MINISTRY OF EDUCATION AND TECHNICAL EDUCATION

وزارة التربية والتعليم والتعليم الفني

Performance Tasks and Assessments

Science

Third preparatory



First Term

nezakr.natega4uk.net

INTRODUCTION

The Ministry of Education and Technical Education recognizes the importance of empowering teachers with effective tools that elevate classroom performance, enhance the quality of education, and improve its outcomes. This is a real response to the voices of teachers, interacting with the feedback channels from the educational field, and meeting the needs of teachers for flexible and comprehensive educational tools that assist them in fulfilling their noble educational mission. This book has been designed to serve as an integrated educational support for teachers, helping them in planning and executing their teaching tasks efficiently. It also facilitates continuous assessment processes. The content has been designed to offer diverse models of effective classroom performance and educational activities created based on an interactive methodology that enhances active learning. It contributes to a qualitative shift in teaching practices, clearly focusing on the student as the core of the educational process. The book includes formative and diagnostic questions, as well as purposeful learning tasks that students can complete as homework, enhancing the integration of learning inside and outside the classroom and contributing to the sustainable construction of learning for students. These tools help develop critical and creative thinking, deepen understanding, and support and enhance student motivation, giving them a sense of achievement and excellence. It also includes short weekly tests and periodic assessments, allowing teachers to measure the extent of learning outcomes and address learning gaps early, providing feedback on the initial results. The performances at the end of each month are concluded with immediate training sessions that help improve student performance. These assessments are gradual, taking into account individual differences and targeting various levels of cognitive development, within a framework of diversity, depth, and integration, preparing students for monthly tests efficiently. This book is a true translation of the Ministry's directions to ease the burdens on parents, provide supporting educational content that enriches the classroom environment, and allow teachers more time for educational innovation and productive interaction with their students. It also forms an effective tool in supporting the Ministry's direction to enhance learning outcomes, achieving a real transformation in the learning environment—from memorization to understanding, from rote learning to application, and from passive reception to active participation. When we place this work in the hands of teachers and students, we hope it will be a valuable contribution to improving academic performance, enhancing the quality of education, and becoming an additional cornerstone in building a generation that is aware and knowledgeable, equipped with the skills and competencies needed for success in a world that demands creativity and innovation. It aims to have a tangible impact in realizing an ambitious educational vision for the future of education in our beloved country.

Allah is the one sought for help, and He guides to the right path..

nezakr.natega4dk.net

Lesson 1

Types of Chemical Reactions

Week: .....

Date: __ / __ / ____



Classroom performance

1- Observe and Conclude

After following safety procedures and exercising caution

(1) Burning a magnesium strip	(2) Burning a piece of steel wool

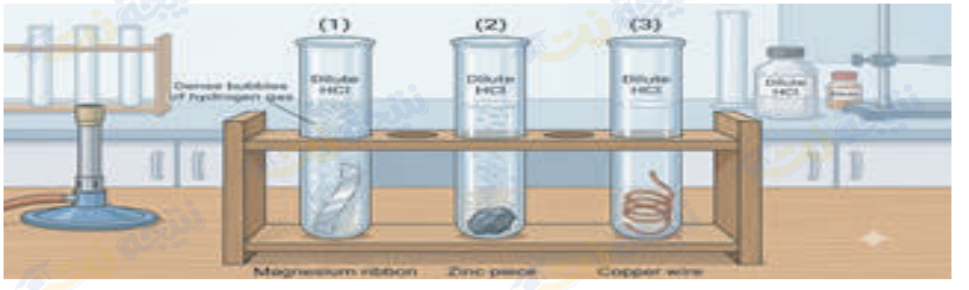


Burn a magnesium strip and a piece of steel wool, then complete the following comparison table:

Point of Comparison	Burning a Magnesium Strip	Burning a Piece of Steel Wool
Reaction rate	.....	.....
Observation	.....	.....
Description of the product	.....	.....
Reaction equation	.....	.....

2- Observe and Conclude:

The Chemical Reactivity Series



nezakr.natega4dk.net

Study the previous figure then answer the following:

1.Based on the rate of bubble evolving, arrange the three metals in descending order of their chemical reactivity.

.....

2.Explain: why did no chemical reaction occur in test tube (3)?

.....

3.Write the balanced symbolic chemical equation for the reaction that occurred in test tube (2).

.....

4.What type of chemical reaction occurred in the test tubes in which a reaction took place?

.....

3. Study the reaction illustrated in the following figure, then answer:



In front of you is a glass beaker containing a blue copper(II) sulfate (CuSO4) solution, with a zinc (Zn) rod immersed in it.

1.Answer the following, using the figure above and the concepts of electron transfer:

a)What happens to the color of the blue solution after the zinc rod is left inside it for a while? Why?

.....

b)Write the two "half-reaction" equations that show the oxidation process and the reduction process taking place?

.....

c)Extract from the previous reaction: (the oxidizing agent, the reducing agent)?

2.Groundwater sometimes contains a high concentration of calcium and magnesium salts, which cause "hard water." How is the idea of "double displacement (precipitation) reactions" used in water-treatment plants to remove these salts?

.....

nezakr.natega4dk.net

3. Compare what you observe in the following two cases when using acids:

Case One: A metal capable of replacing the hydrogen of acids (and reacts very slowly with cold water).

Case Two: An alloy consisting of copper and gold when placed in dilute hydrochloric acid.

.....



Using a balanced chemical equation, explain what happens when...?

1.Burning a magnesium ribbon over a Bunsen burner flame.

.....

2.Burning a piece of steel wool over a Bunsen burner flame.

.....

3.Adding dilute hydrochloric acid to magnesium.

.....

4.Heating a tube containing red mercury oxide.

.....

5.Immersing a zinc rod in a copper sulfate solution.

.....

6.When studying the combustion reaction of a magnesium ribbon in atmospheric air, it is always strongly advised to wear protective goggles and avoid staring at the glare produced by the ignition.

(a) Deduce the scientific reason for this preventive measure based on the nature of the light produced by the combustion of magnesium.

.....

(b) Write the balanced chemical reaction equation.

.....

nezakr.natega4dk.net



Weekly Assessment



First: Write the scientific term indicating the following statements:

1.The arrangement of metallic elements in descending order according to their degree of chemical reactivity. (.....)

2.The reaction of an acid with an alkali to form salt and water. (.....)

3.A chemical process in which an atom of an element gains one or more electrons. (.....)

4.Chemical reactions in which a double exchange occurs between the radicals (ions) of two different compounds to form two new compounds. (.....)

5.The substance that gains one or more electrons during a chemical reaction. (.....)

Second: Complete the following statements with what is scientifically appropriate:

1.Reactions that rely on the exchange between the ions of two compounds to form two new compounds (one of which is often a precipitate or water) are known as ..... reactions.

2.In an oxidation-reduction reaction, the substance that loses one or more electrons during the reaction is called .....

3.Complete the following chemical equation, with writing the type of reaction:

$NaOH(aq) + HCl(aq) \xrightarrow{dil}$ .....+.....

Type of reaction: .....

4. ..... does not burn with a visible flame, but rather a black layer of ..... forms on its surface.

5.Metals that ..... hydrogen in the chemical reactivity series replace it in dilute .....

Third: Give reasons for the following:

1.Chemical reactions are classified into several main types.

.....

2.A white precipitate forms when a silver nitrate solution is added to a sodium chloride solution.

.....

3.Using water to extinguish sodium fires is considered a catastrophic mistake (support your answer with the balanced chemical equation).

.....

4.When a piece of silver (Ag) is immersed in a beaker containing a zinc sulfate ($ZnSO_4$) solution, no change is observed.

.....

nezakr.natega4dk.net

Fourth: Choose the correct answer:

1.To dispose of heavy metal impurities such as lead ions (Pb^{2+}) from underground water, we use a more active metal to precipitate them. Which of the following metals is the most appropriate?

(Copper Cu - Silver Ag - Zinc Zn - Gold Au)

2.When an active metal is added to the blue copper sulfate ($CuSO_4$) solution, the color of the solution gradually disappears because copper ions (Cu^{2+}) undergo a process of .....

(Oxidation - Reduction - Decomposition - Ion exchange)

Fifth: Answer the following:

1.Express the following reaction with a chemical equation: «Burning a steel wool wire in an oxygen atmosphere to form magnetic iron oxide.»

2.What is the substance that is .....?

- oxidized ..... - reduced .....
- acts as an oxidizing agent ..... - acts as a reducing agent .....

3.What do you expect to happen when immersing a copper rod in a beaker containing silver nitrate solution? Explain your answer chemically in light of your study of the chemical reactivity series, writing the reaction equation.

.....

4.In a metal plating factory, large quantities of liquid waste containing copper sulfate solution (CuSO4) are left behind. The factory manager requested proposing an inexpensive chemical method to recover copper metal (Cu) from this waste for the purpose of selling it, using iron scrap (Fe) available in the factory.

a-What is the (type of reaction) that this proposal will rely on?

.....

b-Write the balanced symbolic chemical equation for this reaction.

.....

c-What is the visual observation that will confirm to the factory workers the completion of the copper recovery process?

.....

5.Study the following reaction, which represents a metal displacing the hydrogen of an acid:

$$Mg_{(s)} + 2HCl_{(aq)} \xrightarrow{dil} MgCl_{2(aq)} + H_{2(g)}\uparrow$$

Based on the electronic concept (loss and gain):

a-Determine accurately the substance that was oxidized and the substance that was reduced.

b- Write the «half-reaction» equation specific to the oxidation process of the magnesium metal.

.....

nezakr.natega4dk.net

6.A piece of an unknown metal (X) was placed in a beaker containing a zinc sulfate ($ZnSO_4$) solution, after a while, it was observed that a layer of zinc deposited on metal (X) and the color of the solution changed.

a. Does metal (X) precede or follow zinc in the chemical activity series? And why?

.....

b. Suggest a probable name for this metal, its approximate location in the chemical activity series, and state the safety precautions that must be considered when handling it in the laboratory. .....

7. A student in the laboratory noticed that upon adding dilute hydrochloric acid (HCl) to a piece of marble (calcium carbonate, $CaCO_3$), effervescence occurred and a gas evolved.

a. Determine the type of chemical reaction that occurred.

.....

b. Explain the scientific reason behind this effervescence.

.....

c. Write the balanced chemical equation for this reaction.

.....

d. What is the name of the evolved gas and how can it be detected?

.....

8. Explain scientifically: Why is it strictly prohibited to store dilute acids in tanks and pipes made of iron (Fe) or zinc (Zn), whereas copper (Cu) is considered a safe option for this task?

.....

9. Double displacement (precipitation) reactions are considered a very effective method for separating unwanted impurities during the preparation of pure active substances.

.....

a)Write the symbolic chemical equation for the reaction of silver nitrate (AgNO3) solution with sodium chloride (NaCl) solution.

.....

b)Based on the previous equation, explain how the concept of this reaction can be utilized chemically to get rid of dissolved silver ions as impurities in an aqueous solution and separate them completely from it.

.....

10. Before disposing of liquid industrial waste containing sulfuric acid (H_2SO_4) residues into drainage networks, it undergoes a chemical treatment process by adding calculated amounts of sodium hydroxide (NaOH) solution.

a)What is the chemical and environmental purpose of this procedure?

.....

b) What is this type of reaction called?

.....

c) Express this chemical procedure with an equation, identifying the main reaction products.

.....

nezakr.natega4dk.net

Lesson 2 | Combustion Reactions and Environmental Pollution | Week: .....

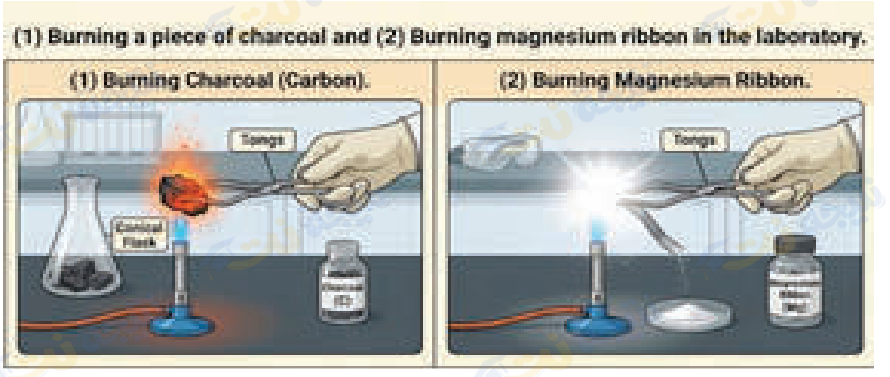
Date: __ / __ / ____



Classroom performance

After following safety procedures and exercising caution

With your teacher, and after taking safety precautions



Burn a piece of carbon and a piece of magnesium, then complete the following table:

Point of Comparison	Burning Charcoal (Carbon)	Burning Magnesium
Observation	.....	.....
Equation	.....	.....
Type of oxide produced	.....	.....
Effect of the oxide solution on litmus	.....	.....

