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CERTIFICATE

This is to certify that the Action Research titled " CONTEXTUALIZATION
OF EIGHTH STANDARD SCIENCE CONCEPT ON RESPIRATION AND METABOLISM
submitted by G.Dhavamani Maheswari is a record of the Senior
Lecturer's own work, carried out by her and it is not submitted to
any paper or presentation.

Researcher

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G.DHAVAMANI MAHESWARI

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CONTEXTUALIZATION OF THE EIGHTH STANDARD SCIENCE CONCEPT ON RESPIRATION AND METABOLISM

CHAPTER –1

1.1 INTRODUCTION

After independence, the percentage of literate in our society is less than 10%. The former prime minister with a vision created many schools and encouraged young minds to learn. As days pass by number of students who have enrolled in schools has increased but the quality of education was not up to the level. To improve the quality of education pre-service and in-service training were given focus. Teachers were trained to follow the new methodology. Officials monitored the implementation of a pedagogical approach for quality upliftment. Later content was given more importance. Change of pedagogies will improve interest and curiosity, and it will pave the way for inquiry. One of the methods that will enhance learning and science-related skills is contextualization. The investigator has tried this methodology in the content specified in the topic.

1.2 AIMS OF TEACHING SCIENCE

The following are the aims of teaching science for secondary-level

- to encourage and enable students to develop inquiring minds and curiosity about science and nature.
 - to acquire knowledge, conceptual understanding, and skills to solve problems and make informed decisions in scientific contexts.
 - to develop skills of scientific inquiry to design and carry out scientific investigations and evaluate scientific evidence to draw conclusions
 - to communicate scientific ideas, arguments, and practical experiences accurately in a variety of ways
-
- to think analytically, critically, and creatively to solve problems, judge arguments, and make decisions in scientific and other contexts

- to appreciate the benefits and limitations of science and its application in technological developments
- to understand the nature of science and the interdependence of science, technology, and society including the benefits, limitations, and implications imposed by social, economic, political, environmental, cultural, and ethical factors
- to demonstrate attitudes and develop values of honesty and respect for themselves, others, and their shared environment.
- Development and training of the power of observation
- Development of knowledge and skills for social life
- Development of the power of reasoning
- Development of quantitative sense to solve the problem
- Economic efficiency and knowledge about society and the natural environment

develop desirable scientific attitudes and values like cooperation, teamwork, spirit, fellow feeling, leadership, courage, truthfulness, honesty, and sincerity.

CHAPTER II

RELATED STUDIES AND STATEMENT OF PROBLEM

2.1 TITLE OF THE PROBLEM

CONTEXTUALIZATION OF THE EIGHTH STANDARD SCIENCE CONCEPT ON RESPIRATION AND METABOLISM

2.1 STUDIES RELATED TO TEACHING IN CONTEXTUALIZATION

THE IMPLEMENTATION OF CONTEXTUALIZATION IN TEACHING VOCABULARY TO ELEMENTARY STUDENTS (REACT: Relating, Experiencing, Applying, Cooperating, and Transferring) Tuti Rohayati*
chi_luq_ba@yahoo.com *Graduated in 2013 from English Education Study Program of Indonesia University of Education Abstract: The primary focus of this study is to determine the effect of contextualization on students' vocabulary mastery and to investigate the students' responses toward contextualization in teaching and learning vocabulary. In this study, contextualization is employed through the REACT (Relating, Experiencing, Applying, Cooperating, and Transferring) strategy proposed by Crawford (2001). The samples of this study are students in the fifth grade of one elementary school in Bandung who were chosen on purpose. By using a quasi-experimental with nonequivalent groups design, both experimental and control groups (30 students in each group) are given pretest of multiple-choice tests to find out their initial ability. Then, the experimental group is treated by using contextualization for four meetings. Meanwhile, the control group is treated by using a traditional (non-REACT) method; the grammar-translation method. An interview is administered to find out students' responses toward contextualization. The findings indicate that the implementation of contextualization was effective in improving students' vocabulary mastery. It can be seen from the statistical computation result of a post-test score of the experimental group ($M=78.66$) that is higher than the control group ($M=67.33$). In reference to the result of this study, it can be concluded that contextualization using REACT is recommended to be applied in teaching vocabulary to elementary students. Moreover, the teachers who are interested in carrying out contextualization need to choose appropriate contexts based on students' daily lives or experiences and create a lively classroom atmosphere as well.

Contextualized Strategies of Elementary School Teachers in Teaching IP Learners

John Erwin P. Pedroso^{1*}, Gwen Jerric V. Alvarez¹, Ma. Michaela A. Dela China¹, Karl R. Futotana¹, Ayessa Mae Tumabotabo¹

Teaching Indigenous Peoples requires a thoughtful, culturally sensitive approach that recognizes and respects their unique histories, languages, cultures, and worldviews. Contextualized teaching strategies are essential for creating a warm and productive learning environment. Indigenous communities are distinct, and teaching strategies should be tailored to the student's specific cultural contexts and needs. Building relationships and trust with students. Based on a study by West (2013), differentiated instruction is a culturally responsive strategy that recognizes that learners may succeed in the classroom when their culture, language, background, and experiences are respected and used to support their learning and growth. Contextual learning among indigenous students created interest in learning.

2.2 CONTEXTUALIZATION NEED OF THE STUDY

Learning is influenced by home, school, and community. Students spend more time at home, school, and in the community. they imbibe life and social skills also. In our teaching students have difficulty in understanding concepts as they are traditionally taught. Students don't understand why they are learning the concept and how this concept can be used in real-world contexts. So due to the lack of this linkage, interest declines in science. Interest in science and technology decreases as school years progress and there is a large gap between school science offerings and students' preferences. School science is not communicated in a personally relevant way and does not allow for discussion. Every day problems that can be described as complex are often interdisciplinary. Eighth-standard students have to learn about respiration homeostasis, dispersion, osmosis, cellular respiration, and aerobic and anaerobic respiration. National Sustainable Development Goal four highlights the importance of quality education for the welfare of society. The gap that exists due to a lack of linkage can be rectified by connecting classroom learning with daily activity.

