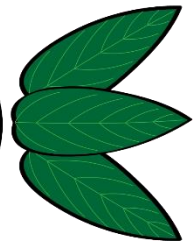
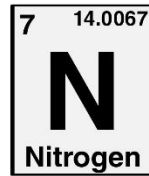
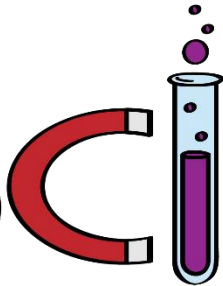
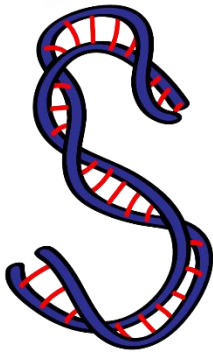




ASPIRE
INTERNATIONAL SCHOOL



Science Department

2023/2024

Year 8

Summary notes on Unit 5.5 & unit 6

Name:

Class:

Topics have been covered for the Mid-term exams:

Unit 5: Reactivity

5.5 Rearranging atoms

Unit 6: Sound and space:

6.1 Loudness and pitch of sound

6.2 Interference of sound

6.3 Formation of the Moon

6.4 Nebulae

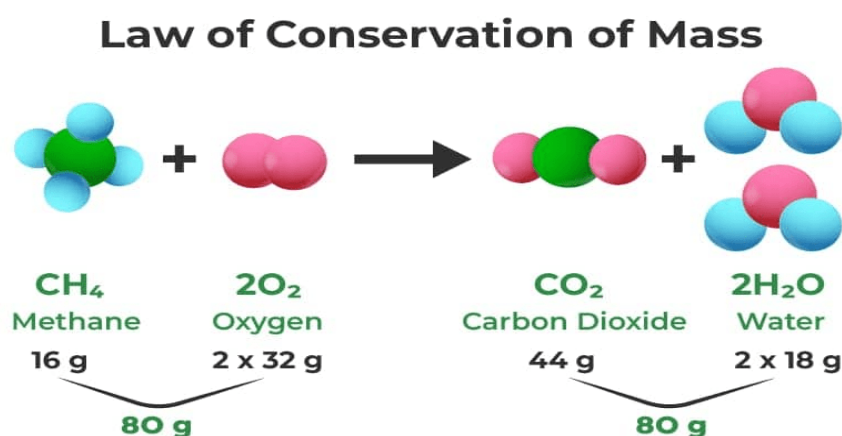
6.5 Tectonics

1-What happens during chemical reactions?

- In chemical reactions atoms form new combinations.
- In a chemical reaction, no atoms are lost. No new atoms are produced. The atoms are simply rearranged into new combinations.

2-Law of Conservation of mass.

- The law of conservation of mass states that in a chemical reaction mass is neither created nor destroyed.
- The mass of the reactant is equal to the mass of the product.



3- Types of reactions:

ENDOTHERMIC REACTIONS

VERSUS

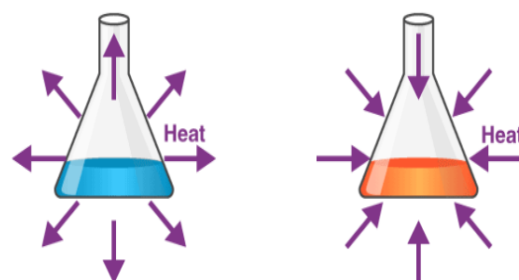
EXOTHERMIC REACTIONS

Endothermic reactions are chemical reactions that absorb heat energy from the surrounding

Temperature decreases with progression of the reaction

Exothermic reactions are chemical reactions that release heat energy to the surrounding

Temperature increases with progression of the reaction



Exothermic Reactions

A reaction that releases energy from the system in the form of heat.

Endothermic Reaction

A reaction that the system absorbs energy from its surrounding in the form of heat.

Energy in chemical reactions:

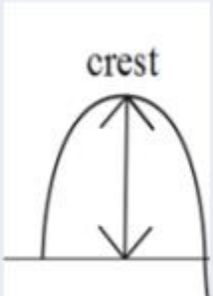

- All chemical reactions involve energy.
- Energy is used to break bonds in the reactants and energy is released when new bonds are formed in the products.

Exothermic reactions.	Endothermic reactions
-In this reaction less energy is needed to break bonds in the reactants than is released when bonds form in the products.	-Reactions that takes more energy to break bonds in the reactants than is released when the bonds form in the products

- Whether a chemical reaction takes in energy or releases energy there is no overall change in the amount of energy during the reaction.
- This is because energy cannot be created or destroy. This is the law of conservation of energy.

