



Critical Thinking at St Leonard's College

What is it? Why is it important? And, how
can we make it happen?



Who am I?

- Dr Mark Hodges
- PhD in philosophy from La Trobe University.
- Taught philosophy at La Trobe and the University of Melbourne between 2003 and 2010.
- Ran critical thinking workshops at La Trobe from 2004 to 2010.
- Philosophy/History teacher and Theory of Knowledge coordinator at St Leonard's College since 2013.



Why am I talking to you about critical thinking?

- I am leading a push to bring explicit, structured, accumulative teaching of critical thinking skills into the middle-school curriculum.
- The year 7 Philosophy course has formed the basis for this push.
- Over the course of 2014 this course has been transformed from a philosophical problems-based course to a critical thinking course.



What is critical thinking?

- We all have a rough idea of what thinking is, but what is *critical* thinking?
- Sometimes we use the word “critical” to simply mean “negative”:
 - E.g. “I wish you were not always so critical of my handwriting!”
- “Critical thinking” does not mean “negative thinking”, although it sometimes does involve negative evaluations.
 - Think film critics.



What is critical thinking?

- Critical thinking is:
 - Thinking that is independent
 - Thinking that is reflective
 - Thinking that is logical



What is independent thinking?

- Independent thinking = “thinking for yourself”
- Independent thinkers don’t accept what someone says just because that someone is in a position of authority.
- This does not mean independent thinkers reject the claims of experts.
- Independent thinkers are interested in the difference between legitimate and illegitimate authority.



What is reflective thinking?

- Reflective thinking = thinking about the structure and quality of your own thinking
- For example:
 - Did I have good reason to think X, or did I just accept X because:
 - I was hoping that X was true.
 - Everyone around me seemed to think that X was true.



Logical thinking

- Logical thinking involves two main elements:
- (1) Argument analysis
- (2) Argument evaluation



What's an argument?

- All arguments are sets of propositions/statements.
- But, not all sets of propositions/statements are arguments.

If the governments of the world do not unite to tackle climate change, many important ecosystems will be destroyed. And that will be an absolute disaster for future generations.

The car's battery is clearly flat. This can easily be seen from the fact that its headlights were left on all night, and now when you turn the key it doesn't start.

What's an argument?

- An argument is a set of propositions/statements that includes:
- (1) A *conclusion*: a statement that is supported by other statements in the set.
- (2) One or more *premises*: statements that support the conclusion.


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What is argument analysis? – Standard Form

- If unemployment rises, house prices will inevitably fall. But, only a fool would think that unemployment is going to rise. So, only a fool would think that house prices will fall.
- *In Standard Form:*
- P1) If unemployment rises, then house prices will fall.
- P2) Unemployment will not rise.
- _____
- C) House prices will not fall.

What is argument analysis? – Logical Form

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- Next, we need to identify the atomic propositions.
- P = Unemployment rises.
- Q = House prices fall.

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- C) **House prices will not fall**.
- Next, we need to identify the atomic propositions.
- **P = Unemployment rises**.
- **Q = House prices fall**.
- *In Logical Form:*
- P1) If **P**, then **Q**
- P2 Not **P**
- _____
- C) Not **Q**.
- *In Symbolic Form:*
- P1) **P** → **Q**
- P2 **~ P**
- _____
- C) **~ Q**



What is argument evaluation?

- Evaluation of arguments involves deciding how compelling or persuasive they are.
- In evaluating arguments we look for two main things.
- 1) *Validity*: an argument is valid if and only if the truth of the premises guarantees the truth of the conclusion.
- 2) *Soundness*: an argument is valid if and only if it is valid, and all of its premises are true.

How do we decide if an argument is valid?

An argument is valid if and only the truth of the premises guarantees the truth of the conclusion.

○ *In Standard Form:*

○ P1) If unemployment rises, then house prices will fall.

○ P2) Unemployment will not rise.

○ _____

○ C) House prices will not fall.

○ *Is this argument valid?*

How do we decide if an argument is valid?

At this point, having the argument in symbolic form is very handy.

