What is Argument Mapping?

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Introduction

Argument maps are visual representations of arguments to help people better understand them. A meta-analysis of various studies found that classes with lots of argument map practice are the most effective type of critical thinking class to help improve critical thinking skills.

We want to know how to create and identify good and bad arguments insofar as we want to know what we should believe. Good arguments give us a good reason to believe something. Some arguments fail to give us a good reason to believe something, so we should make sure not to form beliefs on the basis of bad arguments. Argument maps can help us identify good and bad arguments, but they are insufficient to do so. There are many issues that should be studied in order to better understand the difference between good and bad arguments, such as logical fallacies and argument interpretation. Argument mapping might help us better understand informal fallacies and argument interpretation, but the focus here is merely the distinctions argument maps help us understand.

Argument maps are mainly helpful because they help us better understand the distinctions between the following:

1. Premises and conclusions
2. Arguments with one and multiple premises
3. Multiple arguments and multiple premises
4. Simple and extended arguments
5. Supporting arguments and objections
6. Objections to conclusions, premises, and forms of reasoning

I will present examples of argument maps that illustrate each of these distinctions.

Chapter 1: The distinction between premises and conclusions

A rational argument is supposed to give us a reason to believe something is true. Arguments require both premises and conclusions. Premises are statements (true or false sentences) that are used as a reason (or part of a reason) to believe something. Conclusions are statements that are supported by premises.
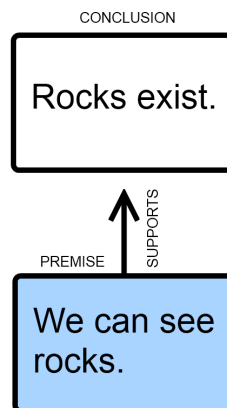
Consider the following argument:

> We should believe that rocks exist because we can see them.

In this case the word 'because' makes it clear that "we can see them" is the reason to believe the conclusion, so it's a premise. The phrase "we should believe that" helps indicate that the conclusion is "rocks exist." We can then rephrase the argument with a statement representing the premise and the conclusion as the following:

1. We can see rocks.
2. Therefore, rocks exist.

An argument map can represent the rephrased version of the argument as the following:

CONCLUSION

Rocks exist.

SUPPORTS

PREMISE

We can see rocks.

Consider the following:

1. Each statement of the argument is put into a separate box and that the word 'therefore' was removed from the conclusion.
2. The argument map is a visual representation of the argument, and there are various features to help us understand how the argument works.
3. The word 'conclusion' is written above the box containing the conclusion, and the word 'premise' is written above the box containing the premise.
4. The box containing the premise is blue.
5. An arrow points from the premise to the conclusion.
6. The word 'supports' is written alongside the arrow.

Chapter 2: The distinction between arguments with one and multiple premises

Although some arguments only have one premise, almost all good arguments actually require more than one premise. The argument above only uses one premise, but it could be considered to be rationally persuasive for those of us who make a certain assumption—that *if we can see rocks, then rocks exist*. The assumption should be made explicit to make it clear why seeing rocks is sufficient to conclude that rocks exist. Only then will we have a truly good argument.

Now that we have identified an assumption, we can add it to the argument as an additional premise in order to form the following argument:

1. We can see rocks.
2. If we can see rocks, then rocks exist.
3. Therefore, rocks exist.

The argument map for this argument is the following:

CONCLUSION

Rocks exist.

SUPPORTS

PREMISE

We can see rocks.

PREMISE

If we can see rocks, then they exist.
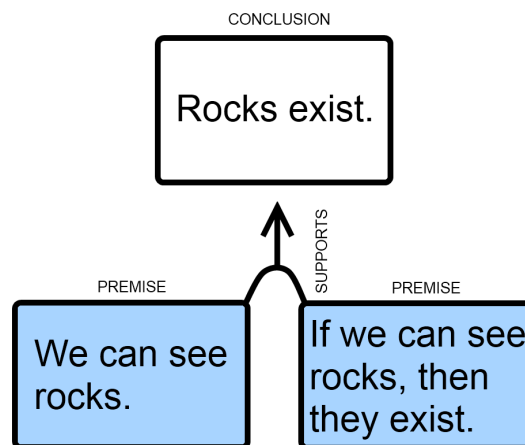
This time there are two premises and each are in a separate blue box. There is a single line connecting both premises that lead to the arrow to make it clear that both premises are part of a single reason to believe the conclusion is true. In this case the assumption that both premises are true is sufficient to assume the conclusion is true. If either premise is false, then the other premise will not be sufficient for us to know that the conclusion is true.