Unit 6:

6.1 Loudness and pitch of sound

Amplitude.	Peak or Crest	Trough	Pitch	Frequency
<ul style="list-style-type: none"> • The maximum distance that particles move, either forward or backward in a sound wave 	Highest point of the graph or in the wave	The lowest point in the wave	Is how high or low the sound appears on a musical scale	The number of vibrations in each second
<ul style="list-style-type: none"> • As the amplitude of a sound wave increases, the loudness of the sound increases 	 crest	 trough	<ul style="list-style-type: none"> • The higher pitch sound has a larger frequency (more waves in the same time) than the lower pitch sound. 	<ul style="list-style-type: none"> • Frequency is measured in a unit called hertz or Hz • a wave with a higher frequency will have more waves in the same time

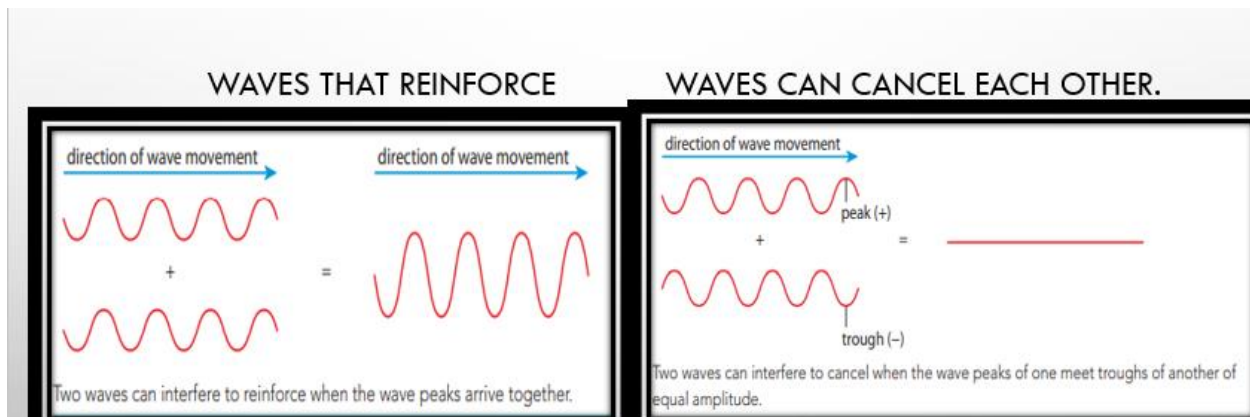
as the amplitude of a sound wave increases, the loudness of the sound increases.

- The number of vibrations in each second is called frequency.
- As the frequency of a sound wave increases, the pitch of the sound also increases.
- Frequency is measured in a unit called hertz or Hz.

6.2 Interference of sound

Must be from the same type of wave Same amplitude & frequency

The effect that is produced when the waves meet each other is called **interference**



- Waves will reinforce, when they meet with the peaks together and with the troughs together
- Waves will cancel when they meet with the peaks and troughs together.

Noise cancelling headphones work by making sound waves cancel.

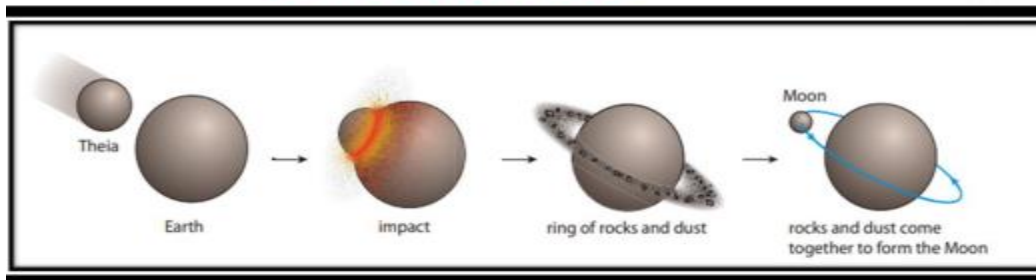
- 1-THE HEADPHONES PICK UP THE SOUND FROM THE SURROUNDINGS,
- 2-ANALYSE THE SOUND WAVE
- 3-CREATE ANOTHER SOUND WAVE WITH THE SAME AMPLITUDE AND FREQUENCY, BUT OUT OF PHASE WITH THE ORIGINAL WAVE
- THIS NEW SOUND WAVE IS USED TO CANCEL THE SOUND WAVE FROM THE SURROUNDINGS.

6.3 Formation of the Moon

Alternate theories suggested by scientists include:

- the moon broke away from the Earth ("Fission theory")
- the moon formed elsewhere in the solar system and was captured by Earth's gravity ("Capture theory")
- the Earth and moon formed from the protoplanetary disk at the same time ("Co-formation")

Collision Theory:



- An object of a similar size to Mars collided with Earth; the object has been called Theia.
- The impact caused a disc of dust and rock to form around Earth; the dust and rock eventually came together under gravity to form the Moon.

