1. Fundamentals
1.1 What is critical thinking? Why is there a need to learn critical thinking?

The ability to think critically is not easily acquired but can be learned with appropriate learning activities. Critical thinking is indispensable whether for academic purposes or for dealing with problems in everyday life.

Young people have an exceptionally strong ability to learn. It is the best time for you to learn and improve critical thinking.

It takes effort to apply critical thinking. We have to be very clear about the purpose of critical thinking while applying it. When you apply critical thinking, you will be thinking about your thinking processes as well as the possible outcomes. However, different individuals tend to have different understandings of what critical thinking is. So, what is critical thinking as you understand it?
A. Read the following examples carefully. In the following examples, who uses critical thinking? Can you explain your answer?

Jennifer had a problem. She had to take a college entrance exam the next day and in order to do well, she needed to review the materials and she had to get enough sleep. On the other hand, Jennifer's best friend, Sandra was going away to study abroad in a month's time and had therefore invited Jennifer to attend a party that night. Jennifer was fully aware that if she failed to go home before midnight, she would be told off by her parents, and her performance in the exam of the following day would also be affected by her lack of sleep. However, she thought that even if she failed to perform well in her exam, there might still be a chance that her good interview would make up for her underperformance. She did not want to miss this social gathering and above all, she did not want to upset her best friend. Finally, under the persuasion of Sandra, who emphasised that it would be the last chance for them to meet, Jennifer accepted her invitation and went to the party.

Anki needed to reduce her weight in order to join the dancing group in her school. She heard that the aunt of her friend Simon had lost 20 pounds after taking some diet pills and now she was selling the pills at $300 with a refund guarantee. Anki visited the website of the manufacturer of the pills and found that the pills contained a considerable amount of caffeine, which produced side effects. Furthermore, in the course of taking the pills, she would also have to stick to a liquid diet, which is known to be harmful to the growth of teenagers. If she did not stick to the liquid diet and take all the pills as directed, the refund guarantee would not be effective. After considering the offer, Anki decided to consult her dancing teacher. The teacher advised Anki to take more training after school and to consult a nutritionist for a diet menu that would be more suitable for her. Anki decided to take the teacher's advice.
B. Based on the above examples, what is your understanding of critical thinking? Please choose the answer that best suits your understanding.

- a way of thinking that criticises the ideas of others
- the application of thinking skills and strategies to reach an ideal result
- a way of thinking that is used in emergency or crisis situations

C. When solving problems encountered in school or in daily life, critical thinking could be used to (You can choose more than one.)

- assess and analyse the arguments raised by other people
- when you are being persuaded to make a decision or buy something, you evaluate their reasons and make a decision
- decide what to think or to do
1.3 What is an “argument”?

Are you familiar with the phrase “For Free”? Persuasive appeals are everywhere: in magazines, classrooms, radio stations, TV news programmes and even family gatherings. These appeals aim to persuade you to buy particular products, to vote for a particular candidate, to give a donation to a specific charity, or to support a friend in an argument. Persuasive appeals exist in almost any kind of communication. You have to be able to apply your critical thinking skills to decide what to believe and what to do.

**Argument Analysis is the core of critical thinking.**

A critical thinker would apply the skills of argument analysis. You are going to learn how to make use of arguments to decide what to believe and what to do when being bombarded with persuasive appeals.
Let us first get to know what an argument is.

How would you define the term “argument”? Write down what you think in the box below.
1.5 What is an “argument”? 

A person who puts forward his/her argument uses reasoning techniques to convince the person to believe in or to do certain things. An effective argument would have a definite and clear conclusion supported by solid reasons.

Read the following example carefully:
“Please vote for me to become the chairperson of the student union.”

The conclusion is clear, but this is not an argument because there is no reason to support the conclusion. Now consider another example where a reason is provided.
“Please vote for me to become the chairperson of the student union. I will fight for transportation allowances for everyone.”

This statement ends with a strong reason explaining why you should vote for him/her (despite the fact that s/he might not be able to accomplish what s/he promises).

An argument must at least consist of one conclusion and one reason that supports the conclusion. A statement will not be called an argument if either component is missing.
Read the following sentences and identify which of them are arguments.