Chapter 3: The distinction between multiple arguments and multiple premises

The above argument map featured a single argument that had multiple premises, but sometimes there are also multiple arguments for the same conclusion. Consider the following passage:

> We should believe that rocks exist because we can see them, and also because we can touch them.

In this case the passage presents us with two separate arguments:

1. We can see rocks.
2. Therefore, rocks exist.

1. We can touch rocks.
2. Therefore, rocks exist.

A single argument map can represent both of these arguments at the same time:

CONCLUSION

Rocks exist.

PREMISE   SUPPORTS   SUPPORTS   PREMISE

We can see rocks.   We can touch rocks.
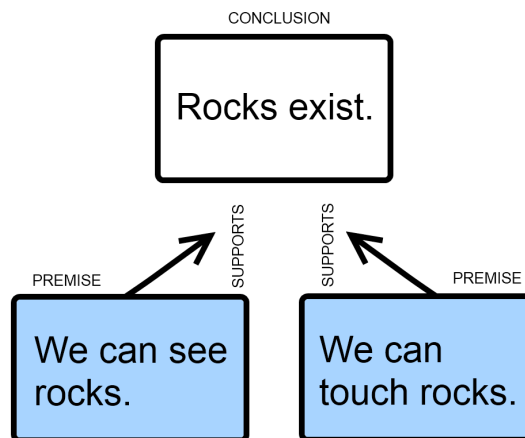
This time there is no line connecting both premises to a single arrow. Instead, each premise has its own arrow pointing separately to the conclusion. This makes it clear that each premise is a separate argument for the conclusion. They are considered to be different reasons to believe the conclusion to be true.

Chapter 4: The distinction between simple and extended arguments

Simple arguments in this context are those with a single conclusion. Extended arguments have more than one conclusion—at least one premise is also a conclusion that is supported by another argument.

Consider the following passage:

> We should believe that rocks exist because we can see rocks; and if we can see rocks, then they exist. Moreover, sight is a reliable way to know what exists, so we should believe that if we see rocks, then they exist.

In this case we could rephrase this passage as the following two arguments:

1. We can see rocks.
2. If we can see rocks, then they exist.
3. Therefore, rocks exist.

1. Sight is a reliable way to know what exists.
2. Therefore, if we see rocks, then they exist.

These two arguments are represented by a single argument map:

CONCLUSION

Rocks exist.

SUPPORTS

PREMISE

We can see rocks.

PREMISE

If we can see rocks, then they exist.

SUPPORTS

PREMISE

Sight is a reliable way to know what exists.
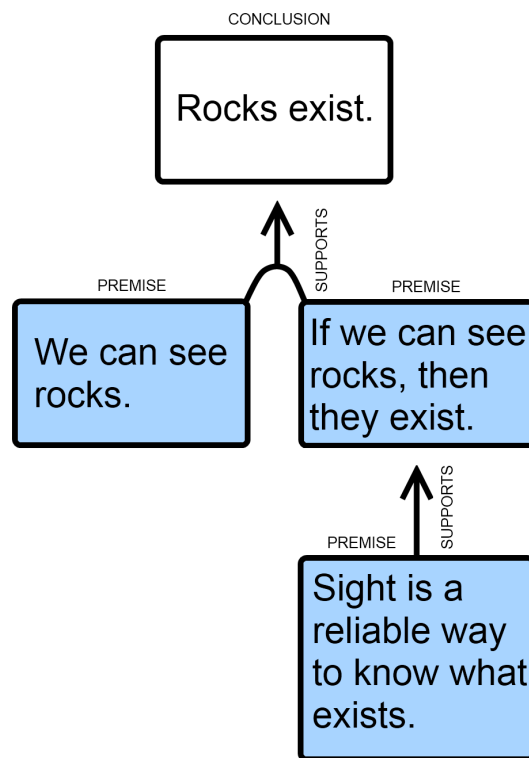
In this case the main conclusion (that is not a premise) is in a white box with 'conclusion' written over the box, but the premise that is supported by an argument is in a blue box with 'premise' written over it.

Chapter 5: The distinction between supporting arguments and objections

All the arguments above are supporting arguments. They are meant to tell us why we should believe something. Objections are attempts to tell us why we should reject something. An objection is meant to tell us when a statement is false or unjustified. Unjustified statements are those that we currently have no good reason to believe to be true, and such statements could be either true or false. However, all statements we prove to be false are also proven to be unjustified.

Consider the following passage:

> Karla believes that rocks exist because she sees them, but we should believe that rocks don't exist because that's what my parents believe.

In this case the passage contains the following two arguments:

1. We see rocks.
2. Therefore, rocks exist.

1. My parents believe that rocks don't exist.
2. Therefore, rocks don't exist.

These two arguments can be represented with a single argument map:

CONCLUSION

Rocks exist.