2.3 SCOPE OF THE STUDY

Since the above-specified concepts are abstract the researcher has linked the basic

principles underlying the concept with the activity

Students will know the basic concept and acquire the skill of associating the situation with the problem

2.4 OBJECTIVES

To shift the learning from rote memory to meaningful learning

To acquire the skill of associating scientific concepts with day-to-day happenings

To find solutions for the problem from their learning

2.5 ACTION HYPOTHESIS

There is a significant improvement in the performance of the post-test through contextualization

There is a significant difference between pre and post-test performance

There is a significant difference in the performance of girls in pre and post-tests than boys

2.6 LIMITATION

The study is restricted to eighth-standard students of G.H.S, Vanagaram

2.7 WAY OF CONTENT CONTEXTUALIZATION

Based on place---where the students come from

Based on student –Finding the needs and interests of the students

Based on pedagogical practices ---Diversed pedagogical practice to be practiced

Based on cultural practice ---Bias ,preconceived practices

Based on disciplinary content

2.8 value of contextualized teaching

Contextualization can make the experience more meaningful to the student

Learning in contextualization can help the student appreciate the relevance of interdisciplinary knowledge and skills and increase motivation

Student will be able to understand transfer and apply their knowledge outside the classroom. It sparks interest, curiosity, motivation, and engagement with students.

Relating the content and context learner experience, Applying and Cooperating in group activity.

2.9 PROCESS OF CONTEXTUALIZATION

I

Understand Your Audience: the context to be modified to the knowledge level, interests, and needs of your audience. Consider what they already know and what they need to know to grasp the information

effectively.

1. **Provide Background Information:** Offer relevant background information to set the stage for the new information you are presenting. This helps the audience understand the significance and relevance of the information.
2. **Use Analogies and Examples:** Analogies and examples can help make abstract or complex information more concrete and relatable. They bridge the gap between unfamiliar concepts and familiar experiences.
3. **Highlight Connections:** Point out connections between the new information and what the audience already knows. This can help reinforce understanding and retention.
4. **Use Visual Aids:** Visual aids such as diagrams, charts, and graphs can help clarify complex information and provide a visual representation that enhances understanding.
5. **Provide Real-World Context:** Relate the information to real-world scenarios or practical applications. This can help the audience see the relevance of the information in their own lives or work.
6. **Consider Timing:** Present information in a logical sequence, building upon previously introduced concepts. This helps the audience follow the flow of information and grasp the context more easily.
7. **Encourage Interaction:** Encouraging questions, discussions, and feedback can help clarify any misunderstandings and provide additional context as needed.
8. **Be Clear and Concise:** Avoid unnecessary jargon or complexity that may confuse the audience. Present information clearly and concisely to ensure it is easily digestible.
9. **Review and Recap:** Periodically review and recap key points to reinforce understanding and help the audience retain the information.

By incorporating these strategies into your communication, you can effectively contextualize information and enhance understanding for your audience.

CHAPTER 3

RESEARCH DESIGN

3.0 STUDY TYPE

The research design of the study is Experimental and is based on pre-test intervention and post-test analysis.

3.1 AREA TO BE FOCUSED

Areas focused are
linking new learning with previous learning or existing knowledge
linking or clarifying basic underlying principles in the content
Inculcating the skill to solve basic problems

3.2 SELECTION OF TEST ITEMS

For assessing the pretest performance of the students in the specified topic a questionnaire was prepared. This questionnaire contains 10 questions relevant to the topic. Since the students were not exposed to basic concepts underlying the major systemic function students' performance on the pre-test was not up to the level. The duration of the exam was one hour. Two marks are allotted for each question. The same questionnaire was administered for the post-test to assess the performance after intervention.

3.3 SELECTION OF THE TOPIC

Teachers handling biology with interest will associate everyday happenings with the learning concept. However, the students of this school have no idea about respiration and related concepts. The curricular expectation of the lesson is ; students will be able to understand the cellular-level functions. So to simplify the topic the investigator has selected contextual learning.

3.4 SAMPLE OF THE STUDY

15 Tamil medium students of GHS, Vanagaram were selected for the study

3.5 SCORING GUIDELINES

Two marks were awarded for the correct answer

Negative marking was not followed

The omission was considered the wrong answer

The aim of conducting pre and post-tests is to frame intervention activities to enhance learning and retention of concepts.

INTERVENTION DESIGNED FOR CONTEXTUALIZED LEARNING

ACTIVITY -1

The following animals' names were given to the students. They are Amoeba, Earthworm, Grasshopper, Frog, Bird, Human beings, Leaf, Root, Stem, Students were asked to identify the respiratory organs. Do they have any special cells for

respiration

Respiration in plants: Occurs by diffusion

- Through root hairs
- Stems of herbs have stomata and the bark of woody stems have lenticels.
- Leaves have stomata.

1. During the time, when photosynthesis occurs, oxygen is produced.

Due to photosynthesis net gas exchange in leaves during day time is:

O₂ diffuses out; CO₂ diffuses in.

2. At night time, when no photosynthesis occurs, no oxygen is produced.

So, oxygen from the air diffuses into leaves to carry out respiration and carbon dioxide produced by respiration diffuses out into the air.

Thus, due to respiration net gas exchange in leaves at night is:

O₂ diffuses in; CO₂ diffuses out.

