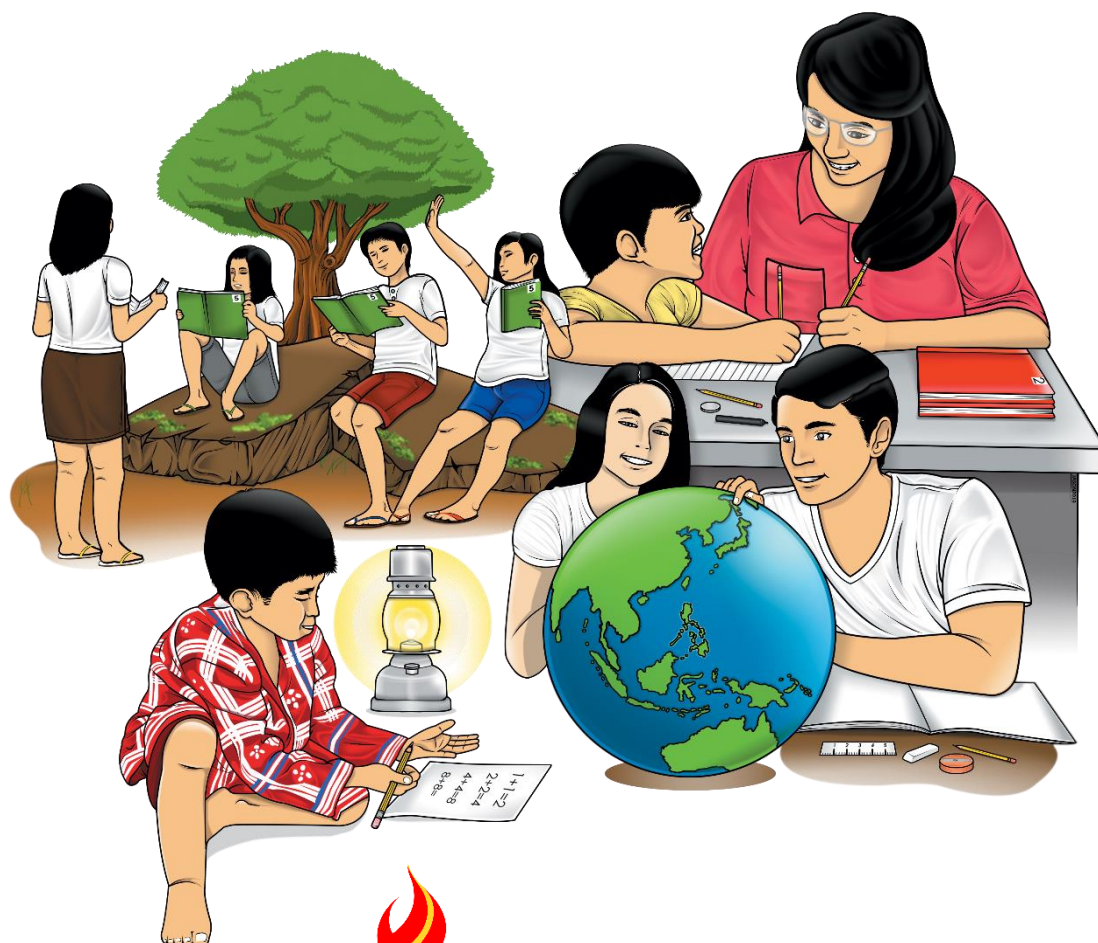


Senior High School

# Physical Science

## Quarter 1 – Module 13:

### Use of the Other Ingredients in Cleaning Agents



GOVERNMENT PROPERTY  
**NOT FOR SALE**

**Physical Science**  
**Alternative Delivery Mode**  
**Quarter 1 – Module 13: Use of the Other Ingredients in Cleaning Agents**  
**First Edition 2021**

**Republic Act 8293, Section 176** states that “no copyright shall subsist in any work of the Government of the Philippines. However, prior approval of the government agency or office wherein the work is created shall be necessary for exploitation of such work for profit. Such agency or office may, among other things, impose as a condition the payment of royalties.”

