Lesson Plan
Science Subject

By
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Science Teacher

English Program
Strisuksa School

Lesson Plan

Topic: Solutions **Unit:** Solutions **Subject:** Science
Level: Matthayomsuksa 2 **Times:** 6 Hours

Teacher: Mr. Andrew Stergio

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1. Strand:
Standard S: 1
2. Grade level indicators: 1

3. Important Concept: Solutions consist of solvent and solutes

4. Objective: To explain how solutions are mixtures that contain solutes that are dissolved into solvents.

5. Process of learning
Warm up

In this lesson we asked the question of why we use 70% alcohol when we treat wounds and when we enter school to prevent the spread of COVID. We also asked why we call it 70%

Presentation

In this section of the unit we used Aksorn Mastering Science 2A pages 113-121. We defined solvent, solute, and solution. We looked at how solutions are different from pure substances, why a solvent is a solvent and why a solute is a solute, as well as working on objectives in the lab.

Practice

To better understand, solute and solvents we talked about various solutions and students identified which substance should be the solvent and solute based on their concentration and their state.

Product

In our lab investigation for this section we used Aksorn Mastering Science 2A pages 118-119. Students made their own solutions with specific measurements by mixing acetic acid and water, sugar and water, salt and water, and were given clear sugarless soda. Students then evaporated the solvent water from the solution to see if any solutes were left. Students left with an understanding of separation techniques as well as solvent and solutes.

Wrap up

Students for homework worked on Aksorn Mastering Science 2A pages 120-122.

6. Materials

Aksorn Mastering Science Book
Lab Equipment

Report after learning

1. Effect of learning.

2. Problem

3. Recommendation.

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(Mr. Andrew Stergio)

Lesson Plan

Topic: Solubility **Unit:** Solutions **Subject:** Science
Level: Matthayomsuksa 2 **Times:** 6 Hours

Teacher: Mr. Andrew Stergio

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1. Strand:
Standard S: 1
2. Grade level indicators: 1

3. Important Concept: Solubility is affected by 5 factors

4. Objective: Design and conduct experiments to explain how temperature, pressure, solvents, solutes, and agitation affect solubility.

5. Process of learning
Warm up

Students will try stirring a large portion of sugar to dissolve it into cold water. We will time that. We will also stir a large portion of sugar to dissolve it into hot water. We will time that. We will discuss our findings.

Presentation

In this section of the unit we used Aksorn Mastering Science 2A pages 122-126. Here we will talk about the 5 factors the affect solubility: temperature, pressure, solvents, solutes, and agitation affect solubility.

Practice

To better understand this we reviewed various solubility graphs to see what happens to solids, liquids, and gases as the factors change.

Product

In our lab investigation for this section we will use Aksorn Mastering Science 2A pages 124-125. Students need to work in groups of 4-5. Students randomly pick one of the five factors. Students together design their own experiments using the template in their books. Students in the next class will perform and record the results of their experiments. Students then share with the class the results of their investigations to serve as teachers to reinforce what they learned about each of the 5 factors.

Wrap up

Students for homework worked on Aksorn Mastering Science 2A pages 126.

6. Materials

Aksorn Mastering Science Book
Lab Equipment

Report after learning

1. Effect of learning.

2. Problem

3. Recommendation.

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(Mr. Andrew Stergio)

Lesson Plan

Topic: Concentration **Unit:** Solutions **Subject:** Science
Level: Matthayomsuksa 2 **Times:** 6 Hours

Teacher: Mr. Andrew Stergio

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1. Strand:
Standard S: 2
2. Grade level indicators: 1

3. Important Concept: Concentrations of solutions

4. Objective: (2) Indicate the quantify of solvents in solution; concentration units; volume per volume, mass per mass, and mass per volume.

5. Process of learning
Warm up

We will look at various concentrations of syrup and judge their concentrations by appearance (color) as well as taste. Students will try to predict the order of colorless syrup based on their taste. We will begin our study of concentrations.

