

# Bounded Functional-Group Reactivity Patterns

g12\_u01\_w04

## Purpose and boundary

Compare original fictional structure cards as models of functional-group features and possible outcomes. No reaction, synthesis, chemical handling, procedure, product selection, or real-world prediction is requested.

**Targets:** I can identify a functional-group feature, compare stated model patterns, and separate a structure-based claim from an unsupported claim. **Vocabulary:** functional group, alcohol, carbonyl, carboxyl, amine, alkene, aromatic, structure–property relation. **Prerequisites:** line structures, bonding, polarity, formal charge, electron-accounting models.

Each prompt refers only to a supplied fictional card. A card can name a feature but cannot establish a procedure, rate, safety, or real-world outcome.

1. In a structure card, what is a functional group?  
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2. Name the feature commonly represented by an oxygen bonded to hydrogen in an organic framework.  
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3. Name the feature commonly represented by a carbon double-bonded to oxygen.  
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4. Name the feature commonly represented by a carbon–carbon double bond.  
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5. Why can one molecule contain more than one functional-group feature?  
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6. What does a line-angle drawing intentionally omit or compress?  
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7. A fictional Card A has an oxygen-containing feature; Card B does not. State one observation about the drawings that is supported.  
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8. Why does identifying a feature not by itself predict a safe use or a reaction outcome?  
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9. Explain the difference between a functional-group label and a complete molecular identity.  
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10. What additional information would be needed before comparing two structures' behavior beyond a simple pattern card?  
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11. A card labels a carbonyl feature. What structural relation must be visible for that label to fit?
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12. A card labels an amine-like feature. What atom is central to the label, and why might neighboring bonds matter?
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13. Two cards share an alkene feature but have different overall frameworks. Give one reason their complete behavior need not match.
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14. A student says, "This feature causes the result." Rewrite the claim with an appropriate model limitation.
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15. Which is stronger evidence: a feature label alone or a controlled, relevant measurement? Explain.
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16. A fictional card has two oxygen-containing features. Why should a reader avoid treating it as two independent one-feature molecules?
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17. State one property claim that a line drawing alone usually cannot settle.
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18. Design a text annotation that makes a functional-group diagram usable without color vision.
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19. Compare a structural pattern with a mechanism model: what does each help represent, and what does neither prove?
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20. Write a two-sentence evidence-bounded interpretation of a fictional card showing an alkene and a carbonyl feature.
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