7

Lesson Exemplar for Science

Quarter 1
Lesson
5

Lesson Exemplar for Science 7
Quarter 1: Lesson 5 (Week 5)
S.Y. 2024-2025

Development Team

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SCIENCE (CHEMISTRY) / QUARTER 1 / GRADE 7

I. CURRICULUM CONTENT, STANDARDS, AND LESSON COMPETENCIES	
A. Content Standards	Learners learn that there are specific processes for planning, conducting, and recording scientific investigations.
B. Performance Standards	By the end of the Quarter, learners recognize that scientists use models to describe the particle model of matter. They use diagrams and illustrations to explain the motion and arrangement of particles during changes of state. They demonstrate an understanding of the role of solute and solvent in solutions and the factors that affect solubility. They demonstrate skills to plan and conduct a scientific investigation making accurate measurements and using standard units.
C. Learning Competencies and Objectives	***Learning Competency*** The learners follow the appropriate steps of a scientific investigation which include: (a) aim or problem, (b) materials and equipment, (c) method or procedures, (d) results including data, and (e) conclusions ***Learning Objectives*** At the end of the lesson, the learner shall be able to: 1. identify the different types of variables; 2. make hypotheses based on the given scientific problem; 3. conduct an experiment to prove hypothesis; 4. determine the procedure in a given experiment; 5. define conclusion; 6. draw conclusions from given scientific scenarios; 7. define application; and 8. apply the scientific method in investigating certain scenarios.
D. Content	Planning, following, and recording scientific investigations: – Steps in Scientific Method – Identifying problem – Gathering Data – Hypothesis

E. Integration	• Research Design • Data Collection and Analysis • Peer Review and Validation • Ethical Considerations • Application and Decision Making

II. LEARNING RESOURCES

- CLMD4A_Science G7.pdf Pivot Material

III. TEACHING AND LEARNING PROCEDURE

NOTES TO TEACHERS

A. Activating Prior Knowledge

DAY 1

1. Short Review

Based on the previous lesson about hypothesis and variables, the learners will complete the table.

Complete the table below

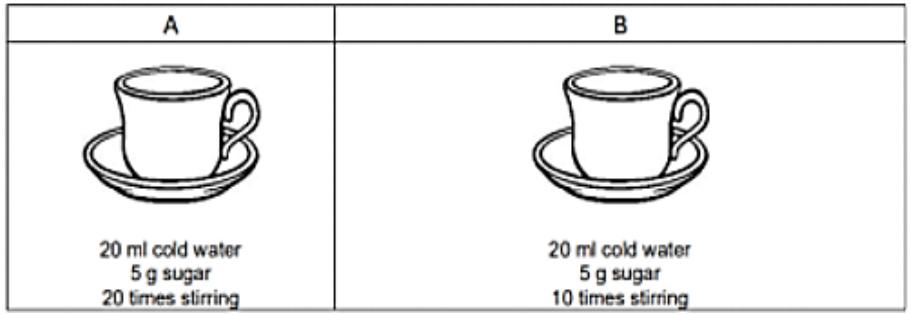
Problem	Hypothesis	Independent	Dependent	Controlled
Which material can remove the bubble gum stain?	1. The bubble gum stain will be removed if oil is used. 2. The bubble gum stain will be removed if water is used. 3. The bubble gum stain will be removed if ice is used.	**1**	You changed: Household material to be applied on the stain.	**2**
Which kind of shampoo can make your hair shiny?	**3**	The same shampoo applied on the hair. Amount of shampoo applied on the hair. Time the shampoo is applied on the hair.	**4**	The effect of the kind of shampoo: How shiny the hair become?

B. Establishing Lesson Purpose	**1. Lesson Purpose** Present and explain the lesson objectives to the learners. a. Learners can identify the different types of variables. b. Learners can make hypotheses based on the given scientific problem. **2. Unlocking Content Vocabulary** **WORD HUNT.** One method for concentrating spelling studies on word patterns is to use "word hunt". Activities like word searches help students connect with books they have already read and are frequently utilized in word studies. The students will search for words encountered in yesterday's discussion and they will give the definition of the found words. **INDEPENDENT** **VARIABLES** **DEPENDENT** **CONTROLLED** **EFFECTS**  Q1. What is a hypothesis? Q2. What is the difference between independent and dependent variables?	

