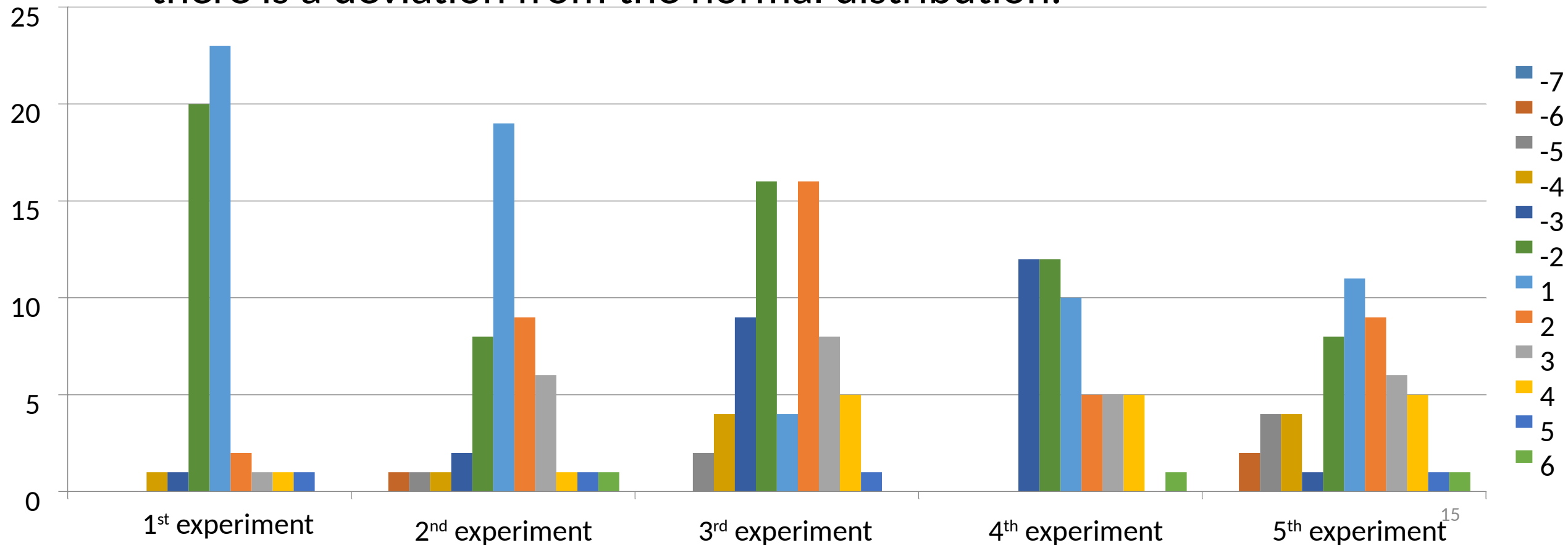
- 50 bids
- Pins

5th experiment

- 52 bids
- Buttons

Conclusion

- When the size of obstacles is comparable with the size of particles there is a deviation from the normal distribution.

Sources of information

- A. Detlaf Course of general physics, 2007
- I. Savelyev Course of general physics, 2007