Learning Design Sequence

VisChem

△ RESOURCES	▢ TASKS	◯ SUPPORTS
1. Lab-level phenomenon as video (CD or tape) or live demo	**1. Observing:** Students write observations for lab-level phenomenon	1. Lecturer introduces concept with an exemplary reaction or substance property in lecture or tutorial
	2. Describing/drawing: Students draw molecular-level representations of substance or reaction, and describe it in words to explain observations	2. Lecturer discusses conventions required for representation
2. Student's representation	**3. Discussing:** Other student(s) gives feedback on student's representation	3. Lecturer focuses student attention on identifying *key features* in representations that explain observations
3. VisChem molecular-level animations on CD or tape	**4. Viewing:** Student sees chemical phenomenon portrayed as a VisChem molecular-level animation – first without, then with narration	4. Lecturer presents animation – first without, then with narration, to assist students to identify *key features*
	5. Reflecting: Student reflects on differences between animation and drawings; discusses discrepancies with partner; amends own drawings	5. Lecturer points out common misconceptions, and asks students to amend drawings to incorporate *key features*
4. Follow-up Online interactive multimedia resources	**6 . Relating:** Student links the three thinking levels together by annotating handout and/or seeing other examples	6. Lecturer summarises the relationship between the lab-, molecular- and symbolic levels. Students are given a 1 page hand-out summarising links between levels.
	7. Adapting: Student is shown an analogous substance or reaction; then draws a representation and receives feedback	7. Lecturer encourages transfer of mental model to new, but analogous examples.

40-min session in lecture or tutorial

same or later session, or assessment item

Intended Learning Outcomes:

• Focus attention on *key features* of prior mental models of substances and reactions at the molecular level.

• Enrich, develop or amend mental models to account for lab-level observations.

• Link mental models to the chemical symbolism used in chemistry.

• Use these mental models to understand concepts requiring a molecular-level perspective.