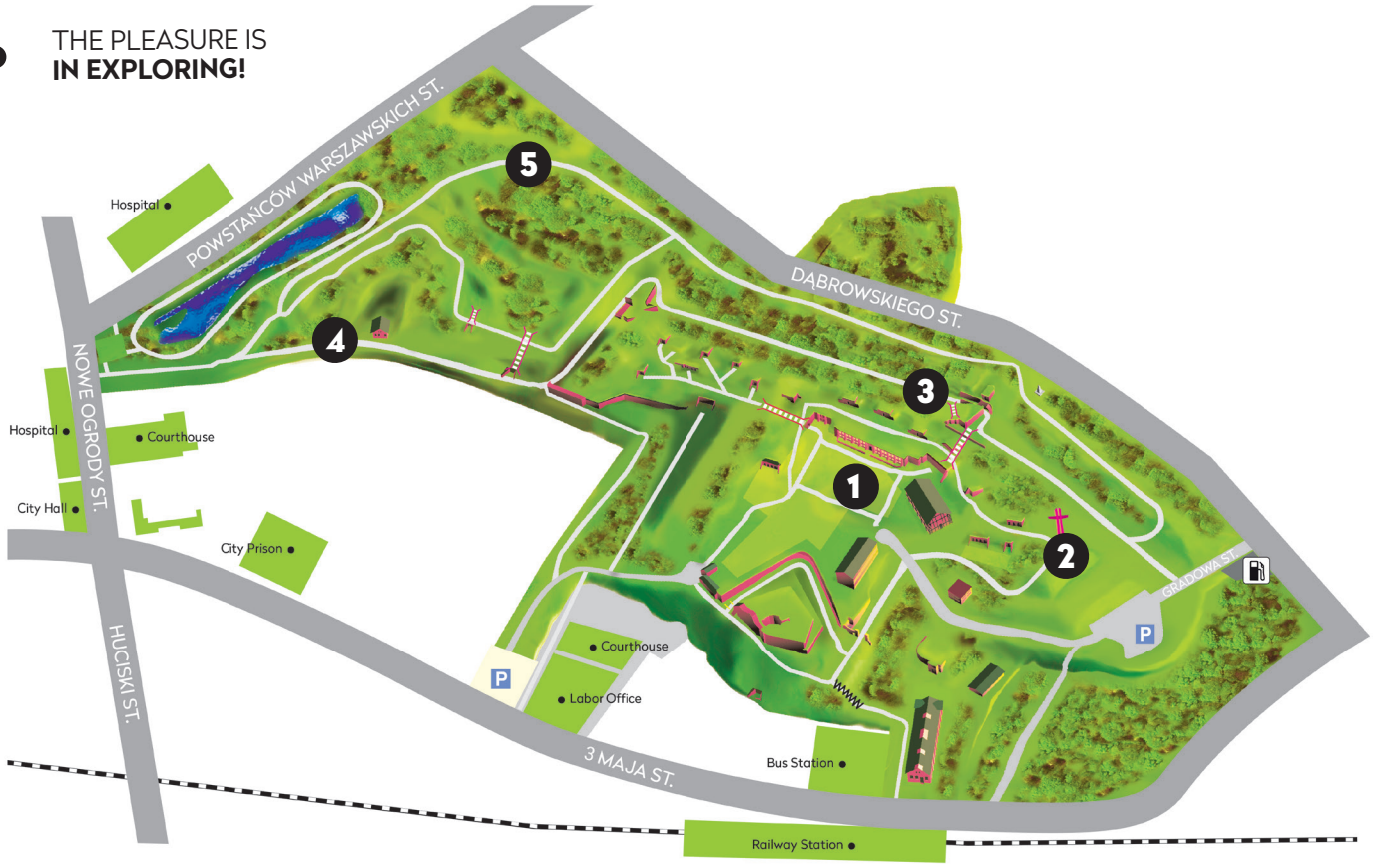
HEVELIANUM

IN STEP WITH SCIENCE

Time for a walk full of experiments! Have your phone ready, measure the length of your gait and enter the Hevelianum park. Visit the locations marked on the map and experiment!

THE PLEASURE IS
IN EXPLORING!



1

Measuring height using Thales's theorem

Can you see that tall pole over there?
Your first task is to measure its height. To do this, lie down on the ground so that you can see the tip of the pole. Have another person stand next to you so that from your point of view, the tip of their head touches the tip of the pole. Mark your positions on the ground. Now measure the number of steps between your position, the place where your friend was standing, and the pole itself. Use the formula below and a calculator to estimate the height of the pole.

height of the pole / height of the standing person = distance from the pole / distance from the standing person

Answer: the height of the pole is ..... m

2

Distance from the horizon

You are at a scenic vantage point, and you can see far into the distance. But just how far can you see? If you were at a beach, the horizon would be approx. 4.5 km away, but the higher you are, the longer the distance becomes. Your next task is to calculate this distance.

Start by adding your height to the height of Góra Gradowa (46 MSL), and then calculate the square root of the result. Now multiply the result by 3.57.

Answer: the distance from the horizon is ..... km

3

Echo

You have reached the Dry Moat. Ahead of you is a long, straight path leading to the brick wall of the Southern Caponier. Clap your hands or shout "echo!", listen carefully, and you will hear an echo. As you are approaching the wall, keep clapping or shouting every couple of steps. Take note of how fast the echo comes back and solve the task below.

Riddle:
the closer you are to the, wall the faster/slower* the echo returns, and the quieter/louder* it is.

**cross off as appropriate*

4

Centrifugal force

Even though you may not feel it, you are affected by it at all times. Centrifugal force is everywhere there is rotation, and it so happens that our planet is spinning all the time. But to feel this force, you need to spin a little harder. There is a merry-go-round in the playground. Hop on it and ask a friend to spin it really fast for you. Hold onto your seat and answer the following question:

Did the centrifugal force try to push you in or out?

Answer: .....

5

Body proportions

Lie down on the grass and relax after a long walk. As you are lying on the ground, spread your arms wide and mark how far they can reach. Mark your height as well, and see if the two measurements are similar.

Arm span and height are/are not* similar.
**cross off as appropriate*

Your feet and forearms are another example. Take off one of your shoes and put your foot against your forearm. Notice something interesting?
Yes! The length of your foot is equal to the distance between your elbow and wrist!

You can even use your proportions to determine how long your femurs are. The femur constitutes approx. 26% of your body length, so simply multiply your height by 0.26.

The length of you femur is: ..... cm