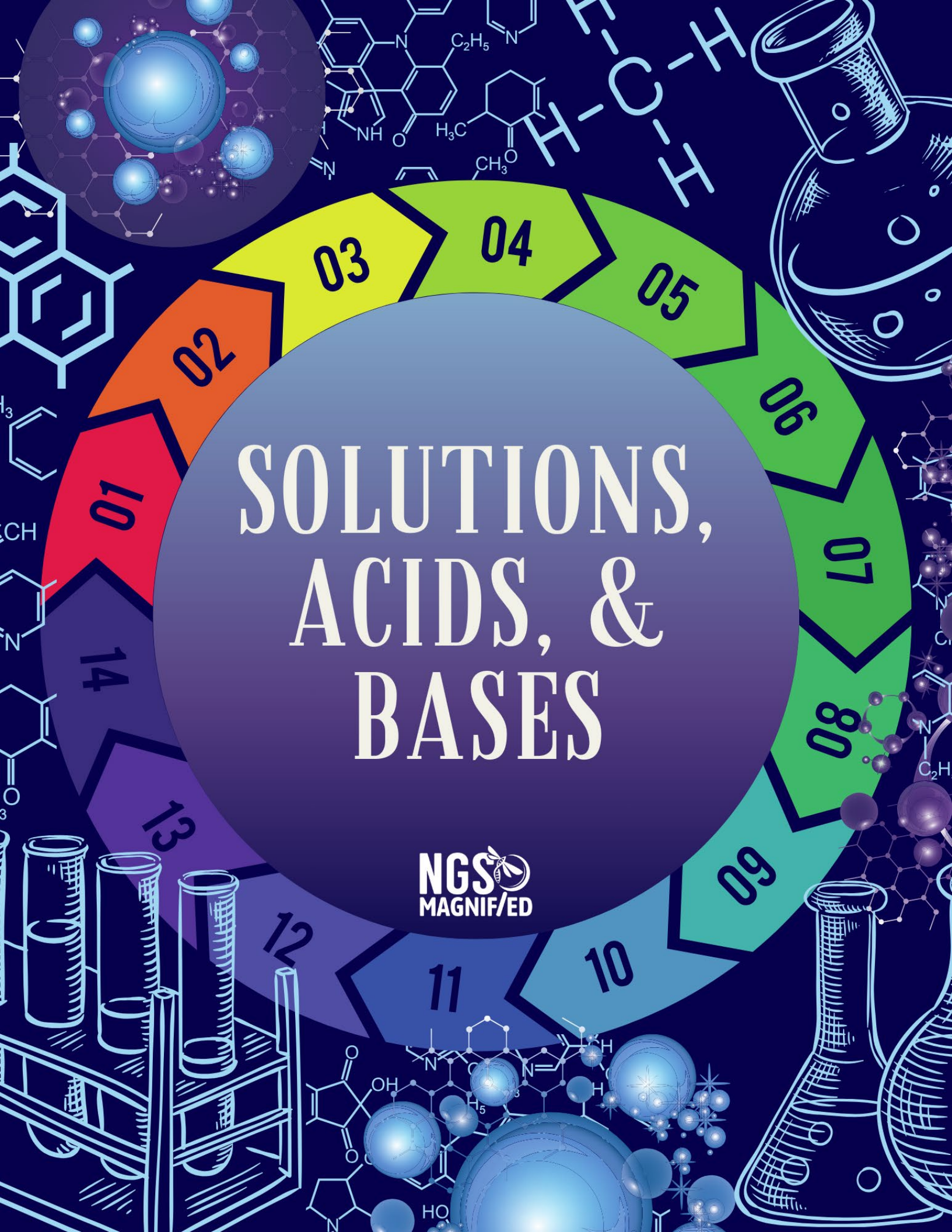
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SOLUTIONS, ACIDS, & BASES
NGS MAGNIF/ED

Table of Contents:
Solutions, Acids & Bases

Introduction

If you are new to the idea of using a Science Interactive Notebook in your classroom, **stop by my Nitty Gritty Science shop and download my Intro to Science Interactive Notebooks tutorial for FREE!** In there you will find tips on how to begin with your students, what materials to have on hand and, most importantly, how it will enhance your students learning through reflection and creativity.

Focused Lessons with Differentiated Instruction

The lessons shared on the following pages cover National Science Standards and meet students' needs. I have given you the notes that I would give my students (Right Side – Input Side of Notebook) so you can understand what I'm having the students focus on when working on their creative assignments (Left Side – Output Side of Notebook). Each lesson focuses on a Question of the Day (QOD) represented in red in the top margin of each "Input" page with the student giving an answer in red on "Output" page.

