Introduction to the Teacher Agendas

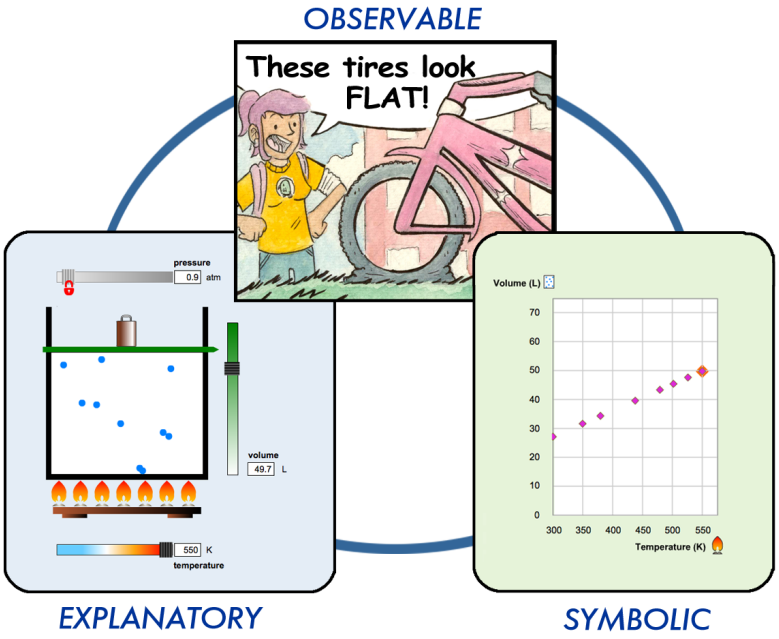
The Teacher Agendas are resource materials designed to provide you with a plan of action for integrating the CREATE Molecules & Minds Chemistry Simulations into your curriculum using the Science Detective's Notebook.

All Molecules & Minds simulations model chemistry concepts that are informed by kinetic molecular theory (KMT).

Molecules & Minds simulations use everyday experiences to explore and explain chemistry concepts. Our simulations provide multiple levels of representation of each content area. The levels of representation we use have been identified by studies of learning in chemistry as observable (phenomenological), explanatory (particulate), and symbolic (communication).

Observational	Everyday phenomena that can be observed or experienced
Explanatory	Characteristics of particles that can explain the observed phenomena
Symbolic	Mathematical or symbolic relationships between variables

Chemistry experts use these levels of representation all the time and move seamlessly between the levels as they discuss a specific phenomenon. However, studies of chemistry classrooms have shown that the symbolic level is the one used most often. Our simulations take students through all levels, so they can begin to be comfortable moving between these levels.



Our simulations apply these concepts:

1. Uniform distribution of particles
2. Constant motion of particles
3. Particle motion is affected by heating and cooling
4. Empty space between particles

Students using our simulations are introduced to the following ideas:

1. Particles, atoms, and molecules do not increase in size when they are heated
2. Atoms/molecules of the same substance are the same
3. Atoms behave in consistent and predictable ways
4. Mass is a characteristic of atoms/molecules
5. Atomic/molecular mass is generally consistent for a specific substance/element/compound

The recommended plan of action sequence is as follows:

1. Diffusion Simulation lesson plan (Science Detective's Notebook #1)
2. Diffusion demonstration lesson plan (Diffusion Lab Notebook)
3. KMT simulation lesson plan (Science Detective's Notebook #2)
4. KMT demonstration lesson plan (KMT Lab Notebook)
5. Gas Laws simulation lesson plan (Science Detective's Notebook #3)
6. Gas Laws demonstration lesson plan (Gas Laws Lab Notebook)
7. Phase Change simulation lesson plan (Science Detective's Notebook #4)
8. Phase Change laboratory activity plan (Phase Change Lab Notebook)

Day 1	*Day 2*	*Day 3*	*Day 4*	*Day 5*
Diffusion ▪ Simulation	**Diffusion** ▪ Demo/lab	**Kinetic Molecular Theory** ▪ Simulation	**Kinetic Molecular Theory** ▪ Demo/lab	**Gas Laws** ▪ Simulation
Day 6	*Day 7*	*Day 8*	*Day 9*	*Day 10*
Gas Laws ▪ Demo/lab	**Phase Change** ▪ Simulation	**Phase Change** ▪ Demo/lab	(Extra day if needed)	(Extra day if needed)

Molecules & Minds simulations and curriculum materials are available at:
www.create.nyu.edu/mm