1st Quarter Grade 7
Revised Standards on Matter

Performance Standards: Perform in groups guided investigations involving community-based locally-available materials

Lesson Focus: Fair Testing

I. INTRODUCTION

Identifying the Community Problem

Community Survey:

Students in groups will observe problems in the nearby community as "Junior Scientists." If field observation is not possible, alternative activity could be reporting using documentary materials like photo or video clips of observed community problems.

After the group activity, give the following checklist as a guide in selecting a research problem:

Identified Community Problem			
	Yes	**No**	**Remarks**
Does the problem deal with the particular needs of the community?			
Is the problem significant enough to warrant research or investigation?			
Is the topic within the group's level of knowledge and experience?			
Are the materials needed for investigation locally available?			
Is the time element sufficient to finish the study?			
Revised formulation of the problem:			

II. BODY

1. Formulating the Hypothesis

   Recall what hypothesis is and how it should be formulated. Ask: "What observations or knowledge in the past are you using in formulating a hypothesis?" Have group work for hypothesis formulation based on their identified community problem.

Team-Pair-Share: Conduct peer review of the group's output using the following checklist:

Problem:			
Hypothesis:			
	Yes	**No**	**Remarks**
Is the hypothesis clear, testable, and specific?			
Does each hypothesis describe a predicted relationship between two more variables?			
Revised hypothesis:			

Have the pupils conduct a group reporting on their chosen community problem and their formulated hypothesis. Students and teachers will give feedback to improve the group's investigatory project. Check each work and determine if the group can proceed to the next step.

2. Designing an Experiment

The following questions may be given to the students for guided investigation:

- How are you going to design the experiment to test your hypothesis?
- What are the dependent and independent variables in your experiment?
- Will you observe or measure? What tools are you going to use?
- What safety precautions should be applied during the experimental process?
- How will you gather your data?

Let the students report in class and defend their experimental procedures. Critique and make corrections to the work, if necessary.

Ask the students to schedule when to conduct the actual experimentation and data gathering using the sample Gantt Chart below:

	Month 1						
	Day 1	**Day 2**	**Day 3**	**Day 4**	**Day 5**	**Day 6**	**Day 7**
Procedure 1							
Procedure 2							
Procedure 3							
Procedure 4							
Procedure 5							

3. Presenting and Analyzing Data

The following guide questions may be given to the students to organize the result of their data gathering:

- What will you do to organize your data?
- Will you present them using tables, graphs, diagrams, or illustrations?
- Do you see patterns or trends in the data?
- Do the data support your hypothesis? Explain the meaning of the figures.

For data analysis, the following guidelines from DOST (Department of Science and Technology) Investigatory Project may be used:

a. Discuss each table, graph, or diagram presented. The reader must be able to draw out all ideas gathered.

b. Point out relationships, implications, and generalizations that can be derived from the data in the table.

c. The following must be included in the discussion:
   - every possible explanation and application of the findings;
   - any defect in the methodology that may have affected the result; and
   - insights that may add new information to the findings.

d. Report all the findings including those that negate the research hypothesis.

4. Formulating Conclusions and Recommendations

Give the general guidelines on how to make conclusions and recommendations through the following guide questions:

a. What does the data tell you? How do these answer your main problem?

b. Do the results support your hypothesis? Do the results lead you to another hypothesis?

c. What general statements can you come up with regarding the results of your investigation? Write your conclusion for the problem.

d. Are there other problems that come up? What are the things you would like to do to improve the result of your study? Write your recommendations.

e. Based on the conclusions, what other aspects would you like to find out about your research topic which you yourself or any other person who is interested may pursue? Include these in the recommendations.

5. Assessment

Self-Assessment: Let the students answer the checklist below to evaluate how they individually perform and contribute to the group activity:

	Always	Often	Sometimes
I listen to and consider the suggestions of my classmates when we are talking about our project.			
I think of alternative things if our group is lacking of materials to use for our experiment.			
I use the Internet and books to search for facts needed in our investigation.			
I investigate, observe, and do some interview so that I can gather data.			
I do not easily give up even if there are many obstacles.			
I am confident to tell the truth about the result of our experiment.			
I do not copy the work of others; my group and I want to have a unique and creative project.			

If the answer is mostly…

ALWAYS – it means you are a real Junior Scientist.