Borrowed materials (i.e., songs, stories, poems, pictures, photos, brand names, trademarks, etc.) included in this module are owned by their respective copyright holders. Every effort has been exerted to locate and seek permission to use these materials from their respective copyright owners. The publisher and authors do not represent nor claim ownership over them.

Published by the Department of Education  
Secretary: Leonor Magtolis Briones  
Undersecretary: Diosdado M. San Antonio

**Development Team of the Module**

**Writers:** Amy B. Villar, Jennifer O. Tullao

**Editors:** Robert G. Yumul, Felipa A. Morada

**Reviewers:** Jay-Ar Z. Gutierrez, Ramonito O. Elumbaring, Angelica J. Macaraeg  
Felipa A. Morada

**Illustrator:** Francis Victor A. Medrano

**Layout Artist:** Michael B. Veriña, Mary Grace L. Asa, Pamela A. Lalusin

**Management Team:** Francis Cesar B. Bringas  
Job S. Zape Jr.  
Ramonito O. Elumbaring  
Reicon C. Condes  
Elaine T. Balaogan  
Fe Ong-Ongowan  
Homer N. Mendoza  
Catherine V. Maranan  
Lorna R. Medrano  
Edita T. Olan  
Editha M. Malihan

Printed in the Philippines by \_\_\_\_\_

**Department of Education – Region IV-A CALABARZON**

Office Address: Gate 2 Karangalan Village, Barangay San Isidro  
Cainta, Rizal 1800

Telefax: 02-8682-5773/8684-4914/8647-7487

E-mail Address: region4a@deped.gov.ph

Senior High School

**Physical Science**  
**Quarter 1 – Module 13:**  
**Use of the Other Ingredients**  
**in Cleaning Agents**

## **Introductory Message**

This Self-Learning Module (SLM) is prepared so that you, our dear learners, can continue your studies and learn while at home. Activities, questions, directions, exercises, and discussions are carefully stated for you to understand each lesson.

Each SLM is composed of different parts. Each part shall guide you step-by-step as you discover and understand the lesson prepared for you.

Pre-tests are provided to measure your prior knowledge on lessons in each SLM. This will tell you if you need to proceed on completing this module or if you need to ask your facilitator or your teacher's assistance for better understanding of the lesson. At the end of each module, you need to answer the post-test to self-check your learning. Answer keys are provided for each activity and test. We trust that you will be honest in using these.

In addition to the material in the main text, Notes to the Teacher are also provided to our facilitators and parents for strategies and reminders on how they can best help you on your home-based learning.

Please use this module with care. Do not put unnecessary marks on any part of this SLM. Use a separate sheet of paper in answering the exercises and tests. And read the instructions carefully before performing each task.

If you have any questions in using this SLM or any difficulty in answering the tasks in this module, do not hesitate to consult your teacher or facilitator.

Thank you.

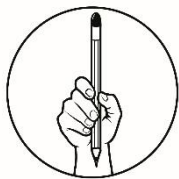


## ***What I Need to Know***

This module was designed and written with you in mind. It is here to help you master the use of the other ingredients in cleaning agents. The scope of this module permits it to be used in many different learning situations. The language used recognizes the diverse vocabulary level of students. The lessons are arranged to follow the standard sequence of the course. But the order in which you read them can be changed to correspond with the textbook you are now using.

The module focuses on the use of the other ingredients in cleaning agents.

After going through this module, you are expected to give the use of the other ingredients in cleaning agents.



## ***What I Know***

Direction: Write the chosen letter on a separate sheet of paper.

