**Physics 20**

**Unit B: Dynamics**

**Knowledge Checklist (Do I know?)**

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| **Concept** | **Example/Explanation** | **Follow-up Questions I want to ask.** |
| 1. Balanced and Unbalanced Forces | Draw Free Body Diagrams for a variety of situations  Explain how Newton’s First and Second Laws apply to a variety of situations. |  |
| 1. Action Reactions | Qualitatively and quantitatively, explain the interaction between two objects by understanding that the two forces are equal in magnitude but opposite in direction. |  |
| 1. Catalogue of Forces | Define each of the following forces and use them together with Newton’s Laws of Motion.   * Net Force * Force of Gravity * Normal Force * Force of Friction (Static & Kinetic) * Applied Force * Tension |  |
| 1. Universal Gravity | Identify Gravity as one of four fundamental forces  Describe both qualitatively and quantitatively, Newton’s Law of Universal Gravity  Define a field and apply it to describe gravitational effects |  |
| 1. Components of Force | Recognise that forces are vectors.  Quantitatively determine the x- and y- components of a non-perpendicular force.  Quantitatively add two vectors to determine a resultant magnitude and direction. |  |
| 1. Inclined Planes | Rotate the x- and y- axis to model the forces on an incline plane. |  |

**Skills Checklist (Can I Do?)**

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| **Concept** | **Example** | **Follow-up Questions I have** |
| 1. Apply Newton’s first law of motion to describe an object at rest or uniform motion. | Use the equations:  To describe the motion of objects at rest or moving at a constant velocity. |  |
| 1. Apply Newton’s second law of motion to explain describe accelerated motion. | Apply the equations:  To situations involving the following Pulleys, Hanging Signs, Elevators, Cars, Boats or other objects that experience acceleration. |  |
| 1. Experiments | Formulate questions about observed relationships involving Forces, Acceleration, Displacement and Time.  Analyze Mathematical Models to assess possible solutions (eg: when is acceleration due to gravity uniform and when is it non-uniform?) |  |
| 1. Add Vectors in 1 and 2 Dimensions | Apply at least one suitable technique to add vectors.  Find the x- and y- components of a vector.  Determine the resultant vector (including both magnitude and direction)  Know the three ways to represent the direction of a vector. |  |