Atoms, Molecules, Particles – Oh My!
What do we call the smallest pieces of matter?

Why?
Look at the things in this room. They are all matter. If you looked at these things with a microscope, could you see the individual pieces they are made of? No, the building blocks of matter are too small to see with most microscopes. However, it is often useful to imagine them. In this activity you will explore different names that we use for the smallest pieces of matter.

Model 1 - Atoms, Particles and Molecules

1. In Model 1 there are three types of atoms. **Some are labeled, some are not.** Describe or draw below the shapes that are used in the model to represent the three types of atoms.

2. Match the symbols below with the three types of atoms used in Model 1 by drawing the corresponding shape.

   T  R  Sq
3. In Model 1 there are three objects labeled as molecules.
   a) How many atoms are in a molecule of RSq?
   b) How many atoms are in a molecule of Sq?

4. Refer to Model 1.
   a) How many atoms are in a molecule of TSqR?
   b) How many Sq atoms are in a molecule of TSqR?

5. Can a molecule be made of only one atom? Answer this questions individually then come to a consensus as a team. Support your answer with evidence from Model 1.

6. According to Model 1, when several atoms are grouped into a molecule, what holds them together?

7. Fill in the blanks to complete the definition of a molecule.
   A molecule is a group of two or more __________ held together by a ________________.

8. As a team, discuss the following questions and record your answers. Be prepared to support your answers using evidence from Model 1.
   a) Can a particle be a single atom?
   b) Can a particle be a molecule?

9. How many particles are in the drawing representing TSqR in Box 2 of Model 1?

10. Compare the codes listed at the top of each drawing in Model 1 with the shapes in that box. What do the small numbers (subscripts) in the codes represent?

11. In Model 1 there are two boxes that are labeled “?”. Label the boxes in Model 1 with their codes.

12. Using the symbols in Model 1, draw at least 4 particles of each of the following. Label three atoms and two molecules in your drawings.

   T₃  SqT₂  SqR₄
Exploring Roles Used in POGIL Teams

Why?

Many people respond negatively to working in groups, based on previous experiences as members of a poorly functioning and/or ill-planned group. The dynamics of the group can quickly become an obstacle to learning. In a process-oriented, guided-inquiry learning (POGIL) environment, the greatest overall learning occurs when each group is functioning well as a team. To ensure effective functioning, you will take on a specific role and perform that role’s duties in addition to completing the day’s guided inquiry activity. You will change roles frequently (often every day), so that you become proficient at performing any role in any team setting. In this short activity, you will explore the duties of each role and will consider how these roles interact to create an effective and efficient group learning experience.

Before starting this activity, you will be assigned one or two roles. Circle your role(s) in the table below (Model 1). Spend 2 minutes reading and becoming the expert ONLY on your assigned roles. You will perform all the tasks of your role(s) as you work with your team to complete the activity. You will also provide evidence from your role’s tasks to help answer the questions.

Model 1
An Example of Roles used in POGIL Classrooms

<table>
<thead>
<tr>
<th>MANAGER</th>
<th>REFLECTOR</th>
</tr>
</thead>
<tbody>
<tr>
<td>“Come on, let’s get moving. No slacking.”</td>
<td>“Let me see if everyone has finished this question before we move on.”</td>
</tr>
<tr>
<td>Keep track of time, so your team can meet the goals for the day.</td>
<td>Participate actively.</td>
</tr>
<tr>
<td>Keep group focused on their tasks.</td>
<td>Make sure everyone comes to an agreement on most answers before anyone writes anything down.</td>
</tr>
<tr>
<td>Participate actively.</td>
<td>Double-check work before you and team members record anything.</td>
</tr>
<tr>
<td>Reach an agreement with your team members before you write anything down. Write answers that are clear and complete.</td>
<td>Observes and reports on team dynamics and behavior while learning.</td>
</tr>
<tr>
<td>Make sure everyone does his or her assigned job.</td>
<td></td>
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<table>
<thead>
<tr>
<th>PRESENTER</th>
<th>RECORDER</th>
</tr>
</thead>
<tbody>
<tr>
<td>“Here’s what my group found out…”</td>
<td>“Let’s stop for a minute so I can write down our conclusion in the report.”</td>
</tr>
<tr>
<td>Participate actively.</td>
<td>Participate actively.</td>
</tr>
<tr>
<td>Reach an agreement with your team members before you write anything down. Write answers that are clear and complete.</td>
<td>Reach an agreement with your group members before you write anything down. Write answers that are clear and complete.</td>
</tr>
<tr>
<td>Ask questions of the teacher; report out your team’s data to the class; interact with other teams to compare results.</td>
<td>Write answers that are clear and complete.</td>
</tr>
<tr>
<td>Write answers on the white board, under the document camera, on a flip chart page, or wherever the teacher directs.</td>
<td>Position your written work on your desktop so that the teacher can see your answers without interrupting your team.</td>
</tr>
</tbody>
</table>

The manager can choose one team member to read the activity out loud.
Use the information from Model 1 to answer the following questions. Be sure you reach a consensus with your team before you write down any answers.

1. Which role is responsible for keeping the team moving at a good pace?

2. Which role is responsible for slowing the team down so everyone can reach an agreement and write down the same answer?

3. List two responsibilities that every role has in common:

4. Circle the only two people who will need to move around the room during class.

   Recorder  Manager  Reflector  Presenter

5. Which two roles are most likely to come into conflict as they perform their duties?
   As a team reach a consensus. Explain your answer in a complete sentence.

Extension Questions

6. Describe 1 – 2 ways that using specific roles might help teams to function more effectively to help every team member learn. Have your spokesperson be ready to present your ideas to the class.