

Introductory Astronomy

This course will be a review of basic principles in astronomy, with an emphasis on current astrological events.

Unit 1:

Light Waves & the Stars

Essential Understanding:

Light is a wave. It possesses all the properties of waves. One of its most important properties for scientists is its frequency/wavelength. The frequency & wavelength of waves are inversely proportional: light waves with large frequencies have small wavelengths. Analyzing the EM spectrum of light rays can tell astronomers many things about the body that produced it.

Quote:

“Once you can accept the Universe as matter expanding into nothing that is something, wearing stripes with plaid comes easy.” -Albert Einstein

Overview:

Students will learn about light, the electromagnetic spectrum, and the information contained within light that gives scientists the ability to identify the composition, type and many other factors for any observable star. What we know about stars comes from the light they emit - the only thing that reaches us.

Guiding Question:

What is it about light that gives scientists so much information about the stars?

Lessons:

1. Mechanical waves & sound waves
2. Light waves
3. The ElectroMagnetic (EM) spectrum and elements
4. Red shift of light waves

Assignment:

1. a) Draw diagram of transverse & compressional waves
b) Vocabulary: frequency, wavelength, amplitude, reflection, refraction, diffraction
c) List characteristics of sound; match each characteristic to a property of waves
2. a) list characteristics of light, match each characteristic to a property of waves.
b) Worksheet/notes associated with Bill Nye “light & color”
c) vocabulary: intensity, power, luminosity,
3. Making waves with the electromagnetic spectrum
4. a) Worksheet/notes associated with ‘crash course in astronomy - light
b) measuring redshift of light activity’

Group Work:

Activity 1: Investigating the relationship between frequency/wavelength/amplitude using a pendulum & ruler

Activity 2: Choose a nearby star (within 250 light years from the Earth)

Describe your Star: its composition, its distance from us; its lifespan; describe how this information is gleaned from the EM spectrum that it emits.

Activity 3: Groups assigned section of the EM spectrum: from NASA launchpad: making waves

Assessment: Quiz 1

Readings: Thephysicsclassroom.com: light, waves, & colors

Links: www.khanacademy.com - 'introduction to waves'