Name:

**Chemistry of Tie-Dying**

**Procedure:**

1. The white 100% cotton t-shirts are soaked in a basic solution (sodium carbonate/ soda ash) to prepare the cellulose molecules to bond with the dye molecules.
2. On the day of tie-dying, wear googles, gloves, and an apron! You will also want to wear old clothes, as dye will NOT come out.
3. Clean your table before you start.Spread your t-shirt out on the table and swirl or fold for your desired tie-dying pattern. Use rubber bands to bind the t-shirt together.
4. Tie-dye: Arrange your colors carefully. Use droppers to slowly add dye. Remember, colors will blend everywhere they overlap. Keep in mind contrasting colors will create brown when they mix. Make sure you add dye in the pleats to avoid white spots.
5. Turn over your t-shirt and REPEAT on the opposite side in exactly the same way.
6. When finished adding dye, place your t-shirt in a Ziploc bag overnight and write your name on the outside.
7. Clean the table where you worked until no more dye residue comes off.
8. The following day, rinse your t-shirt with cold and then warm water until no more dye comes out.
9. Wash and dry your t-shirt and then it is ready to wear!

**Lab Questions:**

1. Is tie-dying a chemical or physical change? Explain.
2. What causes dyes to be different colors?
3. Research 2 dyes. Write their common name and draw the formula.
4. Cotton is made of what type of molecules?
5. How does the dye “stick” to the shirt?
6. Why are the t-shirts soaked in sodium carbonate (soda ash) prior to dying?
7. Write the chemical formula for sodium carbonate:
8. What are the safety protocols the day of tie-dying?
9. Research and describe or draw how to fold your t-shirt for your desired tie-dye spiral pattern:
10. Describe two tips for how to tie-dye a t-shirt with bright colors:
11. Describe the rinsing and drying procedure for finalizing your t-shirt:
12. **Summarize how tie-dying relates to chemistry:**

**You need to complete these lab questions prior to tie-dying on Wednesday.**

**You also need to bring a Ziploc bag (or grocery bag) to hold your dye-soaked t-shirt in on Wednesday.**