



Ch. 22 – The Nature of Light

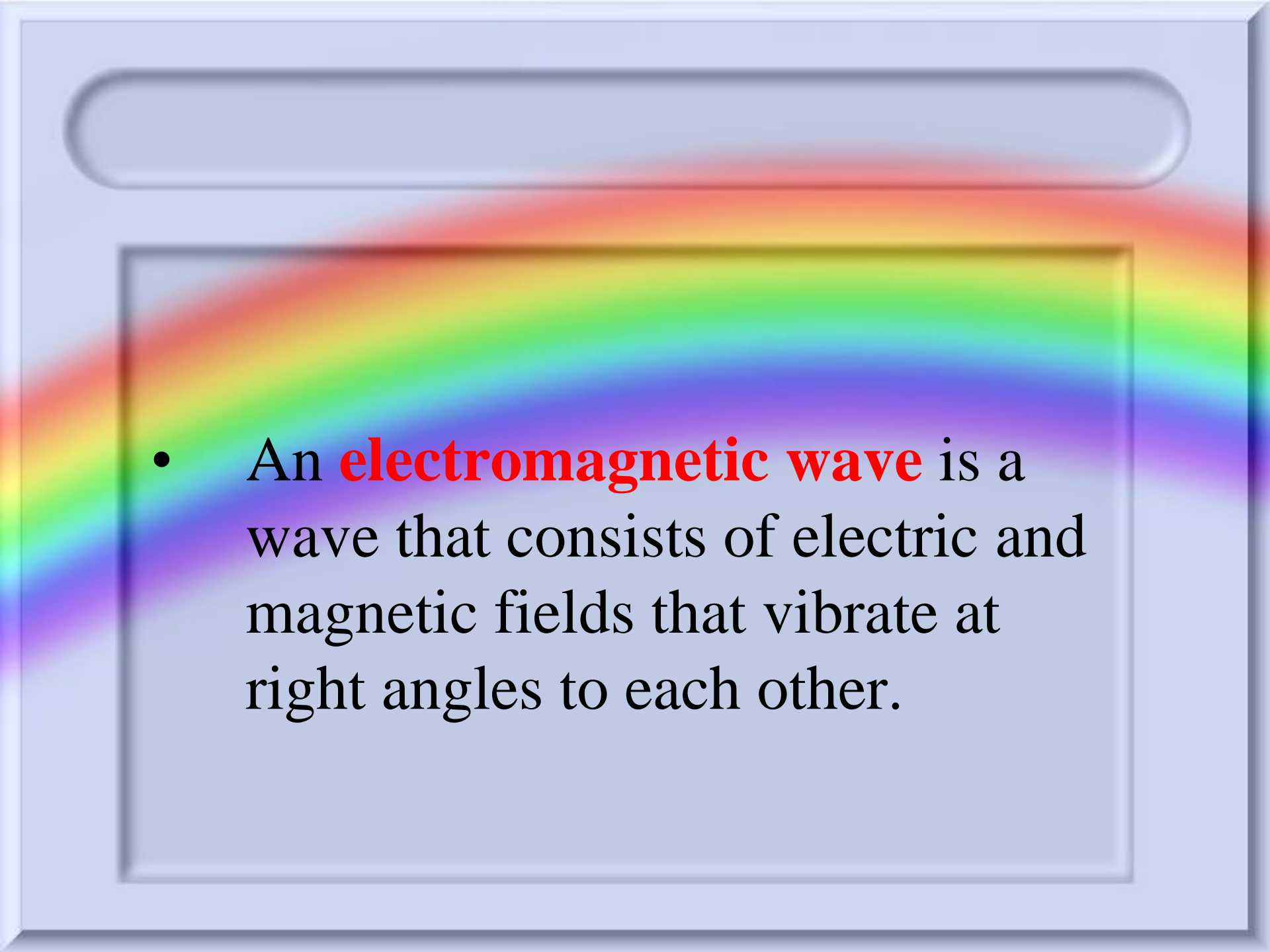
Section 1 What is Light?

