# Mission to Mars - Year 5 Coding Unit Overview

This is a comprehensive 6-week coding unit that takes Year 5 students on a journey from basic 3D programming concepts to creating complex interactive Mars base simulations. The unit builds progressively, with each week introducing new programming concepts while reinforcing previous learning.

**Week 1: Solar System Animation**

* Students learn 3D positioning using X, Y, Z coordinates and object scaling
* Create realistic planetary systems with path-based movement and forever loops
* Animate planets orbiting the sun at different speeds
* Establish foundational skills in 3D space manipulation and continuous animation

**Week 2: Controlling Gravity**

* Focus on interactive programming with velocity control and boolean logic
* Create astronaut movement systems using push blocks and event-driven programming
* Implement toggle systems using true/false conditions to control object behavior and appearance

**Week 3: Control Room Physics**

* Organize code using functions and lists while implementing collision detection
* Build enclosed gravity control rooms with objects having different masses and bounciness properties
* Learn to create reusable code blocks that affect multiple objects simultaneously

**Week 4: Mars Base Construction - Part 1**

* Begin designing interactive Mars bases combining previous skills
* Create base structures and implement animated paths
* Establish foundational Mars environment with physics-controlled objects

**Week 5: Mars Base Construction - Part 2**

* Complete Mars base construction with camera tours and interactive systems
* Demonstrate mastery by creating immersive environments
* Integrate animated paths, physics-controlled objects, and interactive systems working together

**Week 6: Conditional Logic and User Input (Bonus Week - if applicable)**

* Extend unit into educational interactivity with quiz systems using if/else logic
* Handle user input and create adaptive learning experiences
* Provide intelligent feedback and branching responses based on user answers

**Week 7: Documentation and Peer Assessment**

* Create video tours of projects and conduct peer assessments using technical criteria
* Develop ability to communicate technical concepts
* Evaluate programming work using appropriate computing vocabulary

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## Core Computing Concepts Covered

* 3D positioning and scaling
* Animation and path-based movement
* Event-driven programming and user interaction
* Boolean logic and conditional statements
* Functions, lists, and code organization
* Physics simulation and collision detection