A. I like my secondary school.
   □ An argument
   □ Not an argument

B. Some aliens have landed in their U.F.O., abducted some government officials and disappeared from the surface of Earth.
   □ An argument
   □ Not an argument

C. About seventy percent of Earth is covered with water.
   □ An argument
   □ Not an argument

D. When preparing a burger steak, we have to make sure that the inside of the steak is no longer pink, because this is the only way to kill all the bacteria that may be present in the steak.
   □ An argument
   □ Not an argument

E. I have brought the chicken soup made by my sister. Does it taste rather bland?
   □ An argument
   □ Not an argument

F. If the theory of evolution is right, then Darwin is either a maniac or a genius.
   □ An argument
   □ Not an argument

G. My car won’t start because there is something wrong with the engine.
   □ An argument
   □ Not an argument
H. There must be something wrong with the engine because my car won’t start.

☐ An argument
☐ Not an argument

I. The rise in interest rates by 0.25% will not have much negative effect on the housing market because it was announced two months ago. The buyers and sellers are already psychologically prepared for the interest rate rise.

☐ An argument
☐ Not an argument

J. This fruit is rotten with worms. It must have been that the air-tight packaging bag has not been sealed properly, which allowed worms to get in.

☐ An argument
☐ Not an argument

K. An apple a day keeps the doctor away.

☐ An argument
☐ Not an argument
1.7 Identifying conclusions

Conclusion is the “what” in an argument. It tells the reader or listener what to believe and what to do. There are words and expressions which usually indicate conclusions. The following are some examples of conclusion indicators:

- Therefore,
- In conclusion …
- As a result,
- So
- Based on the above reasons …
- I can conclude (decide, deduce) that …
- Thus …

Now let’s take a look at some examples in which these conclusion indicators tell us the conclusion is coming.

- Therefore, the traditional concept of preferring boys to girls is no longer appropriate in the modern world.
- In conclusion, the performance of the stock market this year should be good.
- We could decide that the accused is guilty.
- Based on the above reasons, you should work hard in school.
- So you should support the candidate of a certain Party.

In a conclusion, we bring out certain point of views or beliefs (e.g., stock trading should be more popular next year), but not merely pointing out a statement or description about things (e.g., the stock market was very quiet last year).

Do you understand now what a conclusion is? Now please identify the conclusions in the following sentences in the exercise below.
Please choose what you think is the conclusion part of the sentences below.

A. His name is Mr. Adam Chan.
   □ His name is
   □ Mr. Adam Chan

B. Based on the above reasons, religious freedom is necessary.
   □ Based on the above reasons
   □ religious freedom is necessary

C. From the above examples, the two cultural ambassadors have one thing in common - they both enjoy reading.
   □ From the above examples
   □ the two cultural ambassadors have one thing in common - they both enjoy reading

D. Though he has treated you badly in the past, he is still your brother; so you should help him.
   □ Though he has treated you badly in the past
   □ he is still your brother
   □ you should help him

E. In conclusion, he does not deserve to be trusted.
   □ In conclusion
   □ he does not deserve to be trusted

F. Considering your past performance, we have decided to approve your application for the scholarship.
   □ Considering your past performance
   □ we have decided to approve your application for the scholarship
G. He has always been mean to me, showing that he is a narrow-minded person.

- He has always been mean to me
- he is a narrow-minded person

H. She has always been bright since she was little and was admitted to Harvard University at a young age.

- She has always been bright since she was little
- (she) was admitted to Harvard University at a young age

I. An outstanding student should not only achieve exceptional academic results. More importantly, s/he should also have good conduct and self-cultivation.

- An outstanding student should not only achieve exceptional academic results
- More importantly, s/he should also have good conduct and self-cultivation

J. Scientists have pointed out that, the development of scientific technology of humankind has led to gradual global warming.

- Scientists have pointed out that
- the development of scientific technology of humankind
- gradual global warming
1.9 Identifying reasons

If the conclusion is the “what” of an argument, then reason constitutes the “why”. Reasons explain why a conclusion is right. To be more exact, reasons explain why the readers or listeners should believe that the conclusion is right.

Imagining a desk with legs as an analogy to an argument will help you in your understanding.

- A good argument must contain one strong reason. The reason is like a steady support for a desk.
- Or, an argument may contain several reasons. Though each of the reasons alone may seem not strong enough, when they are counted as a whole, they could offer a very strong support to the conclusion.
- If the reasons are too weak that they cannot even support the conclusion, the argument will collapse like a desk without strong and steady legs.