C. Developing and Deepening Understanding	**1. Explicitation** The learners will be asked to write the following terms in their notebook: **scientific problem** | **investigation** | **hypothesis** | **problem** **data** | **variable** | **conclusion** | **application** What do these terms mean? The focus of today's lesson will be on: a. Identifying Variables a.1.Independent Variable Variable being controlled in the problem, a.2. Dependent Variable. Variable that changes in the experiment b. Hypothesis b.1. Steps in Identifying hypothesis b.1.1. Define the problem b.1.2. Determine variables. Sample Scenario: The pechay plants growing in nitrogen-rich soils for two weeks develop larger leaves than those in nitrogen-poor soils because nitrogen stimulates vegetative growth. What is the problem in the scenario? What are the variables? b.2. Writing hypothesis b.2.1. Make an educated guess including variables to solve the problem b.2.2. Phrase it as an **if-then** statement. … **If** pechay plants are grown in nitrogen rich soils **then** it will develop larger leaves that those planted in nitrogen -poor soils because nitrogen stimulates vegetative growth.	*Active recall of concepts and/or tasks covered in the previous day must be noted to transition to the lesson continuation.* The teacher will facilitate the discussion by asking the learners to give their insights first on the unfamiliar terms, phrases, or sentences cited/identified in an operational manner. Present the focus of the day's lesson. Present the Scenario given ***Expected Response:*** Problem: Plant growth of pechay plants Variables: Independent: Pechay, Sunlight, water Dependent: Type of Soil used

	How are you going to improve the hypothesis statement in the table earlier? *Hint: Use the If..then statement…* 1. The bubble gum stain will be removed if oil is used. 2. The bubble gum stain will be removed if water is used. 3. The bubble gum stain will be removed if ice is used. **2. Worked Examples can be found in LAS 1.** The learners will be grouped into 4. Each group will have a respective station. In each station, there will be a text that the learners will read, and based on the situations, they will formulate the hypothesis and identify independent and dependent variables. Each group will be given 5 min per station, then has to move to the next station. **STATION 1** Manuel is a farmer. He noticed that there are mice that were pests on their rice crops. Their harvest of rice crops decreases. The supply of rice affected their town. Which resulted, to a high price of rice. He uses three steps. First, he mixed 20g bait phosphorus material into the soil; second, he places a scarecrow on the farm and lastly, he planted peppermint in between the rice crops. **STATION 2** Mary's mother is a "plantita". During the Pandemic, she planted tomatoes. Because of lack of space, some tomatoes were planted in the garden soil, while others were on the small pots. She observed that her plant growth and its fruits differ, although she planted them simultaneously. The tomatoes planted on the garden receives enough amount of sunlight. The tomatoes planted on the pots were placed inside on their house. Both were watered and were given same amount of fertilizers. **STATION 3** During the Brigada Eskwela, teacher Mara is cleaning her room. She mops the floor and cleans the board and chairs. While cleaning, she noticed bubble gum stains on the wall. She wanted to remove the stain before she repainted the wall. She tried to use oil, water and ice to remove the bubble gum stain.	**Expected Responses:** 1. If oil is used, then the bubble gum will be removed. 2. If water is used, then the bubble gum stain will be removed. 3. If ice is used, then the bubble gum will be removed. The teacher will observe the learners' answers and will ask the learners to volunteer their answers, giving positive feedback.