Essential Questions

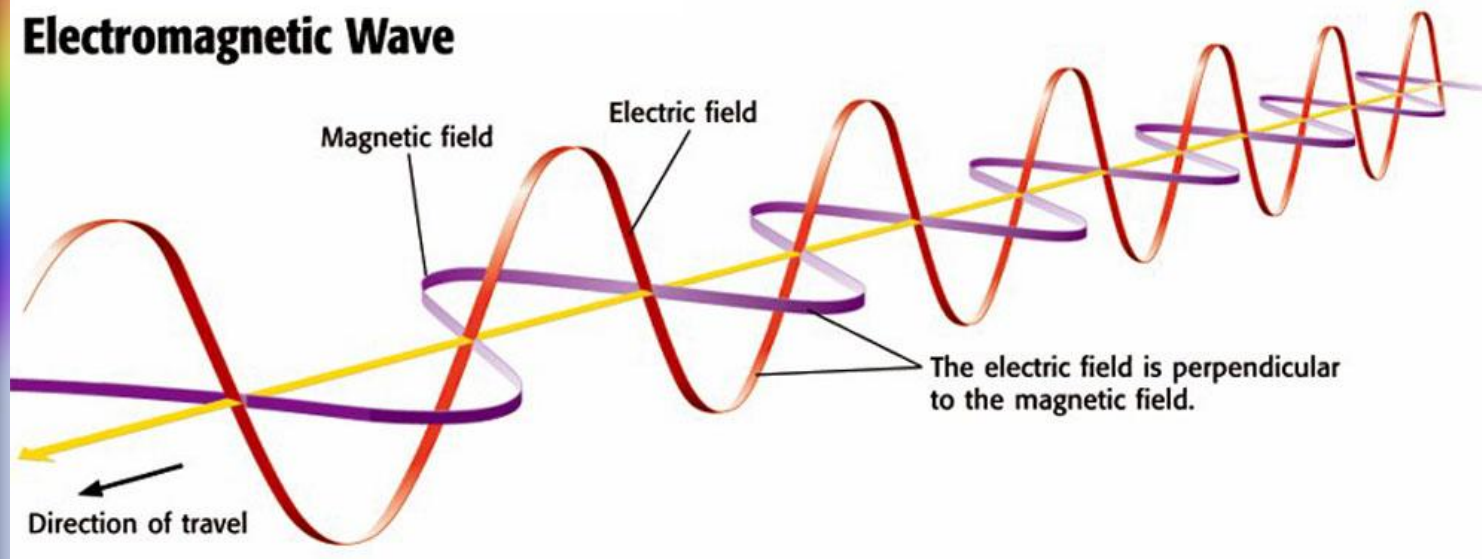
- How is light an electromagnetic wave?
- How is speed of light used to calculate distances travelled by light?
- Why is light from the sun important?

Light: An Electromagnetic Wave

- Light is a type of energy that travels as a wave.
 - But unlike most other types of waves, light does not require matter through which to travel.
- Light is an electromagnetic wave (EM wave).

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- An **electromagnetic wave** is a wave that consists of electric and magnetic fields that vibrate at right angles to each other.

Electromagnetic Wave



- An EM wave can be produced by the vibration of an electrically charged particle.
- This vibration makes electric and magnetic fields vibrate.
 - Together, the vibrating fields are an EM wave that carries energy.
- The transfer of energy as electromagnetic waves is called **radiation.**