Presentation

In this section of the unit we used Aksorn Mastering Science 2A pages 127-136. Here we will present various concentration percentage calculations. Teacher will present the calculation then give the students their own calculation to solve that models what teacher presented for mass/mass, mass/volume, volume/volume.

Practice

As explained above in the presentation, students will practice the calculations by solving problems similar to the ones in the book which the teacher prepares.

Product

In our lab investigations for this section we will use Aksorn Mastering Science 2A pages 130-133.

In the first lab students will first calculate how much solvent and solute they need to make a 50 mL 8% solution of ethanol. Here students will practice making a liquid-liquid solution or a volume/volume solution.

In the second lab, students will make a solid-liquid solution. Students will calculate the amount of solid and measure the mass to add to the liquid.

Wrap up

For homework students will work on Aksorn Mastering Science 2A pages 134-135.

6. Materials

Aksorn Mastering Science Book
Lab Equipment

Report after learning

1. Effect of learning.
2. Problem
3. Recommendation.

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(Mr. Andrew Stergio)

Lesson Plan

Topic: Solutions in Our Daily Life **Unit:** Solutions **Subject:** Science
Level: Matthayomsuksa 2 **Times:** 6 Hours

Teacher: Mr. Andrew Stergio

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1. Strand:
Standard S: 3
2. Grade level indicators: 1

3. Important Concept: Solutions in Our Daily Lives

4. Objective: Recognize the importance and apply the knowledge of the concentrations of substances by giving examples of how we use solutions in our daily lives properly and safely.

5. Process of learning
Warm up

Students will make a list of liquids they've drank or used over the last few days. We will discuss which ones of them are solutions that are very useful to us.

Presentation

The teacher will present ways in which we use solutions safely and properly here in Thailand. The teacher will use as an example a dangerous pesticide. We will read what the concentration of the pesticide is and what the safe concentration is and how to prepare it.

Practice

Students will read about different solutions we use in farming and pharmaceutical industry. Students will explain to the class how solutions are used.

Product

There is no lab activity for this section.

Wrap up

For homework students will work on Aksorn Mastering Science 2A pages 140.

6. Materials

Aksorn Mastering Science Book

Report after learning

1. Effect of learning.

2. Problem

3. Recommendation.

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(Mr. Andrew Stergio)

Lesson Plan

Topic: Respiratory System **Unit:** Human Body Systems **Subject:** Science
Level: Matthayomsuksa 2 **Times:** 6 Hours

Teacher: Mr. Andrew Stergio

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1. Strand:
Standard S: 4, 5, 6
2. Grade level indicators: 1

3. Important Concept: The Job of the Respiratory System

4. Objective: (4) Identify the organs and describe the functions of the organs involved in the respiratory system. (5) Explain the mechanisms of inhalation and exhalation and the process of gas exchange. (6) Realize the importance of the respiratory system by suggesting guidelines how to take care of the organs to function normally.

5. Process of learning
Warm up

Looking at pictures of various organs students will try to guess which organs are the lungs.

Presentation

The teacher will present the structures and functions of the respiratory system. The teacher will use the text as well as diagrams to show how the organs work. The teacher also explains how breathing takes place. The students will demonstrate the function and effect of the diaphragm on the lungs. The teacher will present on gas exchange. Students will then study on how to keep the respiratory system healthy.

Practice

For practice, students will work on a lab activity on Aksorn Mastering Science pages 8-9. Here students have a model of the respiratory system and show how the diaphragm works.

Product

In lab, teacher will buy pig lungs from the market and students will demonstrate their knowledge of the larynx, trachea, bronchi, lungs, and bronchioles. Students use a blower attached to the trachea to show the air capacity of the lungs. Students will cut to show the bronchi as well as bronchioles.

Wrap up

For homework students will work on Aksorn Mastering Science pages 16-17.

