

# student hub live is the OU's live online interactive platform to support academic community



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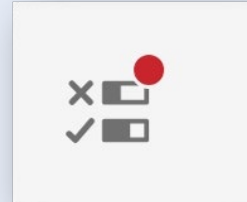
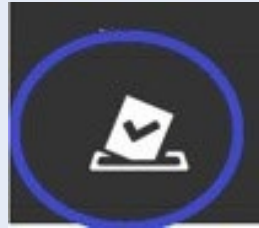
# Online workshop basics



- Polls are anonymous to other participants but the chat box will have your logged in name associated with your comments during the live session.
- All online sessions are recorded and available to view on catch up on a public facing website.
- Slides are available to download during the session(*may not be accessible on some mobile devices*) and from <http://studenthublive.open.ac.uk/>.

# Mobile users

If you are on a mobile device remember you need to tap into the polling option



To come back to these slides after completing a poll click on the share pod slides icon



Chat pod icon



# Today's workshop

- This is a tutor led session about logical problems solving.
- We'll give you some ideas about how to use some logical problem solving in your studies
- There is a lot of interaction so please be ready to answer polls (questions) or add to chat pod during the session
- We can not give module or subject specific advice

## Please be aware

- These sessions are large scale
- They are very busy
- There is lots of interaction
- They are not the same as other tutorials
- You can maximise slides on your own screen by clicking the icon (this will hide the chat)



# Inclusivity

- We welcome all students at our workshops. Please do be aware that they can be very busy and some students may struggle with the non scripted nature.
- Slides are available to download within the live session and from the event page on the studenthublive website 24 hours ahead of every session to follow along or prepare for what will come up.

# Please

- Do NOT share any personal information in the chat pod during the session
- On the recording names will be anonymised to user number
- However if you type anyone's full name or any other personal information in the chat pod it can be seen by everybody and it would also show up on the recording so we would not be able to make the recording available

# Logical Problem Solving





# This was our advert...



- Logical thinking has ancient roots in many cultures and is still valid in structuring our thoughts today both for ourselves and for our audiences. It's a process of rational thinking by a step by step growth of ideas leading to a sensible solution to a problem. If you have good logical thinking you can then explain your thought process to colleagues and they can follow the thought flow.
- In this session, we will look at what logical problem-solving is and how it differs from creative problem-solving. We will consider the benefits of logical thinking and how to map your thoughts using decision trees.
- It is also important that your logical steps are the right size for your target audience. The use of an audience avatar can help you decide what are the vital parts of your thinking you need to share so that your reader or listener can follow your logic.

# Recommended books



- The Scientific Method: Steps, Examples, Tips, and Exercise basic but interesting <https://www.youtube.com/watch?v=yi0hwFDQTSQ>
- 8 step problems solving  
<https://hr.uiowa.edu/development/consultations-support/8-step-problem-solving-process>
- Logic for problem solving  
[https://www.math.uci.edu/~mathcircle/materials/Logical\\_Problem\\_Solving\\_Oct27\\_2014.pdf](https://www.math.uci.edu/~mathcircle/materials/Logical_Problem_Solving_Oct27_2014.pdf)
- Logical problem solving strategy  
[https://www.mso.anu.edu.au/pfrancis/phys1101/Lectures/L10/strategy\\_notes.pdf](https://www.mso.anu.edu.au/pfrancis/phys1101/Lectures/L10/strategy_notes.pdf)
- Logical thinking terms  
<https://www.youtube.com/watch?v=6Sg9zl-GNsl>
- Laws of logic  
<https://www.youtube.com/watch?v=ZQwWrE8jaOs>
- 19 logical fallacies  
<https://www.youtube.com/watch?v=wwUe7T2OKQE>
- More on fallacies  
<https://www.youtube.com/watch?v=4CtofTCXcYI>  
<https://www.youtube.com/watch?v=pCg-SNOteQQ>  
<https://www.youtube.com/watch?v=Qf03U04rqGQ>