1. Aside from the active ingredient, there are also other ingredients included in cleaning agents. This ingredient helps in keeping the minerals out of the way of the surfactants.
  - A. Builders
  - B. fragrance
  - C. pH adjusters
  - D. solvents
2. Depending on the chosen ingredient used in a product, what is the ingredient that helps to be more effective on certain microbes?
  - A. antibacterial
  - B. enzymes
  - C. foam enhancer
  - D. preservatives
3. Adding of this ingredient in a certain liquid cleaning agent will decrease the viscosity of the liquid. What is this ingredient?
  - A. dye
  - B. enzymes
  - C. solvents
  - D. thickener
4. Many people feel bubbles show that a product is working. What is the ingredient that creates suds in a cleaning agent?
  - A. dye
  - B. foam enhancer
  - C. pH adjuster
  - D. preservatives
5. What is the group of ingredients that came in a natural or synthetic compound which gives pleasant smell to the product?
  - A. antibacterial
  - B. foam enhancer
  - C. fragrance
  - D. thickener
6. What ingredient has the power to break down stains like in digestive system which helps break down the food we eat?
  - A. enzymes
  - B. fragrance
  - C. solvents
  - D. thickener

7. This ingredient balanced the acidity or base of a certain product. What is this ingredient?
  - A. dye
  - B. fragrance
  - C. pH adjuster
  - D. solvents
8. What substance when added to a cleaning product makes it stable and safe for a longer period?
  - A. enzymes
  - B. foam enhancer
  - C. pH adjuster
  - D. preservative
9. What kind of ingredient is used in cleaning products that help in creating a unique experience?
  - A. dye
  - B. enzymes
  - C. fragrance
  - D. preservative
10. What is the pH of a certain product to be considered as basic?
  - A. pH greater than 7
  - B. pH less than 7
  - C. average pH is 7
  - D. none of the above
11. What substance provides most of the cleaning power in cleaning products?
  - A. antibacterial
  - B. enzymes
  - C. solvents
  - D. surfactants
12. What are these ingredients included in a hand hygiene product which provides reduction in germs?
  - A. antibacterial
  - B. enzymes
  - C. fragrance
  - D. solvents
13. This substance can be extracted in natural compounds. Which of the following is a natural compound?
  - A. flowers
  - B. fruits
  - C. nuts
  - D. all of the above
14. What substance helps the surfactant more powerful through the reaction of certain stuff which is found in tap water?
  - A. antibacterial
  - B. builders
  - C. enzymes
  - D. fragrance
15. Which of the following ingredients is considered as the active substance in a cleaning product?
  - A. enzymes
  - B. solvents
  - C. surfactants
  - D. thickener

## Lesson

# 1

## Use of the Other Ingredients in Cleaning Agents



In cooking, there are many interpretations of some dishes. But when one or two ingredients are lacking, the food that you will eat will not be delicious as what you expect. The same with the cleaning products. It is not only the active ingredient that plays an important role in cleaning agent but also the other ingredients.



### ***What's In***

Cleaning products or agents are very helpful in maintaining our home a conducive place for relaxation. They can remove dirt, dust, bad odor, and other contaminants present in every corner of our home. They have different ingredients that suit to different cleaning products. Some can kill virus and bacteria while being able to clean an area. Others contain ingredients that can remove grease or oil on the surface. Most of the cleaning agents remove the foul odor in the surroundings.



### ***Notes to the Teacher***

Keep on reminding the learners to take extra careful in handling different cleaning products. They must choose wisely the products they will buy. They should purchase those eco-friendly products.





## ***What's New***

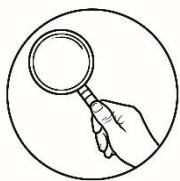
### **Activity 1.1 “What’s that Word?”**

Cleaning products play an essential role in daily life. They can remove dirt and stains from our clothes, dried on food from our dishes and even germs from our hands! Let’s learn more about the chemistry that makes this happen. But before that let’s solve these jumbled words below to see what our next lesson will be.

Direction:

Arrange the following jumbled letters to form the words related to cleaning agents/ingredients/products.

1. S N D H A
2. E A G S R E
3. I T D R
4. S V U R I
5. M U P F E R E
6. T A B E I A C R
7. E C N A L
8. U E H S O
9. L H T E H A
10. L A O H L C O
11. D I C A
12. G R D A E N
13. E G S A T R N M
14. O F R O L
15. T E T R E U X



## ***What is It***

### **Uses of the Other Ingredients in Cleaning Products**

With the different household cleaning products that we have in the market today, we don't know which the best is to use in our household. We assume that these cleaning products are safe to use. In fact, many popular household cleaners are dangerously toxic. They contain different ingredients that are harmful to our health. Together with the active ingredient, there are other ingredients found in cleaning agents. Let's look at their uses.

