DIAGRAMMING

Logic Games

Logic Games test your ability to understand rules and see how they come together. For most students, the ability to diagram these rules and utilize the diagram to see how rules relate are the key determinants of Logic Games success.

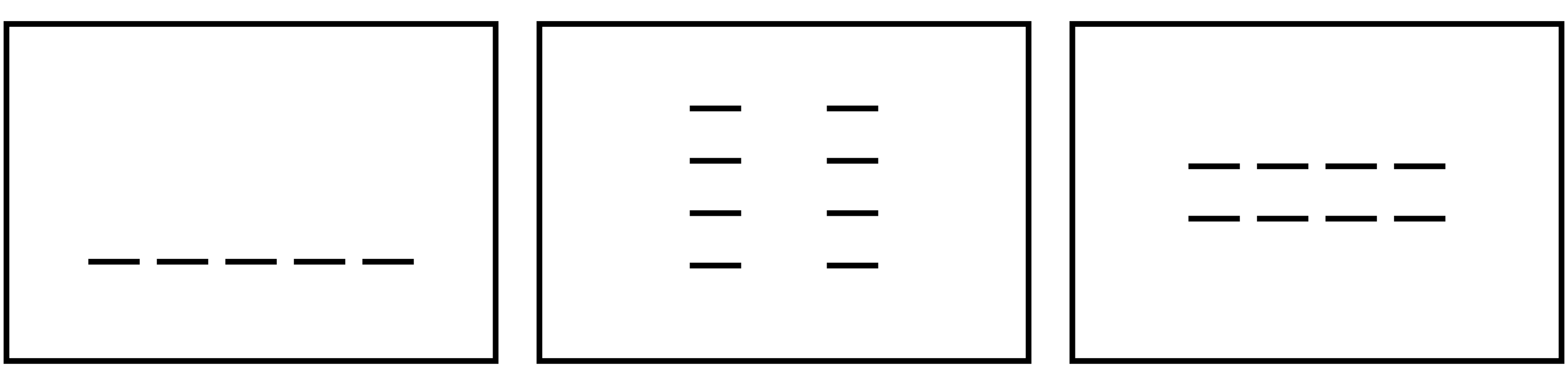
When you start preparing for the Logic Games section, it can seem that there are tons of different types of games, and an infinite number of rules that the test can throw your way. However, the truth is that there is great consistency to the types of games that appear on the exam, and a limited number of rules that you need be comfortable with. If you can master the situations and notations listed on this page (which is of course easier said than done) you'll have the tools to diagram nearly everything that may appear in a game on test day.

Quick Review of Logic Games Basics

(1) All games are about assigning elements to positions
(2) 2/3 of all games involve ordering
(3) 1/2 of all games involve grouping
(4) Games can be complicated by subsets
(5) Games can be complicated by mismatches between positions and elements
(6) Rules can be complicated by conditionals
(7) Rules can be complicated by or situations

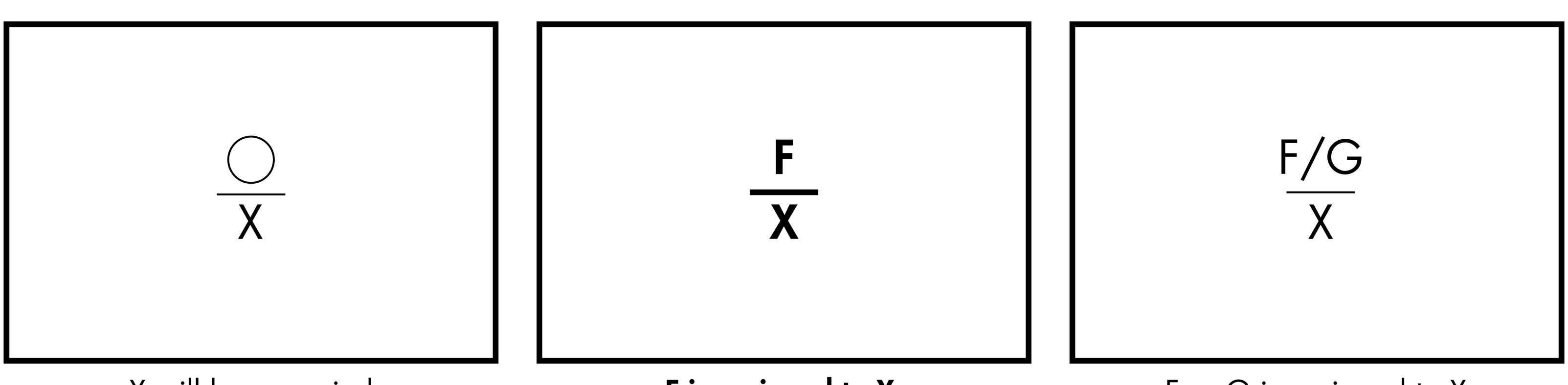
For more on the basics, please see the Logic Games Deconstructed infographic, the Conditional Logic infographic, or the free Logic Games introductory lesson.