# Recommended books

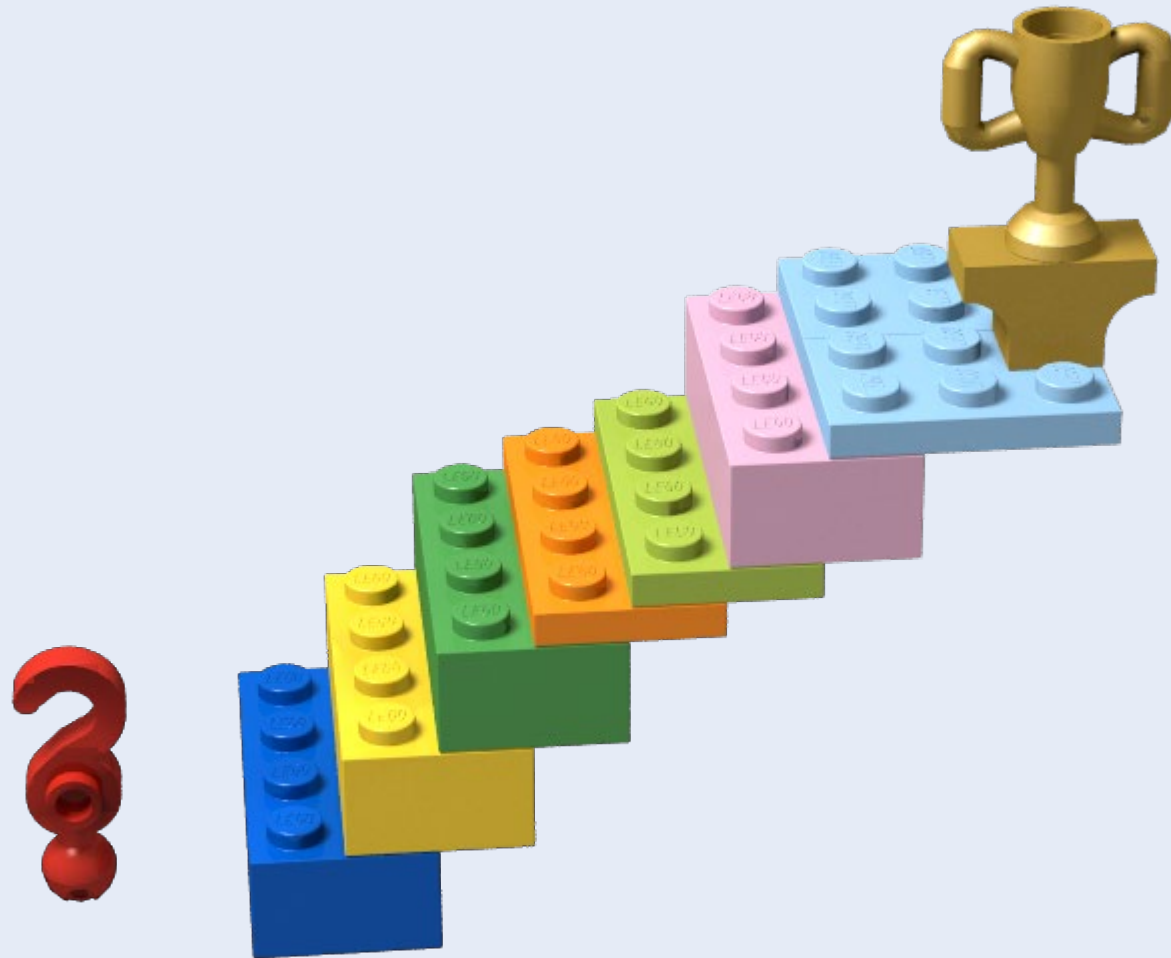


- 15 Strategies to Improve Your Problem Solving Skills  
<https://www.youtube.com/watch?v=kRtdcBfvixE>
- The Psychology of Problem-Solving  
<https://www.youtube.com/watch?v=vg936IW9i7Q>
- How to Solve a Problem in Four Steps: The IDEA Model  
<https://www.youtube.com/watch?v=QOjTJAFyNrU>  
[https://www.youtube.com/watch?v=nlbB17ggh\\_E](https://www.youtube.com/watch?v=nlbB17ggh_E)
- Decision tree  
<https://www.usemotion.com/blog/decision-tree-analysis>
- Tools for Success Suzanne Turner (used only new too expensive)  
<https://www.amazon.co.uk/Tools-Success-Managers-Suzanne-Turner/dp/0077107101>
- Visio Office 365  
<https://help.open.ac.uk/microsoft-365/accessing-your-ou-microsoft-365-account>

# First thoughts poll

- What do you think logic is?