#### *1. Builders*

Builders are one of the important group of ingredients that help make cleaning products better. Builders give the surfactants a helping hand. They are found in several different kinds of products, but you need less of them than you do surfactants.

Builders help make the surfactant more powerful by reacting with stuff found in tap water. Water in your home may contain minerals (such as calcium and magnesium). The more minerals in your water, the "harder" the water is. It is not bad to have minerals in water, but it can leave white marks on surfaces (like dishes). When calcium and magnesium are present in water, they will stop surfactants from being able to do their job of removing soil.

Builders help prevent this by keeping the minerals out of the way of the surfactants. This leaves the surfactants alone to focus on the soil.

#### *2. Solvents*

Solvents are chemicals that help ingredients stay mixed and gives cleaning products the right thickness, so they are easy to use. In addition, solvents can help to prevent liquid products from freezing in cold climates.

Without solvents, a product will be very thick. But for other products, we want the liquid to pour out of the bottle. When we add solvents, we decrease the viscosity, meaning the liquid will move faster when poured out of the bottle. The solvent also helps to make sure we do not end up with a separated solution like when you have pulp at the bottom of your glass of orange juice.

#### *3. Enzymes*

Enzymes are powerful stain removing ingredients. Their power is to break down stains just like the enzymes in our digestive system help break down the food we eat. Enzymes are not living organisms but are created by naturally occurring microorganisms, like bacteria and fungi. In the laboratory, we use carefully selected microorganisms and allow them to grow in a very controlled environment. As they grow, they produce the desired enzymes.

#### *4. Fragrances*

Fragrances are a group of ingredients that provide the cleaning product with a pleasant smell. They are not found in every product, and typically a very small

amount can make a large difference in smell. In many cases, the fragrance is the driving factor for why someone decided to buy a specific product.

A fragrance is a mix of many different substances. These ingredients may be natural compounds (that come from materials like flowers, fruit, trees, plants, or nuts), essential oils, or synthetic compounds.

### *5. Preservatives*

Just like it is important to prevent food from spoiling, cleaning products need to be preserved as well. Adding a small amount of a preservative protects the product from microorganisms.

A preservative is a substance that is added to a cleaning product in order to make it stable and safe for a longer period. Without a preservative, it is possible for bacteria or fungi to grow in the product. This can cause the ingredients in the product (like surfactants and enzymes) to break down and not work as well. Adding a preservative allows a cleaning product to stay on the shelf longer both in the store and in your home.

### *6. pH Adjusters*

Every cleaning product needs to be “balanced” to work well and to be safe for your skin. In order to do this, chemists use pH adjusters to make sure the product is balanced and safe for you to use. The amount used depends on the other ingredients in the formula.

pH is a measure of how acidic (like lemon juice) or basic (like baking soda) a solution is. One way to measure this is by using the pH scale. The pH scale is read from 0 to 14 and tells us if a solution is acidic or basic. Pure water has a pH of 7, which means it's neutral.

pH adjusters are used in cleaning products to raise or lower the pH of a solution, making it either more basic or acidic.

Chemists make sure that the product is effective while balancing safety, in part, by making sure the pH will not be harmful if it touches your skin.

If the pH is less than 7, then the solution is acidic. Lemon juice has a pH around 2. Our skin is slightly acidic, with a pH on average near 5. If our skin comes into contact with a chemical that is too acidic it can cause itching or discomfort.

Adjusting the pH helps to keep the product working well as it gets old. It also affects how the product cleans. For example, each surfactant has a different pH level in which they are the most powerful. Therefore, a chemist may want to adjust the pH to that level.

If the pH is greater than 7, then the solution is basic. For example, baking soda has a pH of around 9. If a solution is too alkaline (basic), it can also irritate your skin.

### *7. Dye*

There are several other ingredients used in cleaning products that help create a unique experience. For example, dye can be used to give a product color.

