**Topic Overview: Speed and Gravity**

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|  | Ref | Outcome | Achieved | ☺ |
| Emerging 1 | E7SpSp1.1 | Know that gravity is a force |  |  |
|  | E7SpSp1.2 |  Know that the higher the speed of an object, the shorter the time taken for a journey |  |  |
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| Emerging 2 | E7SpSp2.1 | Know that gravity acts on anything on earth. |  |  |
|  | E7SpSp2.2 | Understand factors that affect the speed of an object |  |  |
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| Developing 3 | D7SpSp3.1 | Know that mass and weight are different but related. Mass is a property of the object; weight depends upon mass but also on gravitational field strength. |  |  |
|  | D7SpSp3.2 | Describe the meaning of speed. |  |  |
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| Developing 4 | D7SpSp4.1 | g on Earth = 10 N/kg. On the Moon it is 1.6 N/kg. |  |  |
|  | D7SpSp4.2 | Design an experiment to measure speed |  |  |
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| Securing 5 | D7SpSp5.1 | Use the formula: weight (N) = mass (kg) x gravitational field strength (N/kg). |  |  |
|  | D7SpSp5.2 | Illustrate a journey with changing speed on a distance-time graph, and label changes in motion. |  |  |
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| Securing 6 | S7SpSp6.1 | Compare your weight on Earth with your weight on different planets using the formula. |  |  |
|  | S7SpSp6.2 | Use the formula: speed = distance (m) / time (s) |  |  |
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| Mastering 7 | M7SpSp7.1 | Explain unfamiliar observations where weight changes. |  |  |
|  | M7SpSp7.2 | Describe how the speed of an object varies when measured by observers who are not moving, or moving relative to the object. |  |  |
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| Mastering 8 | M7SpSp8.1 | Suggest implications of how gravity varies for a space mission. |  |  |
|  | M7SpSp8.2 | Predict changes in an object's speed when the forces on it change. |  |  |
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| Mastering 9  | M7SpSp9.1 | Compare and contrast gravity with other forces. |  |  |
|  | M7SpSp9.2 | Suggest how the motion of two objects moving at different speeds in the same direction would appear to the other. |  |  |

**Keywords**

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| **Speed:** How much distance is covered in how much time. |
| **Average speed:** The overall distance travelled divided by overall time for a journey. |
| **Relative motion:** Different observers judge speeds differently if they are in motion too, so an object's speed is relative to the observer's speed. |
| **Acceleration:** How quickly speed increases or decreases. |
| **Weight:** The force of gravity on an object (N). |
| **Non-contact force:** One that acts without direct contact. |
| **Mass:** The amount of stuff in an object (kg). |
| **Gravitational field strength, g:** The force from gravity on 1 kg (N/kg). |
| **Field:** The area where other objects feel a gravitational force. |