○ *In Symbolic Form:*

○ P1) $P \rightarrow Q$

○ P2) $\sim P$

○ _____

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P	\rightarrow	Q				

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P	\rightarrow	Q	\sim	P		



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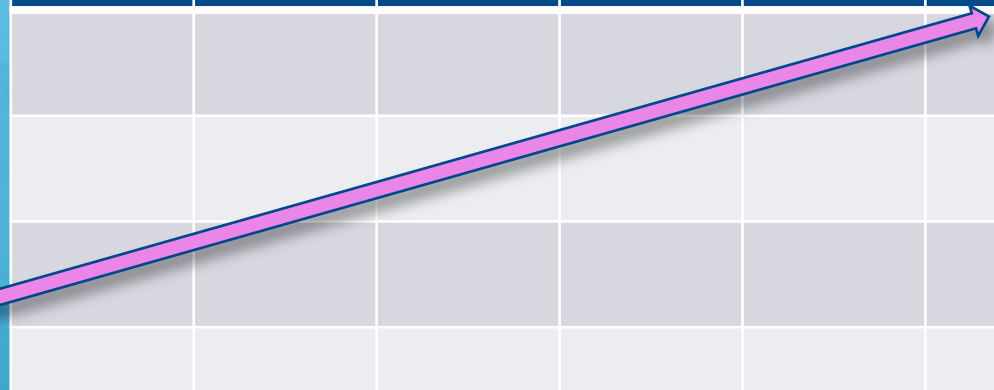
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P	\rightarrow	Q	\sim	P	\sim	Q
T		T		T		T

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○ _____

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P	\rightarrow	Q	\sim	P	\sim	Q
T		T		T		T
T		F		T		F

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P	\rightarrow	Q	\sim	P	\sim	Q
T		T		T		T
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T		F	<u>F</u>	T	<u>T</u>	F
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P	\rightarrow	Q	\sim	P	\sim	Q
T	<u>T</u>	T	<u>F</u>	T	<u>F</u>	T
T	<u>F</u>	F	<u>F</u>	T	<u>T</u>	F
F	<u>T</u>	T	<u>T</u>	F	<u>F</u>	T
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F	<u>T</u>	T	<u>T</u>	F	<u>F</u>	T
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T	<u>F</u>	F	<u>F</u>	T	<u>T</u>	F
F	<u>T</u>	T	<u>T</u>	F	<u>F</u>	T
F	<u>T</u>	F	<u>T</u>	F	<u>T</u>	F

Invalid!



Soundness

- So much for validity – what is soundness?
- An argument is sound if it is valid, and all of its premises are true.



How do we decide if the premises of an argument are true?

- Sometimes we already know that our premises are true.
 - In such cases, we are just working out the logical implications of our prior knowledge.
- What if we don't know whether the premises of an argument are true?
- Then we need to do some research.
- What if we find conflicting answers?



How are the three kinds of thinking related?

- Independent thinking need not involve reasoned/ logical thinking.
 - We all know people who have plenty of original ideas, all of which are completely illogical and baseless.
- However, *quality* independent thinking requires logic/ good reasoning.
 - To come up with original ideas that are worthwhile, you will often need to use sound reasoning.



How are the three kinds of thinking related?

- Reflective thinking need not involve reasoned/logical thinking.
 - It is perfectly possible to think about ones previous thinking processes in a way that is illogical.
- However, *quality* reflection requires logic/good reasoning.
 - For reflection to be worthwhile it must involve high quality evaluation of previous reasoning processes.
 - This requires skills in logical analysis and evaluation.




How are the three kinds of thinking related?

- The dispositions can't be taught in the same way that the skills can.
- We (parents and teachers) need to model them.
- Of course, having the skills helps with the dispositions as well.
- We all enjoy doing things we are good at.
- And we are all disposed to do the things that we enjoy.



Why is Critical Thinking Important?

- Mathematics involves abstract reasoning with quantities/numbers.
- Critical thinking (especially the logic) involves abstract reasoning with propositions/statements.
- We demand that mathematical reasoning skills be explicitly taught up to year 10 and beyond.
- Why don't we insist that critical thinking skills be explicitly taught up to year 10 and beyond?



Critical thinking can help fix our “democracy”

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- Each card has a number on one side and a letter on the other.
- Which two cards do you need to turn over to test the following hypothesis?
- *“All cards with a vowel on one side has an even number on the other.”*



The internet age

- The problem we face in 2014 is not so much finding answers to our questions.
- The problem is the number of conflicting answers that we find.
- Critical thinking can help with this.



Critical thinking and academic/career success

- Some rhetorical questions:
- Can you think of an academic subject that does not require students to make reasoned evaluations regarding the relationships between conclusions and evidence?
- Can you think of a career in which success does not depend on making reasoned choices between claims or courses of action?
- If you can, do you think your son or daughter is likely to find fulfillment in such a career?



What can parents do to help?

- We don't expect you to teach your kids truth-
tables: that's our job 😊
- You can help by:
 - (1) Modeling independent thinking
 - (2) Modeling reflective thinking