### *8. Thickener*

Thickeners give soap the proper viscosity (thickness), making sure it can still flow out of a bottle. Can you imagine trying to wash your hands with a soap that feels like water? It would run right off your skin!

### *9. Foam Enhancer*

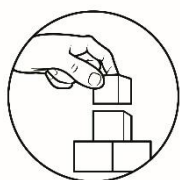
Foam Enhancers help create suds or bubbles. While not necessary for effective cleaning, many people feel bubbles show that a product is working.

### 10. Antibacterial or Disinfecting Ingredients

Cleaning washes away germs with any dirt and soil that is removed, but a further reduction of germs can be achieved by using additional ingredients that will kill germs.

Antibacterial or disinfecting ingredients can be included in a cleaning or hand hygiene product or used separately after cleaning. Their use provides a further reduction in germs on our hands or surfaces in our homes. This reduction of germs helps to prevent people from getting sick when commonly used surfaces, such as door handles, or our hands are cleansed using these products. In environments with sick individuals or where food is prepared, this is especially important.

There are many different types of antibacterial or disinfecting ingredients. Depending on the chosen ingredient used in a product, it may be more effective on certain microbes that make us sick like bacteria, viruses or mold.



## What's More

### Activity 1.2 “A Powerful Tool”

Direction:

Make a short poem about the use of other ingredients found in household cleaning products incorporating your answers in Activity 1.1.

#### Rubrics

Criteria	Excellent (4pts)	Merit (3pts)	Achieved (2pts)	Needs Improvement (1pt)	Score
Content	Information is clearly presented and ordered in such a way that it brings a full picture of the material	Information is clearly presented and ordered	Information is clear Order of information does not clearly show	Information is unclear and written in random order	
Creativity	It is visually inviting and easy to read	Visually inviting and easy to read	Visually pleasing and readable	Readable	
Spelling and Grammar	All spelling and grammar are correct	Some spelling and grammar error	Some spelling and grammar error	Notable spelling and grammar error	
Punctuality	Submitted on time	Submitted on time	Submitted on time	Submitted after the deadline	
				TOTAL	

Highest possible score:  $(4 \times 4) / 4 = 4$  components

### Sample Score Sheet

Adjectival Rating

Criteria	Score
Content	3
Creativity	3
Spelling and Grammar	3
Punctuality	4
TOTAL	13

Learner is within the Merit range and the teacher may choose a grade within this range

$13 \text{ pts} / 4 \text{ categories} = 3.25$



## What I Have Learned

### Activity 1.3 “Puzzled Ingredient”

Direction: Find in the puzzle the given words below.

Adjuster

Builders

Enhancer

Dye

Enzyme

Fragrance

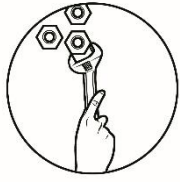
Disinfectant

pH

Preservative

Solvents

E	N	H	A	N	C	E	R	T	B	S	F
S	E	A	R	B	C	N	Y	A	U	E	R
M	O	F	I	G	H	Z	B	X	I	J	A
O	C	L	C	L	M	Y	Z	C	L	O	G
N	P	T	V	A	S	M	D	U	D	R	R
J	S	B	D	E	R	E	V	E	E	T	A
U	P	E	S	W	N	S	F	T	R	Z	N
I	H	Y	A	I	O	T	S	G	S	B	C
C	A	D	J	U	S	T	E	R	E	J	E
D	I	S	I	N	F	E	C	T	A	N	T
P	R	E	S	E	R	V	A	T	I	V	E



## What I Can Do

### Activity 1.4 “A Safe Environment”

Direction: With your knowledge on the different ingredients of cleaning products, make a poster on safe storage and use of the different cleaning agents. Write a short description of your work.