The following are some common reason indicators:

- Because …
- The reasons are …
- First of all, … / Above all …
- From …, we can see that …
- Given …, / In light of …, / Provided that …

In the following examples, there is a reason indicator preceding each reason.

Example 1: You should take out travel insurance because there could be many unexpected incidents during travel.

The conclusion of the above argument is that “you should take out insurance”. Why? The reason supporting this conclusion is that “there could be many unexpected incidents during travel.”

Example 2: We should offer free medical services to poor children. This is very important because children need protection against diseases but poor families often cannot afford the medical expenses.
The reasons of this argument are (1) poor families cannot afford medical expenses, and (2) children need protection against diseases because their immunity is weaker in comparison with adults. Therefore, we should offer free medical services to poor children.

Example 3: Because Derek Choi is a pop singer as well as a composer, there are many singers who wish to imitate his style.

In the example above, the conjunction “because” indicates that a conclusion is coming.

In the above examples, an argument can be expressed through several sentences or an even longer text. When establishing a point of view, several reasons can be employed to support a conclusion; or several conclusions can be drawn from one reason.
Worksheet 1
Fundamentals

1.10
Exercise 5

Identify whether the following sentences or phrases are reasons or conclusions.

A. From the fracture revealed in the X-ray film, we can infer that he has fallen from a height of at least six metres.

<table>
<thead>
<tr>
<th>Reason</th>
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<td>the fracture revealed in the X-ray film</td>
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</tr>
<tr>
<td>he has fallen from a height of at least six metres</td>
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</tr>
</tbody>
</table>

B. The football team did not play well this season. It seems unlikely that it will be competing for the championship.

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<td>it seems unlikely that it will be competing for the championship</td>
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C. Clearly, marine organisms are on the verge of extinction in the polluted water. This reason is enough to completely prohibit the use of pesticide.

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<td>This reason is enough to completely prohibit the use of pesticide</td>
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D. He spends hours every day playing internet games so he has failed in the end-of-term exam.

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</tr>
<tr>
<td>he has failed in the end-of-term exam</td>
<td></td>
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</table>
E. Research has indicated that a modest amount of caffeine can prevent Parkinson’s disease. Therefore, we should encourage people to drink more coffee.

A modest amount of caffeine can prevent Parkinson’s disease
we should encourage people to drink more coffee

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1.11 Identifying conclusions and reasons and determining the strength of reasons

There are reasons which give full or partial support to the conclusion, and some that are completely irrelevant to the conclusion. When thinking about a reason, we must consider whether it gives adequate support to the conclusion.
Identify the reasons and conclusions of the following sentences and assess how supportive these reasons are to their conclusions. (If you find a sentence which contains no reason or conclusion, ignore it on the grounds that it does not constitute an argument.) Identify how supportive they are using the rating scale given, by circling the appropriate option.

A. It’s raining today, so take your umbrella with you.

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<td>It’s raining today</td>
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<td>take your umbrella with you</td>
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</table>

How supportive is the reason for the conclusion: does not weak medium strong

B. My mathematics will not improve because I am a girl.

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<tbody>
<tr>
<td>My mathematics will not improve</td>
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</tr>
<tr>
<td>I am a girl</td>
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How supportive is the reason for the conclusion: does not weak medium strong

C. This liquid medicine is so bitter. It will definitely make me well.

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<td>This liquid medicine is so bitter</td>
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<tr>
<td>It will definitely make me well</td>
<td></td>
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</table>

How supportive is the reason for the conclusion: does not weak medium strong
D. Your decision is right because I support you.

<table>
<thead>
<tr>
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<th>Conclusion</th>
</tr>
</thead>
<tbody>
<tr>
<td>I support you</td>
<td></td>
</tr>
<tr>
<td>Your decision is right</td>
<td></td>
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How supportive is the reason for the conclusion: does not support weak medium strong

E. Travelling by air is more dangerous than other forms of transportation because it has an extremely low survival rate in accidents.

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<tr>
<td>an extremely low survival rate in (plane) accidents</td>
<td></td>
</tr>
<tr>
<td>Travelling by air is more dangerous than other forms of transportation</td>
<td></td>
</tr>
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How supportive is the reason for the conclusion: does not support weak medium strong

F. Your sister works so hard. Her academic record must be very good.

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<td>Her academic record must be very good</td>
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How supportive is the reason for the conclusion: does not support weak medium strong

G. Terry is a boy. He is tanned and strong.

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<tr>
<td>Terry is a boy</td>
<td></td>
</tr>
<tr>
<td>He is tanned and strong</td>
<td></td>
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</table>

How supportive is the reason for the conclusion: does not support weak medium strong
H. I spent a lot of time practising for basketball matches this term, therefore, I got mediocre grades in other subjects.