Common Bases

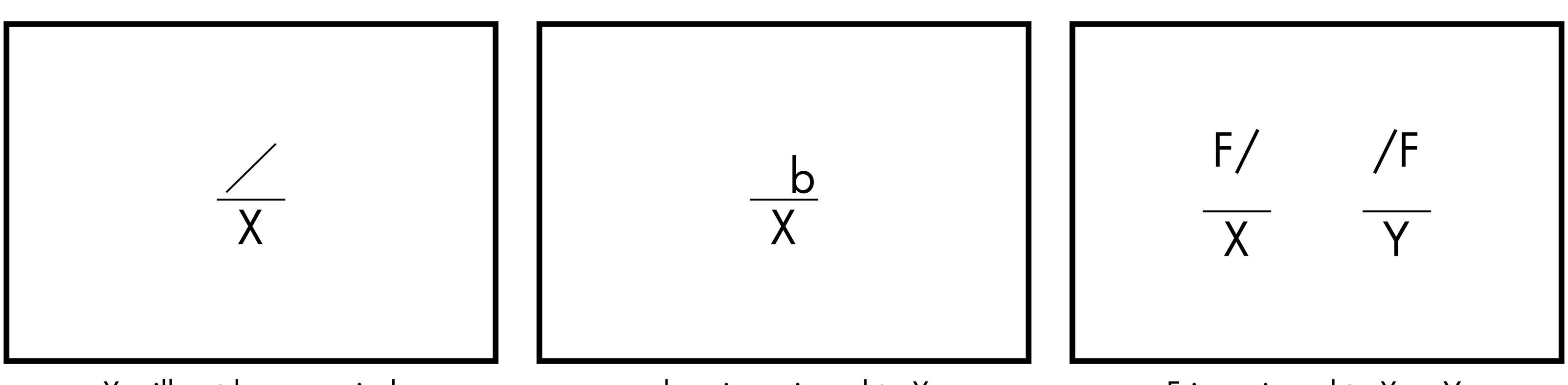


ordering | **grouping** | **both**

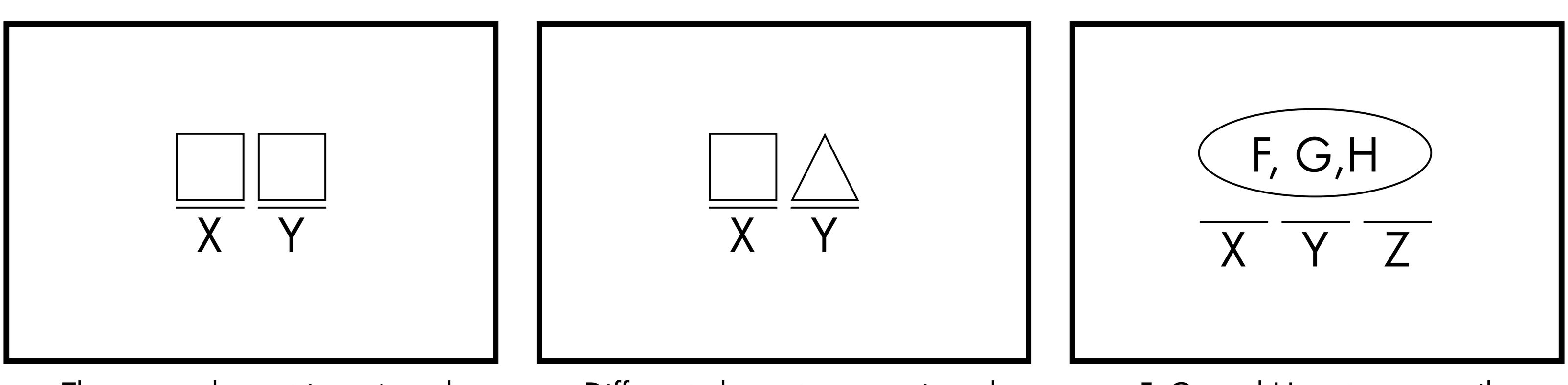
Assignment Rules



X will be occupied | **F is assigned to X** | F or G is assigned to X

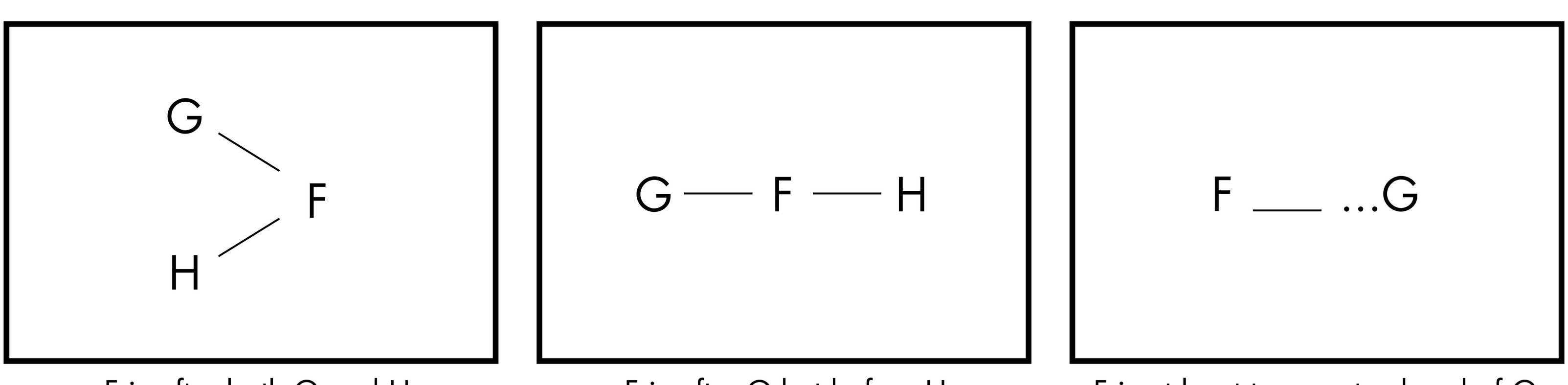