Animals have different organs for respiration-

- Amoeba and paramecium respire through the surface of their body which is a single cell.
- Insects breathe through spiracles and trachea.
- Earthworms through their moist and slimy skin.
- Fishes take in water through their mouths and force it past the gills where the dissolved oxygen is taken up by blood.
- Amphibians like frogs, when in water, take in oxygen through their moist skin (cutaneous respiration). When on land, they respire through the lungs (pulmonary respiration).
- Reptiles, birds, and mammals all respire through their lungs.

Respiration in plants

1 Plants respire through stomata, lenticel, and parenchyma tissue by absorbing oxygen and exhaling carbon dioxide

3. The leaves of the plants have stomata that allow gas exchange

4. The woody stems of the plants also respire. This is because of the presence of special tissue called Lenticels. The cells of this tissue have large intercellular spaces. They exist as dead cells on woody plants and roots and allow the exchange of gases.

Lenticels in plants

5. The roots of the plants have hair-like structures on them. Hence they can absorb the air present in the soil.

Why plants can die if overwatered?

- We know that the roots get oxygen from the soil.
- Air in the soil is present between the soil particles.
- If we over-water the plants the spaces between the soil particles get clogged the roots will not be able to get enough air and the plant can die.

Since the amount of dissolved oxygen is fairly low compared to the amount of oxygen in the air, the rate of breathing in aquatic organisms is much faster than

that seen in terrestrial organisms.

ACTIVITY -2

COMMON FEATURE OF RESPIRATORY ORGAN

All the respiratory organs have three common features:

- All respiratory organs have large surface area to absorb more oxygen.
- All respiratory organs have thin walls for easy diffusion and exchange of gases.
- All respiratory organs like gills, lungs, etc have a rich blood supply for transporting respiratory gases. This concept is explained in the context of the lungs

ACTIVITY –3

POSITION OF THE LUNG

With the help of a model, the investigator has explained the location of the lungs in our body.

ACTIVITY --4

Observe the structure of the nose using a magnifying lens

List your observation in your notebook

What is the function of the specialized cell? What is the main function of the cilia?

ACTIVITY –5

The main organs of the human respiratory system are the nose, Nasal passage, Trachea (windpipe), Bronchi, Lungs, and Diaphragm.

The route of respiration was explained through a chart and a YouTube video

ACTIVITY -6

HUMAN RESPIRATORY SYSTEM

The respiratory system is composed of a conducting portion and a respiratory portion.

- The conducting portion provides a passageway for air and functions to condition the incoming air by warming, moistening, and cleaning it. It consists of nasopharynx, larynx, trachea, bronchi, bronchioles, and terminal bronchioles.
- The respiratory portion consisting of bronchioles, alveolar ducts, and alveolar sacs serves to get rid of the body of CO₂ and pick up oxygen.

Air enters the lungs in this way -

Inhaled air Mouth/Nose, or nasal chamber Larynx Glottis

Trachea Right and left bronchi Bronchioles Alveoli

- The human respiratory system begins from the nose. The air then goes into the nasal passage.
- When air passes through the nasal passage, the dust particles and other impurities present in it are trapped by nasal hair and mucus so that clean air goes into the lungs.
- The part of the throat between the mouth and windpipe is called pharynx.
- From the pharynx the air then goes into the windpipe.
- The trachea does not collapse even when there is no air in it because it is supported by rings of soft bones called cartilage.
- The trachea runs down into the chest cavity and divides into two smaller tubes called bronchi.
- Bronchi are connected to the two lungs.
- The lungs lie in the chest or thoracic cavity which is separated from the abdominal cavity by a muscular partition called the diaphragm.
- Each bronchus divides into still smaller tubules called bronchioles inside the lungs.
- The bronchioles end into small balloon-like structures called alveoli.
- The walls of the alveoli are very thin and have a rich supply of blood capillaries.
- Gaseous exchange takes place in the alveoli.

QUESTION SESSION

(Does oxygen only enter into our nose/ if not how oxygen is taken by our body and what other gases are released from our body)

(How dust is filtered, If dusty air is inhaled what will happen? How dust is exhaled Usually people pat at the head when there is -----, Mother pat young child for burping at the middle of the thorax region Why?

How pressure gradient difference is maintained in our body

How it helps in the exchange of gases

Why breathing at high altitude is difficult

Why cough occurs

ACTIVITY-7

INSPIRATION

Intrapulmonary pressure is LESS than atmospheric pressure

EXPIRATION

Intrapulmonary pressure is **GREATER** than atmospheric pressure This concept is explained through air filled balloon.

Blow the balloon to its holding capacity, release the air, and the air immediately goes into the atmosphere .here air in the balloon is high pressure so air moves into the atmosphere which in lessen pressure

case 2

Blow air into balloon A.

Blow air into balloon B as that of balloon A. Both balloon sizes should be equal.

Un Tie the mouth of both balloons and insert one balloon mouth into another.

Observe the experiment. Air will not move from balloon A to B, or balloon to A

This shows that the diffusion of air occurs when there is a pressure difference.

MECHANISM OF BREATHING

· Breathing involves two phases: inspiration (during which atmospheric air is drawn in) and expiration (by which the alveolar air is released).

□ The movement of air into and out of the lungs is carried out by creating a pressure gradient between the lungs and the atmosphere.

□ Inspiration can occur if the pressure within the lungs (intrapulmonary pressure) is less than the atmospheric pressure, i.e., there is a negative pressure in the lungs concerning atmospheric pressure. Similarly, expiration takes place when the intrapulmonary pressure is higher than the atmospheric pressure.

□ Respiration is carried out with the help of intercostal muscles and diaphragm. Intercostal muscles, between each pair of ribs, are of two types- external and internal.

□ Inspiration is an active process and involves internal intercostal muscles and diaphragm.