# Logical problem solving



# Logical problem solving

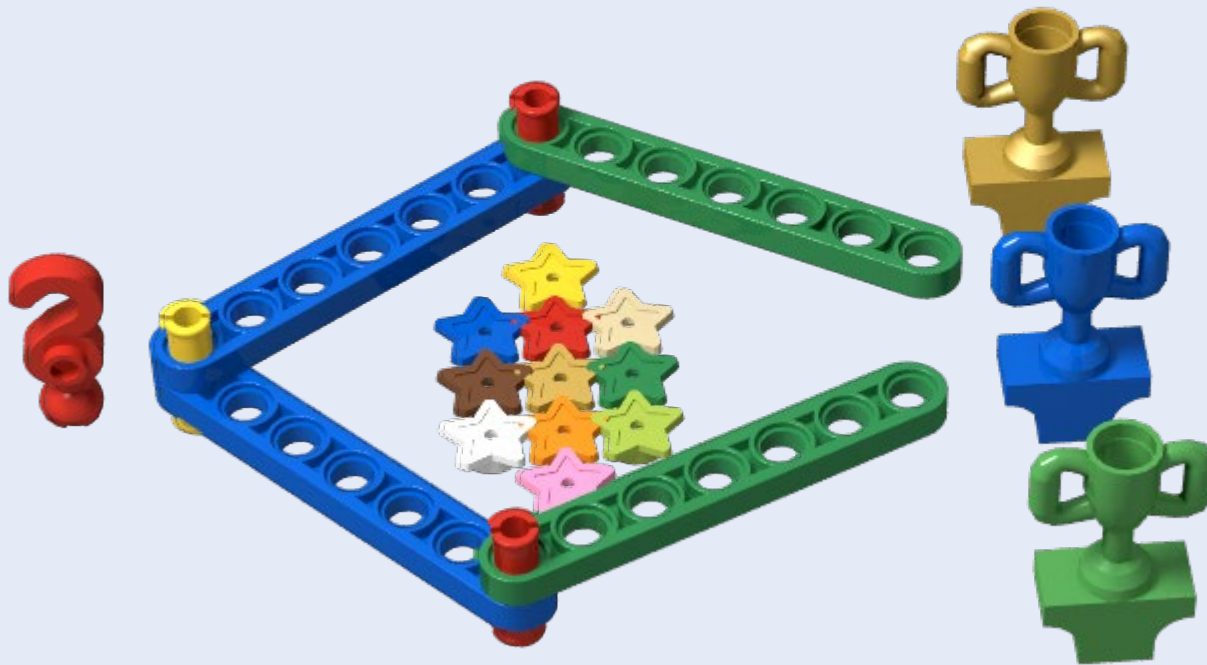
A step by step process of finding a solution to a problem.

Each step should build on the previous one.

Each step should be small enough to be carried out with the resources available.

Each step should be connected in a series that your target audience can understand.

# Creative problem solving



# What are the stages of logical problem solving?



# IDEA method

- Identify
- Develop solutions
- Execute
- Assess

# Stages of a logical problem solving

(Ibn Al-Haytham Basra 1000AD)

- Identify:
  - Break down problem
  - Evidence gathering
  - Evidence checking
- Develop:
  - Hypothesis/solution development
  - Analyse and connect to hypothesis/solution
  - Refine hypothesis/solution
  - Define plan
  - Fallacy/error checking

# Stages of a logical problem solving

(Ibn Al-Haytham Basra 1000AD)