6. Materials

Aksorn Mastering Science Book
Lung Demonstration Model
Pig Lungs and Dissection materials

Report after learning

1. Effect of learning.

2. Problem

3. Recommendation.

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(Mr. Andrew Stergio)

Lesson Plan

Topic: Excretory System **Unit:** Human Body Systems **Subject:** Science
Level: Matthayomsuksa 2 **Times:** 3 Hours

Teacher: Mr. Andrew Stergio

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1. Strand:
Standard S: 7, 8
2. Grade level indicators: 1

3. Important Concept: The Job of the Excretory System

4. Objective: (7) Identify the organs and describe the functions of the organs in the excretory system for the elimination of waste products in the skin, lungs, large intestine, and kidneys. (8) Realize and study the importance of the excretory system by suggesting guidelines on how to take care to allow the system to function properly.

5. Process of learning
Warm up

Students will think of ways we eliminate wastes from our bodies.

Presentation

The teacher will present various processes of how the skin, lungs, large intestine, and kidneys eliminate waste from the body.

Practice

After each explanation the students will get slips of paper that they'll have to place in order. Students must show the teacher they understand the steps of excretion by putting the papers in the correct order.

Product

In lab, the teacher will buy pig kidneys and have students splay open the kidney to identify the various regions of the kidney.

Wrap up

For homework students will work on Aksorn Mastering Science 2A pages 23-24.

6. Materials

Aksorn Mastering Science Book
Order of steps to exretion methods
Pig Kidneys and Dissection materials

Report after learning

1. Effect of learning.

2. Problem

3. Recommendation.

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(Mr. Andrew Stergio)

Lesson Plan

Topic: Circulatory System **Unit:** Human Body Systems **Subject:** Science
Level: Matthayomsuksa 2 **Times:** 6 Hours

Teacher: Mr. Andrew Stergio

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1. Strand:
Standard S: 9, 10, 11, 12
2. Grade level indicators: 1

3. Important Concept: The Job of the Circulatory System

4. Objective: (9) Describe the structures and functions of the heart, blood vessels and blood. (10) Explain the process of the circulatory system using a model. (11) Design and conduct an experiment to compare the normal heart rate and the heart rate after doing activities. (12) Realize the importance of circulatory system by suggesting guidelines of how to take care of the organs in the circulatory system.

5. Process of learning
Warm up

Students will try to guess how much blood the average human being has.

Presentation

The teacher will present on how the heart is a pump to move materials around the body that they body both needs and needs to get rid of. Teacher will show various models and diagrams of how the heart works to oxygenate blood and pump it to the rest of the body. Teacher will then also present on the various blood vessels and components of the blood.

Practice

Students will pair up and practice speaking about how blood moves through the heart. Students must pay attention to the names of the chambers vessels for entry and exit to and from the heart as well as the valves that prevent backward flow.

Product

In lab, the teacher will buy pig hearts. Students must demonstrate knowledge of the 4 chambers and infer the names of the tubes that connect them. Students then cut the heart to locate the valves inside.

In the second lab, students will view blood vessels and cells by using the goldfish as a model. Students will use live goldfish wrapped in gauze and wet cotton onto slides to view blood flowing to and from their tails. Students should show teacher their knowledge of arteries, veins, and capillaries using the goldfish as a model.

In the third lab, students will measure their pulse rates. Then students will do some form of exercise and measure how their pulse rates have changed.

Wrap up

For homework students will work on Aksorn Mastering Science 2A pages 36-37.

6. Materials

Aksorn Mastering Science Book
Pig hearts and Dissection materials
Goldfish, tanks, gauze, and cotton.
Microscopes

Report after learning

1. Effect of learning.

2. Problem

3. Recommendation.

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(Mr. Andrew Stergio)

Lesson Plan

Topic: Nervous System **Unit:** Human Body Systems **Subject:** Science
Level: Matthayomsuksa 2 **Times:** 6 Hours

Teacher: Mr. Andrew Stergio

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1. Strand:
Standard S: 13, 14
2. Grade level indicators: 1

3. Important Concept: The Job of the Nervous System

4. Objective: (13) Identify and describe the functions of organs in the CNS that control and coordinate the various parts of the human body. (14) Realize the importance of the nervous system by suggesting guidelines of hoot take care of and treat the CNS, including prevention of shock and harm to the brain and spinal cord.