SOMETIMES – it means you are good but you need to exert some more effort to become successful.

OFTEN – it means you need to improve on a lot of things.

Peer Review: Ask the students to work in groups to critique their investigatory projects. Rubrics may be used for guided peer review.

CRITERIA	4 – Excellent	3 – Very Good	2 – Satisfactory	1 – Fair
Content	The facts, information, and explanation are clearly, concisely, logically presented, and there is enough supporting information.	The facts, information, and explanation are concisely, logically presented, and with supporting information.	The facts, information, and explanation are clearly presented with supporting information.	The facts, information, and explanation are clearly presented but lack supporting details.
Procedure shows Clear and Specific Ideas	All steps in the scientific method are clear, specific, and very comprehensive.	All steps in the scientific method are clear and specific.	Three steps in the scientific method are clear and specific.	Two steps in the scientific method are clear and specific.
Overall Presentation	Demonstrates a clear understanding of the concept	Demonstrates understanding of the concept	Demonstrates some understanding of the concept	Completes the task but shows little understanding of the concept
Total				

III. CONCLUSION

1. Enrichment Activity

   Junior Scientists Mini-Convention: Students will creatively present the approved final draft of their investigatory project. Local community leaders may also be invited during the mini-convention. An award may also be given to the Best Investigatory Project.

1st Quarter Grade 7
Revised Standards on Matter

Learning Competency: Express concentrations of solutions quantitatively by preparing different concentrations of mixtures according to uses and availability of materials

Lesson Focus: Solution

I. INTRODUCTION

Activating Prior Knowledge

Pre-lab discussion

Give an overview of saturated, unsaturated, and supersaturated solutions.

Discuss the experiment objectives, materials, and procedures.

Objectives:

1. To different concentrations of salt solutions.
2. To express concentrations of solutions quantitatively.

Materials:

- 100 ml graduated cylinder
- 100 ml beaker
- Stirring rod
- NaCl (salt)
- Triple beam balance or analytical balance
- Filter paper (for weighing purposes)
- Cold water (approximately 25°C)

II. BODY

1. Experiment Proper

Procedure:

a. Weigh the filter paper using the triple beam balance. Record the weight of the filter paper.

b. Prepare three sets of solute. Use the formula below to get a more accurate weight of the solute:

Final weight = weight of filter paper + weight of solute (shown below)

No. of beaker	Weight of solute
Beaker 1	0 g (Control group)
Beaker 2	10 g
Beaker 3	35.7 g*
Beaker 4	72 g

* Source of Saturated Salt Solution: *The Internet Science Room. http://crescentok.com/staff/jaskew/isr/chemistry/class14.htm. Retrieved 2014 May 01.*

c. Measure 100-ml cold water in a 100-ml graduated cylinder.

d. Place it in a 100-ml beaker. Repeat this step four times and label the beakers.

e. Place the weighed solutes to each of the three beakers accordingly.

f. Stir continuously to dissolve the solutes.

g. Record your observations.

2. Data gathering

Record the data from the experiment using the table:

Properties	Beaker 1	Beaker 2	Beaker 3	Beaker 4
a. Amount of solvent (ml)				
b. Amount of solute (g)				
c. Presence of precipitate after stirring continuously (none, few, many)				
d. Taste of the solution (none, salty, saltier)				
e. Kind of concentration	(Control group)			

3. Synthesis

Answer the following questions:

a. What properties do beakers 2, 3, and 4 differ in based on the table?

b. Give the amount of solute (g) per amount of solvent ratio of beakers 2, 3, and 4.

Beaker Number	Solute-Solvent Ratio (g:ml)	Percentage of Solute (%)
2		
3		
4		

c. Which beaker has the least percentage of solute in the solution? The highest percentage of solute?

d. How did you classify the kinds of concentration of beakers 2, 3, and 4?

Write a conclusion of the experiment guided by the given objectives.

III. CONCLUSION

Post-Lab Activity

Show flash animation on saturated solutions.

1. Visit http://www.wwnorton.com/college/chemistry/chemistry3/ch/04/chem-tours.aspx (Retrieved May 01 2014.)
2. Then click "Saturated Solutions."

   This interactive website contains thorough explanation of different concentrations of solutions, real-world applications, science connections, and a concept question.