- Execute
  - Carry out plan
- Assess
  - Are the solutions right for the problem
  - Sharing ideas with your audience

# IRAC in law

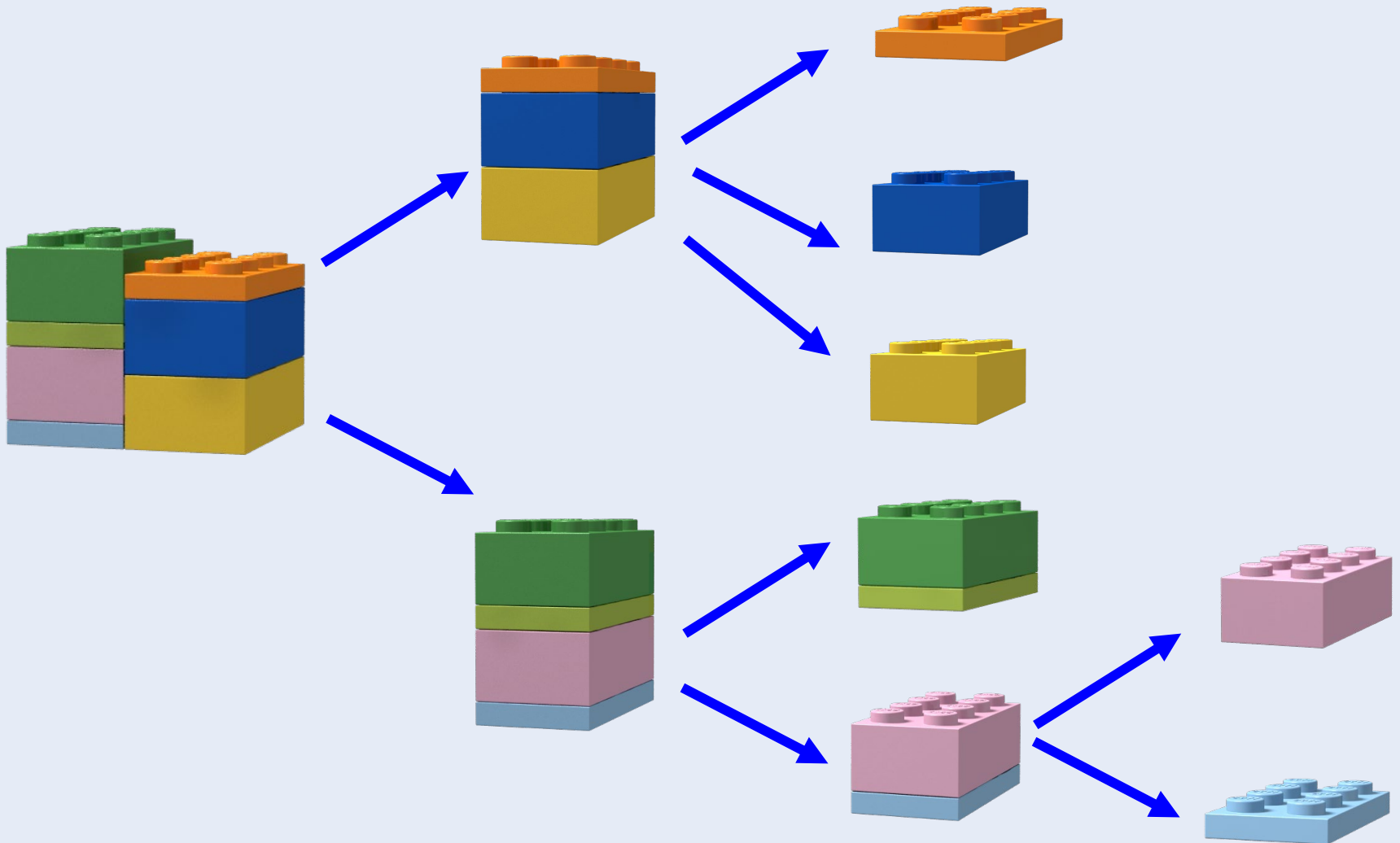
- How to use the IRAC method
  1. Identify the issue
  2. Identify the relevant rule
  3. Analyze how the rule applies to the issue
  4. Conclude your argument

