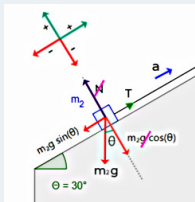


4. Mind Map: How to Draw Free Body Diagrams (FBD)



Free-Body Diagrams (FBD)

Newton's Laws

- Newton's 1st Law — Sum of Forces (ΣF) = 0 for equilibrium
- Newton's 2nd Law — Sum of Forces (ΣF) = ma for non-equilibrium

Key Points

- Applies to a specific body — Decide which body you wish to make FBD for
- Only forces acting on the body matter
 - Include all forces acting **ON** the body
 - Do not include forces the body exerts on other objects**

Problem Solving Steps

- Show the chosen body only in the FBD
- Choose a coordinate system
- Show forces applied by other bodies. Use vectors to show magnitudes & directions of all forces acting on the body
- Resolve the forces into their components
- Sum the forces in each direction to analyze equilibrium or motion of the body
- Apply Newton's second law to the body in each component direction
- Solve equations for unknowns

Analysing the Answer

- Check for consistency and correctness in the solution
- Consider the physical meaning of solutions and check for reasonableness

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