(Homework Performan(Assignment

1. Write the scientific term:

a) A chemical reaction between a substance and oxygen that produces heat or light, or both. (……..)

b) The temperature at which a substance begins to ignite (or the lowest temperature at which the chemical reaction begins to produce energy). (……)

nezakr.natega4dk.net

c)The ability of the substance to ignites or burns when exposed to a heat source in the presence of oxygen. (.....)

2. Write the equation expressing:

a) The combustion of carbon.

.....

b) The combustion of magnesium.

.....

3. Explain the nature of the chemical reaction that occurs when a magnesium ribbon burns with oxygen, indicating how it can be classified as one of the following reactions (simple displacement, thermal decomposition, oxidation and reduction, double displacement) in addition to being a combustion reaction.

.....

4. How does «incomplete combustion» cause the emission of black smoke from car exhausts, the formation of a black layer at the bottom of cooking pots, and delay the boiling of water?

.....

5. To extinguish any fire, one of the essential factors making up the «fire triangle» must be eliminated. Explain this statement.

.....

6. Identify the side that is eliminated to break this triangle in each of the following cases:

a. Spraying cold water on the fire. .....

b. Covering the fire with a heavy blanket. .....

c. Immediate shut-off of the leaking gas source. .....



Weekly Assessment



Choose the correct answer:

1.All complete combustion reactions of organic fuels are always classified as:
(endothermic / exothermic / simple displacement / neutralization reactions)

2.The substance whose incomplete combustion produces carbon monoxide gas and soot is:
(magnesium oxide / methane gas / copper sulfate / potassium chloride)

3.The concept of igniting a matchstick relies on converting ..... energy into thermal energy sufficient to start the reaction:
(electrical / light / mechanical «friction» / chemical)

4.The gas used in extinguishing fires because it is heavier than air and does not burn is:
(oxygen / nitrogen / carbon monoxide / carbon dioxide)

nezakr.natega4dk.net

5. For the combustion process to occur, the complete presence of three elements known as the fire triangle is required, among which is:
(nitrogen / carbon dioxide gas / oxygen gas / carbon monoxide gas)

Determine the validity (true or false) of the following statements, correcting the incorrect ones:

1. The ignition temperature is the maximum temperature that a chemical reaction can reach during fuel combustion. (.....)
2. When natural gas burns in an oxygen-deficient atmosphere, the flame tends to be pure blue due to incomplete combustion. (.....)

Answer the following:

1. Complete: The gas that is considered the primary indicator of «complete combustion» is ....., and the solid substance that indicates «incomplete combustion» is .....
2. Explain the difference between carbon oxides (CO, CO_2) in terms of their formation conditions and properties

.....

3. The extinguishing process relies on breaking the fire triangle. Clarify which side is neutralized when:
(a) Throwing heavy blankets on the fire .....
(b) Spraying cold water .....
4. When thick black smoke emits from a car›s exhaust pipe; what is the expected imbalance in the (fuel/air) mixing ratio? .....
5. Clarify the progression from complete to incomplete combustion and the accumulating gas? .....
6. Explain how immediately shutting off a leaking gaseous fuel source, before attempting to extinguish the already burning flames, causes the fire to gradually die out, clarifying which side of the fire triangle is broken in this case? .....
7. What happens when methane gas burns in the case of a lack of oxygen quantity? (with explanation) .....
8. What happens upon the continuous accumulation of nitrogen oxide gases (NOx) in the air of a crowded city?

.....

9. A student noticed a delay in the boiling of water and the formation of a black layer at the bottom of the flask when using the burner.
What is the technical error in adjusting the ventilation opening? And how did the soot layer delay the boiling?

.....

nezakr.natega4dk.net

Lesson Two (Continued): Combustion Reactions and Environmental Pollution Week: _____

Date: __ / __ / ____



Classroom performance

Observe and Determine

Study and calculate

Comparing types of combustion in a Gas Stove



- **In front of you are two pictures of a gas burner (a pure blue flame, and a yellow/orange flame with soot). Which picture represents "complete combustion"? What is the condition for it to occur?**

.....

- **Explain scientifically: what is the reason for the appearance of the yellow/orange colour and the formation of the black layer (soot) on the vessel?**

.....

- **Write the balanced symbolic chemical equation for the complete combustion of methane gas (CH_4).**

.....

- **What are the three basic components required for any ignition process to occur called? (the fire/combustion triangle)**

.....

nezakr.natega4dk.net

Observe then determine:

Observe and answer



1.Using the illustrative diagram of the "catalytic converter" (the environment box) in cars.

a)What is the environmental importance of installing this component in modern cars?

.....

b)The red arrow in the diagram points to a highly toxic gas entering the converter as a result of the incomplete combustion of the fuel.

Which of the following chemical formulas represents this gas?

(CO_2 - CO - NO_2 -SO_2)

2. Some cities suffer from the "black cloud" problem resulting from burning agricultural waste.

Suggest a solution to reduce this phenomenon?

.....

(Homework Performan(Assignment

Answer the following:

1. Define the combustion reaction chemically, and explain in detail the three elements that make up the «fire triangle»?

.....

2. How does the removal of one of the elements of the fire triangle lead to extinguishing the fire? Support your answer with practical examples.

.....

3. Explain what happens when a magnesium ribbon burns in atmospheric air, and write the balanced equation. What is the type of chemical bond formed in the product, and how can its basic nature be proven?

.....

nezakr.natega4dk.net

4. Compare complete combustion and incomplete combustion in an organized table in terms of:

Point of Comparison	Complete Combustion	Incomplete Combustion
a. Available amount of oxygen		
b. Formed chemical products		
c. Color and type of the resulting flame		

5.Explain scientifically why the combust on equation of methane gas is classified as an exothermic reaction, by using the balanced chemical equation as evidence.

.....



Weekly Assessment



Choose the correct answer:

1. What is the function of precious metals inside the catalytic converter in a car?
(Oxidizing agent / Catalyst / Alternative fuel / Reducing agent)
2. Which of the following gases is colorless, has a suffocating odor, and dissolves in water to form sulfurous acid?
(Sulfur dioxide / Nitrogen dioxide / Carbon monoxide / Nitric oxide)
3. When burning coal, a colorless gas with a suffocating odor evolves and dissolves in water to form sulfurous acid, which is:
(Carbon dioxide / Carbon monoxide / Sulfur dioxide / Methane)

Put a tick (✓) in front of the correct statements and a cross (x) in front of the incorrect statements, with correction:

1. The complete combustion of a given mass of hydrocarbon fuel releases a greater amount of heat energy than the amount released by the incomplete combustion of the same mass of that fuel. (.....)
2. The "black cloud" resulting from burning agricultural waste occurs because of clean, complete combustion of the straw, since a sufficient amount of oxygen is available during the burning. (.....)

Answer the following:

1) Trace, both chemically and environmentally, how nitrogen oxides (NOx) turn into acid rain, stating the name of the acid produced and its properties.

.....

2) Explain scientifically: in the experiment for detecting the products of combustion, why does anhydrous cobalt chloride paper change from pale blue to pink when exposed to the water vapour produced by the combustion of natural gas?

.....

nezakr.natega4dk.net

3) Suggest a technical modification to the method of open burning of agricultural waste, to ensure it is put to good use without causing the "black cloud" (based on the conditions for complete combustion).

.....

4) Explain how acid-gas scrubbers remove the acidic gases produced by the combustion of coal, through neutralization reactions.

.....

5) What happens to the sulfur impurities present in coal when it burns? Write the name of the gas produced and its properties as given in the lesson.

.....

6) Explain scientifically how the catalytic converter converts the harmful carbon monoxide and nitrogen oxide gases produced by the combustion of car fuel into safe substances, based on the idea of increasing the rate of oxidation–reduction reactions inside the exhaust system?

.....

7) Explain the danger to human health of carbon monoxide (CO) gas produced by car exhaust?

.....

8) Compare the type of oxide produced from the combustion of metals (such as magnesium) with the type of oxide produced from the combustion of non-metals (such as carbon), in terms of its chemical nature (acidic or basic)?

.....

9) State two measures that can be followed in factories to reduce the pollution resulting from combustion reactions used as an energy source?

.....

10) Compare the combustion of natural gas with the combustion of coal in terms of the quantities of carbon dioxide, sulfur oxides, and carbon particles emitted by each?

.....

11) Give two examples of heavy industries that rely mainly on combustion reactions as a source of energy, and explain how power stations rely on the combustion of fossil fuel to generate electricity.

.....

12) Formulate a symbolic chemical equation showing the incomplete combustion of methane to produce soot and water vapour only.

.....

13) Complete the equation: $CH_4(g) + 2O_2(g) \xrightarrow{\Delta}$ ..... + ... + ...

14) Does the decrease in the mass of "ash" after burning wood contradict the "law of conservation of mass"? Explain, based on the nature of the products of combustion.

.....

nezakr.nategа4dk.net

Lesson Three | Smoking and its Hazards | Week: _____

Date: __ / __ / ____



Classroom performance

Observe and Explore

Simulation and analysis of artificial lung



Exploring Tobacco Smoke products

1. What happens when the cigarette is lit and the stopper is removed?

.....

2. What causes the white cotton to turn dark or brown?

.....

3. If the cotton represents the alveoli, what do you expect to happen to its elasticity and its ability to exchange gases?

.....

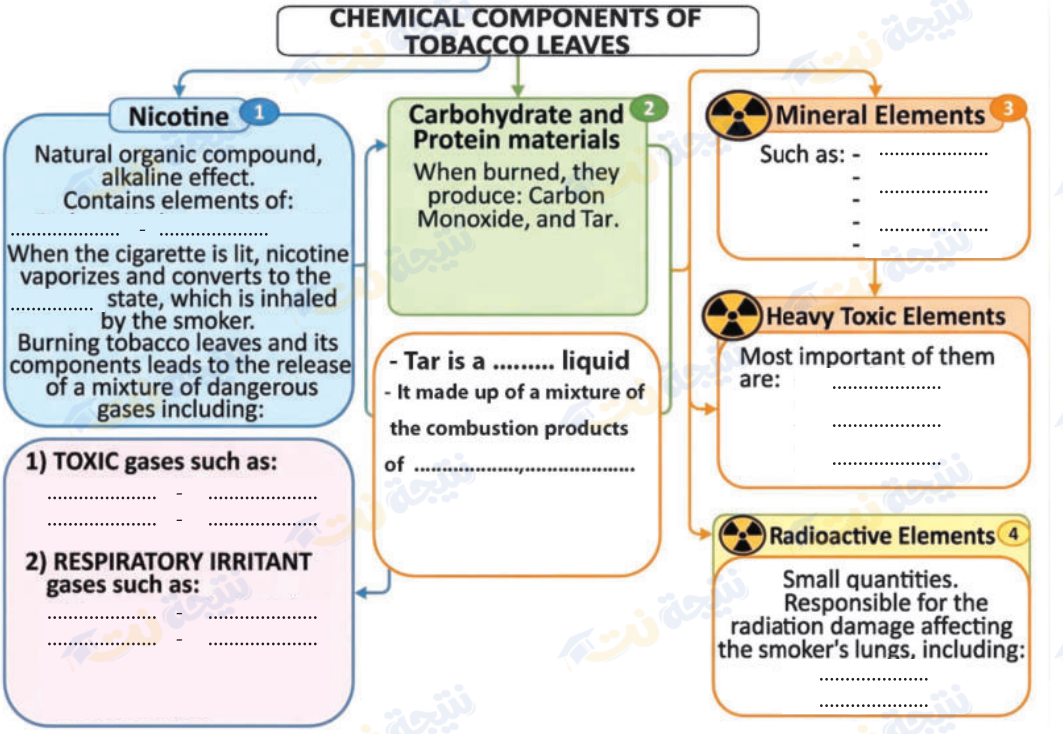


Tobacco Combustion Residue

nezakr.natega4dk.net

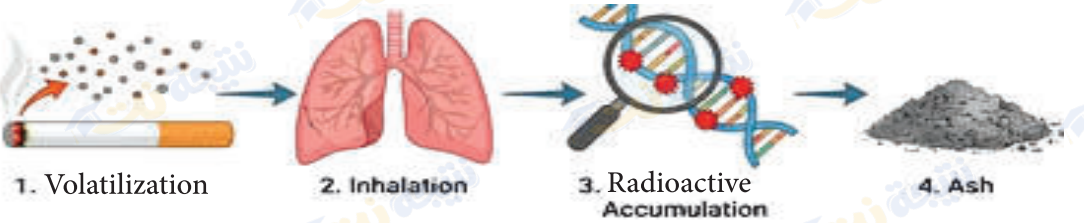
Observe and answer

Observe the chemical components diagram of the tobacco plant and combustion products, then fill in the blanks:



Observe and answer

Observe the chemical components diagram of the tobacco plant and combustion products, then fill in the blanks:



1.Volatilization:.....

