

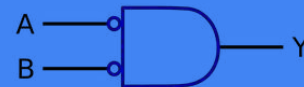
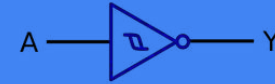
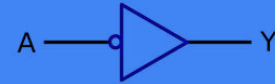
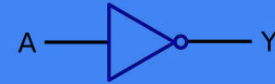
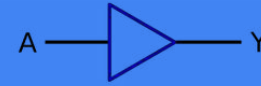
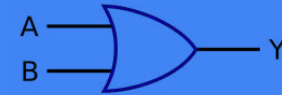
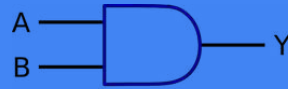
Logic Games Super Review

Overview of the Webinar

- The scope of formal logic on the LSAT
 - Introduction to Conditional Logic
 - Compound Conditionals
 - Contrapositives
 - Fallacies of Conditional Logic
 - A Conditional Logic drill
 - Practical applications for conditional logic
 - Introduction to Grouping Game
 - Grouping Game Drill
- You can learn more using our free online LSAT course:
www.nextsteplsat.com

What is Formal Logic?

- Logic on the LSAT is not nearly this complicated.



What is Formal Logic?

- Formal logic symbolizes relationships expressed through language.
- As we saw on the last slide, this can get pretty complicated!
- You only need to know a handful of ideas



Scope of the LSAT's formal logic

The following topics are *always* tested on the LSAT:

- Conditional Logic
- Contrapositives
- Necessary/Sufficient Propositions

The following topics are sometimes tested on the LSAT:

- “Biconditionals”
- Most/Some/Not All

Introduction to Conditional Logic

Conditional Logic is tested, in some form, on every single modern LSAT.

Conditional Logic is the term for “If – Then” relationships, such as

“If I am in New Hampshire, then I am in New England.”

“If I am not in California, then I am not in San Francisco.”

“If I am in Brooklyn, then I am not in Queens.”

The Conditional Arrow

- The Conditional Arrow is how to express conditionals (if-then) relationships.
- Conditional Arrows **always** employ the same structure:



Using the Conditional Arrow

Let's look back at our first from an earlier slide

- “If I am in New Hampshire, then I am in New England.”
- If New Hampshire → Then New England

But because these terms are constant....

- New Hampshire → New England
- Then use shorthand:



Negatives in Conditional Logic

- “If I am not in California, then I am not in San Francisco.”

There are a few ways to diagram negatives in logic:



Try one on your own

Take a second to try to diagram the final example from an earlier slide:

- “If I am in Brooklyn, then I am not in Queens.”

Introduction to the Contrapositive

- A smart-sounding word
- ...and a concept that appears on every modern LSAT
- Logical Inference
- Every conditional has a contrapositive

How to Find a Contrapositive

Finding a contrapositive involves three steps, in any order:

- Negation
- Reversal
- Switching And/Or

Let's return to our first example: "NH \rightarrow NE"

Contrapositives and Negatives

$NH \rightarrow NE$ becomes $\sim NE \rightarrow \sim NH$

Let's look at our second example: $\sim C \rightarrow \sim SF$

Take a moment on the third example on your own: $B \rightarrow \sim Q$

Simple and Compound Conditionals

Simple Conditionals have exactly 2 terms

Compound conditionals have 3 or more terms.

Those terms are linked with “And” and “Or.” For example

- “If I am in the Twin Cities, then I am in Minneapolis or St. Paul
- “If I’m in a good mood and you’re quiet, then I’ll tell you a story.”

Diagramming Compound Conditionals

- “If you live in the Twin Cities, then you live in Minneapolis or St. Paul”

- “If I’m in a good mood and you’re quiet, I’ll tell you a story”

Contraposing Conditional Compounds

Now we will use all three steps of the contrapositive process:

- Negation
- Reversal
- Switch And/Or

TC → M
or
StP

GM
and → S
Q

Quick Note on “Or”

“Or” has two senses: exclusive and inclusive

- Exclusive: “You can make a left or a right up here, it doesn’t matter which.” This means: Left or Right, *but not Both*.
- Inclusive: “Would you like something to drink or eat?” This means: “Drink or Eat *or Both*.”

The LSAT **always means inclusive Or**. It always means: “Or both”

“You live in Minneapolis or St. Paul” could mean M, StP, or both.

Fallacies in Conditional Logic

Applying all three steps yields the Contrapositive, a **valid** inference
Failing to apply a step will yield a Fallacy, or an **invalid** inference

Let's go back to an old example: $B \rightarrow \sim Q$

Incorrect Reversal (failure to negate)

Incorrect Negation (failure to reverse)

Correct Contrapositive:

Drill!

On the next slide, I'll put 10 conditional statements on the screen.

Please diagram each statement and find the contrapositive.

Drill!

- 1) If the cruise goes to Jamaica, then it won't go to Trinidad.
- 2) If the interview is room #2, then it won't be in rooms #1 or #3.
- 3) All of the students at this law school did well on the LSAT.
- 4) None of my friends are here.
- 5) I can't focus if you're going to play video games or watch a movie.
- 6) All of your employees must wear goggles in order to follow procedure.
- 7) Each of the students achieved a passing mark
- 8) If you are a properly licensed JD and you practice law, you're a lawyer
- 9) You'd be a fool not to take that deal!
- 10) I can bake the cake only if I have eggs and butter

Drill Solutions Part 1

- 1) If the cruise goes to Jamaica, then it won't go to Trinidad.
- 2) If the interview is room #2, then it won't be in rooms #1 or #3.
- 3) All of the students at this law school did well on the LSAT.
- 4) None of my friends are here.
- 5) I can't focus if you're going to play video games or watch a movie.

Drill Solutions 2

- 6) All of your employees must wear goggles in order to follow procedure.
- 7) Each of the students achieved a passing mark
- 8) If you are a properly licensed JD and you practice law, you're a lawyer
- 9) You'd be a fool not to take that deal!
- 10) I can bake the cake only if I have eggs and butter

Where will you face this on the LSAT?

Logic games and Logical Reasoning

In LR: Formal Logic prompts

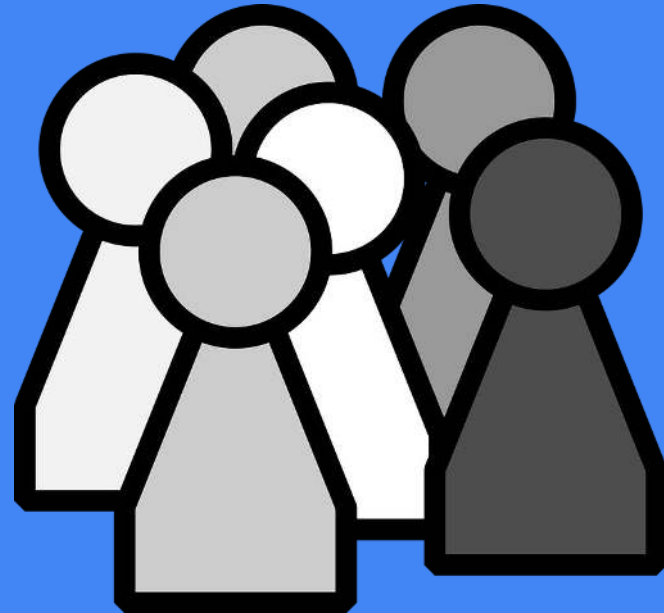
“All of the students in the history major are in the history club. All of the members pay annual dues and attend monthly meetings.”

In LG you'll see conditional logic all over the place, most frequently in...

Grouping Games!

Grouping Games ask you to **sort**.

More than any other of the major game types, grouping games heavily feature conditional logic in the rules.



Basic In/Out Grouping

Nine musicians – M, N, O, P, R, S, T, U, and X – are auditioning for an ensemble. Five will be selected to join. The following conditions apply:

Two Separate Groups

Of six applicants – G, H, I, J, K, and M – four will attend Birmingham Law School and two will attend Chester Law School. No student attends both, and every student must attend one. The following conditions apply:

Fixed Number v. Variable Number

Let's tweak that last example a little.

Six applicants – G, H, I, J, K, and M – will attend Birmingham Law School and two will attend Chester Law School. No student attends both, and every student must attend one. At least one student attends each law school. The following conditions apply:

What's different here?

Three or More Groups

Eight members of the Cadwell family – D, E, F, G, H, I, J, K, and L – will stay in three hotels rooms during their vacation. Each hotel room is occupied by at least one family member, and no family member stays in more than one room.

Rules: In/Out Grouping

Nine musicians – M, N, O, P, R, S, T, U, and X – are auditioning for an ensemble. Five will be selected to join. The following conditions apply:

If M is selected, then N is not selected

If O is not selected, then P must be selected

P and R or both selected, or neither is

In: _____

Out: _____

Rules: Variable Number

Six applicants – G, H, I, J, K, and M – will attend Birmingham Law School and two will attend Chester Law School. No student attends both, and every student must attend one. At least one student attends each law school. The following conditions apply:

*If G attends Birmingham, then K must attend Chester
If I attend Chester, then J and M must too*

B: __ () () () ()

C: __ () () () ()

Drill Question Number 1

Seven dogs – S, T, U, W, X, Y, and Z – will be adopted by two different owners, R and Q. Each dog will be adopted by one of the owners, and no dog will be adopted by both. The following conditions apply:

If S is adopted by R, then T is adopted by R

U and W cannot be adopted by the same owner

If X is adopted by Q, then T is adopted by Q

Drill Question Number 2

A law firm is interviewing seven candidates – F, G, H, I, J, L, and M – to fill three positions at the firm. The following conditions apply

If F is not hired, then J and L are hired

If H is hired, then F is hired

M and L must both be hired, or neither is

Drill Question Number 3

Eight books – one on each of agriculture, business, culture, dendrology, economics, fine art, geology, and humanism – will be sorted onto three different shelves. The following conditions apply:

At least two books and no more than three books are on each shelf

The books on fine art and culture must be on the same shelf

If the book on agriculture and dendrology are not together, then the books on economic and business are

Drill Question Number 4

Six mountaineers – M, N, O, P, Q, and R – will form teams of two to climb three peaks – A, B, and C. The following conditions apply:

R cannot climb Peak C

O and R cannot climb the same mountain together

If O climbs B, then P climbs C

If N climbs A, then so does Q

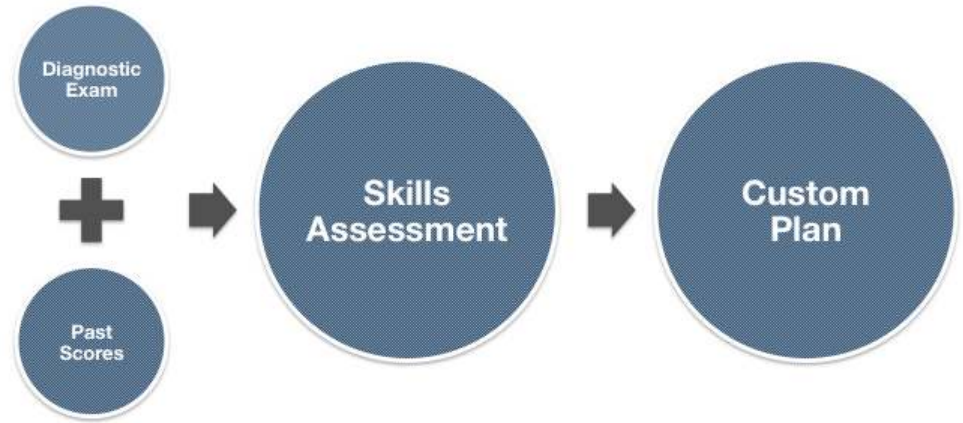
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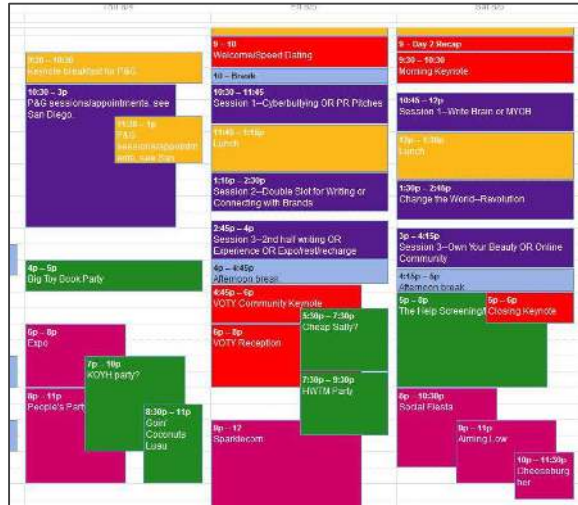
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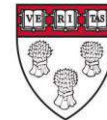
Started self-studying or took the LSAT and need a restart.



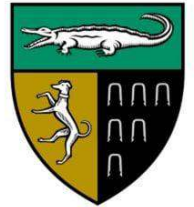
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