5. Process of learning
Warm up

Students will watch a video of a brain manipulation experiment of how various waves can affect how a person walks. Students will do their own brain trick experiment by using a fake hand that they will mimic is their own.

Presentation

Teacher will present about the structures and functions of the nervous system. Teacher will also present about how the nervous system works. We will also discuss how brain injuries can affect humans by discussing football players and people who've had accidents on motorcycles.

Practice

Students will review examples of how various organisms respond to stimuli and then discuss how humans and other mammals use their nervous system to respond to stimuli.

Product

In lab, the teacher will buy pig brains. Students will cut them open and show their knowledge of the three parts of the brain as well as gray and white matter. Students should also demonstrate their knowledge of surface area.

Wrap up

For homework students will work on Aksorn Mastering Science 2A pages 43-46.

6. Materials

Aksorn Mastering Science Book
Pig brains and Dissection materials

Report after learning

1. Effect of learning.

2. Problem

3. Recommendation.

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(Mr. Andrew Stergio)

Lesson Plan

Topic: Reproductive System **Unit:** Human Body Systems **Subject:** Science
Level: Matthayomsuksa 2 **Times:** 9 Hours

Teacher: Mr. Andrew Stergio

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1. Strand:
Standard S: 15, 16, 17, 18, 19, 20
2. Grade level indicators: 1

3. Important Concept: The Job of the Reproductive System

4. Objective: (15) Identify the organs and describe the functions of the male and female reproductive system. (16) Explain the effects of testosterone and estrogen hormones that regulate body changes during puberty. (17) Realize the physical changes when reaching puberty and how to deal with it mentally and physically (18) Explain the menstrual cycle, fertilization, pregnancy, zygote development and the process of giving birth. (19) Understand the proper methods of birth control (20) Realize the impacts of teenage pregnancy by conducting themselves properly.

5. Process of learning
Warm up

Teacher will begin with explanation of the structures and functions of the parts of the reproductive system, the sex hormones, menstruation, pregnancy, and childbirth.

Presentation

Teacher will begin with explanation of the structures and functions of the parts of the reproductive system, the sex hormones, menstruation, pregnancy, and childbirth.

Practice

Teacher will begin with explanation of the structures and functions of the parts of the reproductive system, the sex hormones, menstruation, pregnancy, and childbirth.

Product

Student will watch a video called “Teen Dreams” presented by the BBC. It’s a story of two neighbors who grow up together and later fall in love. The science video tracks their growth and maturation into fertile adults.

Wrap up

For homework students will work on Aksorn Mastering Science 2A pages 54-56.

6. Materials

Aksorn Mastering Science Book

Report after learning

1. Effect of learning.

2. Problem

3. Recommendation.

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(Mr. Andrew Stergio)

Lesson Plan

Topic: Motion **Unit:** Forces and Motion **Subject:** Science
Level: Matthayomsuksa 2 **Times:** 6 Hours

Teacher: Mr. Andrew Stergio

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1. Strand:
Standard S: 21, 22
2. Grade level indicators: 1

3. Important Concept: Motion

4. Objective: (21) Explain and calculate the speed and velocity of the object's movement by using equations. (22) Write diagrams and solve problems showing displacement and speed.

5. Process of learning
Warm up

Students will race from in front of the EP building and time their run. They'll calculate their speed using distance and time.

Presentation

We will introduce this part of the unit on motion. Students will learn about scalar and vector quantities and then will apply that to understanding about distance and displacement. Teacher will derive the formulae for calculating speed and velocity.

Practice

Students will work on the problems in the textbook.