2. Inhalation: .....

3.Radioactive accumulation: ....

4. Ash: .....

nezakr.nategа4dk.net

Observe and Compare

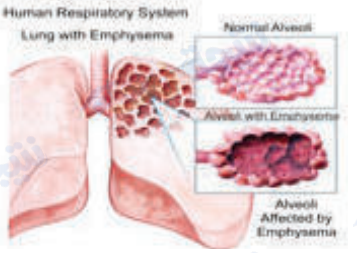
Compare between a normal person›s lung and a smoker›s lung



Looking at the clear differences in color and size between the two lungs; what is the effect of smoking on the lungs over time?

.....

Observe and Answer



Emphysema

1. What is the cause of emphysema? .....
2. What are the symptoms of emphysema? .....

Health Hazards of Smoking

Explain how smoking negatively affects each of the following:

1. Nervous system and senses. .....
2. Fertility and reproductive health. .....
3. Immune system efficiency and general human appearance (skin and hair). .....

Environmental Hazards of Smoking



1.The opposite figure shows a trace of smoking waste affecting the environment. How do these remnants transform from a visual pollutant into a chemical disaster threatening living organisms in soil and water?

.....

Analyze and Answer:

- There is a misconception that electronic smoking is less harmful than traditional smoking.

In light of the previous statement and what you have studied in your textbook:

- Correct this misconception, explaining their joint impact on body organs.

.....

nezakr.natega4dk.net

- Explain scientifically what happens to the human body as a result of the high percentage of nicotine in the case of electronic smoking. .....



- Some people claim that «passive smoking» is merely an annoyance due to air odor and poses no real health hazard like active smoking. .....

.....- Critique this statement scientifically, making use of the carcinogens and gases emitted as a result of smoking.

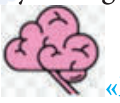
.....



Scientific Riddles

1. «I am a natural chemical compound in tobacco leaves, giving the smoker a false and temporary sense of comfort by stimulating the brain, but I am actually the jailer who binds them with the chains of addiction, making quitting smoking difficult... Who am I? » (.....)

2. «I am a non-smoker, but I contract heart and respiratory diseases just like a smoker simply by sitting next to them... Who am I? » (.....)



«Make a Decision to Refuse»

•The school approved an awareness campaign entitled «Make a Decision to Refuse». Based on your study of «health awareness» regarding methods of smoking prevention and its effects, write three practical and behavioral tips you can offer to raise awareness among others: .....



Imagine and Design

•If you were asked to prepare an awareness message or poster for the Ministry of Health (on the necessity of making a proactive decision to reject smoking completely), what impactful scientific slogan would you choose?

.....



(Homework Performan(Assignment



1. What is meant by each of the following...?

a) Nicotine: .....

b)Polonium-210: .....

c)Remaining ash (of a cigarette): .....

d)Tar: .....

e)Emphysema: .....

f) Passive smoking : .....

nezakr.nategа4dk.net

2. Give scientific reasons for the following:

a)A passive smoker is vulnerable to the same respiratory and heart diseases that affect a active smoker. .....

b)Smoking leads to a pale skin appearance and hair loss in a person.

.....

3. Write the scientific term for each of the following statements:

a)A medical condition resulting from tar inhalation, leading to the destruction of the inner walls of the alveoli, turning them into sagging cavities, and reducing the gas exchange surface area. (.....)

b)Smoking that relies on directly burning tobacco leaves found in cigarettes. (.....)

c) A smoking method that relies on using an electronic device to heat a liquid containing nicotine to produce an aerosol inhaled by the user. (.....)

d)Inhaling tobacco smoke resulting from the smoking of other people surrounding the person in the environment. (.....)

e)A global environmental phenomenon represented by the rise in Earth›s temperature, to which smoking contributes by releasing large amounts of carbon dioxide gas. (.....)

4. Correct the following sentences:

a) Carbon monoxide and hydrogen cyanide gases are classified as respiratory irritant gases. .

.....

b)Tobacco contains the element Polonium-210, which is a heavy element found along with cadmium, lead, and arsenic. .....

c)When suffering from emphysema, the surface area available for gas exchange increases significantly. .....



Weekly Assessment



Question One: Complete the following statements with what suits them scientifically:

1.The tobacco plant grows primarily in ..... regions, and is characterized by a thick, upright stem.

2.The natural alkaline organic compound responsible for causing addiction in tobacco is ....., which contains the elements carbon, ..., and .....

3.Among the toxic gases resulting from cigarette combustion are ..... gas and ..... gas.

4.Nitrogen oxides and ammonia gases are classified as ..... gases for the respiratory system.

5.The dark-colored, viscous, foam-like substance resulting from tobacco combustion that deposits in cotton fibers or alveoli is called .....

nezakr.natega4dk.net

6.Among the metallic elements found in tobacco are potassium and magnesium, in addition to toxic heavy elements such as: ....., and .....

7.Among the radioactive elements present in small quantities in tobacco smoke is the element ....., which accumulates causing damage to the ..... in lung cells.

8.The remaining ash after cigarette combustion contains non volatile metals such as ..... and .....

9.Smoking causes the natural color of the lungs to change from ..... to ..... or black.

10.The disease caused by the accumulation of tar, which leads to the rupture of alveolar walls and their transformation into sagging cavities, is .....

11.The toxic gas that binds to blood hemoglobin at a rate much faster than oxygen is .....

12.Smoking negatively affects fertility by weakening the ability to ..... in both sexes, and increasing the risks of ..... abnormalities/miscarriages.

13.When a non-smoker inhales the smoke emitted and produced by others, this type of smoking is known as .....

14.Electronic smoking relies on heating a liquid containing the substance ..... using an electronic device.

Question Two: Write the scientific term for each of the following statements:

1.A upright-stemmed plant that grows in warm regions and whose leaves contain hundreds of chemical and toxic substances. (.....)

2.A natural organic compound, alkaline in effect, that reaches the brain quickly and stimulates the release of substances causing a temporary feeling of comfort and is responsible for addiction. (.....)

3.A dark or brown viscous substance resulting from tobacco combustion that deposits inside the respiratory tract, causing lung cancer and loss of tissue elasticity. (.....)

4.A radioactive element present in smokers› smoke, which accumulates in lung cells causing damage to their genetic material. (.....)

5.Thin-walled, numerous air structures in the lungs that provide a large surface area allowing gas exchange between air and blood. (.....)

Question Three: What happens if.....?

1.The temperature resulting from cigarette ignition increases with respect to the substance «nicotine». .....

2.Carbon monoxide gas binds to blood hemoglobin instead of oxygen.

.....

3.Radioactive elements such as «Polonium-210» accumulate in the «branches of the bronchi» in the lung. .....

4. Over time, sticky tar accumulated and deposited on the inner walls of the alveoli.

.....

nezakr.natega4dk.net

Question Four: Give scientific reasons for the following:

1.Smoking causes an increased chance of developing cancerous tumors in the lungs.

.....

2.Electronic smoking is not a safe alternative to traditional smoking as some believe.

.....

3.Smoking causes sleep disorders and increased anxiety in adolescents.

.....

4.There is a noticeable decline in a smoker›s ability to exert physical effort.

.....

5.Smoking forces the heart muscle to exert double effort and increases its heart rate.

.....

First Monthly Training

Question One: Write the scientific term for the following statements:

1.Breaking the bonds in the molecules of reactants and forming new bonds in the molecules of products. (.....)

2.Arranging metallic elements in a descending order according to their degree of chemical activity. (.....)

3.The reaction of an acid with an alkali to form a salt and water. (.....)

4.A chemical process in which an element›s atom gains one or more electrons.(.....)

5.Chemical reactions in which a double exchange takes place between the radicals (ions) of two different compounds to form two new compounds. (.....)

6.The substance that gains one or more electrons during a chemical reaction.(.....)

7.A natural organic compound, alkaline in effect, that reaches the brain quickly and stimulates the release of substances causing a temporary feeling of comfort and is responsible for addiction. (.....)

8.A dark or brown viscous substance resulting from tobacco combustion that deposits inside the respiratory tract, causing lung cancer and loss of tissue elasticity. (.....)

9.A toxic gas released from cigarette combustion that strongly binds to hemoglobin and prevents blood cells from transporting oxygen. (.....)

10.A radioactive element present in smokers› smoke, which accumulates in lung cells causing damage to their genetic material. (.....)

nezakr.natega4dk.net

11.Thin-walled, numerous air structures in the lungs that provide a large surface area allowing gas exchange between air and blood. (.....)

12.A chemical reaction between a substance and oxygen resulting in heat, light, or both. (.....)

13.The temperature at which a substance begins to ignite (or the lowest temperature at which a chemical reaction begins to produce energy). (.....)

14.The degree of Flammability of a substance to ignition or combustion when exposed to a heat source in the presence of oxygen. (.....)

Question Two: Give scientific reasons for the following:

1.A white precipitate forms when silver nitrate solution is added to sodium chloride solution.

.....

2.Using water to extinguish sodium fires is considered a catastrophic mistake (support your answer with a balanced chemical equation).

.....

3.When immersing a piece of silver (Ag) in a beaker containing zinc sulfate solution ($ZnSO_4$) , no change is observed.

.....

4.A smoker suffers from a deficiency in the proportion of oxygen carried in the blood to body cells.

.....

5.Smoking forces the heart muscle to exert double effort.

.....

6.It is warned against operating old natural gas heaters in closed rooms.

.....

7.It is highly recommended to perform the thermal decomposition experiment of red mercurial oxide inside a well-ventilated fume hood.

.....

Question Three: Complete the following chemical equations, writing the type of reaction beneath each:

12-$Cu(S) + O_2(g) \xrightarrow{\Delta}$ ……..

Type of reaction: .....

2-$NaOH(aq) + HCl(aq) \xrightarrow{dil}$ ……..+…….

Type of reaction: .....

3-$CH_4(g) + 2O_2(g) \xrightarrow{\Delta}$ ……..+……+……

Type of reaction: .....

nezakr.natega4dk.net

Question Four: Choose the correct answer:

1.When heating red mercury oxide (HgO), the evolved gas is .....

a)Turns clear limewater milky

b)Ignites with a pop sound

c)Increases the glow of a burning matchstick

d)Changes the color of litmus dye

2.To eliminate heavy metal impurities such as lead ions (Pb^{2+}) from factory wastewater, a more active metal is used to precipitate them. Which of the following metals is the most suitable?

a)Cu (Copper) b)Ag (Silver)

c)Zn (Zinc) d)Au (Gold)

3.When an active metal is added to a blue copper sulfate solution ($CuSO_4$), the color of the solution gradually disappears because the process of .....copper ions (Cu^{2+}) take place in:

a)Oxidation b)Reduction

c)Decomposition d)Ionic exchange

4.In internal combustion cars, the function of the precious metals inside the catalytic converter is to act as a:

a)Oxidizing agent b)Catalyst

c)Alternative fuel d)Reducing agent

5.Which of the following gases has a pungent, choking odor, is reddish-brown, and dissolves in water to form nitrous acid and nitric acid?

a) Sulfur dioxide b)Nitrogen dioxide

c)Carbon monoxide d)Nitric oxide

6.When coal burns, a colorless gas with a choking odor evolves and dissolves in water to form sulfurous acid, which is:

a)Carbon dioxide b)Carbon monoxide

c)Sulfur dioxide d)Methane

7.If a fire breaks out in a facility, fire blankets are used to isolate:

a)Fuel b)Heat

c)Oxygen gas d)Carbon dioxide gas

8.When a magnesium ribbon burns in oxygen, the reaction is classified as combustion and can also be classified as:

a)Single displacement

b)Thermal decomposition

c)Oxidation and reduction

d)Double displacement

nezakr.natega4dk.net

Question Five: Answer the following:

1.An amount of dilute sulfuric acid (H_2SO_4) spilled in the laboratory. To neutralize the acid before cleaning it up, which is safer to avoid caustic reactions: using sodium carbonate powder (Na_2CO_3) or sodium hydroxide solution (NaOH)?

