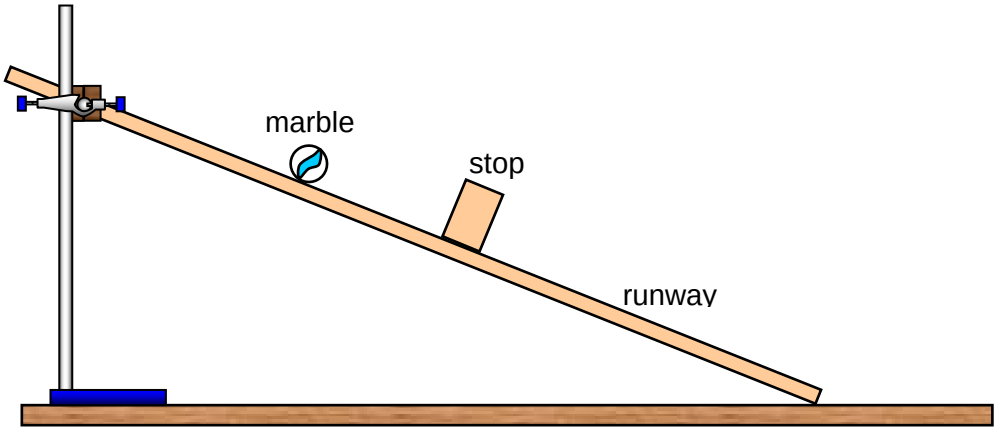
TAP 205- 1: Rolling balls down ramps

This is a version of the experiment that Galileo performed towards the end of the sixteenth century.



Apparatus required

- ✓ wooden runway
- ✓ digital stop clock
- ✓ metre rule to measure lengths along runway
- ✓ metre rule to act as a 'stop'.
- ✓ retort stand and clamp
- ✓ marble

Procedure

- Set the ramp at about 20^{o} slope.
- Measure the time taken for the marble to run from the top of the slope to a rule ('stop') 10 cm along the slope. Repeat this measurement a sensible number of times to establish a mean value.
- Move the stop point to 15 cm from the top of the slope and repeat the process.
- Continue the process, at 5 cm intervals until the marble runs the length of the ramp.
- Results can be recorded in a table with the following headings:

distance along ramp / m	mean time/ s	average velocity / m s^{-1}	final velocity = 2 × average velocity / m s^{-1}

Analysis

Draw graphs of final velocity against distance and final velocity against time. From the second graph deduce the marble's acceleration.

Repeat the experiment using a different angle of slope, and find the new value of acceleration.

If you have time repeat with a marble of different mass.