# WORKSHEETS FOR PUPILS

| Name of activity | Estimated time needed | Difficulty of activity | Age of children for whom the activity is suitable | Tools and used materials | Objective of activity |
|---|---|---|---|---|---|
| Comet | 20 – 30 minutes | medium | 14 – 15 | encyclopaedia, atlas or internet, calculator, spreadsheet | concept of comet, tail, movement around the sun |
| Minor Planet Velocity | 30 – 40 minutes | very hard | 14 – 15 | encyclopaedia, atlas or internet, calculator, spreadsheet | 3. Kepler's law, unit conversions |
| Energy | 20 – 30 minutes | medium | 14 – 15 | paper, computer, calculator | law of conservation of mechanical energy, kinetic and positional energy |
| Impact Craters | 20 – 30 minutes | medium | 14 – 15 | metre ruler, calculator, spreadsheet, graph paper | work with map, kinetic energy, volume, weight, density |
| Gravitational Force | 20 – 30 minutes | medium | 14 – 15 | calculator, spreadsheet, graph paper | gravitational force, sphere volume, unit conversions |

## Worksheet 5: GRAVITATIONAL FORCE

**Practical Exercise:** Calculate the magnitude of the gravitational force between two grains, which are perfect spheres with a radius of 0.1 m and a density of 1,300 kg m$^{-3}$, located at a distance of 1 m from each other.

**Practical Exercise:** Now, imagine that one grain is 10 meters in size and the grains are 1000 meters apart. Calculate the magnitude of the gravitational force between the grains.

**Practical Exercise:** What would be the magnitude of the gravitational force if one grain had a diameter of 10 km, the other 0.1 meters and they were 15 km apart?