# What are the advantages of logical problem solving?

# What are the advantages of logical problem solving?

- Looking at things in parts
- Getting more depth
- Being able to explain the parts to your audience
- Solutions that work

# What's a smaller part of the problem?





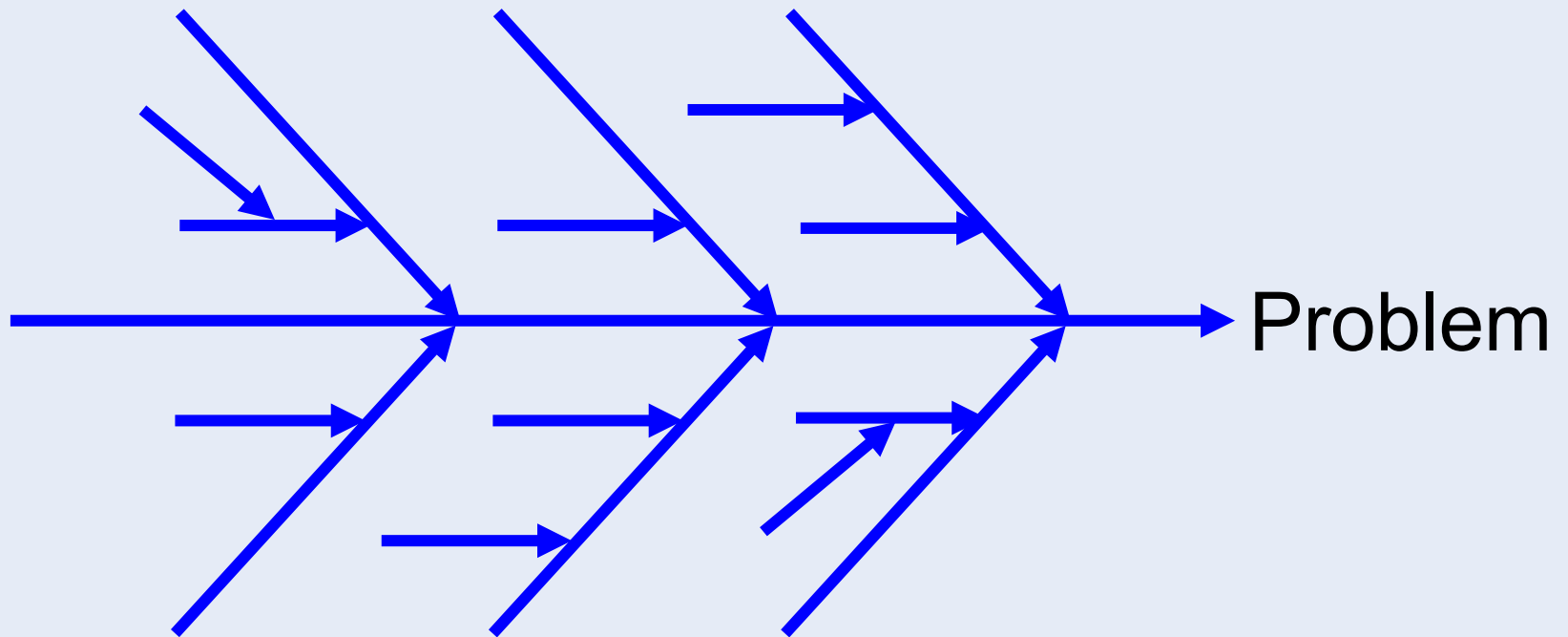




# Fish bone

## What's are the causes of the problem?

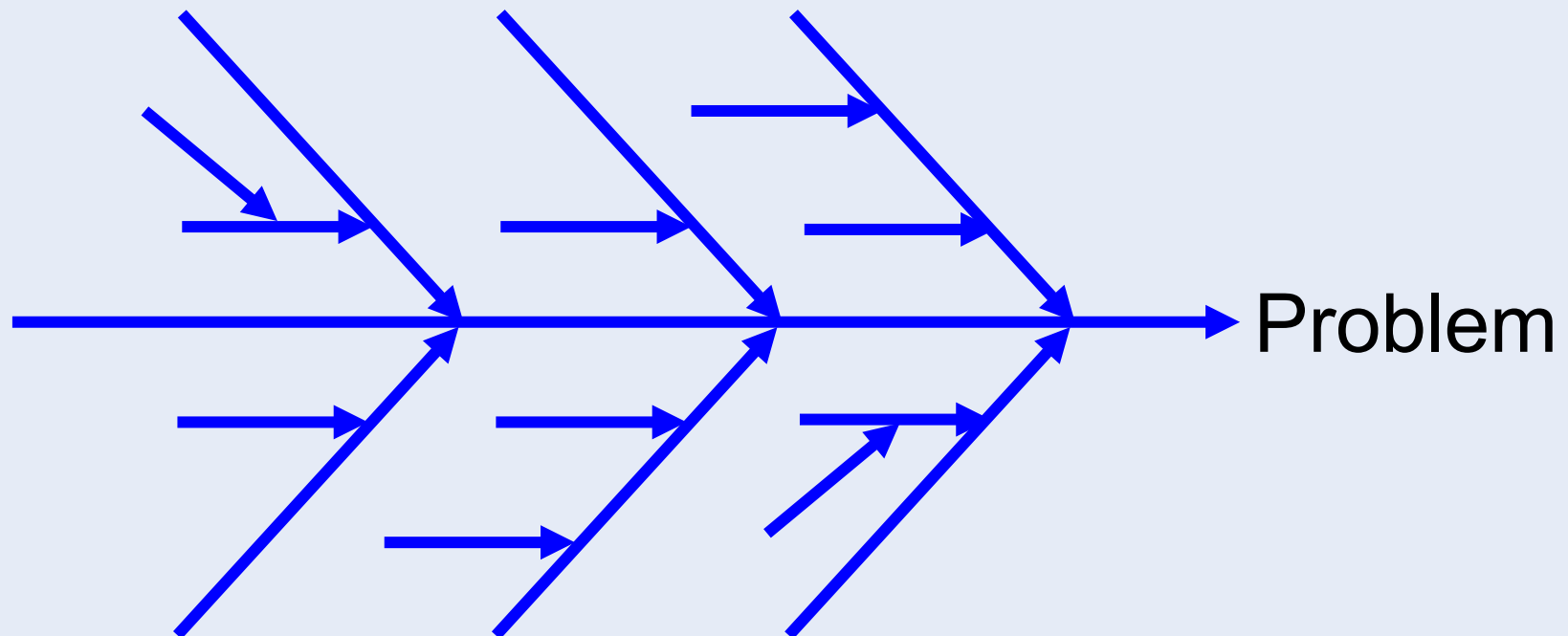
(Ishikawa 1960s)