Product

Teacher will give additional questions for students to understand about speed and velocity. We will look into real world examples as well as revisiting the races done in the beginning of this lesson.

Wrap up

For homework students will work on Aksorn Mastering Science 2B pages 43-44.

6. Materials

Aksorn Mastering Science Book

Report after learning

1. Effect of learning.

2. Problem

3. Recommendation.

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(Mr. Andrew Stergio)

Lesson Plan

Topic: Resultant Forces **Unit:** Forces and Motion **Subject:** Science
Level: Matthayomsuksa 2 **Times:** 6 Hours

Teacher: Mr. Andrew Stergio

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1. Strand:
Standard S: 23, 24
2. Grade level indicators: 1

3. Important Concept: Resultant Forces

4. Objective: (23) Predict the object moving as a result of resultant force of several forces acting on an object in the same plane based on empirical evidence. (24) Write diagrams showing forces and forces resulting from multiple forces acting on the same line of objects.

5. Process of learning
Warm up

We will watch a funny video demonstrating Newton's Laws of forces and motion. We will also talk about forces acting upon various objects.

Presentation

Teacher will present about forces as being vector quantities with magnitude and direction. Because of Newton's third law there should be a net force. We will do a lab activity with sand bags and spring scales to demonstrate.

Practice

Students will work on the problems in the textbook as well as diagramming forces using diagrams.

Product

In lab, students will show that forces can affect objects by magnitude and direction. Students will use sand bags and spring scales and record data.

In the second lab, students will show their knowledge of resultant forces. Instead of only one force acting upon an object, students will demonstrate the effects of having multiple forces acting upon an object.

Wrap up

For homework students will work on the resultant forces questions in Aksorn Mastering Science 2B pages 49-53.

6. Materials

Aksorn Mastering Science Book
Lab equipment (sandbags and spring scales)

Report after learning

1. Effect of learning.

2. Problem

3. Recommendation.

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(Mr. Andrew Stergio)

Lesson Plan

Topic: Liquid Pressure and Buoyancy **Unit:** Forces and Motion
Subject: Science
Level: Matthayomsuksa 2 **Times:** 6 Hours

Teacher: Mr. Andrew Stergio

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1. Strand:
Standard S: 25, 26, 27
2. Grade level indicators: 1

3. Important Concept: Liquid Pressure and Buoyancy

4. Objective: (25) Design and conduct an experiment in a suitable method to explain the factors affecting liquid pressure. (26) Analyze buoyant force, sinking and floating of objects in liquids using empirical evidence. (27) Write a diagram showing the forces acting upon an object in a liquid

5. Process of learning
Warm up

Students will talk about stories of picking up heavy people in pools when they were younger. Teacher will show a video clip of lifting heavy objects in water bodies. We'll talk about buoyancy.

Presentation

Teacher will present about liquid pressure and buoyancy. Teacher will show a demonstration on how liquids flowing through holes at different heights in a bottle will exit the bottle at different distances and velocities because of the pressure on them in the water column. Teacher introduces Archimedes principal.

Practice

Students will work on the problems in the textbook as well as diagramming buoyant forces and liquid pressure.

Product

In lab, students will see liquid pressure by conducting an experiment of putting holes in a bottle. Students will measure the distance traveled.

In the second lab, we measure buoyant force using a Eureka can.

Wrap up

For homework students will work on the buoyancy questions in Aksorn Mastering Science 2B pages 49-53.

6. Materials

Aksorn Mastering Science Book
Lab equipment (bottles)

Report after learning

1. Effect of learning.

2. Problem

3. Recommendation.

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(Mr. Andrew Stergio)

Lesson Plan

Topic: Friction **Unit:** Forces and Motion **Subject:** Science
Level: Matthayomsuksa 2 **Times:** 6 Hours

Teacher: Mr. Andrew Stergio

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1. Strand:
Standard S: 28, 29, 30, 31
2. Grade level indicators: 1

3. Important Concept: Friction

4. Objective: (28) Explain static friction and kinetic friction based on empirical evidence. (29) Design and conduct an experiment in a proper method to explain the factors that affect the size of friction. (30) Write a diagram showing the friction and other forces acting on the subject. (31) Recognize the benefits of friction.