	STATION 4 Joseph loves to eat. One of his favorite food is a sandwich. He makes it with peanut butter, jams, ham, and even portions of margarine. His mother bought two packs of bread. As he was about to prepare his sandwich, he saw molds on the sides of the bread. He ran to his mom and told her about the molds. His mom told him to put a slice of bread inside an air-tight container, the other slice to put in a paper bag and the remaining slices, he left in the bread plastics. **2. Lesson Activity** Present to the students the expected output. The learners will be asked to read and answer the following questions: Q1. Based on the situations, what are the formulated hypotheses? Q2. What are the variables in situation 1? How about in situation 2? In situation 3? In situation 4? Q3. How will you formulate your hypothesis? Q4. Construct your hypotheses and variables based on this given situation: "The COVID-19 pandemic affected several countries around the world. One of the the nation most severely impacted by the epidemic is the Philippines".	
D. Making Generalizations	**Learners' Takeaways** The teacher will highlight and focus the lesson to the learners on **hypothesis** and **variables.** The learners will complete the phrases. They will write their answers in their science or activity notebooks. **Three** things I learned ……	

IV. EVALUATING LEARNING: FORMATIVE ASSESSMENT AND TEACHER'S REFLECTION		NOTES TO TEACHERS
A. Evaluating Learning	**1. Formative Assessment** Written Work. The learners will be given a set of questions that will serve as a formative assessment to evaluate their learning outcomes for the day's lesson objective and competency. I. Read the questions carefully, write your answer on a sheet of paper.  1. Which is the independent variable? A. the amount of water C. the times of stirring B. the amount of sugar D. the temperature of water 2. Which is the dependent variable? A. the dissolving time of sugar C. the number of granules left B. the heating time of water D. the temperature of water 3. Which are the controlled variables? I. water temperature III. amount of sugar V. stirring time II. amount of water IV. dissolving time of sugar A. I, II, III, IV C. II, III, V B. II, II, IV D. I, III, IV	**Answer Key:** 1. C 2. A 3. A 4. D 5. C

	4. Mary wants to know at which temperature does the salt dissolve faster in water. What is the dependent variable in the situation? A. the level of water C. the source of water B. the type of water D. the temperature of water 5. How can a scientist know if his/her hypothesis is effective or not? A. rely on wild guess B. observe from others C. test hypothesis thru testing D. conclude based on gathered info from others **2. Homework** The teacher can give other examples of situations and the learners will formulate their own hypothesis of the problem and identify the given variables.	
A. Activating Prior Knowledge	**DAY 2** **1. Short Review** Based on the previous lesson, create a Venn diagram to compare the types of variables. The students will write their answers on their notebook. **Q1. What are the types of variables?** _____ _____ **Q2. What is the difference between independent and dependent variable?** _____ _____	
B. Establishing Lesson Purpose	**1. Lesson Purpose** Present and explain the lesson objectives to the learners. a. Learners can conduct an experiment to prove a hypothesis. b. Learners can determine the procedure in each experiment.	

	2. Unlocking Content Vocabulary The learners will watch a short video that shows science experiments. (5 minutes) **WATCH THIS YOUTUBE VIDEO** https://www.youtube.com/watch?v=Ywhavrd_3uA Q1. What was the video all about? Q2. How did the girl in the video discover the answer behind things that float in water and things that don't?	
C. Developing and Deepening Understanding	**1. Explicitation** The learners will be grouped into 4. Each group will have a respective station. They will record the data result based on the illustrations. The focus of today's lesson will be on: a. Experimentation follow follows theby gathering and analyzing data of its behavior. b. Data Recording Scenario below are found in LAS 3. **STATION 1 (Figure A)** Manuel is a farmer. He noticed that there were mice that were pests on their rice crops. Their harvest of rice crops decreases. The supply of rice affected their town. Which resulted in a high price of rice. He uses three steps. First, he mixed 20g bait phosphorus material into the soil; second, he placed a scarecrow on the farm and lastly, he planted peppermint in between the rice crops. **STATION 2 (Figure B)** Mary's mother is a "plantita". During the Pandemic, she planted tomatoes. Because of lack of space, some tomatoes were planted in the garden soil, while others were in small pots. She observed that her plant growth and its fruits differ, although she planted them simultaneously. The tomatoes planted in the garden receive enough sunlight. The tomatoes planted on the pots were placed inside their house. Both were watered and were given the same amount of fertilizers.	