SUPPORTS   OPPOSES

PREMISE   PREMISE

We can see rocks.

My parents believe that rocks don't exist.
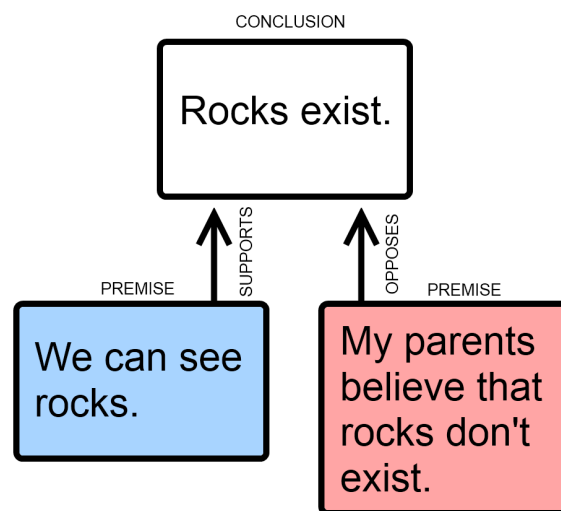
The argument map above makes it clear that there is an argument for and against a conclusion. This time the premise of the supporting argument is in a blue box as usual, but the premise of the opposing argument is in a pink box. Additionally, the box containing the objection has an arrow pointing to the conclusion and the word 'opposes' is written alongside the arrow to make it clear that the premise is an argument against the conclusion.

When having a debate we are interested in arguments both for and against a certain statement, and argument maps are capable of representing multiple such arguments at once.

Finally, the above argument map makes it clear that there is no winning side of the debate at this point

in time. There's an argument for and against a conclusion, but it is not yet clear which side has the better argument. Of course, we know that the opposing argument should be rejecting because what my parents believe is not relevant to the debate.

Chapter 6: The distinction between objections to conclusions, premises, and forms of reasoning

I discussed an objection to a conclusion above, but objections can also be given against premises and forms of reasoning. I will now present an example of an objection to a premise and an objection against a form of reasoning.

An objection to a premise

Consider the following passage:

> Jenny believes that rocks exist because we see them; and if we see them, then they exist. However, we should reject that if we see rocks, then they exist because we can see things that don't exist when we are dreaming.

This passage contains the following two arguments:

1. We see rocks.
2. If we see rocks, then they exist.
3. Therefore, rocks exist.

1. We see things that don't exist when we are dreaming.
2. Therefore, we should reject the belief that *if we see rocks, then they exist*.

These arguments can both be represented in a single argument map:
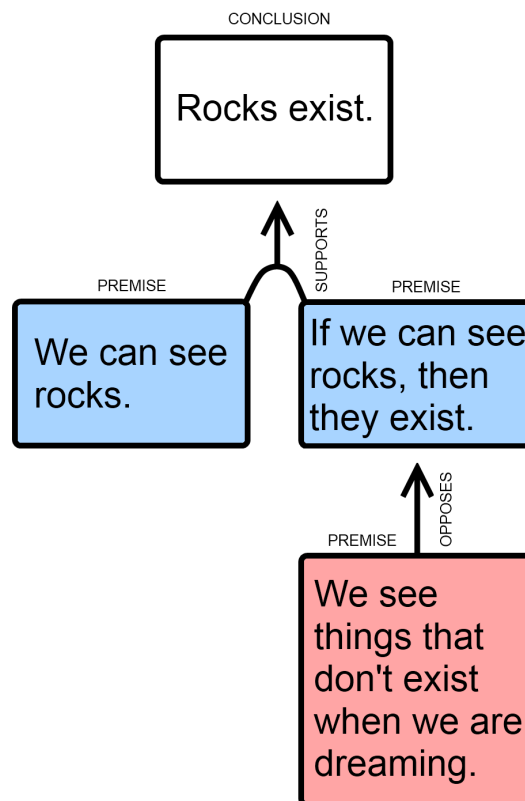
This argument map makes it clear what particular premise is being opposed. Keep in mind that this objection is not against the conclusion. If this objection succeeds, then we will wonder if there's a better reason to believe that rocks exist than the one presented here.

If anyone argues for a conclusion that we believe to be false, then we might want to provide an objection to that argument in addition to an argument against that conclusion. If there is only an argument for and against the conclusion, then we will still need to know if either argument is a good argument. If there is only an objection against the supporting argument, then we still need to know why we should reject the conclusion.