……

a) Write the balanced chemical equation for the reaction you chose:

……

b) What do you observe?

……

2- Sodium (Na) reacts with water (H_2O) to form sodium hydroxide and hydrogen gas according to the equation:

$2Na(s) + 2H_2O(l) \longrightarrow 2NaOH(aq) + H_2(g)\uparrow$ + heat

a)…….acts as an oxidizing agent. b) ……... acts as a reducing agent.

3- A chemical reaction does not create new atoms; it rearranges their bonding.
Explain this statement by applying it to the displacement reaction between zinc and copper sulfate solution, showing how bonds break and others form: ……
……

4-Express the following reactions using balanced chemical equations:

a.Combustion of a steel wool wire (iron Fe) in an atmosphere of oxygen to form magnetic iron oxide (Fe_3O_4)……

b.Combustion of a magnesium ribbon in an atmosphere of oxygen.

……

5-In a metal plating factory, large quantities of liquid waste containing copper sulfate solution ($CuSO_4$) are generated. The factory manager requested an inexpensive chemical method to recover copper metal (Cu) from this waste for resale, using available scrap iron (Fe).

a.What is the proposed type of reaction?

……

b.Write the balanced symbolic chemical equation for this reaction?

……

c.What is the visual observation that will confirm to the factory workers the completion of the copper recovery process?

……

6-Study the following reaction which represents the displacement of a metal replacing the hydrogen of an acid:

$$Mg_{(s)} + 2HCl_{(aq)} \xrightarrow{\text{dil.}} MgCl_{2(aq)} + H_{2(g)}\uparrow$$

nezakr.natega4dk.net

7. A student noticed in the laboratory that when dilute hydrochloric acid (HCl) was added to a piece of marble (calcium carbonate $CaCO_3$), clear effervescence occurred and a gas evolved.

a.Identify the type of chemical reaction that occurred: .....

b.Write the balanced chemical equation for this reaction: .....

c.State the name of the evolving gas and how to verify its identity: .....

8.When studying the thermal decomposition reaction of red mercury oxide (HgO), it is always emphasized to perform the experiment inside a well-ventilated fume hood.

a) Deduce the strict scientific reason for this preventive procedure based on the products formed from this reaction: .....

b) Write the balanced chemical equation for the reaction: .....

nezakr.natega4dk.net

Weeks.....

The electric current

Lesson one

/ / Date



Classroom performance

Observe and explore

Answer the following questions:

1- In the electric circuit shown in the figure:

a- The reason the lamp lights up is.....

b- What are the names of the components shown in the opposite figure?

1-.....

2-.....

3-.....

4-.....

.5-.....



2- The opposite figures show two conductors made of the same material.



Figure 1

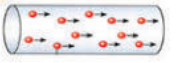


Figure 2

By studying the two figures, answer the following questions:

a- The electric charge (free electron) in Figure (1) moves in a ....., whereas the electric charges in Figure (2) move in .....

b- The reason of the movement of electric charges in Figure (2) is the connection of the conductor to.....

3- In the electric circuit shown in the figure,

If the reading of the voltmeter is 3 volts, and the reading is also 3 volts when the same voltmeter is connected across the battery terminals, what does each reading indicate in the two cases?

Case 1: .....

Case 2: .....

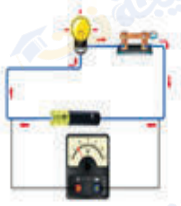


figure 3

nezakr.natega4dk.net

4-The opposite figures represent three electrical circuits.

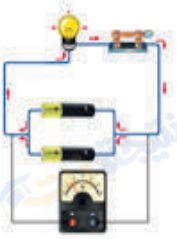
(knowing that the electromotive force for the three electric cells is identical)



Circuit 1



Circuit 2



Circuit 3

a-Explain why the voltmeter reading is the same in circuits (1) and (3), despite the difference in the number of electric cells in the two circuits.

.....

b-Explain why the voltmeter reading differs between circuits (2) and (3), despite having the same number of electric cells. .....

5. In the opposite device Answer the following:

a-The name of the electrical device is .....

b-The function of electric device in the electric circuit is .....



Observe and explore

Answer the following questions :

1-In the shown figure:

a- **What is the name of this device using to measure the electric resistance?**

b-The unit of measurement of electric resistance.....



2-In the shown figure:

a-The name of the electric component is.....

b-Can it be used as a variable resistor? Explain your answer

.....

.....

.....



nezakr.natega4dk.net

3-In the shown figure, answer the following:

a-The name of the electric component is……

b-What is the function of this component in the electric circuit?

……



Homework Performance (Assignment)

1.Define Electric Current Intensity, state its unit of measurement and how it is measured. Then, illustrate with a diagram how an ammeter is connected in an electric circuit to measure current intensity?

……

2. Define Potential Difference, state its unit of measurement. Then, illustrate with a diagram how a voltmeter is connected to measure potential difference between two points?

……

3. Compare between Direct Current source and Alternating Current source in terms of (current direction- an example for each).

Comparison Point	Direct Current Source	Alternating Current Source
Direction of Current		
Example		

4-Compare the connection of equal electrical cells in series and in parallel (diagrammatically). Are enough use 3 electrical cells. The electromotive force resulting from the connection, given that the e.m.f of a cell = E

Comparison Point	Series Connection	Parallel Connection
Diagram		
Electromotive Force		

5-What is meant by:

a.Ampere: ……

b.Volt: ……

c.Electrical resistance:……

d. Variable resistance (rheostat): .....

nezakr.natega4dk.net

Problems:

1-Calculate the electric current intensity passing through a conductor if a charge of 30 Coulombs flows in 5 second.

……

……

2-Calculate the potential difference across a lamp if the work done to transfer 10 Coulombs of charge is 50 Joules.

……

3- Explain two factors that affect the electrical resistance of a conductor.

……

4-Give reasons for:

a.Variable resistor is used in electric circuits.

……

b.Tungsten wire is used in bulb filaments.

……

c.Heat generated in a wire depends on its resistance.

……

5. What happens when...?

a. The tungsten filament of an electric light bulb is replaced with a copper wire.

……

b. The cross-sectional area of the wire increases relative to the electrical resistance.

……

6.Explain how you can measure electrical resistance. State the unit of measurement.

……

nezakr.natega4dk.net


Weekly Assessment


Complete the following statements:

1.The measuring unit of electric current intensity is ……, while the unit of electric charge is …….

2.The device used to measure potential difference between two points is …….

3.When connecting 3 electric cells (1.5 V each) in series, the total potential difference is ……volts.

4.The source that supplies alternating current whose direction changes with time is ……

5.The direction of electric current in the electric circuit is from the ……. pole to the …… pole of the electric source.

6.The measuring unit of electric resistance is ……...

7.A device is used to measure electric resistance is ……

8.Electric resistance is the ……... that encountered during their movement through conductors.

9.Variable resistance used to control current is called ……...

Put a tick (√) in front of the correct statements and a cross (×) in front of the incorrect statements, with correction:

1.An ammeter is connected in parallel with the conductor to measure current intensity. ( )

2.In an external circuit, electrical charges flow from the negative terminal of the conductor to the positive terminal of the power source. ( )

3.Electromotive force is measured in Amperes. ( )

4.When cells are connected in parallel, the total e.m.f. equals the e.m.f. of one cell. ( )

5.A battery is considered an alternating current source. ( )

6.Ohmmeter is connected between the two terminals of the electric resistance to measure the potential difference. ( )

7.Rheostat is used to control the electric current intensity passing in the electric circuit. ( )

8. As resistance increases, current intensity increases at constant potential difference.( )

9.As wire length increases, resistance increases . ( )

What happens when.....?

1.Atoms of some metals (e.g., copper and aluminum) lose some of their electrons? (Regarding electrical conductivity)

……

2.Connecting the terminals of a conductor to a direct current source? (Regarding electron movement inside the conductor)

……

nezakr.natega4dk.net

3.The electric potential at two points in a circuit is equal?

.....

4.There is no electric source (cell/battery) in a closed circuit?

.....

5.Doubling the amount of electric charge (Q) passing through a conductor cross-section per second?

.....

Give reasons for:

1.A voltmeter is connected in parallel between two points in an electric circuit.

.....

2.The electric cell or battery is considered a direct voltage source.

.....

3.Some technological applications connect several electric cells together to form a «battery».

.....

4.Electric cells in a hand flashlight are connected in series.

.....

5.Some portable chargers (power banks) contain several cells connected in parallel.

.....

6.The filament of an incandescent light bulb is made thin and long in the form of a solenoid coil of tungsten.

.....

7.The resistance of a copper wire differs from that of an aluminum wire, even though they have the same length and cross-sectional area.

.....

Write the scientific term:

1-The flow of electric charges through a conductor

2-Quantity of electric charge passing through a conductor cross-section per second.

3-Total work done by an electric source to transfer one Coulomb electric charge through a whole electric circuit.

Solving problems

1.A circuit contains a light bulb connected to a battery. A charge passing in 10 seconds equals 20 Coulombs. Calculate:

a) Current intensity passing through the light bulb

.....

nezakr.natega4dk.net

b) If the potential difference between the two ends of the electric bulb is 6 volts, calculate the work done to move this charge.

.....

2.A circuit contains 4 identical cells (1.5 V each). Calculate:

a) Total potential difference in series connection =.....

b) Total potential difference in parallel connection =.....

c) Which one of the connections is preferred for high voltage device? And why?

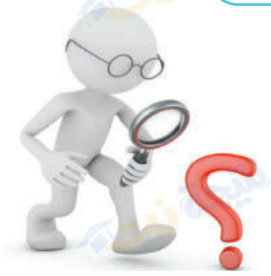
.....

3.Compare between Ammeter and Voltmeter in terms of (method of connection- usage- measuring unit):

.....

Weeks..... | The electric circuit | Lesson two

/ / Date

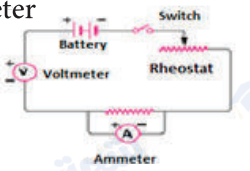


Class Performance

Try and explain

Answer the following questions:

1-A student connected the electrical components to verify Ohm›s Law. However, upon closing the switch, no reading was obtained on either the ammeter or the voltmeter



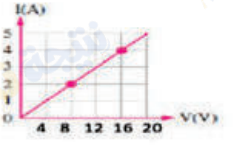
a-What is the reason for not obtaining any reading on both devices?

.....

b-What action is required to enable the student to verify Ohm›s Law successfully?

.....

2-If you performed a practical experiment to verify Ohm›s Law and obtained data show in the graph



Answer the following

a-The value of the resistance in the electric circuit equals:

.....

b-If the potential difference across the resistor is 24 V, the current intensity passing through the resistor is:



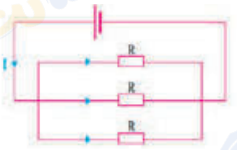
.....

3- The opposite figure showing several identical resistors connected in two circuits (1 & 2), where each single resistance R = 3 Ω

nezakr.natega4dk.net

a- The value of the total (equivalent) resistance in each circuit is:

- Circuit (1)…… .....
- Circuit (2) ……



Circuit 2

b- If the electromotive force of the battery in both circuits equals 9 V, the current intensity through each resistor is:

- Circuit (1): .....
- Circuit (2): .....

4-An electric bulb has a power rating of 12 W. Calculate the monthly cost of operating the bulb for 15 hours daily, given that the average cost per kilowatt-hour is 1.55 EGP.



.....

5- You have different electrical circuit components

Component 1	Component 2	Component 3	Component 4	Component 5	Component 6
					

a-Identify each component from the circuit diagram and state its function:

Component	Component Name	Function in Circuit
1		
2		
3		
4		
5		
6		

b-Illustrate by drawing the electric circuit used to verify Ohm›s Law and write the formula used:

.....

Homework Performance (Assignment)

1. Write the mathematical formula for Ohm›s Law, defining each symbol involved.

.....

2. In the experiment to verify Ohm›s Law:

a. What is the dependent variable? .....

b. What is the independent variable? .....

c. What are the constant factors?.....

nezakr.natega4dk.net

3. Problems

a) Calculate the current intensity passing through a metallic wire with a resistance of 4 Ω when a potential difference of 12 V is applied across its ends.

.....

b) Calculate the resistance of a metallic wire if a current of 3 A passes through it under a potential difference of 15 V.

.....

c) A fixed resistor of 6 Ω is connected in series with a power supply. Calculate the potential difference required to pass a current of 2 A through the circuit.

.....