· During inspiration, contraction of the diaphragm increases the volume of the thoracic

chamber in the anteroposterior axis. The contraction of external intercostal muscles lifts the ribs and the sternum causing an increase in the volume of the thoracic chamber in the dorso-ventral axis. The overall increase in the thoracic volume causes a similar increase in pulmonary volume. An increase in pulmonary volume decreases the intrapulmonary pressure to less than the atmospheric pressure which forces the air from outside to move into the lungs, i.e., inspiration.

□ Expiration is a passive process and caused due to muscle relaxation.

□ Relaxation of the diaphragm and the intercostal muscles returns the diaphragm and sternum to their normal positions and reduces the thoracic volume and thereby the pulmonary volume. This leads to an increase in intrapulmonary pressure to slightly above the atmospheric pressure causing the expulsion of air from the lungs, i.e., expiration.

□ During deep or forced breathing or heavy exercise, an active process is involved requiring internal intercostal muscles and diaphragm.

□ Deep expiration is done by contraction of internal intercostal muscles and relaxation of other muscles and diaphragm. The impulse for deep breath starts from the cerebrum.

- Deep breathing is referred to as thoracic breathing in contrast to normal or quiet breathing referred to as abdominal breathing.
- Sudden deep breath is due to increased $p\text{CO}_2$ and decreased $p\text{O}_2$.

ACTIVITY-8

Alveoli are the primary sites of exchange of gases.

· The exchange of gases between the alveoli and blood in the lungs and between the blood and tissue is the result of differences in partial pressure of the respiratory gases i.e., oxygen, carbon dioxide nitrogen, etc.

□ O_2 and CO_2 are exchanged in these sites by simple diffusion mainly based on pressure/concentration gradient.

□ Solubility of the gases as well as the thickness of the membranes involved in diffusion can affect the rate of diffusion.

□ A concentration gradient is present for oxygen from the alveoli to blood and blood to tissues. Similarly, direction, i.e., from tissues to blood and blood to alveoli is for CO_2 . As the solubility of CO_2 is 20-25 times higher than that of O_2 , the amount of CO_2 that can diffuse through the diffusion membrane per unit difference in partial pressure is much higher compared to that of O_2 .

□ The diffusion membrane is made up of three major layers, the thin squamous epithelium of alveoli, the endothelium of alveolar capillaries, and the basement substance in between them.

· All the factors in our body are favorable for the diffusion of O_2 from alveoli to tissues and that of CO_2 from tissues to alveoli.

ACTIVITY -9

Two students were involved in the activity. Paper, pen, and a stop clock were used for the experiment. One student was asked to count the number of breaths per minute while performing the following activities

Resting

Walking

Jumping

Running up the stairs

ACTIVITY -10

Diffusion- Take a bottle of water and drop a few drops of safranin and the diffusion of color is seen. Lit an incense stick, you can smell the air. This is due to the diffusion of air.

ACTIVITY -11

Common ailments related to the respiratory system were explained in detail through the YouTube video DISEASE IN THE LUNGS

Asthma is an allergic reaction that causes constriction of the bronchial muscles, thereby reducing the air passage thus, the amount of air that can get to the alveoli.

- Emphysema is a situation of shortness of breath in which alveolar walls are damaged due to which respiratory surface is decreased. It is often caused by cigarette smoking.

Artificial hypoxia: It results from a shortage of oxygen in the air at high (over 2400 m) altitudes. It causes mountain sickness characterized by breathlessness, headache, dizziness, nausea, vomiting, mental fatigue, and a bluish tinge on the skin and mucous membranes.

- o Anaemic hypoxia: It results from the reduced oxygen-carrying capacity of the blood due to anemia (decreased hemoglobin content in the blood) or

carbon monoxide poisoning (some hemoglobin occupied by CO). In both cases, less haemoglobin is available for carrying oxygen.

- Asphyxia (Suffocation): The O₂ content of blood falls and the CO₂ content rises and paralyzes the respiratory center. Breathing stops and death occurs.

- Common cold: Disease-causing microbes present in the air attack the respiratory tract, producing inflammation of the mucous membrane. Rhinitis is a chronic or acute inflammation of the mucous membrane of the nose.

- o Rhinitis in the nasal chambers.

- o Sinusitis in the sinuses.

- o Pharyngitis in the pharynx, often called sore throat, is usually accompanied by tonsillitis (enlargement of tonsils).

- o Laryngitis in the larynx, causing a hoarse voice and difficulty in speaking.

- o Bronchitis in the bronchioles.

- Bronchitis: It is caused by the permanent swelling in the bronchi. As a result of bronchitis, a cough is caused and thick mucus with pus cells is spitted out. The patient experiences difficulty in breathing.

- Pneumonia: During pneumonia, oxygen has difficulty in diffusing through the inflamed alveoli, and the blood pO₂ may be drastically reduced. Blood pCO₂ usually remains normal because CO₂ diffuses through the alveoli more easily than O₂. This disease is caused by Streptococcus pneumoniae, other bacteria, fungi, protozoans, and viruses, and the patient feels difficulty breathing. Its prominent symptoms are trembling, pain in the chest, fever, cough etc. This disease is prevalent in either children or elderly persons in old age.

- Lung cancer: It is believed that due to excess smoking, lung cancer (carcinoma of the lungs) is caused. The tissue increases limitlessly, which is called malignancy. This disease is fatal. The frequency of occurrence of this disease in smokers is 20% more. Malignancy of tissues (neoplasia) causes pressure on the cells of other tissues and destroys them. The blood capillaries are ruptured, blood starts flowing and death is caused by excessive bleeding.
- Tuberculosis (TB): It is caused by the bacteria *Mycobacterium tuberculosis*. These bacteria settle in the lungs at different places and convert normal tissue into fibrous tissue. Since the respiratory surface is decreased, difficulty in breathing is also experienced. If the patients start taking medical advice and the medicines right from the initial stage regularly, the patients can be fully cured of the disease. Nowadays, a new therapy DOT (Direct observed treatment) is used for tuberculosis treatment, recently launched by the Indian Government. Many other drugs like rifampin and isoniazid are successful in the treatment of tuberculosis. Tuberculosis bacteria spread by inhalation and exhalation.

