# What is the RED Model of Critical Thinking?

Critical thinking includes many qualities and attributes, including the ability to logically and rationally consider information. Rather than accepting arguments and conclusions presented, a person with strong critical thinking will question and seek to understand the evidence provided. They will look for logical connections between ideas, consider alternative interpretations of information and evaluate the strength of arguments presented.

Everyone inherently experiences some degree of subconscious bias in their thinking. Critical thinking skills can help an individual overcome these and separate out facts from opinions.

The Watson Glaser critical thinking test is based around the **RED** model of critical thinking:

•       **R**ecognize assumptions. This is all about comprehension. Actually understanding what is being stated and considering whether the information presented is true, and whether any evidence has been provided to back it up. Correctly identifying when assumptions have been made is an essential part of this, and being able to critically consider the validity of these assumptions - ideally from a number of different perspectives - can help identify missing information or logical inconsistencies.

•       **E**valuate arguments. This skill is about the systematic analysis of the evidence and arguments provided. Being able to remain objective, while logically working through arguments and information. Critical evaluation of arguments requires an individual to suspend their judgement, which can be challenging when an argument has an emotional impact. It is all too easy to unconsciously seek information which confirms a preferred perspective, rather than critically analyze all of the information.

•       **D**raw conclusions. This is the ability to pull together a range of information and arrive at a logical conclusion based on the evidence. An individual with strong critical thinking skills will be able to adjust their conclusion should further evidence emerge which leads to a different conclusion.

Critical thinking is important because individuals who engage in quality thinking make better decisions. They arrive at conclusions which are impartial, well informed and objective. Furthermore, such people are able to make decisions with limited supervision, enabling them to independently make judgements: in a military environment where agility can mean lethality, in a world where time can be money, waiting for someone else to validate decisions can be costly and result in missed opportunities.

The Watson Glaser test evaluates a candidate's critical thinking ability in five separate areas: **assumptions, evaluation of arguments, inferences, interpretations and deductions**.

## Assumptions

An assumption is something we take for granted. An example might be: "When I retire I will receive a final salary pension". This assumes that you will get to retire, that you will be alive at retirement age, that your pension fund performs well, and that your pension arrangements will not change. People make many assumptions which may not necessarily be warranted; being able to identify these is a key aspect of critical thinking. An assumption question typically involves a statement and a number of assumptions. Your job is to identify whether an assumption has been made or not, and you will have a choice of two answers: yes or no.

**Statement** We need to save money so we'd better take our vacation in Alabama.

**Assumption 1** Vacations in Alabama are cheaper than vacations elsewhere. (YES. It is assumed in the original statement that the cheaper price of vacations in Alabama will enable the individual to save money.)

**Assumption 2** Transport costs make east coast vacations more expensive than those in the south. (NO. This assumption is not made in the statement, there is nothing mentioned about the cost of transport within the passage, and there are many reasons why a vacation in Alabama may be cheaper.)

**Assumption 3** It is possible to take a vacation in Alabama. (YES. This is assumed, as in order for the individual to take a vacation in Alabama, it must be possible to take a vacation there.)

## Evaluation of Arguments

This set of questions examines your ability to evaluate the strength of an argument. Arguments can be strong or weak, and to be strong an argument must be important and directly related to the question. In these questions, you will be presented by a statement followed by a number of arguments (which you should assume are true) and you must then decide whether each argument is strong or weak.

**Statement** Should the voting age in the US be lowered to 16?

**Argument 1** Yes; voting provides an opportunity for young people to feel like adults. (WEAK. This would be a poor reason for lowering the voting age.)

**Argument 2** Yes; young people will be affected in the future by decisions made today. (STRONG. This is important and relevant to the whole purpose of voting.)

**Argument 3** No; 16-year-olds are unduly influenced by celebrities. (WEAK. This argument is not directly related to the question. Everyone is influenced by something no matter what their age, and being influenced by celebrities does not necessarily mean that 16-year-olds should not have the opportunity to vote on important issues.)

## Inferences

An inference is a conclusion based on evidence and reasoning. It enables conclusions to be drawn that are not explicitly stated. For example, if we see someone driving a Ferrari we may conclude that they are wealthy. However, there are a number of alternative explanations: they may have rented or borrowed the car, or they may have acquired huge debt as a result of buying the car. The problem with inferences is that people often reach a conclusion based on insufficient data, and the conclusion may not therefore be correct.