Figure A

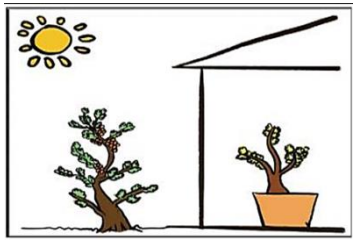


Figure B

STATION 3 (Figure C)
During the Brigada Eskwela, teacher Mara is cleaning her room. She mops the floor and cleans the board and chairs. While cleaning, she noticed bubble gum stains on the wall. She wanted to remove the stain before she repainted the wall. She tried to use oil, water, and ice to remove the bubble gum stain.

STATION 4 (Figure D)
Joseph loves to eat. One of his favorite foods is a sandwich. He makes it with peanut butter, jams, ham, and even portions of margarine. His mother bought two packs of bread. As he was about to prepare his sandwich, he saw molds on the sides of the bread. He ran to his mom and told her about the molds. His mom told him to put a slice of bread inside an air-tight container, the other slice to put in a paper bag and the remaining slices, he left in the bread plastics.

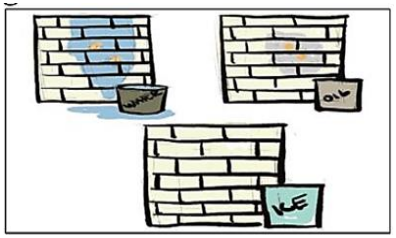


Figure C

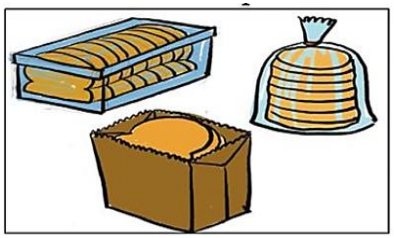


Figure D

	2. Worked Example The learners will be asked to share their formulated scientific problems within their group. Then, they will choose two problems per station. Q1. How many experiments were accomplished on each station? Q2. Can you describe the procedure of the experiment on the first station? How about the 2nd? 3rd? and 4th station? The teacher will observe the learners' answers and will ask the learners to volunteer their answers, giving positive feedback. **3. Lesson Activity** Q3. Which of the experiments in the first station worked? How did you say so? How about the 2nd station? 3rd station? 4th station? Q4. How will you say that the experiment worked well? The teacher will observe the learners' answers and will ask the learners to volunteer their answers, giving positive feedback.	
D. Making Generalizations	**Learners' Takeaways** The teacher will highlight and focus the lesson to the learners on how to conduct an experiment. The learners will complete the phrases. They will write their answer in their science or activity notebooks. Three things I learned …… Two things I wonder…..	

<table>
<tr><th colspan="2">IV. EVALUATING LEARNING: FORMATIVE ASSESSMENT AND TEACHER'S REFLECTION</th><th>NOTES TO TEACHERS</th></tr>
<tr><td>A. Evaluating Learning</td><td>1. Formative Assessment

Performance Task.
The learners will be evaluated based on the experiment they conducted on each station.

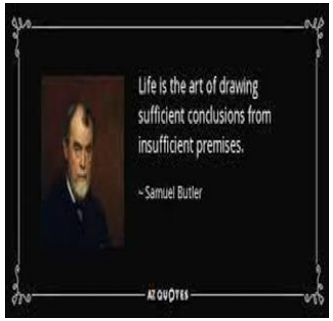
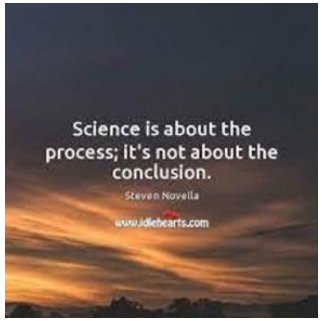
2. Homework
The teacher can give other examples of situations with simple experiment that learners can do at home</td><td></td></tr>
<tr><td>A. Activating Prior Knowledge</td><td>DAY 3

Short Review

MIX AND MATCH
Based on the previous lesson, match the following experiments done on the stations. The learners will write their answer on their notebook.

