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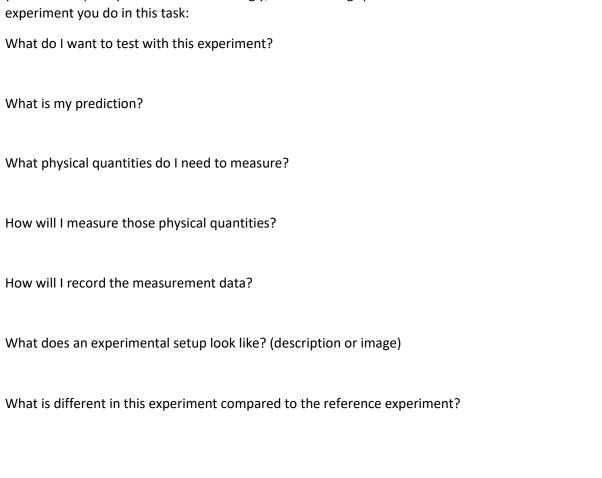
Sliding smartphone

Student version

6.2.2023

Sliding smartphone

In this task, you will study the dynamic friction of a cell phone sliding on a flat table surface. Using the *PhyPhox* application, you will measure the acceleration and determine the coefficient of dynamic friction between the mobile phone and the desk.

Research question:

What does the coefficient of dynamic friction depend on?

In the following, you will conduct several experiments to test different hypotheses. To test your hypotheses and answer the related questions it is necessary to make a reference experiment, so that you can compare your results. Accordingly, the following questions need to be answered for each experiment you do in this task:

What do I want to test with this experiment?

What is my prediction?

What physical quantities do I need to measure?

How will I measure those physical quantities?

How will I record the measurement data?

What does an experimental setup look like? (description or image)

What is different in this experiment compared to the reference experiment?

Note: To transfer data from PhyPhox to Excel and process data, read the appendix.

Attach the obtained $a - t$ graph to each tested hypothesis and write the conclusion of the experiment (whether the hypothesis is supported or not).

Hypothesis 1:

The coefficient of dynamic friction depends on the mass of the cell phone.

Hypothesis 2:

The coefficient of dynamic friction depends on the surface of the cell phone.

Hypothesis 3:

The coefficient of dynamic friction depends on the velocity of the cell phone.

Hypothesis 4:

The coefficient of dynamic friction depends on the mass of the cell phone and the force with which we pull it.

Hypothesis 5:

The coefficient of dynamic friction depends on the surface of the table, i.e. the surface on which the mobile phone moves.

Conclusion:

The coefficient of dynamic friction depends on…