**1.3 Modeling the ballpoint case**

There are two possible scenarios for the ballpoint case: it can be an unfortunate fall of the victim with her eye exactly on the pen she held in her hand or the victim could have been murdered by someone who fired a pen with a crossbow. It is up to you to find as much as possible evidence to be able to advice the judge if these scenarios are possible or not. The first task is to set up two different experiments that can simulate these scenarios. Of course you can not do this experiment with real human beings so you have two think of alternatives. Which objects or materials will give reliable results?

* Set up two experiments to model both scenarios. You can choose the materials that you want. Be sure to use materials that are easily available. Keep in mind what is moving and what is stable in both scenarios. While preparing, doing and discussing the experiment, think about the following points:
	+ Which materials are suitable to use?
	+ What are the similarities and what are the differences between model and reality?
* Discuss this with your group, discuss also with your teacher
* Perform these experiments and report about your experiment. Be sure to address the questions stated above and also pay attention to the following questions:
	+ What are the outcomes of the experiment?
	+ Is it possible that someone dies because of an accident with a ballpoint?
	+ Is it possible that someone dies because he (or she) gets shot with a crossbow?
	+ Where possible, support your findings with quantitative data.