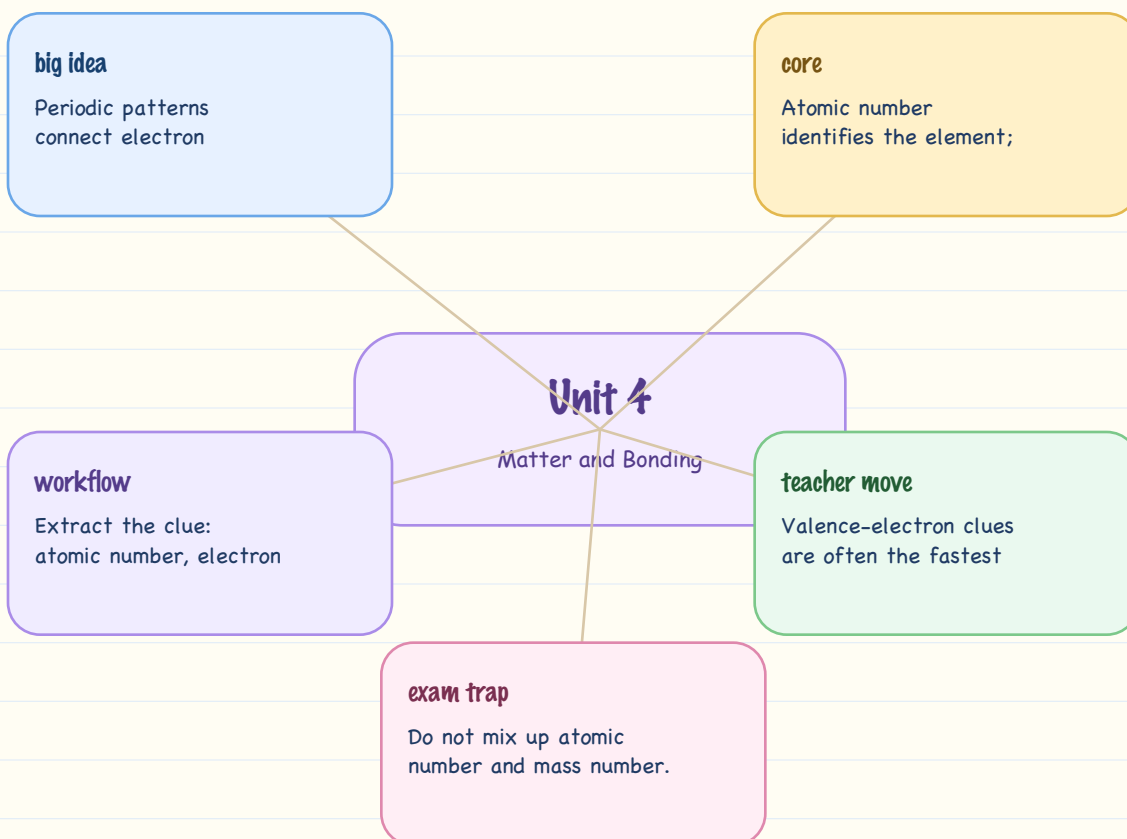


Unit 4 Visual Notebook

Atomic Structure, Periodic Trends, and Bonding

DISTILLED FROM VIDEO

12 lessons, P52-P63. Diagrams summarize the same source-locked workflows.



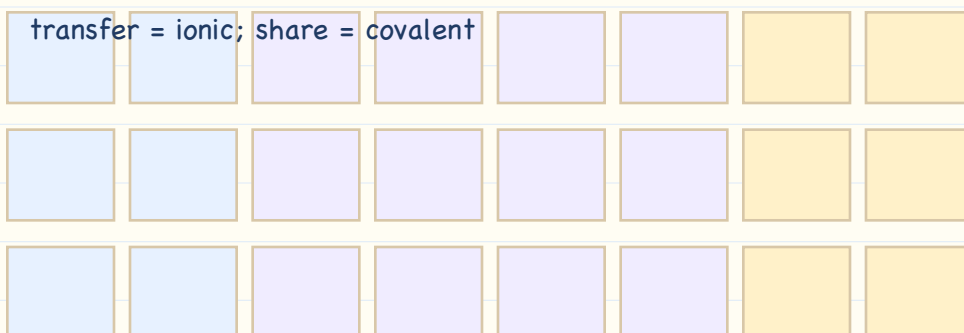
Visual Strategy

periodic clues → group / period / valence electrons

atomic number = protons

mass number = protons + neutrons

nonmetallic



metallic

Teacher routine

- Translate each clue one at a time.
- Valence-electron clues are often the fastest.
- Do not confuse isotope change with element change.

Cornell Notes

cue

Core idea

Core idea

- Atomic number identifies the element; mass number tracks protons plus neutrons.
- Nuclides and isotopes have the same proton count but different neutron counts.
- Period and group positions reveal electron-shell and valence-electron patterns.

cue

Workflow

Workflow

- Extract the clue: atomic number, electron layers, valence electrons, group, or period.
- Translate the clue into a periodic-table position.
- Use nearby trends to compare properties.
- For inference questions, test one clue at a time instead of guessing.

cue

Teacher moves

Teacher moves

- Valence-electron clues are often the fastest way to identify main-group elements.
- Connect bonding type to electron transfer or sharing.
- For periodic inference, translate each clue into group, period, or electron-shell information.
- Molecular polarity needs both bond polarity and molecular shape.

Cornell Notes

cue

Common traps

Common traps

- Do not mix up atomic number and mass number.
- Do not treat isotope identity as a change in the element.
- For short-period inference, special electron structures can narrow the answer quickly.
- Bonding questions often require both formula reading and periodic reasoning.

Example Cards

example 1

Unit 4 isotope and element inference, P52-P63

Infer element identity from particles

1. Atomic number is the proton count.
2. An atom with 17 protons is chlorine.
3. If the mass number is 35, neutrons = $35 - 17 = 18$.
4. Changing neutrons changes the isotope, not the element.

Answer: Chlorine-35, with 18 neutrons.

example 2

Unit 4 bonding clips, P58-P59

Bond type from electron behavior

1. Metal + non-metal usually indicates electron transfer.
2. Two non-metals usually indicates electron sharing.
3. Transfer gives ionic bonding; sharing gives covalent bonding.
4. Use the periodic-table position as the first clue.

Answer: NaCl is ionic; Cl₂ is covalent.