Trajectory Education

Headstart 2026

Subject Syllabus & Timeline

VCE Physics 3+4

WEEK 1: NEWTON'S LAWS IN TWO DIMENSIONS — 21-12-2025

- Resolve force vectors into horizontal and vertical components to solve net force problems.
- Apply Newton's second law to calculate acceleration for objects on inclined planes.
- Analyse the forces acting on connected bodies (such as trains and pulley systems).

WEEK 2: PROJECTILE MOTION — 28-12-2025

- Calculate the range, maximum height, and time of flight for a projectile launched at an angle.
- Construct velocity-time graphs for both horizontal and vertical components of projectile motion.
- Describe qualitatively how air resistance affects the shape of a trajectory and the final velocity.

WEEK 3: UNIFORM CIRCULAR MOTION (HORIZONTAL) — 04-01-2026

- Explain why an object moving at constant speed in a circle is accelerating.
- Calculate the required bank angle for a vehicle to negotiate a turn without friction.
- Draw free-body diagrams for cars on banked tracks, identifying the net force direction.

WEEK 4: VERTICAL CIRCULAR MOTION AND SATELLITES — 11-01-2026

- Calculate the tension in a string or normal force on a track at the top and bottom of a vertical loop.
- Determine the minimum speed required to complete a vertical loop (where $N = 0$ or $T = 0$).
- Apply circular motion formulas to satellites orbiting Earth.

WEEK 5: IMPULSE, MOMENTUM & ENERGY — 18-01-2026

- Calculate the impulse imparted during a collision from a Force-Time graph.
- Analyse energy transformations between kinetic, gravitational, and elastic potential forms.
- Differentiate between elastic and inelastic collisions with reference to kinetic energy conservation.

Headstart classes are **completely free** and a great way to set yourself up for the new school year.

Sign up now

Questions?

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