<table>
<tr><th colspan="3">SET A</th><th colspan="3">SET B</th></tr>
<tr><td>  </td><td>  </td><td>  </td><td>  </td><td>  </td><td>  </td></tr>
<tr><td>Mice</td><td>Tomato Plant</td><td>Bubblegum Stain</td><td>Ice</td><td>Peppermint</td><td>Sunlight</td></tr>
</table>

Q1. What is the fourth step of the scientific method?
Q2. What will be the next step?</td><td></td></tr>
</table>

B. Establishing Lesson Purpose	**1. Lesson Purpose** Present and explain the lesson objectives to the learners. a. Learners can define what is a conclusion. b. Learners can draw conclusions from a given **scientific scenario.** **2. Unlocking Content Vocabulary** The learners will be asked to observe the pictures.    Q1. What is the similarity among the three quotations? Q2. Do you have any idea about the conclusion?	
C. Developing and Deepening Understanding	**1. Explicitation** The learners will watch the short video about experimentation and observation. The students will take down notes important details about writing conclusions. https://www.youtube.com/watch?v=Z_S1pkkN81s The teacher will facilitate the discussion by asking the learners to give their insights first on the unfamiliar terms, phrases, or sentences cited/identified in an operational manner. Then, the teacher will provide additional information/knowledge on those cited/identified terms, phrases, and sentences.	

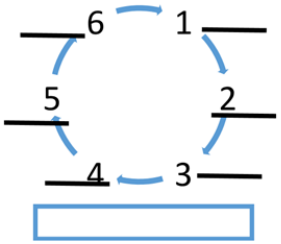
	2. Worked Example You will refer to the different Stations found in Day 3 under Explicitation. **3. Lesson Activity** Q3. How can you draw conclusions? Q4. What is the importance of conclusion in science? The teacher will observe the learners' answers and will ask the learners to volunteer their answers, giving positive feedback.	
D. Making Generalizations	**Learners' Takeaways** The teacher will highlight and focus the lesson to the learners on how to write conclusions. (8 minutes) The learners will complete the phrases. They will write their answer in their science or activity notebooks. Three things I learned. . . . . Two things I wonder. . . . One question I still have	
IV. EVALUATING LEARNING: FORMATIVE ASSESSMENT AND TEACHER'S REFLECTION		**NOTES TO TEACHERS**
A. Evaluating Learning	**1. Formative Assessment** Written Work. The learners will be given a set of questions that will serve as a summative assessment to evaluate their learning outcomes for the day's lesson objective and competency.	

Complete the table below.

PROBLEM	HYPOTHESIS	VARIABLES	DATA GATHERED/ RESULTS	CONCLUSION
Are there more people infected with Covid 19 under General Community Quarantine or in Modified Enhanced Community Quarantine (MECQ)?	**Hypothesis No. 1.** More people were infected with Covid 19 under GCQ than MECQ? **Hypothesis No. 2** Less people were infected with Covid 19 under GCQ than MECQ?	**Dependent Variable:** More or less people were infected. **Independent Variable:** GCQ and MECQ **Constant Variable:** Specific area under GCQ and MECQ under study	200 cases of infected people were under GCQ in Area A. 150 cases of infected people were under MECQ in Area A. No reported cases for three days under GCQ but with several cases under MECQ. It was found out that there are more cases of infected people with Covid 19 in Area A with 200 cases under GCQ. There were about 50 cases less of people infected with Covid 19 under MECQ in Area A.	

2. Homework

The teacher can give other examples of situations and the learners will draw conclusion/s based on the given situation/s.