5. Process of learning
Warm up

We'll view various videos of how friction is beneficial and how friction is a nuisance.

Presentation

Teacher will present about friction and why it happens. Teacher will present about static and kinetic friction and how it changes from each. Teacher will explain the coefficient of friction and how to calculate it. Students will conduct a lab activity to demonstrate their knowledge of friction.

Practice
Students will work on various problems to calculate how much friction is.

Product

Students will conduct a lab activity to demonstrate their knowledge of friction.

Wrap up

For homework students will work on the friction questions in Aksorn Mastering Science 2B pages 49-53.

6. Materials

Aksorn Mastering Science Book

Report after learning

1. Effect of learning.

2. Problem

3. Recommendation.

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(Mr. Andrew Stergio)

Lesson Plan

Topic: Moment **Unit:** Forces and Motion **Subject:** Science
Level: Matthayomsuksa 2 **Times:** 6 Hours

Teacher: Mr. Andrew Stergio

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1. Strand:
Standard S: 32
2. Grade level indicators: 1

3. Important Concept: Moment of Force

4. Objective: (32) Design and conduct an experiment with appropriate methods to explain moment of force when an object is balanced to turn and calculate it.

5. Process of learning
Warm up

Teacher will come in with a bicycle and try to turn a knot with a short wrench. It won't budge. Then teacher will ask the smallest student in the room to try it with a longer armed wrench. That smaller student will turn it with ease. We'll question why.

Presentation

Teacher will present about moment of forces and how to calculate it.

Practice
Students will work on various problems to calculate how much moment of force is.

Product

Students will conduct a lab activity to demonstrate their knowledge of moment of force.

Wrap up

For homework students will work on the moment of force questions in Aksorn Mastering Science 2B pages 49-53.

6. Materials

Aksorn Mastering Science Book

Report after learning

1. Effect of learning.

2. Problem

3. Recommendation.

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(Mr. Andrew Stergio)

Lesson Plan

Topic: Force Fields **Unit:** Forces and Motion **Subject:** Science
Level: Matthayomsuksa 2 **Times:** 6 Hours

Teacher: Mr. Andrew Stergio

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1. Strand:
Standard S: 33, 34, 35
2. Grade level indicators: 1

3. Important Concept: Force Fields

4. Objective: (33) Compare the source of magnetic fields, electrical fields, gravitational fields and directions of each force acting on objects. (34) Write diagrams showing electromagnetic force, power and gravity to the object. (35) Analyze relationships between the size of the magnetic force, electrical force and gravitational force acting on objects in each field.

5. Process of learning
Warm up

Teacher will come in with various magnets and iron filings to demo fields.

Presentation

Teacher will present about force fields and how to diagram them.

Practice
Students will work on various problems to diagram and discuss force fields.

Product

Students will conduct a lab activity to demonstrate their knowledge of force fields.

Wrap up

For homework students will work on the force fields questions in Aksorn Mastering Science 2B pages 49-53.

6. Materials

Aksorn Mastering Science Book

Report after learning

1. Effect of learning.

2. Problem

3. Recommendation.

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(Mr. Andrew Stergio)

Evaluations

Criterion for give to quality score work in presentation

Group Work

Score level Assessment Main Points	4	3	2	1	Quality level	Total
Correct complete of task	Exceeded expectations. Task completed.	Correct complete in task	Few correct complete task	Little correctly completely in task		
Creative thinking	Original thinking throughout task	Mostly original thinking.	Little original thinking in the task	Not enough original thinking in task		
Total						

Report after learning

1. Effect of learning.

2. Problem

3. Recommendation.

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(Mr. Andrew Stergio)