ACTIVITY-12

Human beings maintain homeostasis through a chain of reactions. This reaction was enacted by students

HOMEOSTASIS

homeostasis is a mechanism that maintains a stable internal environment despite the changes present in the external environment.

The body maintains homeostasis by controlling a host of variables ranging from body temperature, blood pH, blood glucose levels to fluid balance, sodium, potassium and calcium ion concentrations.

An Example of Homeostasis in Action

Receptor; -Cutaneous receptors of the skin.

Control center;- Brain.

Effector;- Blood vessels and sweat glands in the skin.

The skin has receptors that detect temperature changes. If the external temperature rises or drops below the equilibrium, the control center sends signals to the blood vessels and sweat glands in our skin to react accordingly.

If the temperature is too hot, the blood vessels dilate vasodilation and cause a drop in the body temperature. Moreover, sweat glands produce sweat to accompany vasodilation. If the external temperature is too cold, the blood vessels constrict (vasoconstriction) and enable the body to retain heat.

To maintain homeostasis in the body, the cells perform the following activities:

Obtain and use energy, exchange materials, make new cells, and eliminate waste.

Our liver plays a vital role in blood glucose homeostasis. When the blood glucose level rises after a meal, the liver removes glucose from the blood and stores it in the

form of glycogen. When the blood glucose levels are low, it converts the stored glycogen back to glucose.

ACTIVITY -13

POTATO OSMOSCOPE

To explain the process of osmosis through potato

When two solutions of different concentrations are separated by a selectively permeable membrane diffusion of solvent molecules takes place from the solution of lower concentration to the solution of higher concentration

Take two fresh potatoes and a boiled potato. One side of the potato is flattened to serve as a base and placed on the tray. Scoop out potatoes in the central region.

Potato A -Nothing is placed in the scoop

Potato B -Place sugar in the scooped region

Potato C-(Boiled)--Place sugar in the scooped region, and observe the setup.

Place the setup in water with a safranin solution.

Potato –A shows no movement of water

Potato –B shows movement of dye water inside the scoop and the sugar starts dissolving

Potato –C Shows no change because it is boiled

Osmoregulation is a process that regulates the osmotic pressure of fluids and electrolytic balance in organisms. In animals, this process is brought about by osmoreceptors, which can detect changes in osmotic pressure. Humans and most other warm-blooded organisms have osmoreceptors in the hypothalamus. Besides the brain, osmoregulators are also found in the kidneys.

Types of Osmoregulation

There are two major types of osmoregulation:

Osmoconformers

Osmoconformers are organisms that try to match the osmolarity of their body with their surroundings. In other words, these organisms maintain the same osmotic pressure inside the body as outside water. They conform either through active or

passive means. Most marine invertebrates such as starfish, jellyfish, and lobsters are osmoconformers.

Osmoregulatory

Osmoregulators are organisms that actively regulate their osmotic pressure, independent of the surrounding environment. Many vertebrates, including humans, are osmoregulatory. Most freshwater fish are considered to be osmoregulatory too.

Osmoregulation in Different Organisms

Different organisms exhibit different types of osmoregulation. Following are some osmoregulation processes in different organisms:

Osmoregulation in Fish

Freshwater fish and marine fish osmoregulate in different ways. The environments

have varying levels of salinity, hence the process of osmoregulation is different.

□ Osmoregulation in Freshwater Fish

Freshwater fishes are hypertonic to their surrounding environment, which means that the concentration of salt is higher in their blood than in their surrounding water. They absorb a controlled amount of water through the mouth and the gill membranes. Due to this intake of water, they produce large quantities of urine through which a lot of salt is lost. The salt is replaced with the help of mitochondria-rich cells in the gills. These cells absorb salt into the blood from the surrounding water.

□ Osmoregulation in Marine Fish

Compared to freshwater fish, marine fish face the opposite problem. They have a higher concentration of water in their blood than their surrounding environment. Consequently, it results in the tendency to lose water and absorb the salt. To get around this problem, marine fish drink large quantities of water and restrict urination. Another additional energy expenditure also arises as these organisms actively need to expel salt from the body (through the gills).

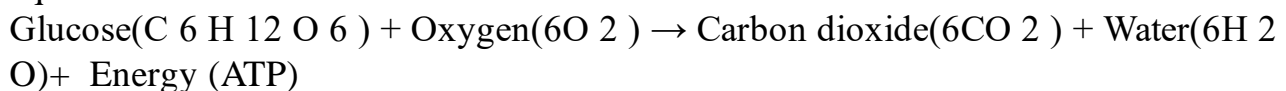
ACTIVITY -14

FERMENTATION EXPERIMENT

Take a conical flask. Add 3 spoons of sugar and one spoon of yeast stir until it dissolves. tie a balloon in the mouth of the conical flask. After 30 minutes we can see the accumulation of carbon dioxide in the balloon balloon increases in size. The carbon dioxide in the balloon turns lime water into milky water.

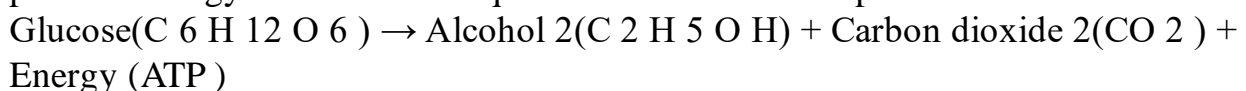
Aerobic respiration

It is a type of cellular respiration that takes place in the presence of oxygen to produce energy. It is a continuous process that takes place within the cells of animals and plants. This process can be explained with the help of the chemical equation:



Anaerobic respiration

It is a type of cellular respiration that takes place in the absence of oxygen to produce energy. The chemical equation for anaerobic respiration is



combustion of the car engine, wherein

organic compounds and oxygen go in, while water and carbon dioxide come out.