A. Activating Prior Knowledge	**DAY 4** **Short Review** Based on the previous lesson, the learners will recall the conclusions they formulated on each station and write it on the respective box. STATION 1 STATION 2 STATION 3 Q1. What is a conclusion? Q2. What is the importance of conclusion in a scientific method?	
B. Establishing Lesson Purpose	**1. Lesson Purpose** Present and explain the lesson objectives to the learners. a. Learners can define what is application. b. Learners can apply the scientific method in investigating certain scenario. **2. Unlocking Content Vocabulary** Based on the previous lesson about the steps in scientific investigation, the students will fill in the concept map posted by the teacher below.  Q1. What are the 6 steps in conducting the scientific method? _____ _____	

Q2. Where does the scientific method start/begin?

_____

_____

Q3. Can we proceed to the next step without taking the other step? Example: can we proceed to the conclusion without formulating hypothesis? Why or why not?

_____

_____

C. Developing and Deepening Understanding

1. Explicitation

The learners will watch the short video about pandemic. They will write down important details discussed in the video using this link: https://www.youtube.com/watch?v=spJo_FJZ84U

The teacher will facilitate the discussion by asking the learners to give their insights first on the unfamiliar terms, phrases, or sentences cited/identified in an operational manner. Then, the teacher will provide additional information/knowledge on those cited/identified terms, phrases, and sentences.

2. Worked Example

Group Activity:

The learners will go to their respective groups and complete the scientific table given by the teacher.

PROBLEM	HYPOTHESIS	VARIABLES	DATA GATHERED/ RESULTS	CONCLUSION
Are there more people infected with Covid 19 under General Community Quarantine or in Modified Enhanced Community Quarantine (MECQ)?	**Hypothesis No. 1.** More people were infected with Covid 19 under GCQ than MECQ? **Hypothesis No. 2** Less people were infected with Covid 19 under GCQ than MECQ?	**Dependent Variable:** More or less people were infected **Independent Variable:** GCQ and MECQ	200 cases of infected people were under GCQ in Area A. 150 cases of infected people were under MECQ in Area A. No reported cases for three days under GCQ but with several cases under MECQ.	

		Constant Variable: Specific area under GCQ and MECQ under study	It was found out that there are more cases of infected people with Covid 19 in Area A with 200 cases under GCQ. There were about 50 cases less of people infected with Covid 19 under MECQ in Area A.	

Researchable Problem	Hypothesis	Variables	Data Gathered	Results and Discussion	Conclusion
Sample: Are there more people infected with Covid 19 under General Community Quarantine (GCQ) or Modified Enhanced Community Quarantine (MECQ)?	**Hypothesis No. 1.** More people were infected with Covid 19 under GCQ than MECQ. **Hypothesis No. 2.** Less people were infected with Covid 19 under GCQ than MECQ	**Dependent Variable:** More or less people were infected **Independent Variable:** GCQ and MECQ **Constant Variable:** Specific area under GCQ and MECQ under study.	200 cases of infected people were under GCQ in Area A. 150 cases of infected people were under MECQ in Area A. No reported cases for three days under GCQ but with several cases under MECQ.	It was found out that there were more cases of infected people with Covid 19 in Area A with 200 cases under GCQ. There were about 50 cases less of people infected with Covid 19 under MECQ in Area A.	I therefore conclude that under GCQ, more people were infected with Covid 19.

The learners will be asked to read out and answer the following questions:

Q1. Based on your table what are your variables?

Q2. What is your hypothesis on the problem?

Q3. What will be your controlled variable?

The teacher will observe learners' answers and will ask the learners to volunteer their answers, giving positive feedback.

	3. Lesson Activity Q4. How will you gather data? Q5. Based on the scenario, what is your conclusion? Why? Q6. Cite other applications of scientific method in real life situations.	The teacher will observe learners' answers and will ask the learners to volunteer their answers, giving positive feedback.
D. Making Generalizations	**Learners' Takeaways** The teacher will highlight and focus on the lesson to the learners about following the steps of scientific problems. (8 minutes) The learners will complete the phrases. They will write their answer in their science notebook. To measure the learners' knowledge based on the activity, the learners will make your reflection by completing the following phrases: "At first I thought . . . " and "Now I think . . ."	