Evidence that supports the collision theory

The Moon is less dense than the Earth.
 Samples of rock from the Moon show that its surface was once molten.
 The Moon has a small iron core, similar to the Earth.
 There is evidence outside the Solar System of similar collisions causing rings of rock and dust.
 The collision theory fits with the theory of how the Solar System was formed.
 The composition of rocks on the Earth and the Moon are the same.

Evidence that contradicts the collision theory

The surface of the Earth does not appear to ever have been molten. A collision that formed the Moon would have caused the surface of the Earth to melt. The surface would have later solidified.
 Venus has no moon. Collisions in the early years of the Solar System would have been common and scientists would have expected Venus to have a moon formed in the same way.
 The composition of rocks on the Moon would be expected to be more similar to rocks on Theia than rocks on Earth. In fact, the composition of the Moon is more similar to Earth.

6.4 Nebulae

◦ **1-What are Nebulae?**

- Nebulae are clouds of dust and gas in space. The word nebulae is plural.
- The singular is nebula.

◦ **2-What Nebulae are made up from?**

- The gases found in nebulae are mostly hydrogen and a smaller quantity of helium.
- The particles of gas and dust are very far apart in nebulae.

◦ **3-Describe the size of Nebulae?**

- A nebula the same size as the Earth would have a mass of only a few kilograms!
- Most nebulae are very large. Some are more than 10 000 times bigger than the Solar System! Some nebulae form when giant stars reach the end of their life.

◦ **4-How are they formed?**

- These giant stars then explode, sending dust and gas over a wide area of space. There are many nebulae visible from Earth.

Types of Nebulae

- **Planetary nebulae**
- **Emission nebulae**
- **Reflection nebulae**
 - **Dark nebulae**
- **Supernova remnants.**

stellar nursery: A nebula / part of a nebula where stars are formed

Briefly describe how a star is formed.

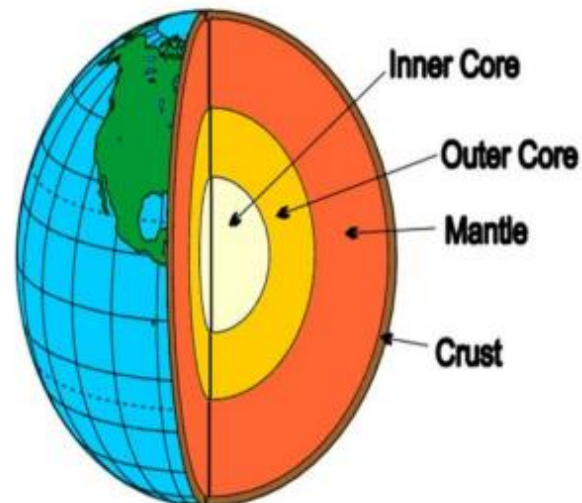
- In a stellar nursery, the dust and gas can start to collapse together under the force of gravity.
- When the mass of dust and gas collects together and becomes larger, the force of gravity pulling inward increases.
- When this force gets very large, the pressure inside the new star also gets very large.
 - The high pressure causes heat.
- The heat can cause atoms to react with each other, causing the new star to give out heat and light

Dust and gas==> Gravity==> greater mass, greater gravity==> causes higher pressure==>pressure causes heat ==> heat causes atom to react==> causing stars to give light and heat

6.5 Tectonics

- A tectonic plate is part of the Earth's crust that can move; it is supported on the mantle and moves on the mantle.

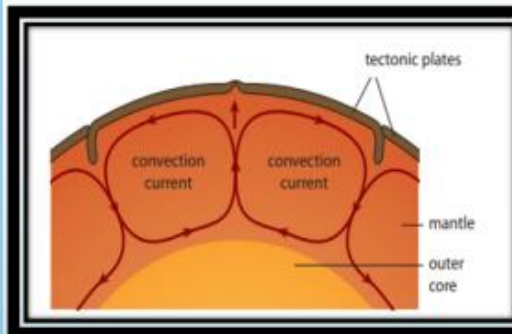
➤ Layers of the earth



- 3 Describe some of the events that are more likely to occur at the boundaries of tectonic plates.
- Volcanoes, earthquakes and the formation of fold mountains are all more likely at tectonic plate boundaries.

Explain how tectonic plates moves?

- The inner part of the mantle gets thermal energy from the core.
- The fluid in the mantle then expands when heated and becomes less dense than the fluid surrounding it.
- This hotter, less dense fluid in the mantle rises towards the crust, cools and sinks again, resulting in a convection current.



the Evidences for tectonic plates

- 1-The continents of Earth appear to fit together like a jigsaw.
- 2-The same types of fossils have been found in different continents.
 - 3-Volcanoes and earthquakes are more likely to happen in particular places.
- 4-The alignment of magnetic materials in rocks varies with the age of the rock.