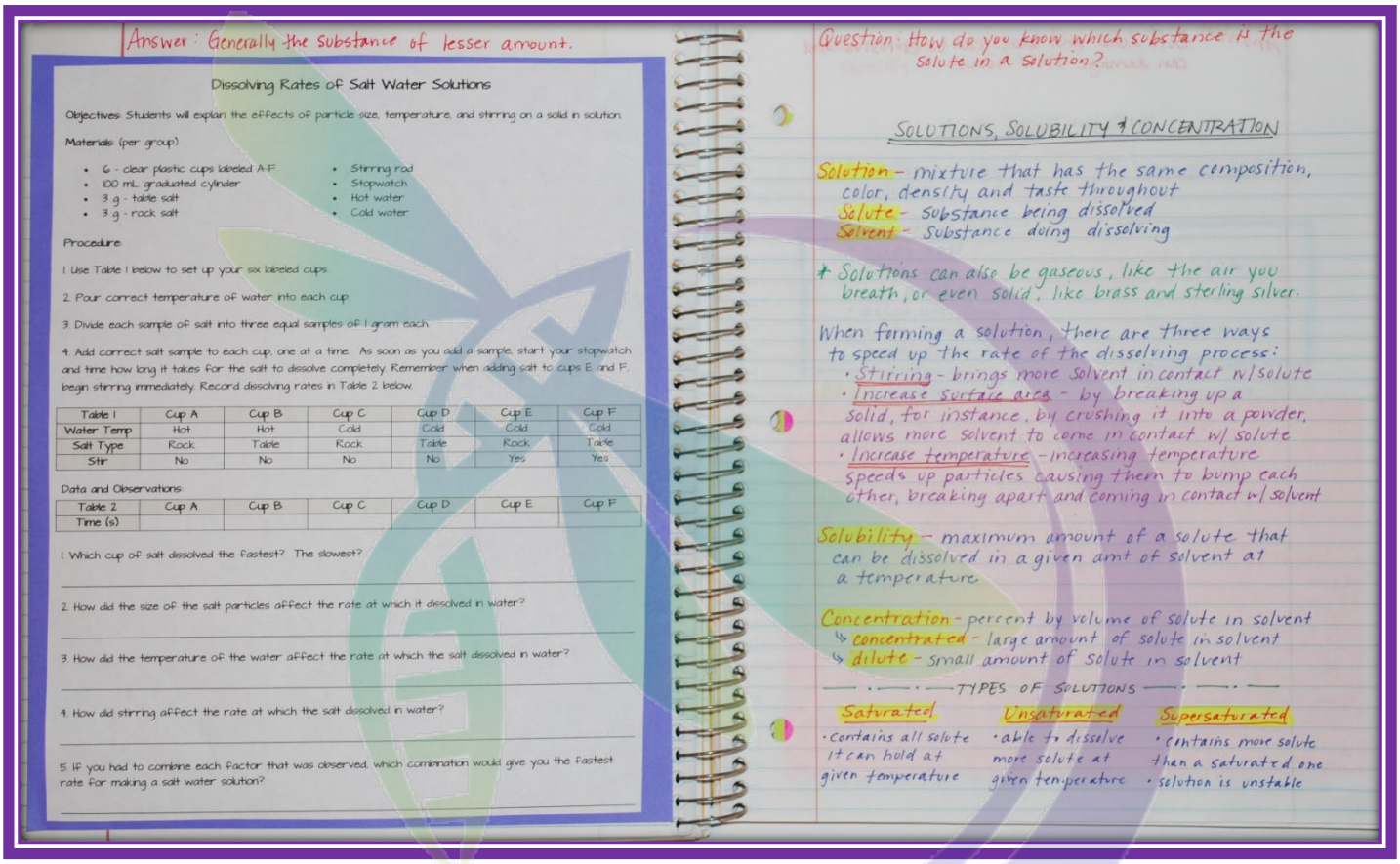
Left Side – Output

Instructions for each Output Side are included. This includes cut-outs, foldables or master copies where applicable. You may find that students work slow at first, but once groups are organized and students know what is expected from them, not only will you see more energy focused on the final product, but also you will be shocked at the level of creativity certain students have in certain areas.

Mini-Assessments

Mini quizzes will be given for each section so you may monitor student's level of understanding. For reproduction purposes, there are two quizzes to a page so you can cut them in half and save on some paper ☺

Section 1: Solutions, Solubility & Concentration



Answer: Generally the substance of lesser amount.

Dissolving Rates of Salt Water Solutions

Objectives: Students will explain the effects of particle size, temperature, and stirring on a solid in solution.