4.Explain why household electrical appliances are connected in parallel with the power source. What is the benefit of that?

.....

5. Define each of the following:

a.Electric Power:.....

b.Electric Energy:.....

c.State the relationship between power and energy: .....



Weekly Assessment



Complete the following statements:

1. The current intensity passing through a conductor is ..... proportional to the potential difference across its ends at constant .....
2. The .....connection of resistors is used to obtain the maximum total electrical resistance.
3. The measuring unit of electric power is .....
4. A medical system used to regulate heartbeats using an electric circuit is known as .....
5. Electric power is defined as .....

Put a tick (✓) in front of the correct statements and a cross (x) in front of the incorrect statements, with correction:

1. Graphing current intensity and potential difference for a conductor at constant temperature according to Ohm›s Law obtains a straight line passing through the origin. ( )
2. When identical resistors are connected in series, the current intensity is equal across all resistors. ( )
3. When identical resistors are connected in parallel, the potential difference across each resistor is equal. ( )
4. The equivalent resistance of resistors connected in parallel is less than the value of the smallest resistance in the group. ( )

nezakr.natega4dk.net

What happens when.....?

1. Adjusting the variable resistor (rheostat) to its maximum value in Ohm›s Law experiment before closing the circuit?

.....

2. Doubling the potential difference across a conductor (fixed resistor) at constant temperature?.....

3. Connecting several identical resistors in series regarding the total equivalent resistance?

.....

4. Connecting several identical resistors in parallel regarding the total circuit current intensity?.....

5. Delayed normal heartbeat in a person with a pacemaker implanted?

.....

Give reason for the following:

1. The cardiac pacemaker is considered a practical application of integrating electric circuits with human physiology. .....

2. Energy efficiency labels are affixed to household electrical appliances.

.....

3. LED lamps are preferred over Compact Fluorescent Lamps (CFL).

.....

4. Air conditioners and heating devices are among the highest energy-consuming appliances in homes. .....

Write the scientific term for each statement:

1-The rate of electrical energy consumption of the device (light bulb)…..……

2-The unit of measurement for the opposition encountered by electric charges flowing through conductors: .....

3-The current intensity passing through a conductor of resistance 1 Ω when potential difference across it is 1 V: .....

4-The potential difference across a conductor of resistance 2 Ω and flow through it an electric a current of 1 A: .....

Problems: An electrical circuit containing two resistors 6-ohm connected in parallel with a 21-volt direct current power supply:

a) Calculate the total equivalent resistance.

.....

b) Calculate the total current intensity flowing through the circuit.

.....

c) Calculate the current intensity flowing through each resistor.

.....

nezakr.natega4dk.net

Weeks..... **Electrical and magnetic forces** Lesson three

/ / Date

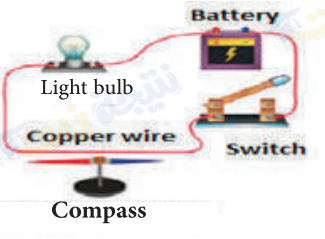


Electric and Magnetic Forces

Try and explain

Answer the following questions

1-The opposite figure shows Oersted›s experiment (a copper wire connected to a battery passing over a compass needle). When the switch is closed, what change occurs to each of:



a- The compass needle : .....

b- The electric light bulb: .....

(2)State the energy transformations of electrical energy from the electrical source for both the electric bulb and the compass .



-What happens to the pins when the electric current is disconnected?

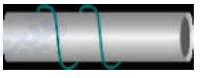
.....

-State two ways to increase the magnetic attraction of a nail:

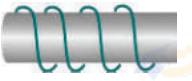
a-.....

b-.....

(3) The opposite figure shows a soft iron core winded by an electric wire consisting of 2 turns in one case, and 4 turns of the same wire in another case:



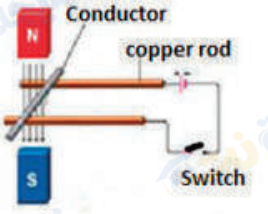
a- In which of the two cases is the magnetic attraction force greater if both are connected to a direct current source?



.....

The reason: .....

(4) In the electric circuit shown in the opposite figure:

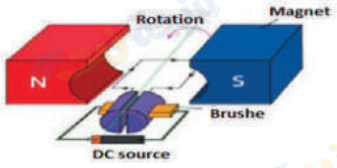


a- What happens to the straight conductor when the switch is closed?.....

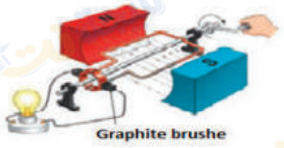
b- If the poles of the power source are reversed, what happens to the direction of motion of the conductor?.....

nezakr.natega4dk.net

(5) Explain the difference between the following two devices in terms of operating principle:



Device (A)



Device (B)

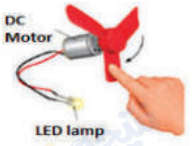
-Device (A) Electric Motor : .....

-Device (B) Electric Generator (Dynamo): .....

(6) A student constructed the circuit shown in the figure, then rotated the fan as shown:

- What happens to the LED lamp when rotated at an appropriate speed?

.....



- By increasing the rotation speed (greater kinetic energy), does the light intensity of the lamp change or not? Explain your answer.....

Homework Performance (Assignment)

1- What is meant by each of the following:

- Electromagnet: .....
- Magnetic Field: .....

2- Compare permanent magnets and electromagnets in terms of:

Point of Comparison	Permanent Magnet	Electromagnet
Retention of Magnetism	.....	.....
Ability to Control Magnetic Force	.....	.....

3- What factors affect the strength of an electromagnet?

.....

4. What happens in the following cases:

a- An electrical conductor is placed perpendicularly to a magnetic field and an electric current passes through the conductor.

.....

b- A copper wire connected to a direct current source is winded around a soft iron nail.

.....

nezakr.natega4dk.net

5-Explain working principle of using massive cranes in collecting scrap metal?

.....

6. State the factors that increase the torque acting on the electric motor›s coil (its rotational speed):

1.....

2.....

3.....

4.....

7. State the type of electric current.....?

a- Used to run the electric motor. .....

b- Generated from the electric generator when operated. .....

8-Answer the following questions:

a-What is the role of the graphite brushes in the electric motor? .....

b- What is the effect of increasing the number of magnets on the electric motor? .....



Weekly Assessment



Complete the following statements:

1. The scientist ..... discovered that the passage of an electric current through a wire produces a magnetic field around it.

2. The core of an electromagnet is made of ..... because it easily magnitized and demagnitized.

3. If a straight conductor is placed ..... to the direction of a magnetic field and an electric current pass through it, the wire is affected by a ..... force in a specific direction.

Put (✓) in front of correct statement and (X) in front of incorrect statement , and correct them:

1. An electromagnet is a permanent magnet that does not demagnitiz when cutting of the current . ( )

2. If a straight wire carrying an electric current is placed parallel to the direction of a magnetic field, the wire is affected by a magnetic force. ( )

3. The attractive force of an electromagnet depends only on the intensity of the current passing through a wire winded around the soft iron core. ( )

4. The attractive force of an electromagnet increases as the number of coils turns decreases.

What happens when.....?

1. A straight wire carrying an electric current is placed perpendicular to the direction of a magnetic field? .....

2. A straight wire carrying an electric current is placed perpendicular to a magnetic needle located nearby? .....

nezakr.natega4dk.net

Give reasons for the following:

1. Huge cranes equipped with electromagnets are used in scrapyards instead of permanent magnets.

.....

2. The needle of a compass placed near a wire deflects when an electric current passes through the wire.

.....

Write the scientific term for each of the following statements:

1. The area around a magnet in which the effects of its magnetic force appear. (.....)
2. A temporary magnet consisting of a wire winded around an iron core through which an electric current passes. (.....).
3. A device that converts electrical energy into mechanical energy (kinetic). (.....)
4. A device that converts kinetic energy into electrical energy. (.....)

Answer the following questions:



1. The opposite figure shows an electric motor of a washing machine rotating in a specific direction. Suggest two ways by which the rotation direction of this motor coil can be reversed.

(a) .....

(b) .....

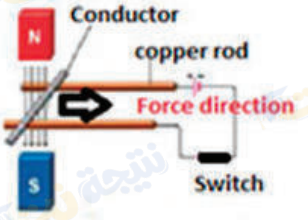
2. In an electric drill, the rotation speed of the motor is controlled to suit the task. How do you scientifically explain the motor›s ability to rotate at different speeds (what factors are controlled inside the device)?.....



Give reasons:

1. Cells in a power bank (portable charger) are connected in parallel? .....
2. The resistance of a wire increases as its length increases? .....
3. Copper is used in connecting wires instead of tungsten? .....
4. The bulb filament glows while the connecting wires do not glow? .....

In the opposite figure:



1. What type of force acts on a wire carrying an electric current?

.....

2. Mention the factors that affect the magnitude of the force acting on the conductor?

.....

nezakr.natega4dk.net

Weeks……

Heredity and Variation of Traits

Lesson one

/ / Date



Classroom performance

Try and explain

The Siblings Puzzle (Explaining Similarities and Differences Among Family Members)



Ahmed and Osama are full brothers sharing the same biological father and mother. Ahmed has brown eyes like his father and straight hair, whereas Osama also has brown eyes but curly hair like his mother.

Based on what you have studied in genetics, answer the following questions to explain this scientific puzzle:

1.What is the main reason for the similarity between the two brothers,(Ahmed and Osama,) in the brown eye color trait?

……

2.How does genetics explain the difference between the two brothers in hair texture even though they originated from the same parents?

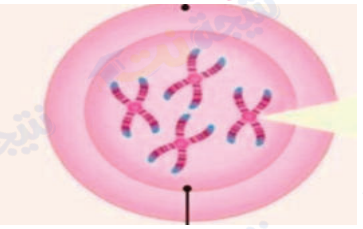
……

Riddle: “Who Am I?”

Your teacher selected four of your classmates to role-play the parts of some cell structures. Solve each riddle to discover: “Who Am I?”

……

nezakr.natega4dk.net

"I am the main containing room and headquarters inside the living cell; inside me, all genetic structures and secrets of the living organism are stored and protected."	
"I am just a small part or specific segment of this long strand, directly responsible for expressing one specific genetic trait (such as your eye color)."	
"I am the extremely long double-helix strand extending inside the chromosome, carrying all the basic chemical codes and instructions for building the body."	

Analyze, Conclude, and Answer:

The following table shows the inheritance of the curly hair trait in a family. Study the table, then answer:

Individuals	Gene copy inherited from mother	Gene copy inherited from father	Expressed inherited trait in the individual
W	Curly hair	Curly hair	Curly hair
X	Straight hair	Curly hair	Curly hair
Y	Curly hair	Straight hair	Curly hair
Z	Straight hair	Straight hair	Straight hair

1.When two identical gene copies for the (Curly hair) trait combine, the individual shows the …… trait.

2.When two identical gene copies for the (Straight hair) trait combine, the individual shows the …… trait.

3.When the two gene copies differ, the individual shows the …… trait.

4.The dominant gene is ……, while the recessive gene is …….

Homework Performance (Assignment)

Question 1: Complete the following statements:

1.Deoxyribonucleic acid (DNA) coils around molecules of …….

2.Specific parts or segments of the genetic material forming the chromosome are called.....

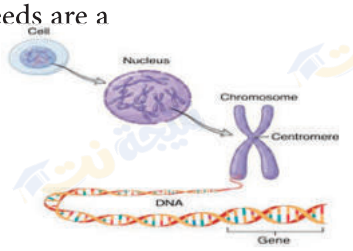
3.Genetic traits are transmitted from parents to offspring through genes carried by ……

4.During the process of ……, the nucleus of a sperm fuses with the nucleus of an egg to form a new individual possessing …… of each gene for every genetic trait.

nezakr.natega4dk.net

5. When two individuals mate—one being pure dominant and the other recessive—the ..... trait disappears in the first generation offspring.

6. Round pea seeds are a ..... trait, while wrinkled seeds are a ..... trait.



Question 2: Answer the following questions:

1.In front of you is a diagram of a chromosome consisting of nucleic acid and protein. Identify the part responsible for carrying the genetic code, and state the structure of this part.

.....

2.If you find a person in your community who is good at playing football and his father was not good at it, explain this scientifically in light of your study of types of traits.

.....

3.Determine the validity (True or False) of the following statements regarding the reasons for the success of Mendel's experiments:

a. ( ) The life cycle of the pea plant is extremely long, allowing Mendel extended study time.

b. ( ) Pea flowers are hermaphrodite, allowing self-pollination to occur easily.

c. ( ) Pea plants has pairs of clear, contrasting traits that are easy to distinguish (such as stem height and shortness).

d. ( ) It is difficult for humans to direct or perform artificial cross-pollination in pea plants.

