

SCIENCE: FORCES, ENERGY & MOTION

LEARNING OPPORTUNITIES

- Energy transfers & motion: students observe how gravity, potential and kinetic energy interact as coaster trains climb and descend.
- Forces & G-forces: rides like Hyperia and Stealth demonstrate positive and negative forces in action – a powerful way to make abstract physics tangible.
- Friction & braking: discuss braking systems (magnetic vs friction) and how energy is transformed (e.g. into heat).
- Circular motion & centripetal force: spinning attractions provide a real context for rotational forces and motion.

CURRICULUM LINKS

KS3: forces as pushes/pulls, speed, motion, energy changes.

KS4: deeper study of energy stores, transfers, work done, forces doing work, and data analysis.

SKILLS DEVELOPMENT

- Observing and describing physical phenomena
- Applying scientific theory to real-world systems
- Analysing and interpreting data

MATHS IN ACTION

LEARNING OPPORTUNITIES

- Calculate speed, velocity and acceleration using ride layouts or simple data gathering.
- Estimate energy at different points on a coaster (potential vs kinetic).
- Use ratios, proportions and graphs to represent motion and forces.

CURRICULUM LINKS

- Measurement and data handling
- Representing relationships graphically
- Applying maths in practical situations

ENGINEERING & DESIGN TECHNOLOGIES

LEARNING OPPORTUNITIES

- Discuss how ride designers use engineering principles to balance safety and thrill.
- Explore risk assessment and design optimisation as part of real engineering practice.

CURRICULUM LINKS

- Design and Technology: forces in structures, material properties
- Engineering principles in ride mechanics

PERSONAL DEVELOPMENT (PSHE & SKILLS)

LEARNING OPPORTUNITIES

- Confidence and resilience through challenge and new experiences
- Teamwork and decision-making as groups navigate the park
- Reflection on risk, safety and personal boundaries

TEACHING IDEAS & FOLLOW-UP ACTIVITIES

- Pre-visit lesson: Introduce energy, forces and motion using videos or simulation tools.
- Data collection on site: Have students time ride segments, estimate height changes or sketch force diagrams.
- Post-visit tasks: Analyse ride data in graphs; write reflective pieces connecting experience to science theory.