Source: https://www.thinkwatson.com/the-red-model/red-critical-thinking-model

An inference question typically involves a statement (which you are to assume is true) and a number of inferences based on that statement. Your job is to evaluate whether the inference is correct. You can do this using both the information contained within the passage and information which is commonly accepted knowledge, or information that practically every person has. You will be given five potential responses and you have to select which you feel is most accurate. These options are:

• Definitely True - from the facts given there is no reasonable possibility of it being incorrect.
• Probably True - in light of the facts given, it is more likely to be true than false.
• Insufficient data to say whether or not it is true - in light of the facts given it is impossible to say whether it is true or not.
• Probably False - in lights of the facts given, it is more likely to be false than true.
• Definitely False - from the facts given, there is no reasonable possibility of it being true.

*An Example Question*

Statement Studies have shown that people who live in England are more likely to own their own homes than people living in Scotland, although there is little difference in the rate of home ownership amongst people who have the same level of educational achievement. The average level of educational achievement is significantly higher in England than Scotland.

• **Inference 1** People with high educational achievements are in a better position to buy their own homes than people with low educational achievements.

(TRUE. The inference follows from the passage.)

• **Inference 2** There is a lower rate of home ownership in Scotland among people with relatively high educational achievements than among people in England with much lower educational achievements.

(FALSE. The passage says that the levels of home ownership are similar in England and Scotland for the different levels of educational achievement, and that more people in England both have higher educational achievement and are likely to own their own homes. This suggests a link between educational achievement and home ownership in both England and Scotland. Therefore the person with the highest educational achievement is more likely, on average, to own their own home than the person with lower educational achievements, regardless of whether they live in England or Scotland.)

• **Inference 3** People with higher levels of educational achievement are more likely to own their own homes, since they earn more money than those with lower educational achievement levels.

(PROBABLY TRUE. It is widely known that educational achievement is linked, on average, to higher-salary jobs. While one cannot conclusively say that this is true based on the information within the passage, it is probably true based on commonly accepted knowledge.)

## Interpretation

An interpretation is an evaluation of whether a conclusion can logically follow from the information or evidence provided. This requires an individual to understand the precise meaning or significance of a piece of information and apply this information appropriately. For example, if you are told in a study that the wavelength of light visible to the human eye ranges from 380- 750nm, you can correctly conclude that no humans can see light at 30nm.

**Statement** A study of carbon dioxide ($CO_2$) emissions from 1990 to 2010 shows that the volume of $CO_2$ emissions fell consistently, from 24bn tons per year in 1990 to 16bn tons per year in 2010.

**Interpretation 1** The reductions in $CO_2$ emissions demonstrate that energy efficiency initiatives have been successful (NO. This conclusion does not follow from the information given, which provides no evidence to explain the changes in $CO_2$ emissions.)

**Interpretation 2** The amount of $CO_2$ emitted in 1992 was less that 24bn tons. (YES. The conclusion follows beyond a reasonable doubt since, according to the statement, the volume of $CO_2$ emissions fell consistently.)

**Interpretation 3** $CO_2$ emissions in 2011 were lower than in 1990. (No. This conclusion does not follow beyond doubt, because evidence is only provided for the period 1990 to 2010.)

## Deductions

A deduction is the drawing of a conclusion in a particular instance, by referring to a general law or premise. However, there may be occasions when such deduction is incorrect. For example, in the statement: "Satsumas, oranges and clementines are all citrus fruits. They are all orange; therefore all citrus fruits are orange." Clearly this is incorrect.

Deduction questions include a statement (which you must assume is true), followed by a number of potential conclusions. Your job is to identify whether the conclusion logically follows from the statement and you will have two options: conclusion follows, or conclusion does not follow.

**Statement** It sometimes snows in January. Schools are always closed when it snows. Therefore:

**Deduction 1** Schools are never closed on days when it is not snowing. (NO. The conclusion does not follow. You cannot tell from the statements whether or not schools ever close on days when it does not snow. Some may do.)
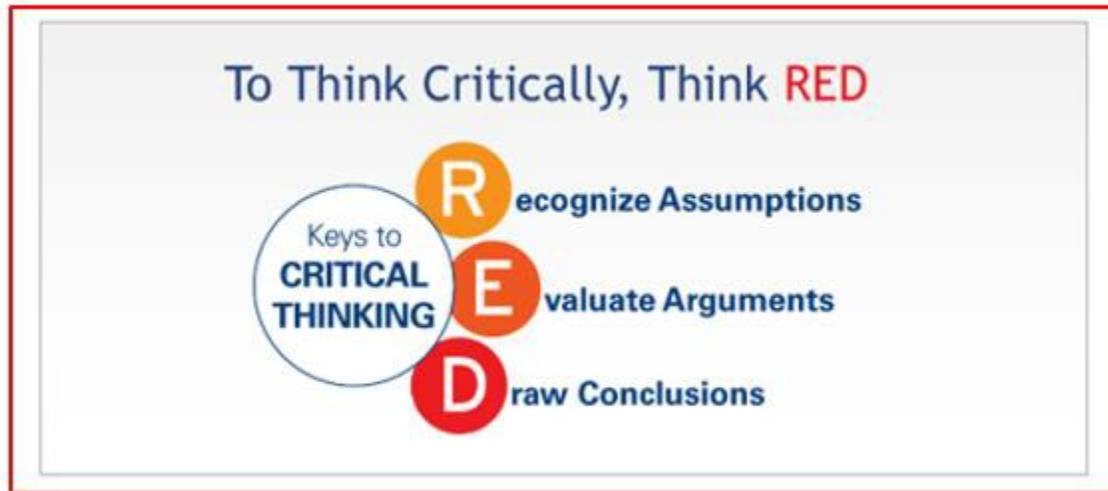
**Deduction 2** Schools are sometimes closed in January. (YES. The conclusion does follow from the information provided since schools must be closed on days when it snows in January.)

