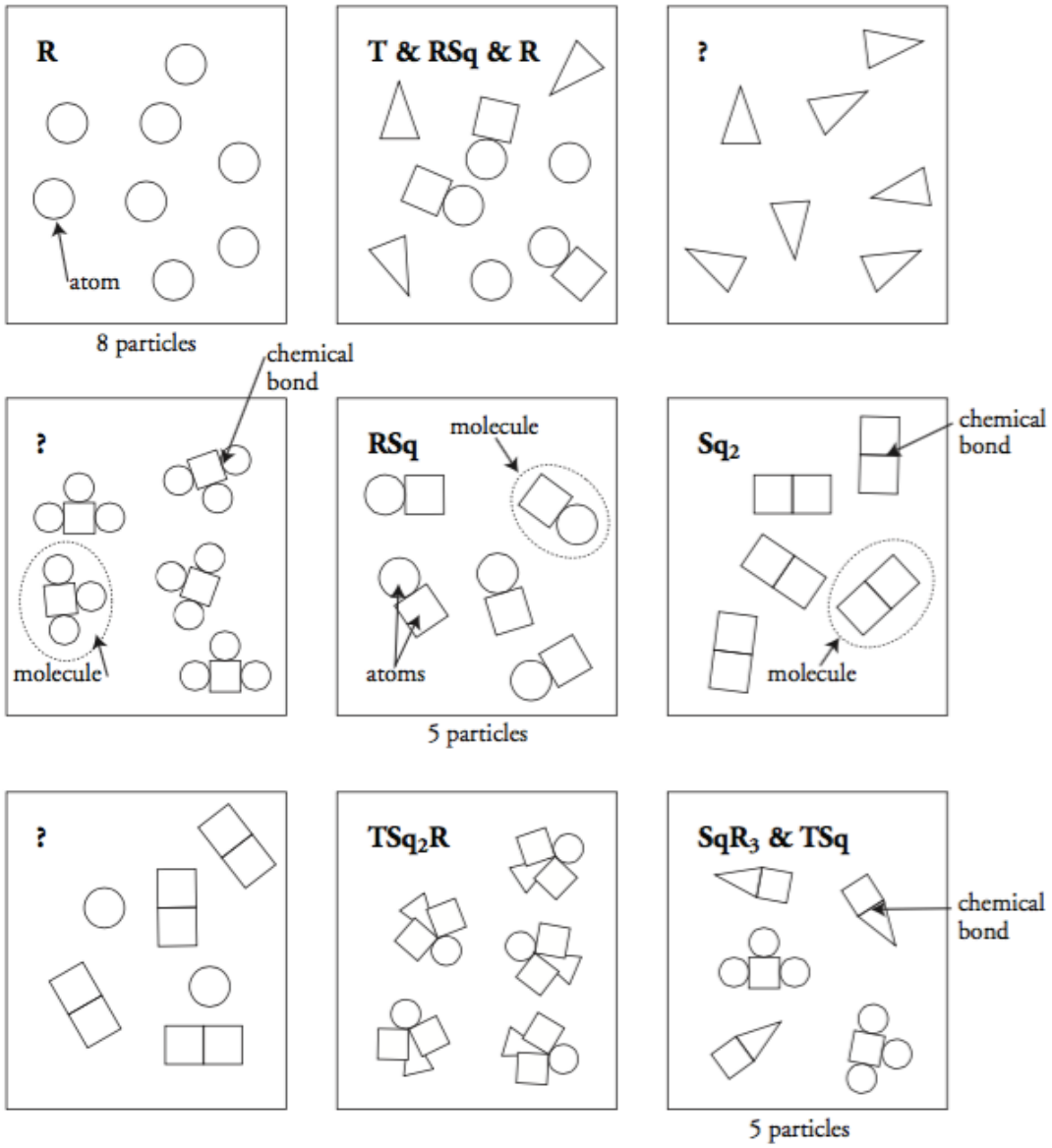
Name: _____ Date: _____

Physical Evidence: Matter and Its Forms

When crime scene investigators arrive on the scene of a crime, the site will usually have been secured from contamination by the first officers to arrive at the location. The site will hold evidence of the criminal's physical presence at the scene, and some evidence from the scene will have been carried away by the criminal. The evidence might consist of carpet fibers, pet hair, blood, or gunshot residues. All of this evidence is a form of matter. In broader terms, **matter** is the physical material of the universe. Analysis of evidence requires an understanding of the properties of matter and the state in which it can exist. R_3Sq

Model 1 – Atoms, Particles, and Molecules



1. Locate the circled molecule of **RSq** in Model 1.
    a. Find a second **RSq** molecule and circle it.
    b. How many atoms are in a molecule of **RSq**?

2. Find and circle a molecule of **TSq_2R** in Model 1.
    a. How many different types of atoms are found in a molecule of **TSq_2R**?

    b. How many **Sq** atoms are in a molecule of TSq_2R?

3. Locate the drawing labeled **SqR_3 & TSq** in Model 1.
    a. How many different types of atoms are found in the sample of **SqR_3 & TSq**?

    b. How many different types of molecules are found in the sample of **SqR_3 & TSq**?

4. When two atoms are touching in the drawings of Model 1, what is holding the atoms together?

Review your answers above in preparation for a mini-quiz on what you have learned about the codes and what they represent.

5. Compare the codes listed at the top of each drawing in Model 1 with the shapes in that box. In Model 1 there are three drawings that are labeled with a question mark. Write codes to properly label these drawings.

6. Ask your teacher for an envelope of laminated Model 1 samples. As a team, sort the drawings into two groups
    - One group where all the particles in the drawing are identical
    - Second group in which the drawings contain more than one type of particle

Read This!

Matter is classified as a **pure substance** when all of the particles are identical. Matter is classified as a mixture if there are different types of particles present.

7. Identify which drawings from Question 6 are pure substances and which are mixtures. List the codes for the drawings in the appropriate places below.

Pure Substances		**Mixtures**
_____	_____	_____
_____	_____	_____
_____	_____	_____

8. How are the codes (chemical formulas) for pure substances different from those for mixtures?

9. As a team, take the set of pure substance drawings from Question 7 and sort them into two new groups, those containing only one type of atom and those with two or more types of atoms.

Read This!

Elements are defined as pure substances made from only one type of atom. **Compounds** are defined as pure substances made from two or more types of atoms.

10. Identify which drawings from Question 9 are elements and which are compounds. List the codes for the drawings in the appropriate places below.

Elements	**Compounds**
_____	_____
_____	_____
_____	_____

11. How are the codes (chemical formulas) for elements different from those for compounds?

Review your answers above in preparation for a mini-quiz on using chemical formulas and pictures to identify an element, a compound, or a mixture.