#### Rubrics

Criteria	Excellent (4pts)	Merit (3pts)	Achieved (2pts)	Needs Improvement (1pt)	Score
Content	Information are clearly presented and ordered in such a way that it brings a full picture of the material	Information are clearly presented and ordered	Information is clear Order of information does not clearly show	Information is unclear and written in random order	
Creativity	It is visually inviting and easy to read	Visually inviting and easy to read	Visually pleasing and readable	Readable	
Spelling and Grammar	All spelling and grammar are correct	Some spelling and grammar error	Some spelling and grammar error	Notable spelling and grammar error	
Punctuality	Submitted on time	Submitted on time	Submitted on time	Submitted after the deadline	
				TOTAL	

Highest possible score:  $(4 \times 4) / 4 = 4$  components

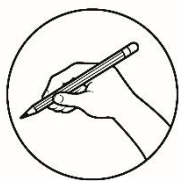
#### Sample Score Sheet

Adjectival Rating

Criteria	Score
Content	3
Creativity	3
Spelling and Grammar	3
Punctuality	4
TOTAL	13

$13 \text{ pts} / 4 \text{ categories} = 3.25$

Learner is within the Merit range and the teacher may choose a grade within this range.

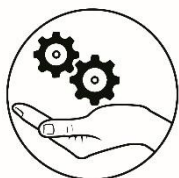


## Assessment

Direction: Write the letter that match the different ingredients of cleaning agents with their uses.

“Use of Different Ingredients”

Use	Ingredients
1. Washes away germs with any dirt	A. Antibacterial
2. Give surfactants a helping hand	B. Builders
3. Create suds or bubbles	C. Dye
4. Give cleaning agents the right thickness	D. Enzymes
5. Making the product balanced	E. Foam enhancer
6. Powerful stain removing ingredient	F. Fragrance
7. Protects products from microorganism	G. pH
8. Provide product with a pleasant smell	H. pH adjuster
9. Helps keep minerals out of way	I. Preservatives
10. Prevents products from freezing	J. Solvents
11. Mix of many different substances	
12. Allows cleaning product to stay longer	
13. Measures how a solution is acid or base	
14. Helps create a new experience	
15. Prevent people from getting sick	



## Additional Activities

### Activity 1.5 “Healthy Atmosphere”

Direction: Read the article below about the effectiveness of a cleaning agent in reducing the occurrence of diseases. Write your short opinion on a separate sheet of paper.

## **Cleaning, Disinfecting and Sanitizing**

<https://medlineplus.gov/cleaningdisinfectingandsanitizing.html>

Where are germs found?

Germs are a part of everyday life. Some of them are helpful, but others are harmful and cause disease. They can be found everywhere - in our air, soil, and water. They are on our skin and in our bodies. Germs are also on the surfaces and objects that we touch.

Sometimes those germs can spread to you and make you sick. For example, there could be germs on a tv remote. You could get infected with the germs if you touch the remote and then rub your eyes or nose or eat with your hands.

How can I avoid getting germs from surfaces and objects?

To avoid becoming infected by germs from surfaces and objects, it is important to wash your hands often. But you can't wash your hands every time you touch something. So, it's also important to regularly clean and disinfect surfaces and objects.

What is the difference between cleaning, sanitizing, and disinfecting?

Some people think that disinfecting is same thing as cleaning or sanitizing. But they are actually different.

Cleaning removes dirt, dust, crumbs, and germs from surfaces or objects. When you clean, you will likely use soap (or detergent) and water to physically clean off the surfaces and objects. This may not necessarily kill the germs. But since you removed some of them, there are fewer germs that could spread infection to you.

Disinfecting uses chemicals (disinfectants) to kill germs on surfaces and objects. Some common disinfectants are bleach and alcohol solutions. You usually need to leave the disinfectant on the surfaces and objects for a certain period of time to kill the germs. Disinfecting does not necessarily clean dirty surfaces or remove germs.

Sanitizing could be done by either cleaning, disinfecting, or both. Sanitizing means that you are lowering the number of germs to a safe level. What is considered a safe level depends on public health standards or requirements at a workplace, school, etc. For example, there are sanitizing procedures for restaurants and other facilities that prepare food. What you do to sanitize will vary, depending on your needs. You might be mopping a floor using a mop, a chemical, and water. You might use a dishwasher to sanitize the dishes. Or you could be using an antibacterial wipe on a tv remote.

If you both clean and disinfect a surface or object, you can further lower the risk of spreading infection.