The energy that is liberated powers the automotive

CHAPTER IV

ANALYSIS OF DATA

S.NO	NAME OF THE STUDENTS	PRE TEST SCORE	POST-TEST SCORE	DIFFERENCE
1	S.Sahana	8	15	7
2	G.Padma Priya	7	14	7
3	M.Priyadarshini	6	15	9
4	V.Rajeswari	9	14	5
5	G.Janani	12	18	6
6	Jeyapriya	10	16	6
7	Vijayakanth	8	15	7
8	M.Saravanan	8	16	8
9	V.Rishithan	6	12	6
10	N.Aththiyan	7	14	7
11	P.Akash	6	12	6
12	S.Gnanapragasam	6	12	6
13	P.Tamilvanan	7	14	7

14	Ramkumar	7	14	7
15	S.Sasitharan	8	13	5
	TOTAL	115	216	99

Pretest achievement mean of students=115

Post-test achievement mean of students= 216

Mean gain of students =99

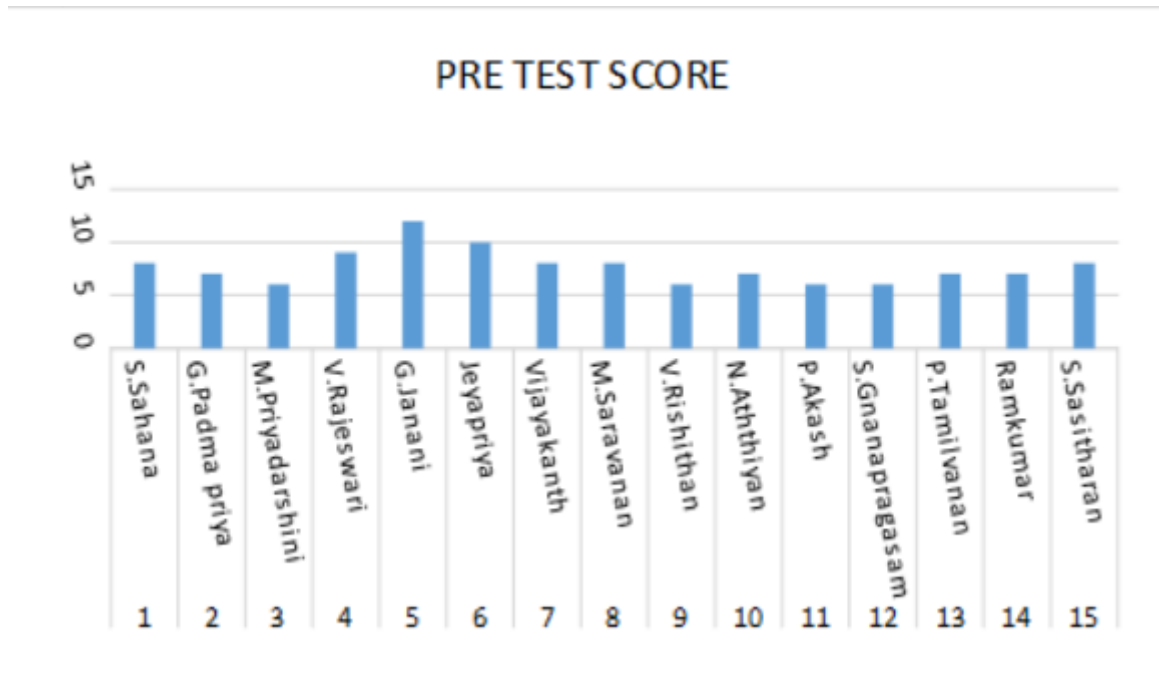
THE FREQUENCY TABLE FOR THE PRE AND POST-TEST OF THE ENTIRE SAMPLE IS GIVEN BELOW

PRE-TEST FREQUENCY TABLE

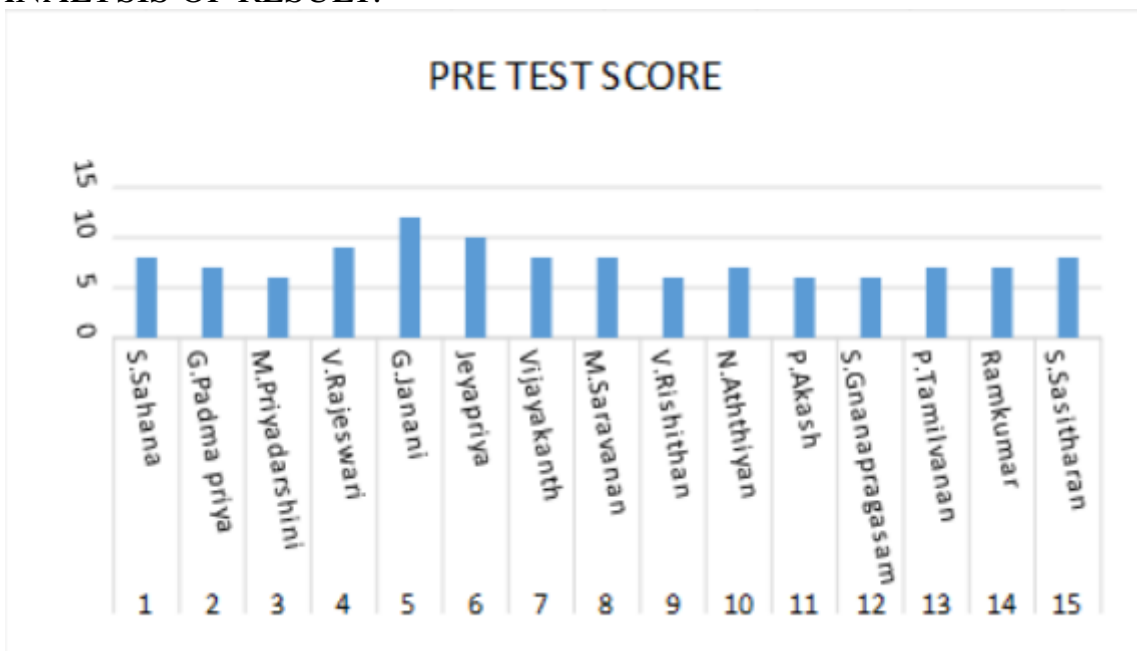
CLASS INTERVAL	FREQUENCY(f)
6---8	8
8---10	5
10--12	2