IV. EVALUATING LEARNING: FORMATIVE ASSESSMENT AND TEACHER'S REFLECTION		NOTES TO TEACHERS
A. Evaluating Learning	**1. Formative Assessment** Choose the letter of the correct answer. The learners will write their answers in their science or activity notebook. 1. What skill does a scientist show when he/she listens to the sounds that whales make? A. Making a hypothesis C. Interpreting data B. Making observations D. Drawing conclusion	

2. Which question would be the best high-level Scientific question?
   A. How many giraffes live in Africa?
   B. Who made the first microscope?
   C. How long ago did dinosaurs live on Earth?
   D. Does the amount of salt in water affect the temperature at which it boils?

3. What do you call the series of steps designed to help you solve problems and answer questions?
   A. Experiment
   B. Hypothesis
   C. Observation
   D. Scientific Method

4. In science, an educated guess is called a/an _____.
   A. Conclusion
   B. Hypothesis
   C. Observation
   D. Question

5. When you decide whether the data supports the original hypothesis, you are _____.
   A. Asking questions
   B. Drawing conclusions
   C. Making observations
   D. Forming a hypothesis

6. When a scientist shares her findings with other scientists, she is _____.
   A. Experimenting
   B. Analyzing data
   C. Making a hypothesis
   D. Communicating Results

7. The final part or a summary of reasonable inferences is/an _____.
   A. Conclusion
   B. Hypothesis
   C. Question
   D. Controlled experiment

8. Anything that can change in an experiment is called_____.
   A. Experiment
   B. Conclusion
   C. Hypothesis
   D. Variable

9. All good experiments should be _____.
   A. Explainable
   B. Questionable
   C. Testable
   D. Thoughtful

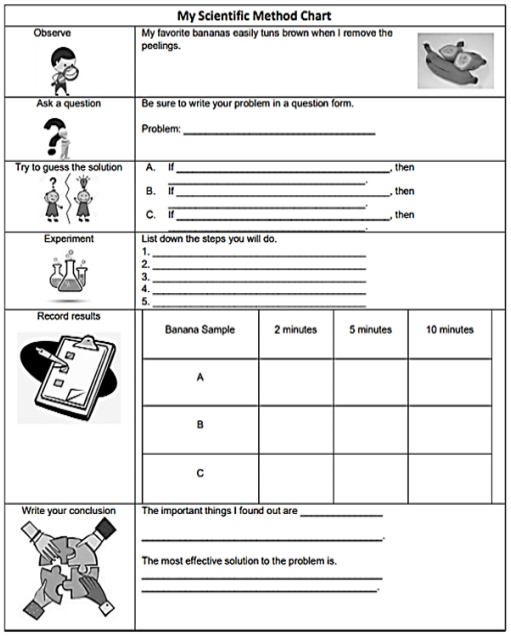
10. Which of the following does not belong to the group?

A. Conclusion C. Hypothesis

B. Experiment D. Plagiary

2. Homework

The teacher can give other examples



My Scientific Method Chart

Observe

My favorite bananas easily turns brown when I remove the peelings.

Ask a question

Be sure to write your problem in a question form.

Problem: _____

Try to guess the solution

A. If _____, then _____.

B. If _____, then _____.

C. If _____, then _____.

Experiment

List down the steps you will do.

1. _____
2. _____
3. _____
4. _____
5. _____

Record results

Banana Sample	2 minutes	5 minutes	10 minutes
A			
B			
C			

Write your conclusion

The important things I found out are _____.

The most effective solution to the problem is.

_____.

D. Teacher's Remarks	*Note observations on any of the following areas:*	**Effective Practices**	**Problems Encountered**	
	strategies explored			
	materials used			

	learner engagement/ interaction			
	Others			
E. Teacher's Reflection	*Reflection guide or prompt can be on:* ▪ *<u>principles behind the teaching</u>* *What principles and beliefs informed my lesson?* *Why did I teach the lesson the way I did?* ▪ *<u>students</u>* *What roles did my students play in my lesson?* *What did my students learn? How did they learn?* ▪ *<u>ways forward</u>* *What could I have done differently?* *What can I explore in the next lesson?*			