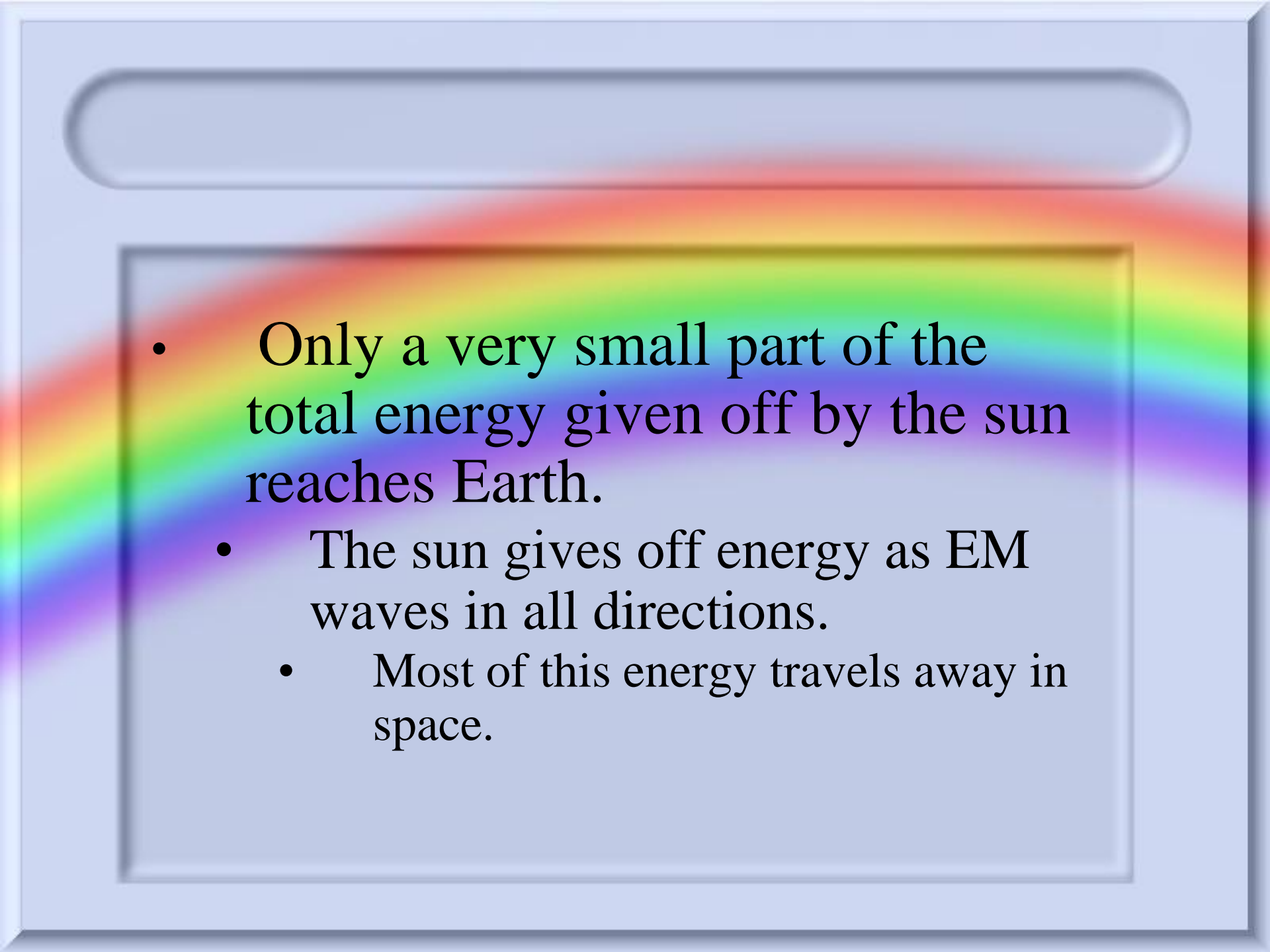
The Speed of Light

- Scientists have yet to discover anything that travels faster than light. (Except the Millennium Falcon)
- In the near vacuum of space, the speed of light is about 300,000 km/s.
- Light travels slightly slower in air, glass, and other types of matter.

Light from the Sun

- EM waves from the sun are the major source of energy on Earth.
- Plants use photosynthesis to store energy from the sun.
- Animals use and store energy by eating plants or by eating other animals that eat plants.

- Fossil fuels store energy from the sun.
- Fossil fuels are formed from the remains of plants and animals that lived millions of years ago.

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- Only a very small part of the total energy given off by the sun reaches Earth.
 - The sun gives off energy as EM waves in all directions.
 - Most of this energy travels away in space.