Investigate Newton’s laws of motion and quantitatively analyse the relationship...

investigate Newton’s laws of motion and quantitatively analyse the relationship between force, mass and acceleration of objects

Learning intention

- investigate Newton’s laws of motion and quantitatively analyse the relationship between force, mass and acceleration of objects

Teach and model

- investigating a moving object to analyse and propose relationships between distance and time, speed, force and acceleration
- using mathematical representations including graphs and algebraic formulas to quantitatively relate force, speed, acceleration and mass
- modelling how a change in net force acting on an object affects its motion and relating to the purpose of safety features such as seatbelts, airbags and crumple zones in...

Check understanding

- Explain the main idea in investigate newton’s laws of motion and quantitatively analyse the relationship... using an example.
- Show the idea in a second way: with words, a model, a diagram or symbols.
- Apply the idea to a short unfamiliar situation and justify the result.

Teaching cautions

- Ask the student to explain their choice, not only state an answer.
- Check that key vocabulary is understood in a new example.
- Mix representations so the skill is transferred rather than copied.

Quick lesson sequence

- Connect to prior knowledge and introduce the key vocabulary.
- Model one clear example, then solve a second example together.
- Finish with an independent check and a short student explanation.