Desirable features

High-quality performance is evidenced by:

- a workable experimental design that includes a testable and plausible hypothesis and appropriate controls and that delineates equipment, method and data collection procedures.
- deep knowledge and understanding of concepts in the natural and physical sciences.
- successful application of mathematical techniques and procedures.
- conveying meaning, orally and in writing, with clarity, precision, completeness and due regard to the order of statements in the explanation.

Acceptable performance (successful task completion) is evidenced by:

- an experimental design that includes a hypothesis and suggests equipment and procedures.
- knowledge of concepts in mathematics and the natural and physical sciences.
- identification of scientific development(s) linked to the space program.

YEARS 4–6

TASK # 7

Space Futures

New Basics referents

Life pathways and social futures

- Learning about and preparing for new worlds of work
- Collaborating with peers and others

Multiliteracies and communications media

- Blending new and traditional communications media
- Mastering literacy and numeracy

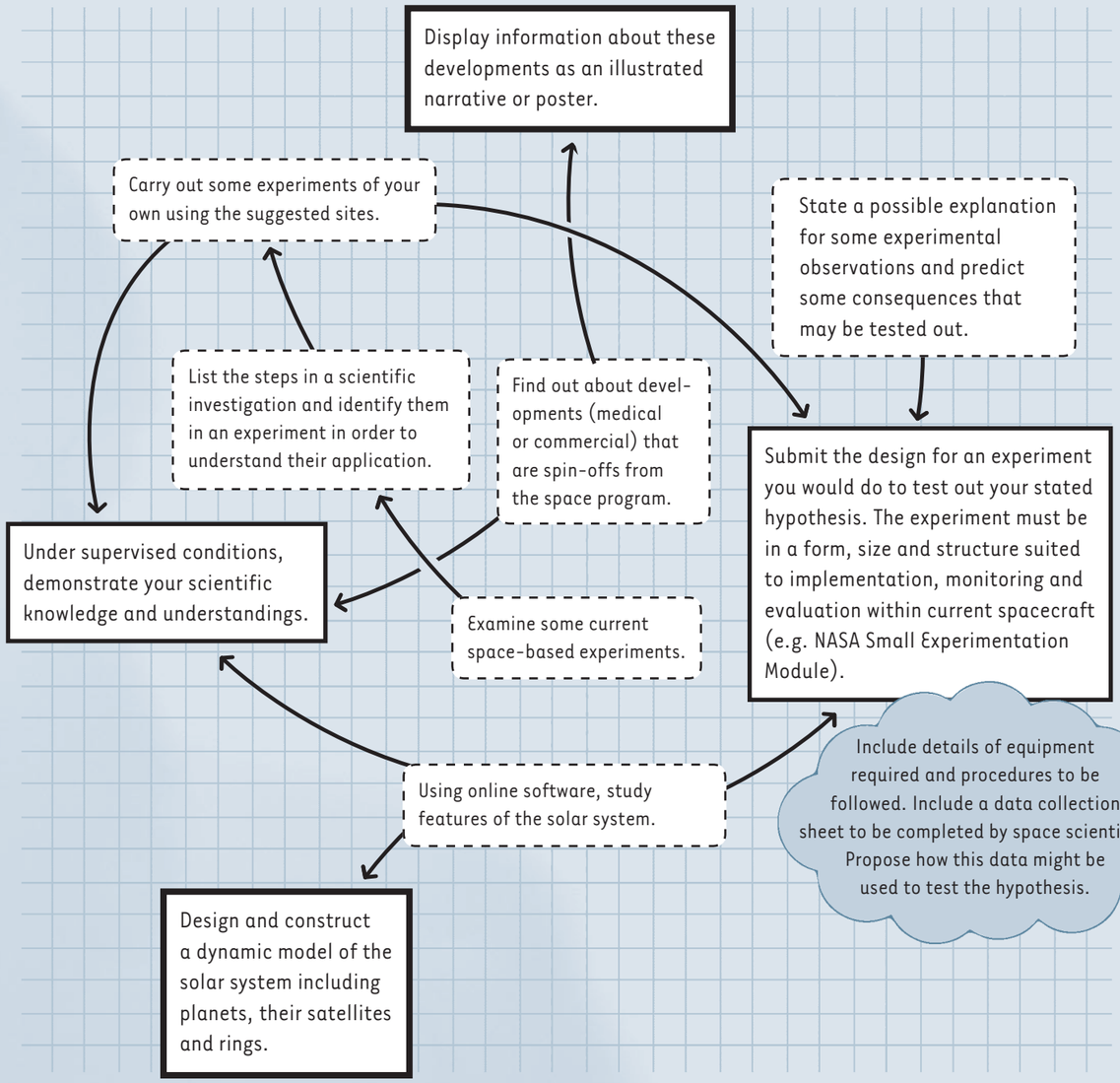
Environments and technologies

- Developing a scientific understanding of the world
- Working with design and engineering technologies

Targeted repertoires of practice

- Approximating and estimating
- Choosing and utilising the appropriate measuring instrument to perform a given task
- Demonstrating knowledge and understanding of scientific concepts (gravity, weightlessness, celestial bodies in orbit, human physiology, properties of matter)
- Designing and conducting scientific investigations
- Devising hypotheses
- Interacting with digital data and texts
- Interrelating the ideas/issues/impacts of space travel with life on Earth
- Observing systematically
- Performing calculations involving ratio, proportion and power-of-ten notation (place value to millions)
- Scale drawing and modelling

Students will engage with the exploration of space and with the techniques and procedures of the mathematical and physical sciences. They will produce a model of the solar system, investigate the impact of space travel on life on Earth, and produce a coherent design for an experiment to be performed on a spacecraft.



Ideas, hints and comments

- Use software to:
  - explore virtual galaxy resources
  - discover stellar bodies and events
  - calculate mathematical relationships of ratio within the virtual solar system
  - draw connections to the solar system through observation and software.
- The model of the solar system could be a human tableau or a computer simulation.
- Teachers will need to walk students through the steps involved in a scientific investigation.
- Suggested sites for space-based experiments:
  - visit the Stars Academy at www.starsacademy.com
  - go on a virtual tour of the solar system at www.spacekids.com
  - visit the learning centre of the Planetary Society at http://planetary.org
  - track the Stardust spacecraft's mission at http://stardust.jpl.nasa.gov
  - find out more about NASA at http://www.nasa.gov
  - track the Starshine research satellite at http://www.azinet.com and follow the links to the Starshine Project.
- If you intend to enter your design in the Small Experimentation Module, visit NASA at http://www.wff.nasa.gov and then follow the links through Public Education outreach, Education outreach and the Space Experiment Module.
- Teachers are encouraged to include material relating to solar phenomena as part of the scientific knowledge and understandings demonstrated by students under supervised conditions.

Task parameters

- Task intensity: high
- Students are to work in small groups.
- Available grades: 5