X will not be occupied | a boy is assigned to X | F is assigned to X or Y

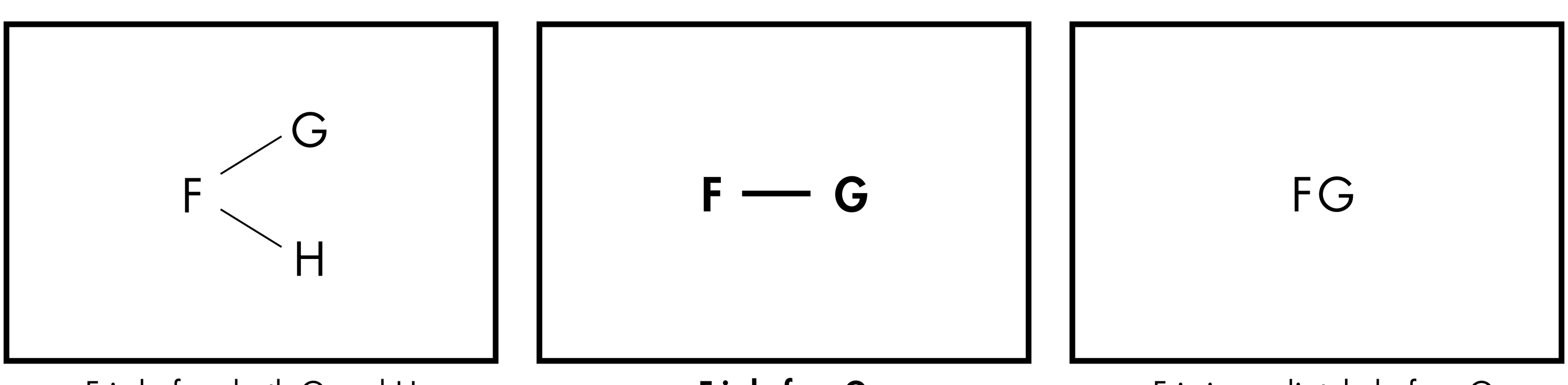


The same element is assigned to X and Y | Different elements are assigned to X and Y | F, G, and H, not necessarily in that order, fill spots X, Y, and Z

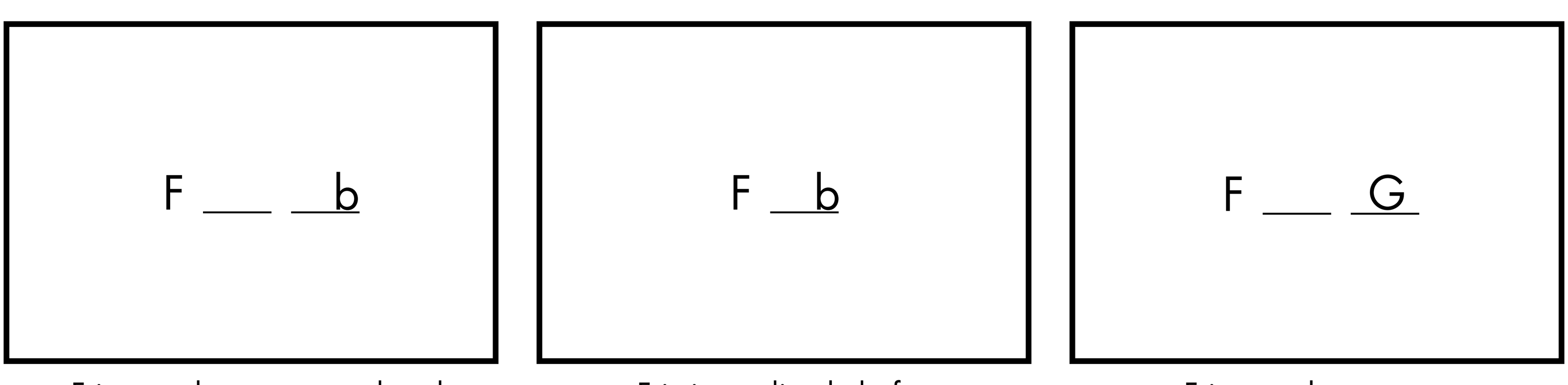
Ordering Rules



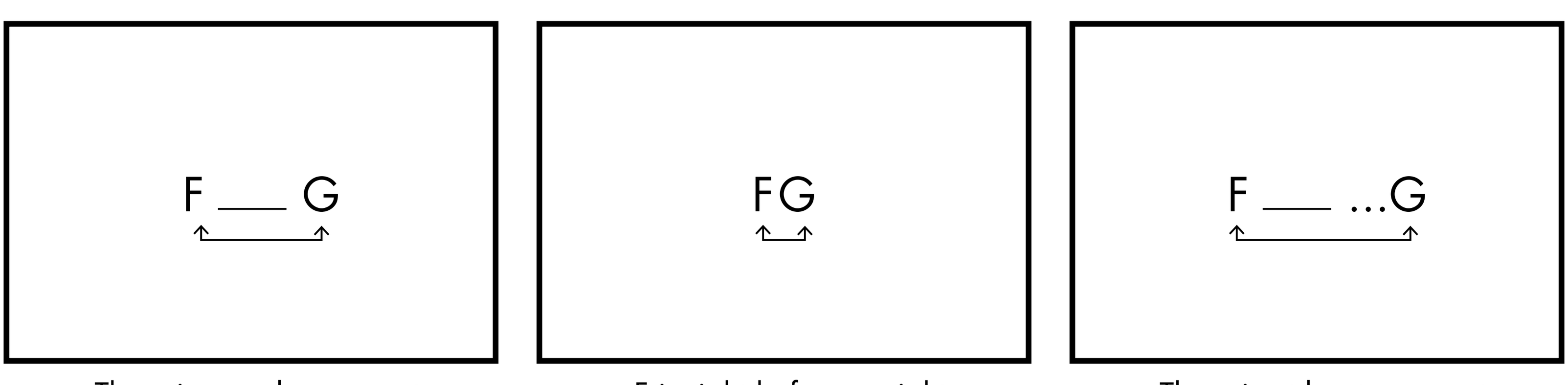
F is after both G and H | F is after G but before H | F is at least two spots ahead of G



F is before both G and H | **F is before G** | F is immediately before G



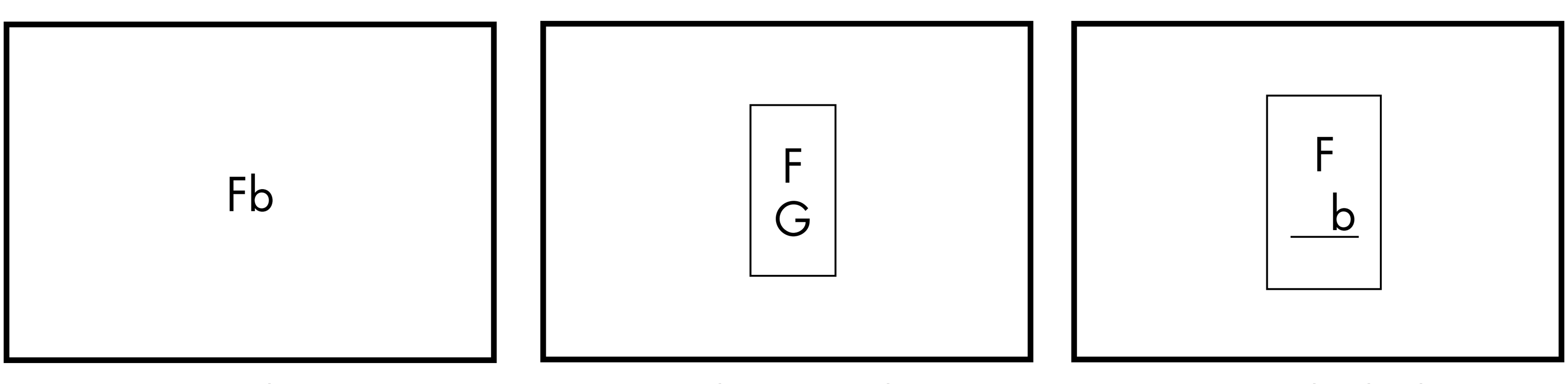
F is exactly two spots ahead of a boy | F is immediately before a boy | F is exactly two spots ahead of G



There is exactly one spot between F and G | F is right before or right after G | There is at least one spot between F and G

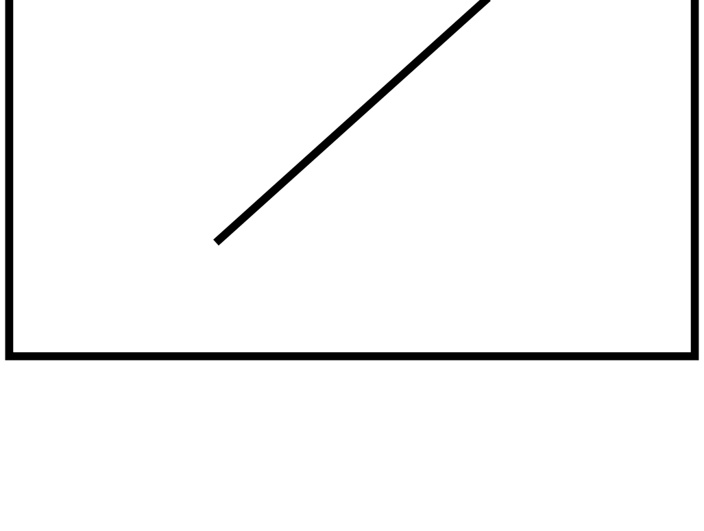
Subset

Grouping



F is a boy | F and G are together | F is teamed with a boy

"Not"



Any of these rules can be turned into a "not" rule by crossing out the element. In general, when you know that elements will not go in positions, yo want to notate that above or below the position, rather than in the slot itself, so that you can still "picture" the position as being open.

The Meaning of "Or"

Rules can also be brought together through the use of "and" and "or." The meaning of "and" is simple and clear, but the meaning of "or" is a bit more complex.

Keep in mind that, unless there are other considerations, the word "or" does not, in and of itself, exclude the possibility of "both." Thus, if a rule states "F or G will be assigned to the management team," it is entirely possible that *both* F and G can be assigned to the management team.

Also keep in mind that in many instances there are natural restrictions that prevent "or" from including "both." If we are told each person can have one locker, then told F can have either "locker 2 or locker 3," we will know that F getting both is not a possibility.

Conditional Rules

Nearly any pair of the rules mentioned above can be turned into a *conditional* rule—that is, a rule that is triggered by something else happening. For any conditional rule, it's necessary to understand the rule correctly, understand ways in which it can be utilized, and (perhaps most importantly) ways in which it cannot. You must also account for the fact that every conditional statement yields an inference, known as the contrapositive (please see the Conditional Logic infographic for more information about the contrapositive). You can choose to just track the contrapositive in your head, or on paper, based on the specific situation, but you should always put it down on paper if there is a chance it will be forgotten or mistaken.

We use a simple arrow to represent all conditional rules. Here is the basic notation, along with the common wordings that you will see for the rule. Down below that is an example of a biconditional—a rule that is triggered in both directions.

"M → P" contrapositive "~~P~~ → ~~M~~"

If M, then P
Any with M must have P
All with M have P
No M's are without P's
You can't have M unless you have P
M only if P

"M ↔ P" contrapositive "~~P~~ ↔ ~~M~~"

M if and only if P

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