Question 3: Give reasons for:

1.The importance of genetics.

.....

2.The new individual (offspring) possesses two copies of each gene for every genetic trait, even though each gamete contains only one copy.

.....

3.Mendel's choice of the pea plant specifically to conduct his famous genetic experiments (state three reasons).

.....



Weekly Assessment



Question 1: Give reasons for:

1.Mendel's first law being named the "Law of Segregation".

.....

2.The complete disappearance of the short-stem trait in first-generation plants when a pure tall-stemmed plant is pollinated with a pure short-stemmed plant.

.....

nezakr.natega4dk.net

3-Mendel removing the stamens of pea flowers before their anthers matured during his cross-pollination experiments.

……

4-The dominant trait appearing with two different genotypes, whereas the recessive trait appears with only one fixed genotype.

……

Question 2: What happens in the following genetic cases? (Predict expected results and ratios):

1-Pollinating a pure tall-stemmed pea plant (TT) with a hybrid tall-stemmed plant (Tt) regarding first-generation traits.

……

2-Leaving first-generation hybrid pea flowers to self-pollinate, regarding the ratio of traits among the resulting offspring.

……

3-Meeting a dominant gene allele for a trait with a recessive gene allele for the same trait in a hybrid individual regarding the external phenotype.

……

Question 3: Correct the following genetic statements:

1-Pure blue eye color in humans is considered a dominant trait.

2-The recessive trait clearly appears in an individual when the two gene copies forming it are different.

3-Mendel's first law states that genetic factors merge and interfere together during gamete formation.

4-The recessive trait is the trait that always appears in all first-generation individuals at a full percentage of 100%.

5-Genetic factors and genes are transmitted from parents to offspring via somatic cells of the individual.

6-The phenotype of an individual carrying the pure genotype BB for eye colour is blue eyes.

Question 4: Complete the blanks in the following sentences with appropriate genetic terms:

1- Every inherited trait appearing in a living organism is controlled by a pair of genetic……

2- If the actual genotype of an individual is (Tt), this individual is genetically called a …… individual.

3-The principle of …… means the appearance of the dominant trait in first-generation individuals when two individuals carrying contrasting traits are crossed.

nezakr.natega4dk.net

4.Mendel used capital letters to represent the …… gene, and small letters to represent the …… gene.

5.The typical percentage for the appearance of the recessive trait in the second generation of Mendel's experiments is ……%.

6.The first generation is symbolized in genetic mating diagrams by the symbol ……, whereas the resulting second generation is symbolized by the symbol ……

Question 5: Write scientific terms indicated by the following statements:

1.Genetics: ……

2.Deoxyribonucleic Acid (DNA):

……

3.Chromosomes: ……

4.Gene: ……

5.Phenotype: ……

6.Genotype: ……

Question 6: Choose the correct answer for the following:

1.An example of an acquired trait in humans is ……

a) Blood type b) Skin color

c) Language speaking skill d) Hair shape

2.If two heterozygous individuals for a certain trait mate, the percentage of appearance of the recessive trait in the resulting offspring is ……

a) 25% b) 50%

c) 75% d) 100%

3.The genotype of a short-stemmed pea plant is always ……

a) Hybrid b) Homozygous dominant

c) Homozygous recessive d) Undefined type

4- Chemically, a chromosome consists of nucleic acid combined with ……

a) Lipids b) Protein

c) Carbohydrates d) Mineral salts

5- When pollinating a red-flowered pea plant RR with a white-flowered plant rr, the first generation offspring are 100% ……

a) Pure white-flowered b) Pure red-flowered

c) Hybrid red-flowered d) Pink-flowered

nezakr.natega4dk.net

Question 7: Correct the underlined words in the following statements:

1.Genetic information is stored and directs cellular activities inside human cells within the cytoplasm. (.....)

2.The long DNA molecule coils around molecules of lipids to form the chromosome. (.....)

3.A new individual possesses two copies of each gene because a single gamete carries the complete genetic material. (.....)



second monthly training



What is meant by each of the following?

1.Electric Current .....

2.Volt .....

3.Electric Current Intensity .....

4.Electromotive Force .....

5.Electric Resistance .....

6.Ohm .....

7.Variable Resistance (Rheostat) .....

8.Ohm's Law .....

9.Electric Power .....

10.Magnetic Field .....

11.Electric Motor .....

12.Electric Generator (Dynamo) .....

13.Gene .....

14.Chromosome .....

15.Phenotype .....

16.Hybrid Individual (Heterozygote) .....

Give reasons for:

1.Metals like copper are good electrical conductors. ....

2.Ammeters are connected in series in electrical circuits. ....

3.Voltmeters are connected in parallel in electrical circuits. ....

4.Electric current does not flow between two points having equal electric potential. ....

5.Dry cells in a manual flashlight are connected in series. ....

nezakr.natega4dk.net

6.Using rheostats in electrical circuits.....

7.Connecting household electrical appliances in parallel.....

8.The equivalent resistance for a group of identical resistors connected in parallel is very small.....

9.LED lamps are preferred over fluorescent lamps.....

10.Air conditioners are the highest power-consuming devices in homes.....

11.A magnetic compass needle deflects when placed over a wire carrying electric current.....

12.Soft iron is preferred as a core for electromagnets.....

13.An electromagnet drops iron scrap pieces when its circuit is opened.....

14.The presence of a split metallic commutator cylinder in electric motors.....

15.A bicycle lamp's brightness increases as its movement speed increases.....

16.Alternating current is easily transmitted over long distances.....

17.Mendel selected the pea plant specifically when performing his experiments.....

18.The phenotype of a recessive individual always indicates its genotype.....

Solve the following problems:

1-Calculate the intensity of an electric current passing through a conductor if an electric charge of 600 coulombs flows through it in 2 minutes .

2-If the work done to transfer an electric charge of 20 coulombs between two points is 100 Joules, calculate the potential difference.

3-A battery consists of 4 identical dry cells («e.m.f.» of each =1.5 volt) connected in series; calculate its total electromotive force.

4-Calculate the equivalent resistance for 3 identical resistors (the value of each equals 6 ohms) connected in parallel.

5-In an Ohm's Law experiment, if the potential difference is 12 volts and current intensity is 2 amperes, calculate the fixed resistance value.

6-If a plant with hybrid yellow seeds is crossed with another plant having green seeds, what is the expected percentage of green seeds? Explain your answer genetically.

Mark (✓) for correct and (×) for incorrect statements, correcting the incorrect statements:

1-Electric charges flow from a point of low potential to a point of high potential. ( )

2-The electrical resistance of a conductor increases with an increase in its cross-sectional area (thickness). ( )

nezakr.natega4dk.net

3- The electromotive force of identical cells connected in series equals the e.m.f. of a single cell. ( )

4- Alternating current is constant in intensity and direction over time. ( )

5- The strength of an electromagnet increases by increasing the number of coil turns. ( )

6- The electric motor converts kinetic energy into electrical energy. ( )

7- The unit of electrical power is the Watt, which is equivalent to Joules/second. ( )

8- An ohmmeter is used to measure electrical resistance directly. ( )

9- The inherited trait appearing in all first-generation individuals in Mendel's experiments is the recessive trait. ( )

10- The ability to speak Japanese is an example of an acquired trait. ( )

Answer the following questions:

1- A mother and father are phenotypically healthy but are «carriers» of an inherited disease caused by recessive allele (r). Using a Punnett square, what is the possible percentage of their child being born whith desease?

2-Based on your study of inherited human traits, complete the expected phenotype for eye color, knowing that the dominant allele is (B) and recessive allele is (b):

Individual (BB): .....

Individual (Bb): .....

Individual (bb): .....

3-Denoting the tall stem gene with dominant symbol (T) and short stem gene with recessive symbol (t): complete the Punnett square resulting from crossing two hybrid first-generation plants (Tt×Tt):

Gametes	T	t
T	TT (Pure tall)	..... (.....)
t	..... (.....)	tt (Pure short)

nezakr.natega4dk.net

Weeks……

Natural Selection and Artificial Selection

Lesson two

Date / /



Classroom Performance



Try and explain

Growth of Populations

- Define :Biological Population: ……
- Complete: The growth of biological populations is linked not only to living organisms, but also to the interaction of individuals with ……



Observe and Conclude:

The figures below illustrate stages in deer population growth and interaction with the environment:

Order the figures from (1) to (4) and write the correct number below each, then write the correct statment thah expressing the pictures:

1. Numbers increase rapidly with food availability.
2. Deer begin reproducing and adapting to the environment.
3. The population reaches a state of relative stability.
4. As individual numbers increase, food begins to decline.

Corresponding Sentence	Figure	
……		( )

nezakr.natega4dk.net

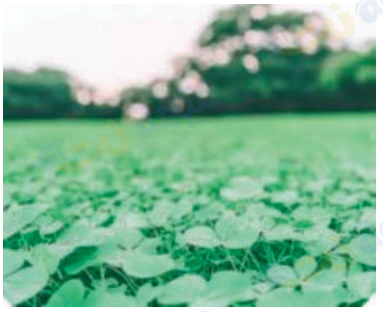
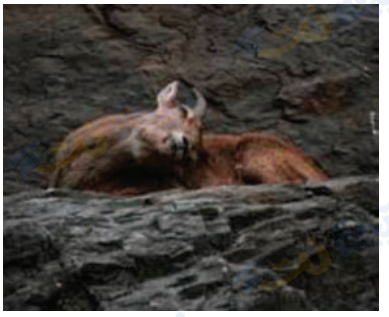
.....		( )
.....		( )
.....		( )

Reflect and Classify

Factors Affecting Biological Population Growth

Observe and classify the following cases

Examine the four cases presented in the table carefully; determine the nature of the factor affecting population growth in each case and its impact

Case 1	Case 2
	
Abundant growth of clover plants in open fields following a rainy season. Factor Type:	Decline in mountain ibex numbers on rocky heights due to inheriting genes causing immune deficiency. Factor Type: .....

nezakr.natega4dk.net

Case 3	Case 4
	
Survival and successful reproduction of a squirrel population possessing an inherited trait providing strong teeth to crack hard hazelnut shells. Factor Type:	Sharp decline in frog numbers within a marshland polluted with toxic industrial chemical waste. Factor Type: .....

Based on the previous activity, answer:

1.What is the impact of flourishing environmental resources on population size?

.....

2.Discuss which factor type—environmental or genetic—has a faster and direct effect on population size, explaining your point of view.

.....

Homework Performance (Assignment)

Question 1: Complete the following statements:

1.The more individual numbers increase in a population, the more ..... begin to decrease.

2.On a growth curve, the ..... phase is characterized by rapid doubling of population numbers.

3.Scarcity and shortage of resources are considered ..... factors controlling population growth.

4..... ..... gives some individuals a greater ability to cop with environmental conditions compared to others.

5.In natural ....., ecologists monitor the carrying capacity to maintain ecological balance.

6.The adapted individuals have ..... less chances of survival within an ecosystem.

Question 2: Give scientific reasons:

1.Studying an organism's characteristics in isolation is insufficient to understand its behavior and activity within an ecosystem. .....

2.Biological population sizes in nature are not fixed and change continuously. .....

nezakr.natega4dk.net

3.A slow down occurs in the rate of rabbit population growth after a period of rapid growth.

……

Question 3: What happens when...?

1.Introducing a small number of rabbits into an environment rich in food and entirely free of competitors?

……

2.Rabbit population numbers increase continuously and significantly relative to available food resources?

……

3.Competition intensifies among individuals of a single biological population over a limited food supply?

……



Weekly Assessment



Question 1: Choose the correct answer:

1.A group of individuals belonging to the same species, living in the same place and time, and capable of reproduction is a ……

(Ecosystem – Biological Population – Biological Community – Biodiversity)

2.Upon initial entry of rabbits into a new environment (Phase 1), the first thing they begin with is ……

(Rapid reproduction – Severe competition – Adaptation to environment – Mass migration)

3.Pollution may lead to a …… in fish numbers.

(Rapid increase – Moderate increase – Decrease – No change)

Question 2: Write scientific terms indicated by:

1.Biological Population: ……

2.Population Growth Curve: ……

3.Environmental Resistance: ……

Question 3: Give reasons for:

1.Biological population growth is extremely slow during the adaptation phase.

……

2.No natural population can continue growing exponentially forever.

……

3.Environmental factors such as food and water shortages are termed «environmental resistance».