# Fish bone

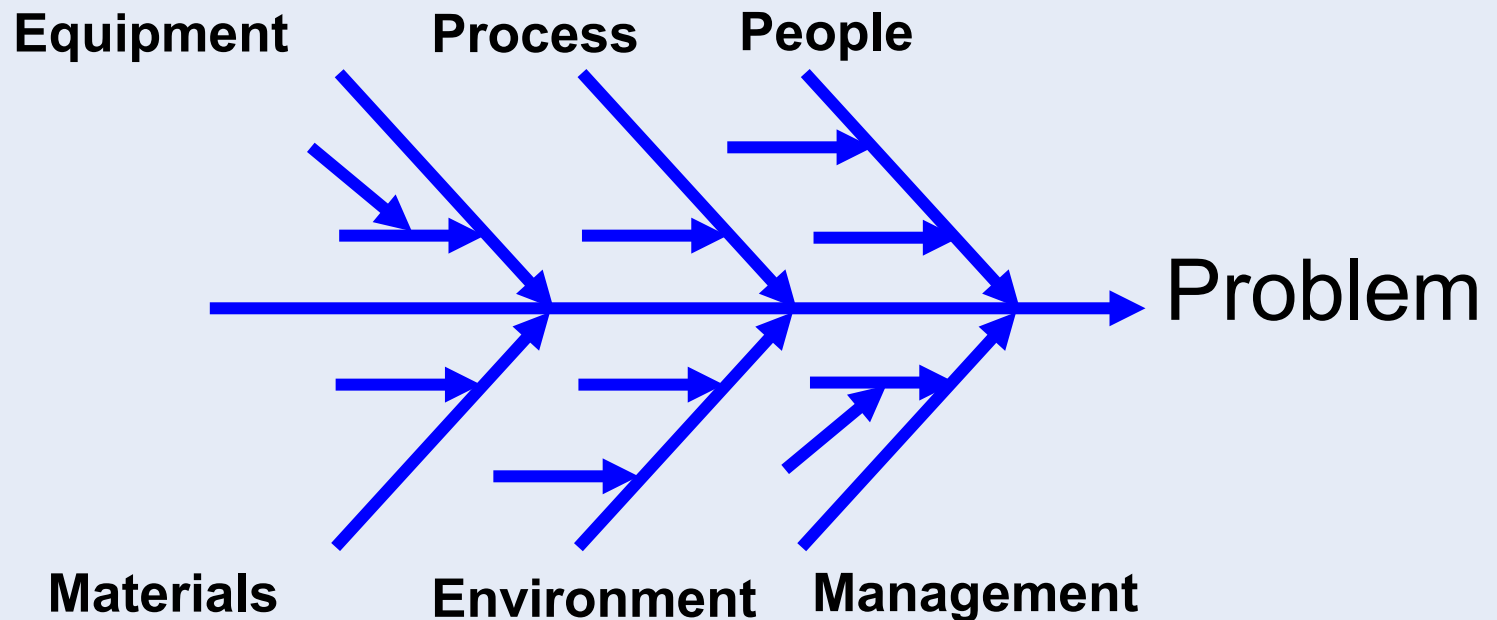
## What would your regular categories be?

(Ishikawa 1960s)



