Chapter 8 - Mechanics

Modelling in Mechanics

Chapter Overview

1. Constructing a Model

2. Modelling Assumptions

3. Quantities and Units

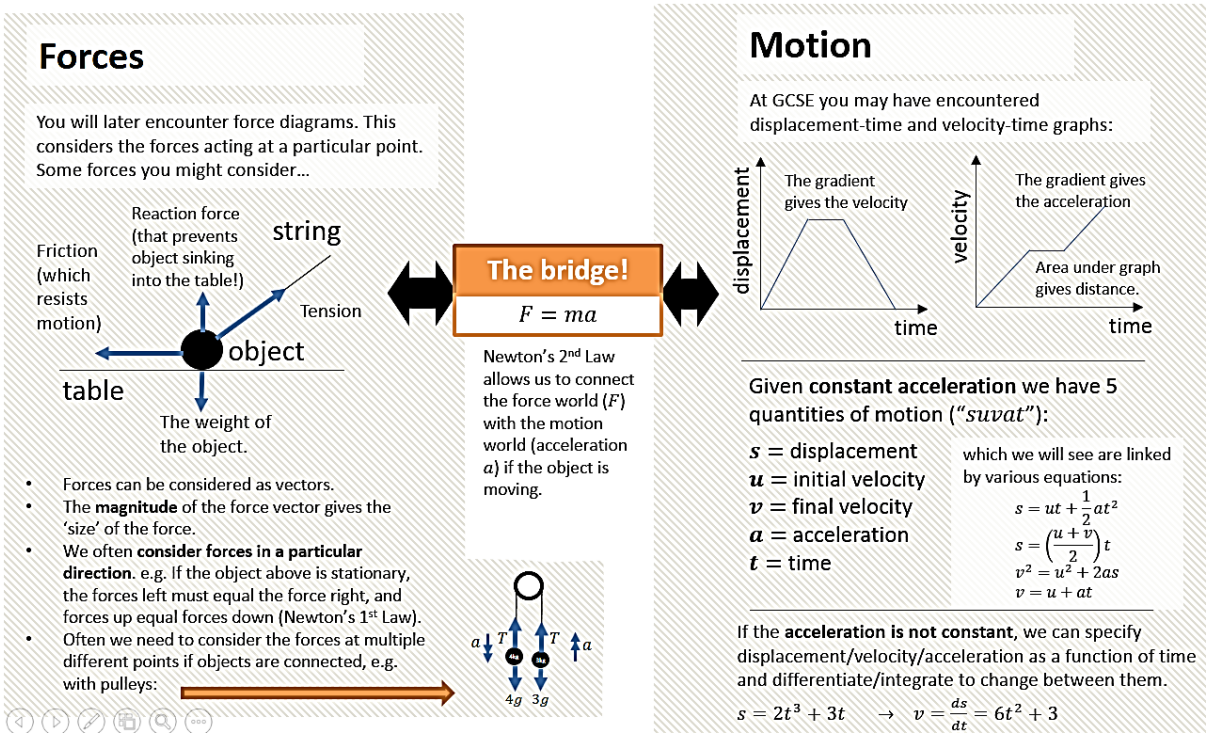
4. Working with Vectors

Topics	What students need to learn:		
	Content		Guidance
6 **Quantities and units in mechanics**	6.1	Understand and use fundamental quantities and units in the S.I. system: length, time, mass. Understand and use derived quantities and units: velocity, acceleration, force, weight.	

What is Mechanics?

Broadly speaking, mechanics covers motion, forces and how the two inter-relate with each other.

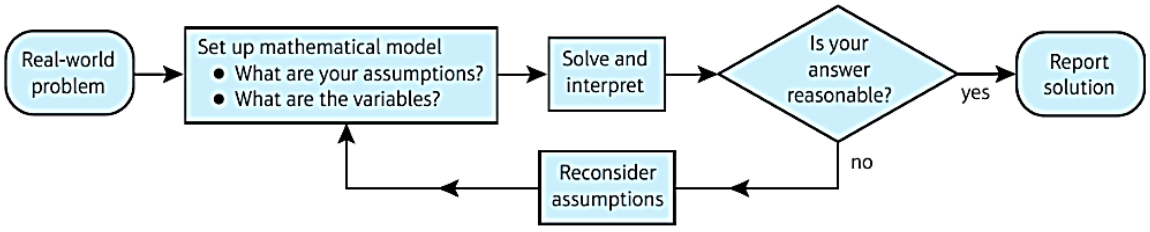
Mechanics, broadly speaking, concerns motion, forces, and how the two interrelate.
This chapter just gives you an overview of what you'll be covering in Year 1 and how it all links together.



1. Constructing a Model

Why use a mathematical model?

The solution to a mathematical model needs to be interpreted in the context of the original problem. You may need to refine the model and reconsider your original assumptions.



Example *(Textbook)*

The motion of a basketball as it leaves a player's hand and passes through the net can be modelled using the equation $h = 2 + 1.1x - 0.1x^2$, where h m is the height of the basketball above the ground and x m is the horizontal distance travelled.

a Find the height of the basketball: **i** when it is released **ii** at a horizontal distance of 0.5 m.

b Use the model to predict the height of the basketball when it is at a horizontal distance of 15 m from the player.

c Comment on the validity of this prediction.

Exercise 8A Page 119