……

nezakr.natega4dk.net

Question 4: What happens if:

1.Ideal conditions (unlimited food, vast space, absence of predators) are provided to a population?

……

2.A squirrel population and a bird population compete for the same limited food source in a forest?

……

3.An invasive foreign organism (a new predator) is introduced into a stable environment containing a deer population?

……

Question 5: Compare between:

1.Characteristics of a biological population during the (Exponential Growth Phase) and (Stationary Phase) regarding growth rate and available resources:

Comparison Item	Exponential Growth Phase	Stationary Phase
Growth Rate	……	……
Available Resources	……	……

2.Environmental Factors and Genetic Factors controlling population growth regarding definition and example:

Comparison Item	Environmental Factors	Genetic Factors
Definition	……	……
Example	……	……

Question 6: Answer the following:

1.How does the natural balance between predator and prey (e.g., wolves and deer) contribute to maintaining the carrying capacity of pastures and preventing vegetation degradation?

……

Weeks…… **Natural Selection and Artificial Selection** Lesson two continuous

/ / Date



Classroom performance

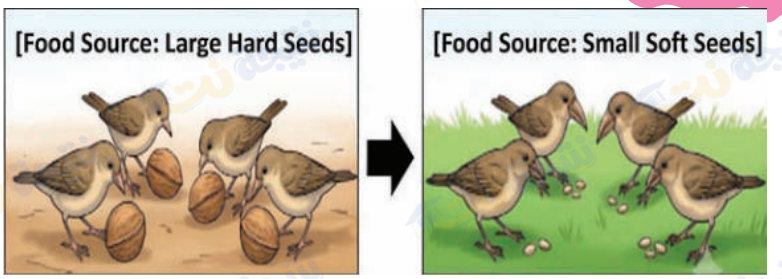


Try and explain

Natural Selection and Artificial Selection

The figures show the impact of environmental change on a fine-beaked bird species. Originally, the environment contained hard seeds (Case 1); subsequently, the food source changed in (Case 2) to soft seeds

nezakr.nategа4dk.net



Answer the following questions:

1.State the type of selection shown in this example: …….....
.....……

2.Explain how this example demonstrates the concept of selection:
…….....……

3.If the number of birds in Case 1 was 300, the expected number in Case 2 is …….....
.....……

(500 – 300 – 200 – 100)

Environmental Change and Selection of the Fittest:

In a dry, sandy forest, a population of brown bears with dark fur lived for camouflage. Due to sudden climate change, the region turned into an entirely white, snow-covered environment. This change allowed hunters to easily hunt brown bears due to loss of camouflage, leading to a sharp decline in their numbers.

In figures , white-furred bears appeared, distinct from brown bears and invisible in snow. These white bears began reproducing exponentially amid abundant food and absence of predators.



nezakr.natega4dk.net

Answer the following:

1.Explain this example, clarifying the type of factors controlling the growth of this bear population:

……

2.Compare the availability/prevalence of brown bears versus white bears in the previous example:

Environmental Phase	Brown Bears	White Bears
Sandy Forest	…… ……	…… ……
Snowy Environment	…… ……	…… ……



Question 1: Complete the following sentences:

1.Before the Industrial Revolution, natural selection favoured …… moths.

2.Lichens result from a symbiotic relationship between …… and ……

3.Natural selection is a …… process taking place across generations.

4.Examples of artificial selection include ……,……

Question 2: Give scientific reasons:

1.Farmers perform artificial selection processes.

……

2.Using lichens as bio-indicators in the environment.

……

Question 3: What happens when...?

1.The Industrial Revolution had no effect on the tree trunk colour?

……

2.A biological population is exposed to continuous, sudden changes in surrounding environmental factors?

……

nezakr.natega4dk.net



Weekly Assessment



Question 1: Choose the correct answer:

1.A decrease in bird numbers resulting from a defect in a gene is a factor that is .....
.....

(Environmental only – Genetic only – Environmental and Genetic – Has no effect)

2.After the Industrial Revolution, ... moths disappeared.

(Light-colored – Dark-colored – Trees – Lichens)

Question 2: Write scientific terms indicated by:

1.Carrying Capacity: .....

2.Genetic factors controlling population growth: .....

3.Natural Selection: .....

Question 3: Give reasons for:

1.Every natural environment has a specific, roughly constant limit known as carrying capacity.

.....

2.Natural selection on dark moths differed before and after the Industrial Revolution.

.....

3.The importance of natural reserves.

.....

Question 4: What happens if:

1.A forest area experiences severe, harsh drought for several consecutive years regarding carrying capacity?

.....

2.The rate of emigration (departing individuals) exceeds the rate of immigration and births within a population?

.....

3.A rabbit population is struck by a highly contagious epidemic disease while in the exponential growth phase?

.....

4.Producer plant production increases massively in a closed ecosystem containing a population of herbivores?

.....

nezakr.natega4dk.net

Question 5: Compare between:

Natural Selection and Artificial Selection regarding (Controlling Factor) and (Speed of Change):

Comparison Item	Natural Selection	Artificial Selection
Controlling Factor	.....	.....
Speed of Change	.....	.....

Question 6: Answer the following:

1.Analyze the following statement scientifically: «An environment's carrying capacity is not a rigid, fixed number; rather, it is a flexible value that changes with seasons and climatic conditions.»

.....

2.A biological population consists of 150 birds, of which 100 possess large wings and 50 possess small wings. The population came under attack by predatory birds such as eagles. Predict the difference in numbers of each bird type over the coming period:

.....

nezakr.nategа4dk.net

Lesson 1 | The Fossil Record | week .....

Date : / / 1



Classroom performance

Try and explain

Journey of Organisms: Analyze the Trace



Organisms Trace Analyztic

1. What are the possible organisms based on this figure?

.....

2. What visual evidence supports your conclusion?

.....

3. Describe the imagined scenario of interaction between the two organisms

.....

Looking at the shape of footprints and trace fossils:



Worm -tunnel trace Fossil



Burro Trace Fossil



Dinosaur Footprint Fossil



FootPrints

1. Explain the fundamental difference between a «trace» and «remains» in terms of timing of formation (during the organism's life vs. after its death).

.....

2. How does a «trace» help us understand the behavior of a living organism? How does a geologist infer the lifestyle and behavior patterns of an organism through a «trace»?

.....

Observing and answer: By looking at mammoth fossil in ice and insect fossil in amber

1. Why do scientists classify these examples under the term «whole-body fossil»?

.....

2. What if the «medium that protects the organism from de-composition» was not available?

.....

3. Predict the fate of these organisms if the protection medium disappears?

.....



Mammoth fossil in the ice



nezakr.natega4dk.net

Geological Laboratory and Decoding Ancient Environments





Cast fossil

If you poured plaster into the cavity of a hard shell piece, then completely removed the shell, producing a solid interior 3D model. Does this model represent a «mold» or a «cast»? Prove your answer based on your understanding.

.....

Answer the following:

1. In a sedimentary rock sequence that has not been deformed, fossils of invertebrate animals and other fossils of vertebrate animals have been found. Which of these two types of fossils would you expect to find in deeper layers?

.....

2. What do you conclude from this about the trace of the evolution of life on Earth?

.....

Observe and Answer:



1. Looking at the picture of Wadi El-Hitan:
What story does the presence of whale skeletons in a desert area like «Fayoum» tell us? What environmental changes can you conclude?

.....

2. In front of you , a figure of the Petrified Forest in Maadi.



answer the following

1. Analyze the climate nature prevailing back then in the Petrified Forest based on this figure.

.....

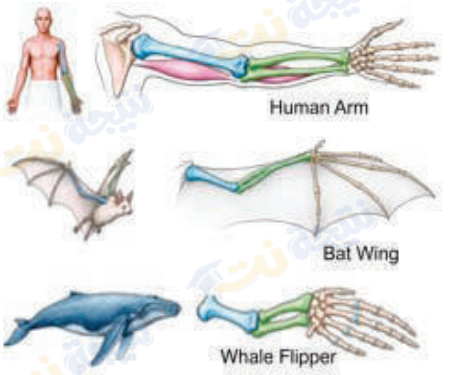


2. Looking at the picture of an extinct marine reptile:
What explanations did scientists provide for the diversity of living organisms and the emergence of new species across geological ages?

nezakr.natega4dk.net

Observe and Complete

The similarity in the general structure of ..... among the human arm, the bat wing, and the whale flipper is considered evidence that helps scientists classify these organisms within the class of ....., despite differences in ..... .



Observe and Compare:



The wing in pterosaur, bat, and butterfly

Why we don't consider the butterfly wing, bat wing, and pterosaur wing as evidence of a single common origin despite the similarity in function?

.....

Reflect and Explain:

Reflect on the figure and explain the statement with an example: «The more similarities in internal structures between two species of organisms, the closer their evolutionary relationship».

.....

.....



Extinct theropod

Imagine and Design:

Imagine you are an environmental consultant asked to explain future climate changes based on the past; Design an «imaginary scenario» of what will happen to the fossils of current living organisms (such as modern birds) millions of years from now if Earth suffers a sixth mass extinction due to high pollution? .....

Geological Riddles:

The Owner of Two Identities

«I am a bird unlike all birds, feathers fill my wings to cross the seas, but my jaw is full of teeth, and my tail is long and bony unlike pigeons, I stand bewildered between two worlds connecting ancestors and descendants..... So who am I?» (.....)

nezakr.natega4dk.net

A Trace Without a Body

«I walked on Earth's sand millions of years ago, I left my signature and left, and no one saw my bones in this place, I teach you how I used to eat and move without touching my skull..... So who am I?» (.....)

The Golden Coffin:

«I was a flying insect looking for my food, when the sticky tears of trees fell upon me, I held my breath and was maded a shiny coffin colored like gold, keeping my body in its exact details until your present day.. So who am I? (.....)

«Mysterious Phrases» Challenge:

Discover the «scientific trick» (correct the riddle) in the following:

1. «A geologist found an ammonite mold fossil and a fish cast fossil in the same rock, so he said the mold shows the internal intestines of the organism»

.....

2. «When mass extinction occurred, dinosaurs died because they found no genetic mutations to protect them from meteorites».

.....

3. Referring to the textbook, and in light of what you studied, write what the following refers to:

Petrified fossils	
Homologous structures	
Geographical isolation	

Homework

What is the importance of each of the following...?

1. Studying layer sequence in the fossil record.

.....

2. Comparative anatomy of fossils and living organisms.

.....

3. The Archaeopteryx fossil in geology and biology.

What is meant by each of the following?

1. The Fossil Record. .....

nezakr.natega4dk.net

2.Mass Extinction.

……

3.Amber.

……..

Compare between each of the following

Trace fossils and Remains fossils: In terms of definition, timing of formation during life vs. after death), mentioning an example for each).

Comparison points	Trace fossils	Remain fossils
Definition		
Timing of formation		
Example		

Cast fossil and Mold fossil: **In terms of the type of details preserved (internal vs. external), .method of formation, and a clear example of each appearing in rocks**

Comparison points	Cast	Mold
Type of details preserved		
Method of formation		
Example		

3. Compare Homologous structures and Analogous structures: In terms of point of similarity (structure or function), with an illustrative example for each.

Comparison points	Homologous structures	Analogous structures
point of similarity		
Example		



Weekly Assessment



Complete the following statements:

1. The ..... are defined as the remains or traces of ancient living organisms that lived in past geological eras and were preserved in sedimentary rocks.
2. Examples of whole organism fossils include the fossil of ..... preserved in ice, and the fossil of ..... preserved in amber.
3. The ..... represents the internal details of an ancient living organism's skeleton, while the ..... represents the external details of the organism's skeleton.

nezakr.natega4dk.net

4. Among the minerals that replace organic matter in petrified fossils are ..... or .....

5. Disasters that lead to the disappearance of more than 75% of living species in a short period are called .....

6. Archaeopteryx combines traits of ..... and traits of ....., serving as a transitional link between them.

Write the scientific term indicating the following statements:

1. Remains or traces of ancient living organisms that lived in past geological eras and were preserved under special environmental conditions. (.....)
2. Footprints, track ways, burrows, or coprolites waste that indicate the behavior of a living organism or its feeding habite. (.....)
3. A fossil representing the internal form or cavity of an ancient living organism's skeleton, formed as a result of filling its cavity with mineral solutions such as silica and calcite. (.....)
4. A fossil of an extinct organism representing a transitional link between reptiles and birds. (.....)

Give reasons for the following:

1. Archaeopteryx is considered an important transitional fossil in the geological record.
.....
2. Formation of the Petrified Forest area in Katameya.
.....
3. A butterfly wing and a bat wing are not considered homologous structures despite both being used for flight.
.....
4. The rarity of whole-organism fossil formation for any living organism that dies in an exposed terrestrial environment.
.....

