

# Grade 9 - Unit 5 – Space Exploration Concepts

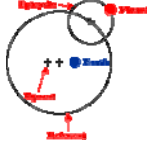
## Views of Space

Ancients  
↓  
Structures  
(Equinox – Solstice)

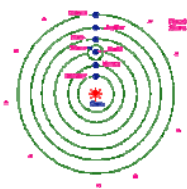
↓  
Myths

↓  
Models

↓  
Geocentric



↓  
Heliocentric



## Technologies to View Space



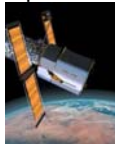
- Refracting  
- Reflecting

Interferometry



(Radio Telescopes)

Hubble Space Telescope



## Objects in Space

'Nebular Theory'  
(Protoplanet Hypothesis)

<http://zebu.uoregon.edu/~js/ast121/lectures/lec24.html>

Stars	Planets	Comets	Other Phenomena
<b>Our Sun</b>	<b>Inner Planets</b>	Meteors Asteroids	Galaxies Nebula Black Holes
Star Life Cycle	<b>Outer Planets</b>	Space Junk	
Constellations Asterisms			

Summary Cards

<http://www.edquest.ca/content/view/208/>



Celestial Sphere

Azimuth – Altitude – Zenith

Triangulation - Parallax

Natural – Artificial

**Satellites**

Communication    Observation & Research    Remote Sensing    GPS

Historical Events

↑  
**Rocket Science**

Parts of a Rocket:

Fuel    Structural & Mechanical Elements    Payload

## Technologies For Exploring Space



Spacecraft

Shuttles



Probes



Space Station



Living In Space - Life-Support Systems

Hazards

Environmental    Psychological    Physiological

Apollo 1

Accidents

Challenger

Columbia

Manned Missions  
& Space Applications



## Space Related Issues

Cost  
Dangers  
Resources

Technology  
Curiosity  
Understanding

Political  
Ethical  
Environmental

## Canadians in Space

1<sup>st</sup> Magnetic  
Observatory

Communication  
Satellites  
*Anik 1*  
*Allouette 1*

Landing Gear

Marc Garneau

Roberta Bondar

Rover Ramp

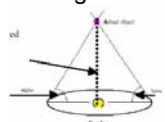
Canadarm



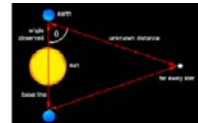
Canadarm2  
(Chris Hadfield)

## Technologies to Interpret What We See

Triangulation



Parallax



Doppler Effect



Spectroscopy