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<td>I spent a lot of time practising for basketball matches this term</td>
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</tr>
<tr>
<td>I got mediocre grades in other subjects</td>
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How supportive is the reason for the conclusion: does not support

I. This country is in a leading position of science and technology in the world, it must also be an economic leader, too.

<table>
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</tr>
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<tbody>
<tr>
<td>This country is in a leading position of science and technology in the world</td>
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</tr>
<tr>
<td>it must also be an economic leader, too</td>
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How supportive is the reason for the conclusion: does not support

J. Tom is often ill. He must have a weaker immune system than normal people.

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<tr>
<td>Tom is often ill</td>
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How supportive is the reason for the conclusion: does not support

1 neither very good nor very bad
1.13 Identifying assumption

In an argument, an assumption can lead to a conclusion. The assumption is usually treated as true, even if it is presented by hinting, omission or unverified means. The assumptions of a certain argument can be the conclusion of another argument, and may not be mentioned or verified in the current argument.

In argument analysis, it is very important to identify assumptions because assumptions are often used by some advertisers and other people to persuade us.

Politicians often use assumptions in political debates. Assumptions are statements made without either any supporting evidence or being verified. For example, the promises made by politicians during election campaigns are usually based on the assumption that their policies will effectively address the present social problems. People usually only pay attention to these promises and neglect whether these politicians can prove that they have the ability to realise what they have promised.
Try to list the possible assumption(s) indicated in / implied by the following arguments.

A. We should increase our investment because the economy is undergoing rapid growth.

B. Parents who care about their children’s future success should enrol their children early into preschool, because there is great competition in society nowadays.
C. Parents should encourage their children from an early age to learn different skills in their spare time such as playing musical instruments, learning foreign languages and taking up sports training etc., so that they can discover and develop the potential of their children, giving them a leading advantage in the future.

D. In western society, it is very common for students to have a part-time job. Similarly, our society let youngsters work in their spare time and holidays so that it can help them develop the consciousness to work as well as identify their career interest. Thus part-time jobs for students “kill two birds with one stone”.
E. If parents want their children to have a healthy body and mind, and develop well socially, they should not let them play electronic games; especially those involving violence.
1.15 Identifying and listing counterargument

Counterargument refers to the one or several additional argument(s) used to refute the reason(s) that support the conclusion, so that the readers and audience understand certain opposite opinions. In the argument process, we sometimes deliberately add in some counterarguments, not for overturning the original arguments, but to let our readers understand that we have comprehensively considered some opposite arguments and opinions.

Similar to assumption, counterargument has often been omitted. Arguments in real life usually do not contain countering reasons. So finding out what is missing is an important component of argument analysis in real life situations.
Identify which are the conclusions, reasons and counterarguments in the following examples.

A. During education, students should take part in more extracurricular activities. Extracurricular activities can help students to acquire information beyond their textbooks and develop various skills. However, if they get too involved in extracurricular activities, their academic performance may be affected.

Conclusion:

Reason:

Counterargument:
B. Rock-climbing is very popular because it is challenging and builds self-confidence as well as improving one’s physique. Rock-climbing may look rather dangerous, but if the apparatus are carefully checked and protective measures are taken, one can enjoy the fun of it without worrying about its safety.

Conclusion:

Reason:

Counterargument:
C. We may substitute other food for black moss. Even though it is good for our health as well as relatively cheap, its exploitation has accelerated the desertification of northern China and interrupted the ecological balance.

Conclusion:

Reason:

Counterargument:

---

2 the process by which land becomes desert
Think carefully about the following sentences and try to write down at least one counterargument.

A. It is an excellent opportunity to become an exchange student and study abroad because one can learn to become independent, experience the unique local culture and make new friends.

Counterargument(s):
B. We should implement small class teaching because it can improve the teacher-student ratio and give teachers more time to take care of every student.

Counterargument(s):

C. We should advocate the purchase of second-hand computers because they are not only cheap, but this is also good for the environment.

Counterargument(s):
D. The government should take on the responsibility for the increasing air pollution because it is the only institution that has the authority to supervise and control the discharge of pollutants. It is only natural that it should be responsible for it.