POST-TEST FREQUENCY TABLE

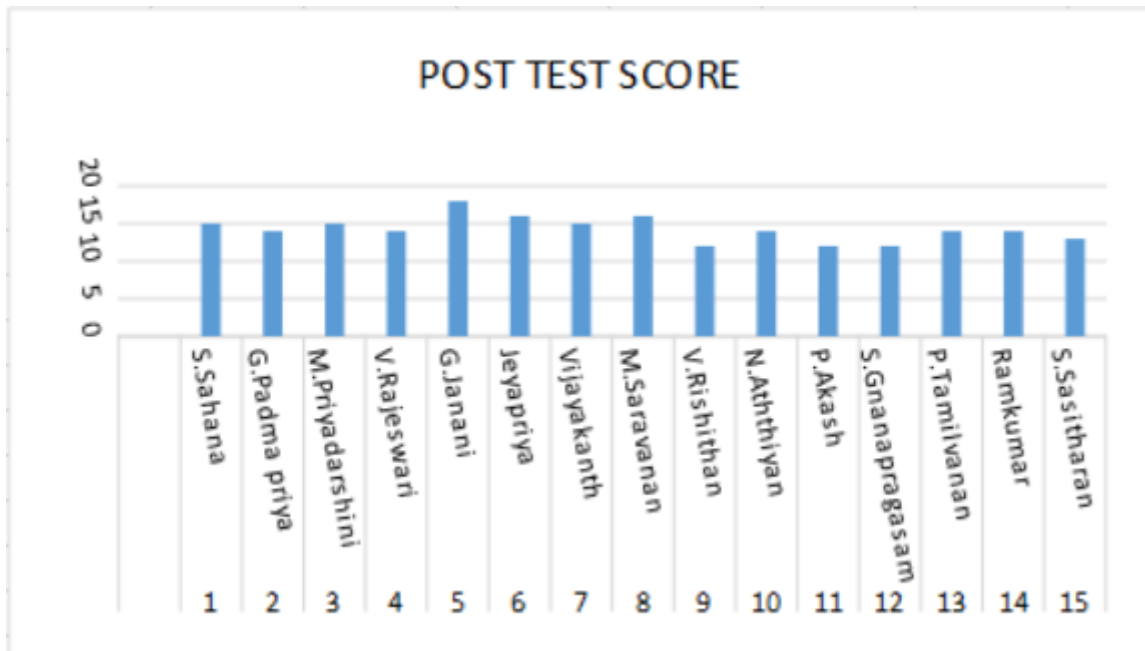
CLASS INTERVAL	FREQUENCY(f)
12--14	4
14--16	8
16--18	3



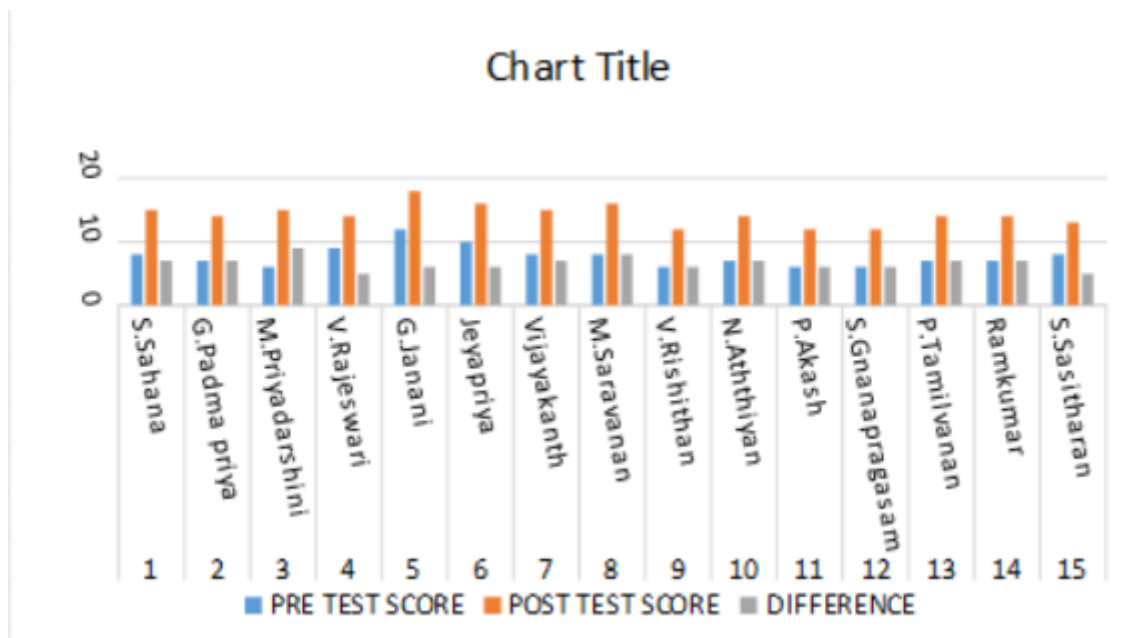
4.1 ANALYSIS OF RESULT:



A minimum number of students have scored above 6 out of 20. The maximum score in the pretest is 12 out of 20. The minimum score of students in the pretest is 6 . The maximum score of students in the post-test is 18 . This shows the effectiveness of the methodology (Contextualization)



CHAPTER V



FINDINGS AND SUGGESTIONS

5.0 MAJOR FINDINGS

A minimum number of students have scored above 6 out of 20. The maximum score in the pretest is 12 out of 20. The minimum score of students in the pretest is 12. The maximum score of students in the post-test is 18. This shows the effectiveness of the methodology (Contextualization). There is a significant difference in achievement in

pre and post-test. All the objectives and hypotheses were found true to the sample

5.1 RECOMMENDATIONS

In the future Investigators have to extend the methodology to another subject. Contextualization should be familiarised in motivation, introduction, content explanation, assessment, and in-home assignments. Based on contextualization students should be trained to do projects, This investigation has to be extended to other schools also. SCERT should familiarise contextualization among teachers.

5.3 CONCLUSION

The aims and objectives of teaching science highlight many skills for students that skills can be inculcated through contextualization. In the future contextualization will create more wonders in the teaching and learning process deepen content learning, and promote the transfer of skills. The approach is well grounded in psychological theories of transfer and motivation. Learning takes place when students have successfully related and applied what they have learned in school to real-life situations. For learning to be more effective and lasting, students must be able to see the relevance of the lessons in their respective contexts. By establishing both personal and real-world relevance, students are provided with an important opportunity to relate the subject matter to the world around them, and to assimilate it by their previously held assumptions and beliefs. It is a key factor in providing a learning context in which students construct their understanding of the course material

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THE IMPLEMENTATION OF CONTEXTUALIZATION IN TEACHING VOCABULARY TO ELEMENTARY STUDENTS (REACT: Relating, Experiencing, Applying, Cooperating, and Transferring) Tuti Rohayati*

Contextualized Strategies of Elementary School Teachers in Teaching IP Learners

John Erwin P. Pedroso^{1*}, Gwen Jerric V. Alvarez¹, Ma. Michaela A. Dela China¹, Karl R. Futotana¹, Ayessa Mae Tumabotabo¹

ANNEXURE 1

INTERVENTION OF CONTEXTUALIZATION

NAME OF THE CONCEPT	EXPERIMENTS
Find the respiratory organs of the following: Amoeba, Earthworms, Grasshopper, Frog, Birds, Humanbeing, Leaf, Roots, Stem	Finding the different respiratory structure
A common feature of respiratory organ	Large surface area-- Thin wall for easy diffusion The rich supply of blood for transporting respiratory gas
Flow chart of respiration	Series of questions to understand respiration
Structure of nose	Magnifying lens, observation sheet
Model of lungs in the human body model	Understand the position of lungs in the human body
Learns inspiration&expiration	Students were asked to extend their hands and they were allowed to observe
Experiment	How many breaths per minute their partner takes Resting, Walking, Jumping, Running up the stairs
Experiment, Scent smell	To explain diffusion
Experiment to learn homeostasis	Functions of thermostat, sugar level, water level,
Diffusion	Where and how diffusion occurs in our body
Osmosis	Potato osmoscope
Isotonic, Hypertonic, Hypotonic	Preparation of iso, hypo, and hypertonic solution to learn the impact on cells
Impact of isotonic solution on cells	Water, raisins

Impact of hypotonic solution on cells	Potato experiment
Impact of hypertonic solution on cells	
Anaerobic respiration	Fermentation
Aerobic respiration	Respiration in higher-level organism
Osmoregulator fish – jellyfish changes its osmotic pressure	
Project	Anabolic reaction
Case study	
Questions related to respiration were put forth by the investigator and answers were given	

செயலாய்வு முன்தேர்வு / பின் தேர்வு

மாவட்ட ஆசிரியர் கல்வி மற்றும் பயிற்சி நிறுவனம் திருநீர்
, திரு வள்ளூர்

1

1) கலா சாப்பிடும் போது தன் தோழியுடன் பேசிக்கொண்டு சாப்பிட்டதால் பொறை ஏறிவிட்டது அவ்வாறு ஏற்பட காரணம் என்ன

2) குமாருக்கு சளி தொந்தரவு அதிகமாக அதனால் அவன் வாய் மூலம் சுவாசிக்கிறான் இதனால் ஏற்படும் உபாதை என்ன

3) விமலாவிற்கு தொடர் தும்மல் ஏற்படுகிறது. இவ்வாறு ஏற்பட காரணம் என்ன?

4) நாம் சுவாசிக்கும் காற்றில் உள்ள ஆக்சிஜன் எவ்வாறு உடலிலுள்ள செல்லுக்குள் செல்கிறது

- 5) தன்னிலைக்காத்தல் ஒரு உதாரணத்துடன் விளக்க
- 6) விரவுதல், சவ்வூடு பரவுதல் உடலின் எந்தெந்த பகுதிகளில் நடைபெறுகிறது
- 7) திராட்சையை நீரில் ஊற வைக்கவும், ஏற்படும் மாற்றத்தையும் அதன் காரணத்தையும் கூறுக
- 8) உப்பு செரிவு அதிகம் உள்ள நீரில் வெங்காயத்தின் வேர் நுனியினை அழுத்தி வைக்கவும் என்ன மாற்றம் நிகழ்கிறது
- 9) நன்னீர் கடலா மீன் தண்ணீர் தேவையை எவ்வாறு பூர்த்தி செய்கிறது
- 10) காற்றில்லா சுவாசத்திற்கான சமன்பாட்டினை எழுது