**Deduction 3** Sometimes schools are open in January (NO. The conclusion does not logically follow from the information provided, even though you may know that in reality schools are often open in January.)

## Putting it All Together

Critical thinking ability can be significantly improved **with practice**. It is a skill that can be learned, although it does come more easily to some people than others. Look for opportunities to think critically about information every day. Once you start practicing, you'll find useful material everywhere: blog posts, newspapers, and journal articles are great places to look. It is also useful to develop your self-awareness. Understanding your biases and thinking patterns can help you identify where your thinking might be limited.

It can be useful to organize your thinking and practice around the RED model mentioned earlier in the article:

To Think Critically, Think RED

**R**ecognize Assumptions

Keys to CRITICAL THINKING

**E**valuate Arguments

**D**raw Conclusions

•        **Recognize assumptions**. Practice identifying the assumptions in material that you read or news that you hear. What can be objectively proven and what is inferred? Where might there be gaps in the logic? What information is important and relevant, and what isn't? What is missing? Is there any information that needs to be included which isn't?

   o   *Why does it matter*? This is the ability to separate fact from opinion. It is deceptively easy to listen to a comment or presentation and assume the information presented is true even though no evidence was given to back it up. Noticing and questioning assumptions helps to reveal information gaps or unfounded logic. Taking it a step further, when we examine assumptions through the eyes of different people (e.g. the viewpoint of different stakeholders) the end result is a richer perspective on a topic.

   o   *How / When to use it*: When you're gathering information, listening to what people say, or assessing a situation, think about what assumptions you have going in. Perhaps you assume that a trusted co-worker is providing reliable information – but is there really evidence to back it up? Learn to see gaps in logic and opinion disguised as fact.

•        **Evaluate arguments**. Practice carefully analyzing arguments presented. What is your perspective on the evidence? Could someone else have a different perspective? Consider the impacts of the arguments from a range of different viewpoints (it can be useful to use a model like MILPECTITE - Military, Information/data, Legal, Political, Economic/financial , Cultural/social,  Technology,  Infrastructure, Time, and Environment - to organize your thoughts). How would someone argue against your position? What merits are there to their arguments?

   o   *Why does it matter?* We often have problems sorting through conflicting information because we unknowingly let our emotions or pride get in the way, or because we only hear what we want to hear (confirmation bias). Being able to remain objective and sort through the validity of different positions helps people draw more accurate conclusions.

   o   *How / When to use it*. The art of evaluating arguments entails analyzing information *objectively and accurately,* questioning the *quality* of supporting evidence, and understanding how emotions – yours or others – influence the situation or get in the way of objectivity.  People may quickly come to a conclusion simply to avoid conflict. Learn how to push all that aside, and analyze information accurately and objectively.

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• **Draw conclusions**. After you have considered all of the facts, what is the best possible conclusion? Could there be any other conclusions? What new information might change your conclusion? Does this conclusion seem sensible based on your common sense and experience? What are the implications of this conclusion?

o *Why does it matter*? People who possess this skill are able to bring diverse information together to arrive at conclusions that logically follow from the available evidence, and they do not inappropriately generalize beyond that evidence. Furthermore, they will change their position when the evidence warrants doing so. They are often characterized as having "good judgment" because of their quality decisions.

o *How / When to use it*. This is the payoff. When you think critically, the true picture becomes clear, and you can make the tough decision or attack the difficult problem.

As you can see, higher level thinking must be cultivated, requires some effort, and

takes <u>practice</u>. . .

*"What we hope ever to do with ease, we must learn first to do with diligence."* - Samuel Johnson

and an <u>open mind</u>. . .

*"It is the mark of an educated mind to be able to entertain a thought without accepting it."* – Aristotle

but it is so <u>worth it</u>!

*"Any fool can know – the point is to understand."* - Albert Einstein

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