

# **Grade 12 Earth and Space Science**

SES4U

Qinghao Hu

December 3, 2025

# Contents

<b>1</b>	<b>Unit 1: Astronomy</b>	<b>2</b>
1.1	Episode 1: Standing up in the Milky Way . . . . .	2
1.2	Episode 4: A Spacetic Odyssey . . . . .	3
1.3	Measuring the Universe . . . . .	4
1.3.1	Some important constants . . . . .	4
1.3.2	Unit Conversion . . . . .	4
1.3.3	Radar . . . . .	4
1.3.4	Parallax . . . . .	4
1.4	Cepheid Variable Stars, Redshift and Hubble's Law . . . . .	5
1.4.1	Apparent Magnitude and Absolute Magnitude . . . . .	5
1.4.2	Cepheid Variable stars . . . . .	5
1.4.3	Determining absolute magnitudes using Cepheid Variables . . . . .	6
1.4.4	Hubble's Law . . . . .	6
1.4.5	Redshift . . . . .	6
1.4.6	Overall summary of this section . . . . .	6
1.5	Cosmology . . . . .	8
1.5.1	Some stupid theories . . . . .	8
1.5.2	Is our Universe finite? . . . . .	8
1.6	Developments in Cosmology . . . . .	9
<b>2</b>	<b>Our Solar System</b>	<b>11</b>
2.1	The Wonders of the Solar System . . . . .	11
2.2	Newton's Law of Gravitation . . . . .	13
2.3	Kepler's Law of Planetary Motion . . . . .	14
2.3.1	Kepler's first law . . . . .	14
2.3.2	Kepler's second law . . . . .	15
2.3.3	Kepler's Third Law . . . . .	15
2.4	Sun-Earth-Moon System . . . . .	16
2.4.1	Earth's Rotationsc . . . . .	16
2.4.2	Earth's Orbit . . . . .	16
2.4.3	Tide . . . . .	16
2.4.4	Eclipses . . . . .	16
2.4.5	SOLAR ECLIPSE . . . . .	17
2.5	The wonders of the Solar System: Episode: 5 . . . . .	18
<b>3</b>	<b>Earth's Material &amp; Geological Process</b>	<b>19</b>
3.1	Unit 3 - seminar Testable Question . . . . .	20
3.1.1	Formation and Identification of minerals . . . . .	20

## **Chapter 3**

# **Earth's Material & Geological Process**

## 3.1 Unit 3 - seminar Testable Question

### 3.1.1 Formation and Identification of minerals

#### Question 1

What is the definition of a mineral?

A solid inorganic substance that occurs naturally

#### Question 2

Explain streak, hardness and cleavage/fracture

- Streak: Used to determine the color of mineral in its powdered form, test by rubbing the mineral against a streak plate
- Hardness: use Moh's scale of hardness, compare hardness of an unknown minerals to the hardness of 10 known minerals and/or to the household objects
- Cleavage: