

Advice for argument maps

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Argument maps represent reasoning as relations between claims. Mapping arguments can help you understand evidence and arguments by clarifying which claims serve as reasons, and which serve as conclusions. Mapping arguments can also help you to discover implicit premises, because by making your own maps you can see where the gaps are in an argument and make educated guesses about what claims should fill those gaps.

The basics

In an argument map, **conclusions** appear above their reasons. **Reasons** are made up of one or more (often two) **premises**—sometimes called **co-premises** when they function together—which are each represented as separate bullet points. Reasons should **support** conclusions; they do this visually by appearing beneath their conclusions. A reason should always be an answer to the question *Why should I believe the conclusion?* You should always be able to insert premises and conclusions into the following sentences: “Why should I believe that [conclusion]? Well, I should believe it because [premise] and [other premise].”

Not all arguments provide *good* reasons to believe the conclusion, but in most of what we read the reasons will seem pretty good, at least at first. When constructing maps, you should strive to express **valid** reasoning (see “Philosophical Methods,” p. 3).

- e-1 A taco is a sandwich. ⇐ **conclusion**
- Anything that **has a filling surrounded by bread** is **a sandwich**. ⇐ **co-premise**
 - **A taco has a filling surrounded by bread.** ⇐ **co-premise**

Argument maps are **recursive**, meaning that any premise can also be the conclusion of a (different) argument. An argument whose conclusion is also a premise is called a **subargument**. A subargument’s reason is indented one level deeper than its conclusion. Argument maps with many levels should not be read top-to-bottom, but outside-in. The outermost argument is called the **main argument**. Example [e-2] below features five arguments: lines 1–3; lines 3–5; lines 5, 6, and 9; and lines 6–8:

- e-2 A taco is a sandwich. 1
- Anything that has a filling surrounded by bread is a sandwich. 2
 - **A taco has a filling surrounded by bread.** 3
 - **A taco has a filling surrounded by a tortilla.** 4
 - **A tortilla is bread.** 5
 - **A tortilla is a food made from baked flour.** 6
 - A tortilla is made from wheat flour or corn flour. 7
 - Wheat flour and corn flour are kinds of flour. 8
 - Any **food made from baked flour** is **bread**. 9

Can you identify the conclusion of each argument in [e-2]? Which argument is the main argument? Each **co-premise** in a reason should be indented the same amount, and should appear underneath its conclusion. Co-premises do not provide reasons *for each other* (the reasons for a premise should be a subargument). Nor should they provide independent reasons for the conclusion (for many reasons, make many maps).

Three rules for argument maps

No internal reasoning: The conclusion and each premise should be claims (i.e. when you write them down, they are complete, declarative sentences). Normally, claims can express reasoning (e.g. “I’ll bring my umbrella **because** it is raining”) but the point of an argument map is to separate conclusions and premises so we can visualize their relationships. When making a map you should represent reasoning using bullet points, and not within the claims. Avoid words that imply reasoning (e.g. because, since, hence, therefore) when composing conclusions and premises. (**But note:** the expression if... then... doesn’t express reasoning, so it’s fine to use; it is common in premises.)

The rabbit rule: You can’t pull a rabbit out of a hat, and you can’t support a conclusion with concepts that don’t appear in the premises. Every part of the conclusion should be supported by the reason. Consider the following (invalid) argument (the * at the left means something is wrong):

- *e-3 A hotdog is a sandwich.
- A hotdog has a bun.

You might see how to make a valid argument out of these elements, but it’s incomplete. The premise is a true claim about hotdogs, but by itself it doesn’t illuminate why hotdogs *are sandwiches*. So [e-3] violates the rabbit rule.

Holding hands: In order to support a conclusion, premises work together (they “hold hands”). They do this by sharing **key phrases** (marked here in various colors). Generally speaking, if there is an important expression that appears in one claim of the map but no others, you need another claim that features the lonely expression. If you have a complete reason but there’s a premise that doesn’t hold hands, the lonely premise is not needed.

- e-4 A hotdog is a sandwich.
- *A hotdog has a bun.
 - Anything that has a filling surrounded by bread is a sandwich.
 - A hotdog has a filling surrounded by bread.

The second and third premises hold hands with each other, but the first premise has an unpaired key phrase (“has a bun”). It’s not holding hands. So the first premise doesn’t contribute to the reason. We can remove it from the map.

Other essential notes

When you follow the rabbit rule and holding hands, your maps will appear very **repetitive**. That's fine; that the right way to make an argument map. Key phrases should be repeated.

To avoid repetition in prose, authors often state one premise explicitly (perhaps after because... or since...) but leave others unstated. I call an unstated premise an **implicit premise**. You may have to guess what the implicit premise should be, but you can make a good guess using the *rabbit rule* and *holding hands*. Often an implicit premise can be expressed as “if [P] then [Q].”

Some expressions are exempt from the rabbit rule and from holding-hands, so they don't have to be repeated. Understanding the details requires training in formal logic, but as a general rule don't worry too much about repetition with logical words, including:

- **logical connectives:** and, or, not, if...then, only if
- **quantifiers:** all, none, some, anything, everything, any, every
- **modal terms:** can, might, should, must, possibly, necessarily
- **the copula:** is, are, was, were, will be, *etc.*

Examples: Here are more examples of maps that can be fixed by following the rules.

- *e-5 Linda has a beard.
- Linda is a goat.

In [e-5], the key phrase “**has a beard**” in the conclusion came out of a hat. And “**goat**” in the premise doesn't hold hands. But we can fix both of these problems by adding in a premise that combines both missing key phrases: “All **goats have beards.**”

- *e-6 It must have rained.
- The roads are all wet.

When the conclusion and the premises seem to have no elements in common, it might help to add a premise with an “if...then...” structure. For example, [e-6] can be fixed by adding the premise “If **the roads are all wet**, then **it must have rained.**”

Checklist: Once you've put together an argument map, check it by asking yourself these questions:

- ☞ Are all the claims in the map complete, declarative sentences? (**no internal reasoning**)
- ☞ Does every non-logical key phrase appear in at least two different claims? (**rabbit rule** and **holding hands**)
- ☞ Does the map express **valid** reasoning?
- ☞ Check the **key phrases** that are supposed to match across claims. Adjust them so the match is as perfect as possible (with exceptions for grammatical correctness).

A procedure for writing argument maps

If the advice above isn't clear enough for you, here is a procedure that usually works.

☞ First, identify an argument in the text. Let's consider an example as we go:

They'll like that, since it's tall.

☞ Now step back from the text and try to express the argument in your own words. What's the conclusion? What premise(s) are given in the text? Write down the conclusion (at the top) and the premise(s) (underneath, with bullet points). Express each claim as clearly and precisely as possible, so they can be understood without extra context.

The goats will like the picnic table.

- The table is tall.

☞ Now start identifying key phrases. If there are key phrases across claims that mean the same thing, but they're phrased differently in different claims, adjust the language so that they match as closely as possible. But there might not be any key phrases in common. That's okay.

The goats will like **the picnic table**.

- **The picnic table** is tall.

☞ Usually this isn't enough. Look at the key phrases that do not match yet. What do they have to do with each other? You need to specify an implicit premise that explains what the connection is. Remember that you don't have to come up with a *new* reason for the author's conclusion; you just need to fill in the gaps that of the reason you're already working on. Usually at this point there is no need to introduce any new key phrases

e-7 The goats will like **the picnic table**.

- **The picnic table** is tall.
- If something **is tall**, **the goats will like** it.
Or: **The goats will like** things that **are tall**.

That's a complete argument map! Now you should have a list of claims that the author of the argument is committed to, and if you want to evaluate the argument you can ask yourself (1) are all of these claims true? and (2) assuming that the premises are true, is it impossible for the conclusion to be false? If the answer to either of these questions is *no*, then the argument is not sound.

Tips and tricks

Finding arguments in prose: Expressions like *because*, *since*, *after all*, or *for* are often preceded by *conclusions* and followed by *reasons* (when the grammatical complement of *for* is a clause, not a noun phrase). Expressions like *therefore*, *hence*, and *so* are often preceded by *reasons* and followed by *conclusions* (when the grammatical complement of *so* is a clause). But not all arguments are marked this way—the best way to find arguments is to understand the text.

Valid reasoning: The authors we read in this class are thoughtful and careful, so they'll rarely endorse invalid arguments (see "Philosophical Methods," p. 3). However, they will often make false claims (for many reasons, including ignorance, overenthusiasm, and ideology), and unsound arguments.

The best way to learn valid patterns of reasoning is to learn formal logic, but it generally takes a whole semester of practice exercises to master the basics. If you haven't learned logic in another class, you should rely on your own sense of what makes for good reasoning. To help you out, I've provided a list of several common valid forms in my "Philosophical Methods" handout (pp. 4–5).

The bracket trick: Sometimes the arguments we examine include long, complicated claims with lots of abstract expressions. This can be intimidating. But if you map the argument (maybe with several levels of structure, including subarguments), the underlying reasoning is often quite simple. To help see this, you can find complicated expressions that are repeated in several claims and mark them somehow. I've used colored text here; if you don't have different colors to use, you can enclose the repeating expressions in brackets. When you look at the repeated phrases as units, the structure of the argument can become more obvious.

One difficulty with the bracket trick: if you have multiple levels of structure (i.e. if there are subpremises in the map), then you may need to break up claims differently in main argument and the various subarguments—the key expressions might come apart in a different way. That's why many of the examples here don't use the bracket trick consistently across different argument levels. And note that I use the bracket trick here just to make the maps easier to read; you do not need to color-code your work.

Objecting to arguments

Students often find it challenging to develop objections to arguments made by professional thinkers. "They seem so smart! They know so much more than I do! It seems like they covered everything!" But you *do* have the savvy to question and pick apart the arguments we read. Even really good arguments have faults. Argument mapping can make it easier to check your understanding of arguments, and to find their weaknesses.

One reason to uncover implicit premises and make them explicit is to represent the reasoning in an argument more completely. Another reason is that implicit premises are often weak, and trying to put them into words reveals that they're not plausible. Consider the argument that An open face sandwich is a sandwich because it's got the word "sandwich" in it. We can make a map of this argument:

- e-8 An open face sandwich is a kind of sandwich.
- The phrase "open face sandwich" contains the word "sandwich."

And we can make the implicit premise explicit by following the rules above:

- Any phrase that contains the word "sandwich" refers to a kind of sandwich.

Plausibly, that last premise is what makes the original argument valid. It's the principle one relies on when one says An open face sandwich is a sandwich because it's got the word "sandwich" in it. But the hidden premise isn't true! For example, a knuckle sandwich isn't a kind of sandwich. Since one of the premises isn't true, the argument is not sound. If you're seeking a way to question an argument, find the implicit premises and ask if yourself they're true.

Note that [e-8] (when it includes both premises) is a good *argument map*. It's just a map that represents an unsound *argument*.

Alternative notation styles

Normally argument maps involve colored boxes, but it's easier to produce bulleted lists in a word processor so I'm hoping that this method works, too! But if these other visualizations work better for you, you can map in these other ways...

Numbered claims: You can number your claims, adding a new decimal numeral for new levels of structure. I've used brackets below instead of colored text.

- e-1
 - c [A taco] is [a sandwich].
 - c.1 Anything that [has a filling surrounded by bread] is [a sandwich].
 - c.2 [A taco] [has a filling surrounded by bread].

- e-2
 - c A taco is a sandwich.
 - c.1 Anything that has a filling surrounded by bread is a sandwich.
 - c.2 [A taco has a filling surrounded by] [bread].
 - c.2.1 [A taco has a filling surrounded by] a [tortilla].
 - c.2.2 A [tortilla] is [bread].
 - c.2.2.1 A [tortilla] is a [food made from baked flour].
 - c.2.2.1.1 A tortilla is made from wheat flour or corn flour.
 - c.2.2.1.2 Wheat flour and corn flour are kinds of flour.
 - c.2.2.2 Any [food made from baked flour] is [bread].

- *e-3
 - c [A hotdog] is [a sandwich].
 - c.1 [A hotdog] has a bun.

- e-4
 - c [A hotdog] is [a sandwich].
 - c.1 *[A hotdog] has a bun.
 - c.2 Anything that [has a filling surrounded by bread] is [a sandwich].
 - c.3 [A hotdog] [has a filling surrounded by bread].

- e-5
 - c [Linda] [has a beard].
 - c.1 [Linda] is a [goat].
 - c.2 All [goats] [have beards].

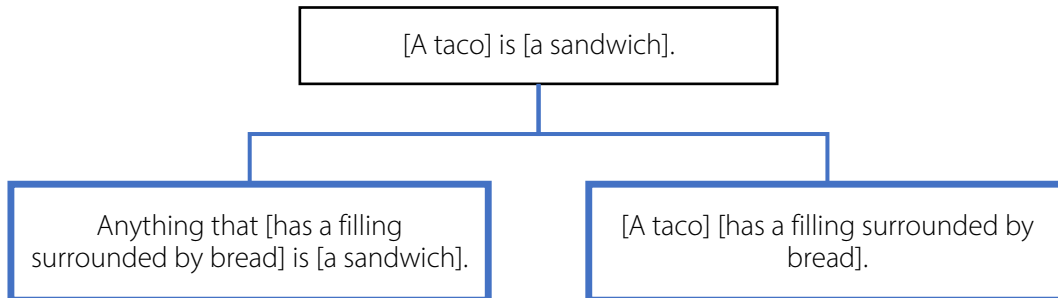
- e-6
 - c [It must have rained earlier].
 - c.1 [The roads are all wet].
 - c.2 If [the roads are all wet], then [it must have rained earlier].

- e-7
 - c [The goats will like] [the picnic table].
 - c.1 [The picnic table] [is tall].
 - c.2 If something [is tall], [the goats will like] it.

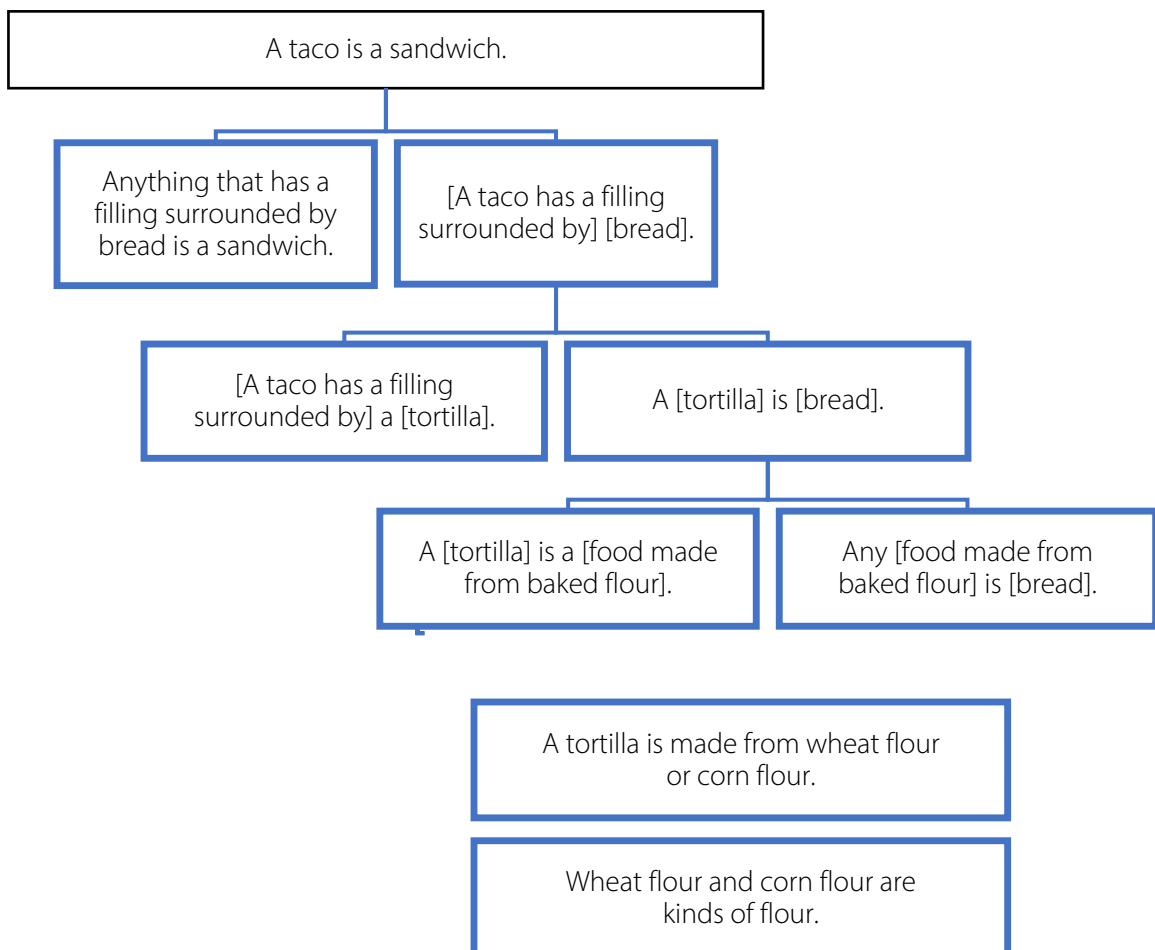
- e-8
 - c An [open face sandwich] is [a kind of sandwich].
 - c.1 [The phrase] "[open face sandwich]" [contains the word "sandwich."]
 - c.2 Any [phrase] that [contains the word "sandwich"] refers to [a kind of sandwich].

Colored boxes: This is the traditional visual notation for argument maps, where **blue or green boxes** indicate supporting premises and **red boxes** indicate premises of an objection (as in [e-8]). To try it in MS Word, click on the “Insert” tab at the top of the screen, click the “SmartArt” menu, click “Hierarchy,” and select the first option: “Organization Chart.” Or draw by hand.

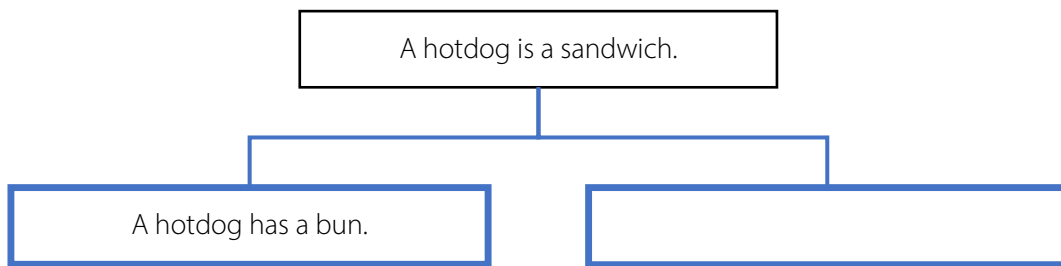
e-1



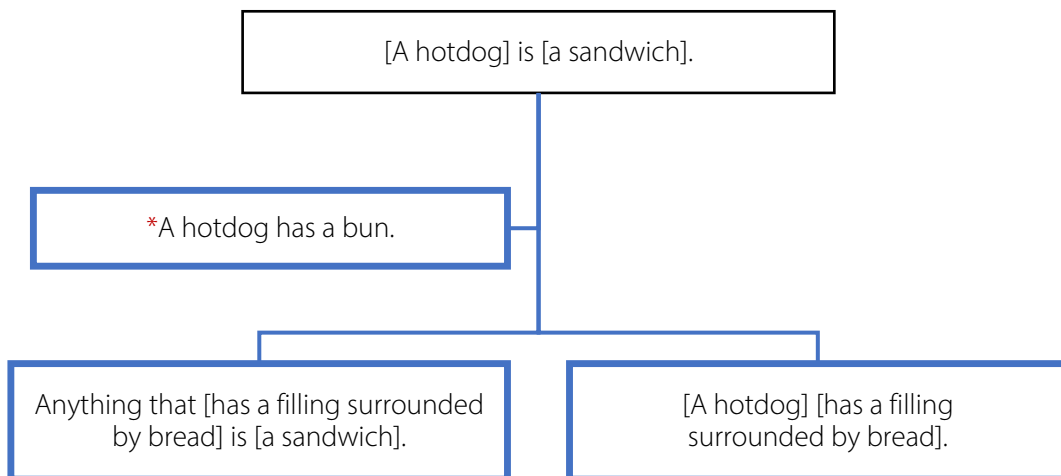
e-2



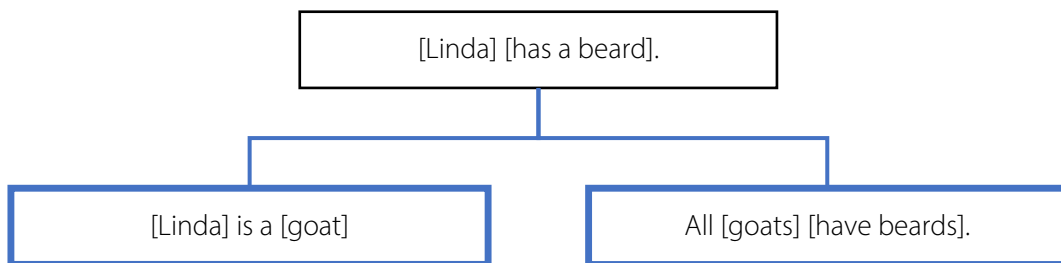
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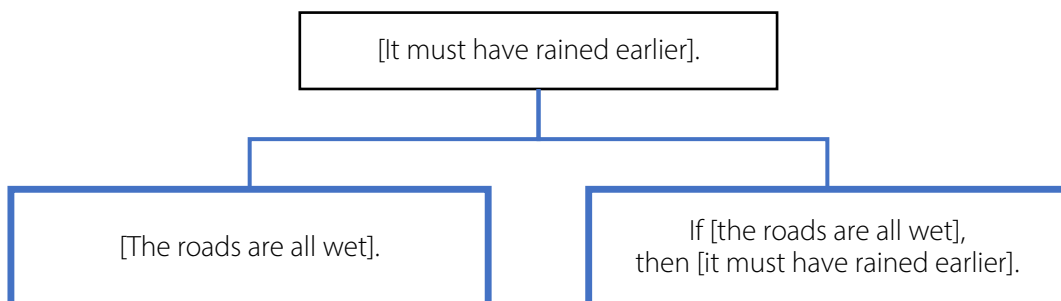
e-4



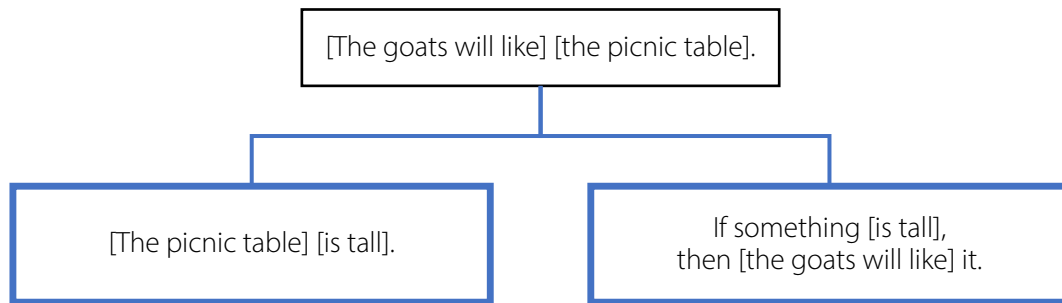
e-5



e-6



e-7



e-8