For example, imagine that someone argues that all dogs are reptiles because dogs have cold blood and scales. In this case we can object to the conclusion by saying that dogs aren't reptiles because they are warm-blooded, have mammary glands, and give birth to live young. Additionally, we can object to the supporting argument by stating that biologists have unanimously confirmed that dogs are not cold-blooded and don't have scales.

An objection to a form of reasoning

An argument has a logically valid form of reasoning when assuming the premises are true would guarantee that the conclusion is also true. It's impossible for logically valid arguments to have true premises and a false conclusion. An example of a logically valid argument is, "If dogs are reptiles, then dogs are animals. Dogs are reptiles. Therefore, dogs are animals." In this case a premise is false, but the *form of reasoning* is valid. We object to the form of reasoning of an argument when it's not valid or has contradictory premises.

Consider the following passage:

> Mark argues that we should believe that rocks exist because life used to be on Mars and life never used to be on Mars. However, Mark's argument requires us to accept two contradictory premises and two contradictory statements can't be true at the same time, so at least one of Mark's premises has to be false.

This passage contains the following two arguments:

1. Life used to be on Mars.
2. Life never used to be on Mars.
3. Therefore, rocks exist.

1. Both those premises form a contradiction.
2. It's impossible for two contradictory premises to be true at the same time.
3. Therefore, at least one of the above premises are false.

An argument map can represent both of these arguments:

CONCLUSION

```
┌─────────────────────┐
│                     │
│   Rocks exist.      │
│                     │
└─────────────────────┘
```

PREMISE — SUPPORTS — PREMISE

```
┌──────────────┐      ┌──────────────┐
│ Life used to │      │ Life never   │
│ be on Mars.  │      │ used to be   │
│              │      │ on Mars.     │
└──────────────┘      └──────────────┘
```

OPPOSES — PREMISE — OPPOSES

```
┌──────────────┐
│ At least one │
│ of the above │
│ premises are │
│ false.       │
└──────────────┘
```

PREMISE — SUPPORTS — PREMISE

```
┌──────────────┐      ┌──────────────┐
│ Both those   │      │ It's impossible│
│ premises     │      │ for two      │
│ form a       │      │ contradictory│
│ contradiction.│     │ premises to  │
│              │      │ be true at the│
│              │      │ same time.   │
└──────────────┘      └──────────────┘
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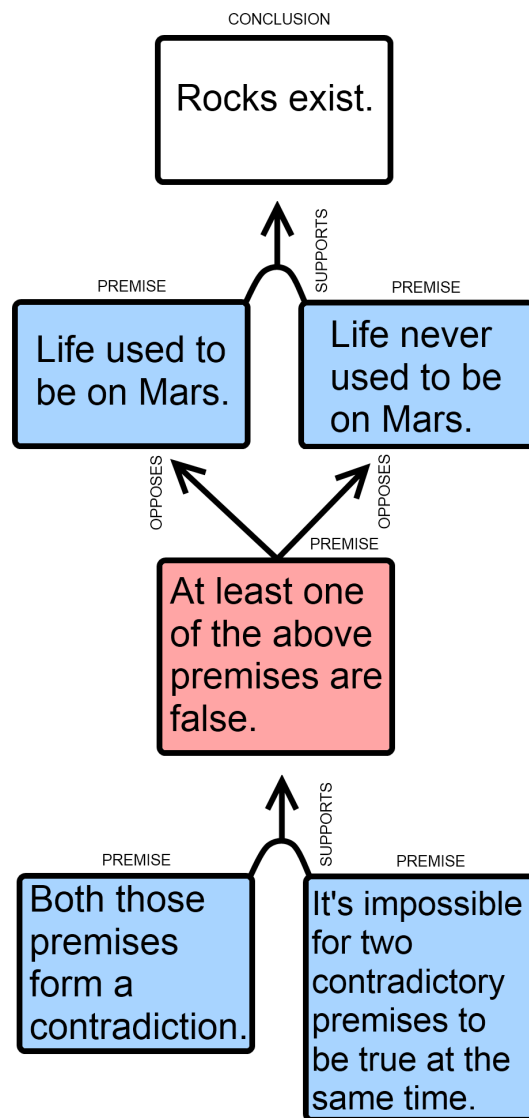
This time the objection is against both premises at the same time, so there are two arrows pointing at each of them. We don't currently know which premise is false, but we know one of them is because they form a contradiction. One premise literally says the other premise is false.

The reason that this objection is against the form of reasoning is because the form of reasoning contains a contradiction. A contradictory form of reasoning occurs when two statements state "A and not-A." In other words, they state that something is both true and false at the same time. "A" could be any statement. For example, it could be that "there's intelligent life on another planet." In that case the contradictory statements would be "there's intelligent life on another planet, and it's not the case that there's intelligent life on another planet."