Correct the following statements:

1. A cast is formed as a result of the impression of the external shape of an ancient living organism's skeleton in sedimentary rocks.
.....
2. The fossil record proves that vertebrates appeared on Earth before invertebrates.
.....
3. Amber is a frozen substance produced by the solidification of permanent ice across geological ages.
.....
4. The Archaeopteryx fossil is a transitional link between fish and amphibians.
.....

nezakr.natega4dk.net

What happens if...?

1. An ancient living organism was buried immediately after its death in a medium that isolates it from oxygen and decomposition (such as permafrost).

.....

2. An ancient insect fell inside liquid resin secreted by coniferous trees.

.....

3. Sediments or minerals (such as calcite) filled the internal cavity of a shell or skeleton of a living organism after its death, and then the outer skeleton dissolved over time.

.....

4. Silica gradually replaced the organic matter in the cells of ancient tree trunks.

.....

Lesson two | Geologica time | week .....

Date : / / |

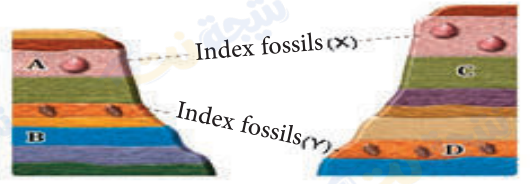


Classroom performance



Try and explain

investigators of Inverted Layers «Superposition and Index Fossils»



Two distant rock sequences



LAW OF SUPERPOSITION

Try and Explain:

1. Fossils are usually formed after an organism is buried under special environmental conditions. What is the essential condition for a fossil to form after an organism's death? Mention three examples of media that protect it from decomposition.

.....

2. Based on the law of superposition, if you have a sequence of rock succession containing layers (1, 2, 3) from bottom to top, which of these layers is the youngest ? And which is the oldest?

.....

nezakr.natega4dk.net

Engineers of the Geological Time Scale

1. Scientists divided the Earth's long-term age into varying time units. What are the major events that the Earth went through, which the geologica time scale helped scientists organize and understand?

.....

2. Arrange the following geological time units from smallest to largest according to the diagram shown:

(Eras – Epochs – Eons – Periods).

3. Complete the following diagram:



Paradox of the Himalayas and the Ocean Floor (Conquest of Peaks)

1. State the scientific evidence that scientists found on the peaks of the Himalayan mountains proving that this area was a sea floor in the past.

.....



2. What is the geological reason that led to the elevation of these marine rocks to become high mountain peaks?

.....



Observe and Infer as a Geologist:

1. The opposite image represents the formation of the Red Sea mountains and Mount Uweinat from igneous rocks (granite) and metamorphic rocks. Infer some geological events associated with them.

.....

nezakr.natega4dk.net

2. The opposite image represents the presence of a basalt cover overlying limestone in the Abu Roash area.

.....



3. The opposite image represents the presence of fossils of extinct organisms (such as dinosaurs) in specific rock layers worldwide.

.....



Scientific Riddles:

1. «I am a record that keeps Earth's history, but I contain no paper nor writing; rather, my pages are made of rocks and their sequences... So who am I?»

.....

2. «I lived for a very short period in Earth's age, but I traveled and spread to every corner of the world, and today scientists use me as a reference to know the ages of matching rock layers... So who am I?»

.....

Referring to the textbook, and in light of what you studied, write what the following refers to:

Relative age of rocks	
Law of Superposition	
Index Fossils	
The layer containing the index fossil	
Absolute age of rocks	
Unstable radioactive elements	

nezakr.natega4dk.net

Homework Performan(Assignment)

What is the importance of each of the following.....?

1.«Index fossils» in geology.

.....

2.The layer containing the index fossil.

.....

3.Unstable radioactive elements (such as Uranium-238 and Carbon-14) in studying Earth's history.

.....

What is meant by each of the following.....?

1.Geologica time scale.

.....

2.Rock record.

.....

3.Unstable radioactive elements.

.....

Compare between each of the following:

1. Relative age and Absolute age of rocks in terms of: definition , and how it is determined .

.....

2. Fossil record and Rock record in terms of: definition , and primary use.

.....

Weekly Assessment

1. Write the scientific term indicating the following statements:

1. The collection of fossils that were naturally preserved in rock layers or other media.

(.....)

2. The accumulation and sequence of all rocks and their formations in the Earth's crust.

(.....)

3. The largest unit of geological time in Earth's history, divided into several eras.

(.....)

4. Estimating the age of rocks or fossils by knowing whether they are older or younger than another rock without determining their age in years.

(.....)

5. A law stating that in an undisturbed sedimentary rock sequence , the oldest layer is at the bottom and the youngest is at the top. (.....)

nezakr.natega4dk.net

Correct the following statements:

1. The absolute age of rocks depends on the principle that older layers lie at the bottom and younger ones at the top.

……

2. The Phanerozoic Eon is divided into three eras: the Paleozoic, Mesozoic, and Primitive eras.

……

3. Index fossils are characterized by having a long time range and wide geographic distribution.

……

4. The presence of ancient whale skeletons in Wadi El-Hitan in Fayoum indicates that the area was a rainforest.

……

Give reasons for the following:

1. Trilobite fossils and Ammonite fossils are considered index fossils.

……

2. In an intact sedimentary rock sequence, layer (1) at the bottom is the oldest and layer (6) at the top is the youngest.

……

3. Scientists can accurately determine the absolute age (in years) of certain rocks.

……

What happens if?

1. Scientists found the same index fossil in two rock layers in two distant regions.

……

2. We accurately measured the amount of the remaining radioactive element in the rock and the amount of the element resulting from decay.

……

3. Index fossils completely disappeared from the Earth's crust? (How would this affect determining the relative age of distant layers?)

……

Compare in a table between «Determining Relative Age of Rocks» and «Determining Absolute Age of Rocks»: (In terms of definition - method used)

Point of Comparison	Determining Relative Age of Rocks	Determining Absolute Age of Rocks
Definition		
Method used		

nezakr.natega4dk.net

Third Monthly Training

. Correct the following statements:

1. A mold fossil is considered an exact replica of the internal details of an ancient living organism's skeleton.

……

2. One of the geological causes of mass extinction is the occurrence of natural selection.

……

3. Natural selection represents the sudden and random change in the genetic material of isolated species.

……

4. Mendel's second low is known as (factors isolation low)

……

5. The period required for the decay of all of the mentioned radioactive element's quantity is known as half-life.

……

6. The largest unit of time in the geological time scale is the era.

……

Write the scientific term indicating the following statements:

1. The sequence of living organism fossils in sedimentary rock layers according to their appearance from oldest to youngest. (……)

2. The nucleic acid that carries genetic information of the living organism (……)

3. Fossils of organisms that lived for a short time range, spread geographically over wide areas, then went extinct and did not exist in subsequent geological ages. (……)

4. Determining the exact or actual age of certain rocks or fossils using radioactivity. (……)

5. The time period taken for half the amount of a radioactive element to decay and convert into stable elements. (……)

6. The trait which appears only by the presence of a pair of similar factors. (……)

3. Give reasons for the following:

1. The dark colored maths stay and reproduce after industrial revolution while the light coloured maths disappear..

……

2. The genetic diversity inside population is the main condition for success of natural selection.

……

nezakr.natega4dk.net

3. Fennec foxes which live in desert have big ears while polar foxes have very small ears .

……

4. Scientists infer the nature of ancient climate and geological environment of the region from Wadi El-Hitan fossils in Fayoum.

……

5. The occurrence of geographical isolation (such as the appearance of a river or mountain range) leads to diversity in life forms.

……

What happens in the following cases...?

1. Gene flow completely ceases between two groups of the same species due to a natural barrier for a long period?

……

2. The functions of the forelimbs of all mammals (human, whale, bat) become identical in different environments?

……

3. Short-necked giraffes are unable to reach leaves on high trees during severe drought seasons?

……

4.Unstable radioactive elements completely disappear from the Earth's crust? How would that impact geologists' ability to document Earth's history?

……

What is the importance of each of the following...?

1. Genetic diversity among individuals of the same species.

……

2. Premarital medical examination.

……

3. Modern techniques for preserving desirable genetic traits.

……

4. Discovering whole 3D fossils in ancient environmental rocks.

……

5. The presence of «homologous structures» in comparative anatomy among organisms.

……

nezakr.natega4dk.net

6. Discovering complete whale skeletons in the «Wadi El-Hitan» area in Fayoum.

.....

7. The «Fossil Record» in studying ancient climates.

.....

8. The geologica time scale.

.....

Answer the following questions:

1.In a breeding experiment of garden pea plants with hybrid green pods, the seeds of the resulting generation were collected and planted, and the statistical results were as follows: (601 plants with green pods, and 199 plants with yellow pods).

A. Calculate the simplified numerical ratio between plants with green pods to yellow pods

B. Does this result comply with Mendel's First Law? Explain your answer genetically using symbols, considering the symbol for the green pod gene as (G) and the yellow pod as (g)

2.State the conditions for whole-organisms fossil formation, explaining the role of the medium that protects against decomposition.

.....

3.Trace in steps the sequence of appearance of living organisms in the fossil record starting from the marine world up to land.

.....

4.State the four hypotheses proposed by scientists to explain the mass extinction of dinosaurs.

.....

5.Explain how the form of extinct organisms can be reconstructed using skeletons and comparative anatomy.

.....

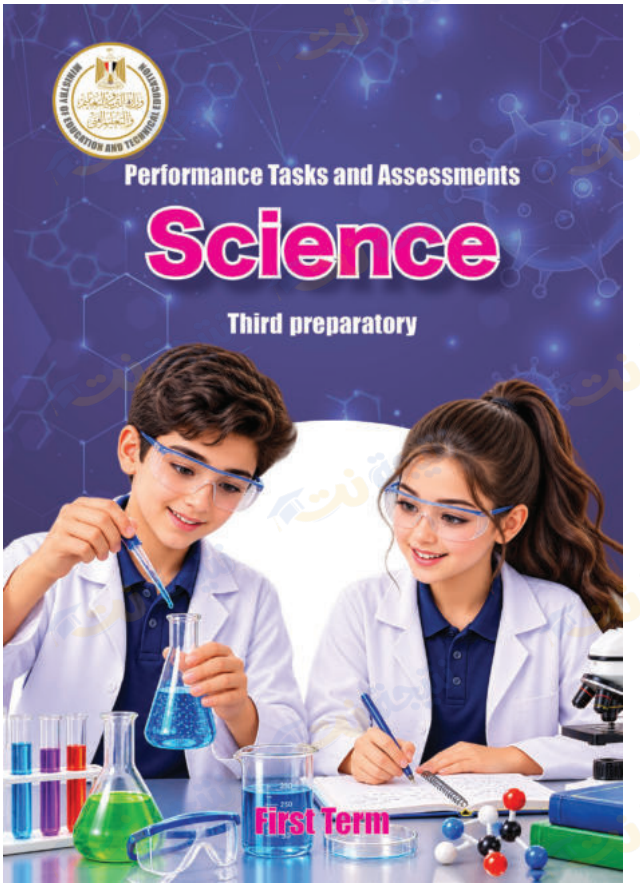
nezakr.natega4dk.net

Prepared by

Dr. Amal Mohamed Ali
MS. Rania Mohamed El-madawy
Dr. Dalia Ali Mohamed Ali
MS. Monda Abd Elrhman Salam

Head of Science Department
Dr. Hanan Abu Al Abbas
Science Consultant
Dr. Aziza Ragab Khalifa

General Supervision
Dr. Gebriel Anwar Hemeida
Head of the Central Administration for Curriculum Development



مقاس الكتاب	ورق المتن	ورق الغلاف	ألوان الكتاب	عدد الصفحات بالغلاف	التجليد	تاريخ الطبعة	كود الكتاب
١٩×٢٧سم	٧٠ جرام	١٨٠ جرام	٤ ألوان	٧٦ صفحة	حصان	٢٠٢٦-٢٠٢٧	٣٠/٣/١١/١٥/٦١/١١٦٤

رقم الإيداع : 2026/21234

الترقيم الدولي : 978-633-8530-75-4

يحظر طبع أو نشر أو تخزين أو توزيع أى جزء من هذا الكتاب بأية وسيلة إلكترونية أو ميكانيكية أو بالتصوير أو خلاف ذلك،

جميع الحقوق محفوظة لوزارة التربية والتعليم والتعليم الفنى

nezakr.natega4dk.net





nezakr.natega4dk.net