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CHEM 411: Lab: Introductory Chemistry for the Life Sciences
Concept Mapping in the General Chemistry Lab
Assessment Goals

Are individual students **activating prior knowledge**?
Are they **transferring knowledge between modules** within
the course as it progresses?
Instructor goals:
• Assess individual understanding

Student goals:
• Recall previous concepts
• Integrate new material with old
• Build appropriate knowledge framework

Implementation: During Lab

1. Whiteboard lectures organized into a concept map
2. Students build on their existing map
3. Student maps quickly reviewed during lab time

✓ No additional time cost
✓ No changes to grading
✓ Instant feedback for students and instructor
Acids & Bases

HCl
Strong acid

LiF
Lithium fluoride

Na₂SO₄
Sodium sulfate

H₂O
Monatomic

Position on periodic table

Ionic bond
Covalent bond

Compounds

Element

# e charge decided by group
Implementation: Final Review

Students sort review questions onto their maps
• Decide what kind of problem it is
• Transfer-appropriate practice for exam

I don’t know where to start...
Chemistry Example: ”p”

What do pH and pKa have in common?

- Different concepts
- Shared mathematical meaning
Generalization:

\[ p(\text{anything}) = -\log(\text{anything}) \]

- Clarifies numerical operation
- Allows student to focus on concepts
What You Might Assess

• Course-related knowledge and skills
  • Prior knowledge
  • Minute paper
  • Muddiest point
  • Concept maps

• Learner attitudes
  • Self-confidence
  • Goal ranking and matching