Solving Problems like a Scientist

Background Questions
1. How are acids and bases different?

2. What does “absorbent” mean?

3. What materials can speed up the process of oxidation (which results in rust)?

Problem
You walk into your science classroom on a Monday morning and notice some strange things happening! Solve the following problems using your knowledge of physical and chemical properties, as well as any resources your teacher allows (either online research or classroom materials).

Directions
● Read each scenario below.
● For each scenario, use your prior knowledge as well as to conduct research in order to answer the questions and provide a solution to the problem. There may be more than one right answer!

Scenario 1
In the back of the room, there is a cleaning bucket next to the sink with three lemons inside of it. The sink has some soap scum buildup and other dirt inside of it. Research lemons and acidity to answer the following questions.

1. What are 3 uses of lemons (besides food/drink)?

2. What materials/objects can lemons be used to clean?

3. What can lemons NOT be used to clean?

4. Can the lemons be used to clean the sink? Why or why not?

Scenario 2
You see that next to your teacher’s desk, water has spilled onto the floor. There is a sponge, two sheets of paper towels, wax paper, and a piece of Styrofoam on the desk. Research absorption to answer the following questions to help you decide which material would clean up the spill the most quickly.

1. What makes a material more absorbent than another?

2. What is found inside paper towels and tissues that helps them to be absorbent?

3. You can only use one material to clean up the spill. Which material do you think would clean it up the most quickly? What evidence can you use to support this claim?

Scenario 3
You look out the window and notice that the basketball hoop has an orangey/brown substance on it. Research rust and oxidation to answer the following questions.

1. What is on the basketball hoop?

2. How did it get there?

3. What are two things that can be used to prevent oxidation from occurring?

4. Your principal decides to buy a new basketball hoop. What could you do in order to prevent the hoop from rusting? What evidence can you use to support this claim?