Counterargument(s):

E. We should encourage children to watch more TV programmes because they provide all kinds of information, which gives children access to knowledge beyond their textbooks and promotes the development of their brains and intelligence.

Counterargument(s):
1.18 Identifying fallacy

A fallacy is something seems to be correct but in fact contains wrong reasoning.

The two most common fallacies are affirming the consequent and circular reasoning.

**Affirming the Consequent**

If A happens, then B will happen. Since B happens, therefore, A must happen.

Examples:

- If I catch a cold, I will get a day off school.
  – I am off from school today. I must have caught a cold.
- If there is not enough funding from the government, it will be difficult for farmers to make a living.
  – The farmers are not making a living. This must be due to the lack of government funding.

**Circular Reasoning**

1) An unproven hypothesis is first assumed to be right and then used to prove itself.
2) The reason is restated as the conclusion.

Examples:

- All his decisions are wise, because he has never made any stupid decisions.
- Women are not competent for managerial work because they are not men.
Please read the following sentences carefully and then determine whether they are arguments. If so, determine how supportive the reasons are to their conclusions.

A. There are a large number of juvenile delinquents in society because there are too many working mothers.

☐ An argument
☐ Not an argument

How supportive is the reason for the conclusion: does not weak medium strong support

B. She looked into his eyes passionately and said, “I love you.”

☐ An argument
☐ Not an argument

How supportive is the reason for the conclusion: does not weak medium strong support

C. The commercial agreement between Hong Kong and the rest of the Pearl River Delta is an essential condition for reducing accidents on highways.

☐ An argument
☐ Not an argument

How supportive is the reason for the conclusion: does not weak medium strong support
D. These books form the foundation of our culture and society. Only a few students will read these books unless made to by teachers. Based on the above two reasons, it can be concluded that these books should become mandatory readings for college students.

- An argument
- Not an argument

How supportive is the reason for the conclusion: does not support weak medium strong

E. Are you bored with the speeches given by those politicians? Then vote for me. Don’t forget, vote for me, David Chan.

- An argument
- Not an argument

How supportive is the reason for the conclusion: does not support weak medium strong
Please read the following sentences carefully and then complete the exercise.

A. All murderers were abused in their childhood. Damien Chan was abused when he was little, so he will become a murderer.

What type of reasoning is this? Is it valid? Why?

B. If Ben does not call home, his parents will be worried. Ben’s parents are very worried. It can be concluded that

1. Ben has not called home.
2. Ben has called home.
3. No conclusion can be drawn.

C. If Anna does not practise, she will not play well. She does not play well. It can be concluded that

1. Anna has not practised.
2. Anna has practised.
3. No conclusion can be drawn.

D. We do not allow teenagers under the age of 18 to drink alcohol because they are too young.

☐ An argument
☐ Not an argument

<table>
<thead>
<tr>
<th>How supportive is the reason for the conclusion:</th>
<th>does not support</th>
<th>weak</th>
<th>medium</th>
<th>strong</th>
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### 1.21 Summary

Every day, we are bombarded with persuasive appeals, which are intended to make us believe certain conclusions are true or to make us follow certain behaviours.

In this activity, you have had an opportunity to discuss and practise a number of important techniques in argument analysis. Next time, when you are dealing with persuasive appeals, these techniques will help you make sensible decisions.

By applying critical thinking in argument analysis, you will be able to

<table>
<thead>
<tr>
<th>Technique</th>
<th>Description</th>
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<tbody>
<tr>
<td>identify reasons</td>
<td>why you should believe an argument</td>
</tr>
<tr>
<td>identify conclusions</td>
<td>what the argument is trying to convey</td>
</tr>
<tr>
<td>consider assumptions</td>
<td>implications that are often omitted in an argument</td>
</tr>
<tr>
<td>put forward or identify counterargument</td>
<td>refute any additional reasons for a predetermined conclusion</td>
</tr>
<tr>
<td>determine the overall strength of an argument</td>
<td>whether the conclusion is well supported</td>
</tr>
<tr>
<td>identify fallacy</td>
<td>whether the argument is valid or whether there is any fallacy</td>
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The techniques of argument analysis are very valuable, so you should make sure that you make good use of them.

You should try to use these techniques as a foundation in daily life when determining whether the relationship between two events or two ideas is valid and based on a solid foundation.

**Please think carefully and strive to make good progress.**