## Rubrics

Criteria	Excellent (4pts)	Merit (3pts)	Achieved (2pts)	Needs Improvement (1pt)	Score
Content	Information is clearly presented and ordered in such a way that it brings a full picture of the material	Information is clearly presented and ordered	Information is clear Order of information does not clearly show	Information is unclear and written in random order	
Creativity	It is visually inviting and easy to read	Visually inviting and easy to read	Visually pleasing and readable	Readable	
Spelling and Grammar	All spelling and grammar are correct	Some spelling and grammar error	Some spelling and grammar error	Notable spelling and grammar error	
Punctuality	Submitted on time	Submitted on time	Submitted on time	Submitted after the deadline	
				TOTAL	

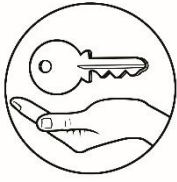
Highest possible score:  $(4 \times 4) / 4 = 4$  components

### Adjectival Rating Sample Score Sheet

Criteria	Score
Content	3
Creativity	3
Spelling and Grammar	3
Punctuality	4
TOTAL	13

13 pts/4 categories= 3.25

Learner is within the Merit range and the teacher may choose a grade within this range.



# Answer Key

**Additional Activities**

Answer may vary.  
Refer to rubrics for scoring.

**Assessment**

1. A
2. B
3. E
4. J
5. H
6. D
7. I
8. F
9. B
10. J
11. F
12. I
13. G
14. C
15. A

**What I Have Learned**

Answers may vary.

P	R	E	S	I	N	S	E	R	R	V	A	L	I	B
D	I	S	I	N	S	J	U	S	T	E	G	L	A	T
C	A	D	J	U	S	R	E	J	E	N	A	N	T	E
I	H	A	V	I	O	T	S	G	S	B	C	N		
U	P	E	S	W	N	S	F	T	R	Z	N			
J	S	B	D	E	R	E	V	E	T	A				
N	P	T	M	A	S	M	D	U	D	R	R			
O	C	L	C	L	M	Y	Z	C	L	O	G			
M	O	F	I	G	H	Z	B	X	I	J	A			
S	E	A	R	B	C	N	Y	A	U	E	R			
E	N	H	A	N	C	E	R	T	B	S	E			

**What I Can Do**

Answers may vary.  
Refer to rubrics for scoring.

**What's More**

Answers may vary.  
Refer to rubrics for  
scoring.

**What's New**

1. HANDS
2. GREASE
3. DIRT
4. VIRUS
5. PERFUME
6. BACTERIA
7. CLEAN
8. HOUSE
9. HEALTH
10. ALCOHOL
11. ACID
12. DANGER
13. GARMENTS
14. FLOOR
15. TEXTURE

**What I Know**

1. A
2. A
3. C
4. B
5. C
6. A
7. C
8. D
9. A
10. A
11. D
12. A
13. D
14. B
15. C

## **References**

“Baking Soda”, Accessed July 21, 2020,  
<https://oonto.extension.wisc.edu/files/2011/02/Baking-Soda.pdf#:~:text=Cleaning%3A%20Baking%20Soda%20acts%20a%20cleaning%20agent%20because,for%20easy%20removal%20as%20a%20gentle%20scouring%20powder.>

“Ingredients”, Accessed July 22, 2020, <https://explorationclean.org/ingredients>

Commission on Higher Education. *Teaching Guide for Senior High School: Physical Science*. Book. <https://drive.google.com/file/d/0B869YF0KEHr7SHFGVG5mVFFhcXc/view>. Creative Commons Attribution-NonCommercial-ShareAlike 4.0

**For inquiries or feedback, please write or call:**

Department of Education - Bureau of Learning Resources (DepEd-BLR)

Ground Floor, Bonifacio Bldg., DepEd Complex  
Meralco Avenue, Pasig City, Philippines 1600

Telefax: (632) 8634-1072; 8634-1054; 8631-4985

Email Address: [blr.lrqad@deped.gov.ph](mailto:blr.lrqad@deped.gov.ph) \* [blr.lrpd@deped.gov.ph](mailto:blr.lrpd@deped.gov.ph)