Materials (per group):

- 6 - clear plastic cups labeled A-F
- 100 mL graduated cylinder
- 3 g - table salt
- 3 g - rock salt
- Stirring rod
- Stopwatch
- Hot water
- Cold water

Procedure:

1. Use Table 1 below to set up your six labeled cups.
2. Pour correct temperature of water into each cup.
3. Divide each sample of salt into three equal samples of 1 gram each.
4. Add correct salt sample to each cup, one at a time. As soon as you add a sample, start your stopwatch and time how long it takes for the salt to dissolve completely. Remember when adding salt to cups E and F, begin stirring immediately. Record dissolving rates in Table 2 below.

Table 1	Cup A	Cup B	Cup C	Cup D	Cup E	Cup F
Water Temp	Hot	Hot	Cold	Cold	Cold	Cold
Salt Type	Rock	Table	Rock	Table	Rock	Table
Stir	No	No	No	No	Yes	Yes

Data and Observations:

Table 2	Cup A	Cup B	Cup C	Cup D	Cup E	Cup F
Time (s)						

1. Which cup of salt dissolved the fastest? The slowest?
2. How did the size of the salt particles affect the rate at which it dissolved in water?
3. How did the temperature of the water affect the rate at which the salt dissolved in water?
4. How did stirring affect the rate at which the salt dissolved in water?
5. If you had to combine each factor that was observed, which combination would give you the fastest rate for making a salt water solution?

Question: How do you know which substance is the solute in a solution?

SOLUTIONS, SOLUBILITY & CONCENTRATION

Solution - mixture that has the same composition, color, density and taste throughout
Solute - substance being dissolved
Solvent - substance doing dissolving

* Solutions can also be gaseous, like the air you breath, or even solid, like brass and sterling silver.

When forming a solution, there are three ways to speed up the rate of the dissolving process:
- Stirring - brings more solvent in contact w/ solute
- Increase surface area - by breaking up a solid, for instance, by crushing it into a powder, allows more solvent to come in contact w/ solute
- Increase temperature - increasing temperature speeds up particles causing them to bump each other, breaking apart and coming in contact w/ solvent

Solubility - maximum amount of a solute that can be dissolved in a given amt of solvent at a temperature

Concentration - percent by volume of solute in solvent
↳ concentrated - large amount of solute in solvent
↳ dilute - small amount of solute in solvent

TYPES OF SOLUTIONS

Saturated	Unsaturated	Supersaturated
• contains all solute it can hold at given temperature	• able to dissolve more solute at given temperature	• contains more solute than a saturated one • solution is unstable

Instructions:

Students will complete a short activity on Dissolving Rates of Saltwater Solutions in which they will observe and communicate the effects of particle size, temperature and stirring on a solid in a solution. The material list is made of everyday items such as salt (table and rock), water and cups.

I have included the student printable for the activity and a mini-quiz.

MULTIPLE LEARNING STYLES ADDRESSED WITH ORIGINAL ACTIVITIES – NO REPEATS!

Dissolving Rates of Saltwater Solutions

Objectives: Students will explain the effects of particle size, temperature, and stirring on a solid in a solution.

Materials: (per group)

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- 3 g – table salt
- 3 g – rock salt
- Hot water
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- Stirring Rod
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Procedure:

1. Use Table 1 below to set up your six labeled cups and pour the correct temperature of water into each cup.

2. Divide each sample of salt into three equal samples of 1 gram each.

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1. Which cup of salt dissolved the fastest? The slowest? _____
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3. How did the temperature of the water affect the rate at which the salt dissolved in water? _____
_____

4. How did stirring affect the rate at which the salt dissolved in water? _____
_____

5. If you had to combine each factor that was observed, which combination would give you the fastest rate for making a saltwater solution? _____
_____

Name _____ Date _____

Quiz: Acids, Bases and Salts

Read each description below. Write the term ACID, BASE or BOTH next to the description that describes the properties best.

_____ 1. can be slippery

_____ 2. bitter taste

_____ 3. can cause tissue damage

_____ 4. sour taste

_____ 5. produces hydroxide ions (OH−)

_____ 6. can be corrosive

_____ 7. reacts with indicators

_____ 8. produces hydronium ions (H+)

_____ 9. crystalline solid

_____ 10. can conduct electricity

MINI QUIZZES INCLUDED FOR EACH SECTION

Name _____ Date _____

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SOLUTIONS, ACIDS, & BASES
INCLUDES STUDENT SECTION COVERS
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Question: How do you know which substance is the solute in a solution?

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- ↳ dilute – small amount of solute in solvent

TYPES OF SOLUTION

Saturated	Unsaturated	Supersaturated
• contains all the solute it can hold at a given temperature	• able to dissolve more solute at a given temperature	• contains more solute then a saturated solution is unstable

Thank you for sharing NGS Magnified with your students!

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