# Fish bone

## What would your regular categories be?



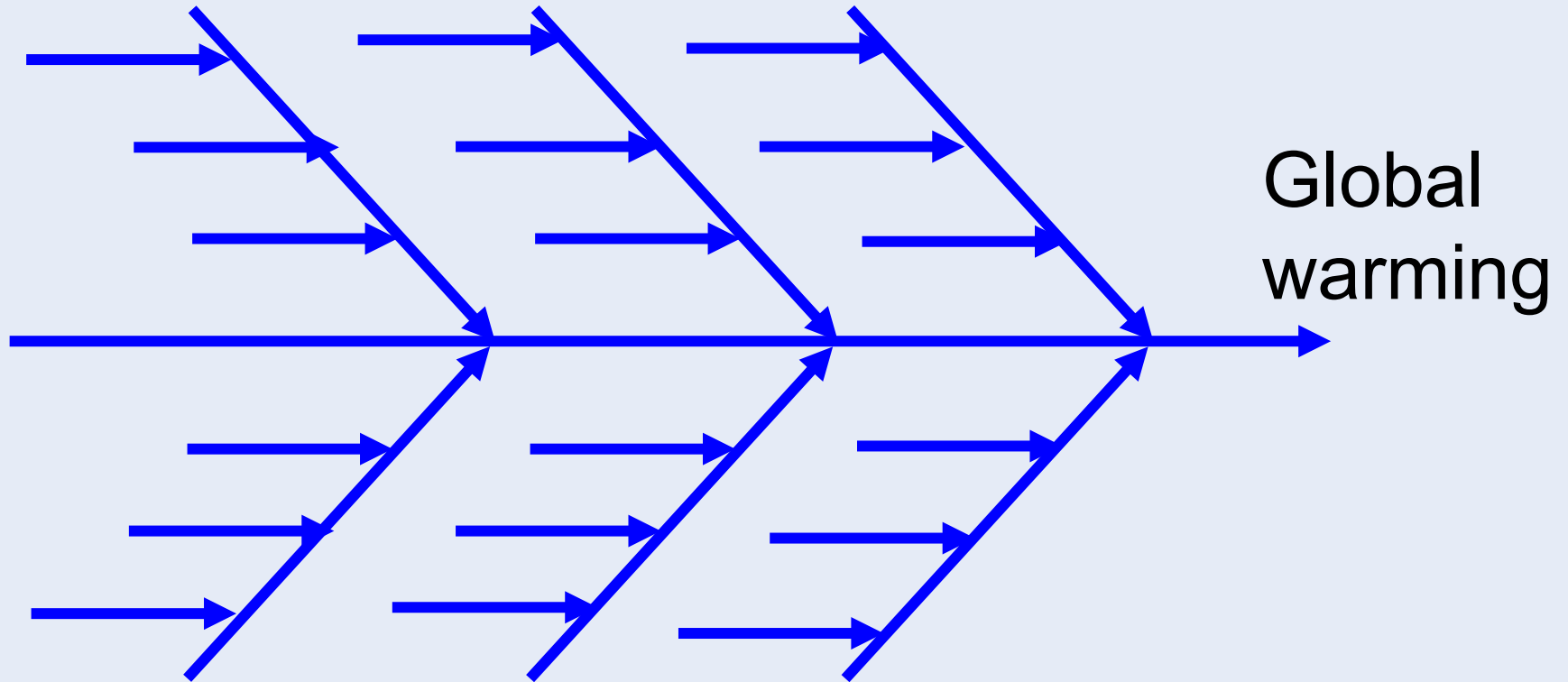
# Example

## What are the causes of global warming?

**Equipment**

**Process**

**People**



**Global  
warming**

**Materials**

**Environment**

**Management**

# Questions to find smaller parts

(phoenix list)



What is the unknown?

What is it you don't understand yet?

What is the information you have?

Is the information sufficient? Or redundant?

Or contradictory?

What isn't the problem?

Should you draw a diagram of the problem?

Where are the boundaries of the problem?

Can you separate the various parts of the problem?

Can you write them down?

# Phoenix list



What are the relationships of the parts of the problem?

What can't be changed and is constant in the problem?

Have you seen this problem before?

Have you seen this problem in a different form?

Can you use someone else's solutions?

Can you restate your problem?

Can you make it more general or more specific?

What are the best, worst and most probable cases you can imagine?

# Which question do you like best?



1. What are the relationships of the parts of the problem?
  2. What can't be changed and is constant in the problem?
  3. Have you seen this problem before?
  4. Have you seen this problem in a different form?
  5. Can you use someone else's solutions?
  6. Can you restate your problem?
  7. Can you make it more general or more specific?
  8. What are the best, worst and most probable cases you can imagine?
- A. What is the unknown?
  - B. What is it you don't understand yet?
  - C. What is the information you have?
  - D. Is the information sufficient? Or redundant? Or contradictory?
  - E. What isn't the problem?
  - F. Should you draw a diagram of the problem?
  - G. Where are the boundaries of the problem?
  - H. Can you separate the various parts of the problem?
  - I. Can you write them down?



**What type of evidence or resources do you use and where do you find them?**

# Where do you go to find evidence?

- Library
- Google scholar
- Internet
- People who have already solved similar problems

# How do you check your evidence?

# CRAP

- Currency
  - Reliability
  - Authority
  - Purpose/point of view
- 
- <https://cccs.libguides.com/c.php?g=1311828&p=9641826>
  - <https://necc.mass.libguides.com/c.php?g=973707&p=7038875>

# PROMPT

- Presentation
  - Relevance
  - Objectivity
  - Method
  - Provenance
  - Timeliness
- 
- <https://www.open.ac.uk/library/help-and-support/advanced-evaluation-using-prompt>

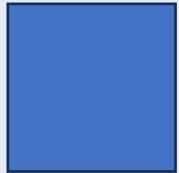
# Hypothesis/solution

- **Hypothesis (TARMS)**
- Testable
- A way of proving it to be false
- Repeatable
- Measurable
- Specific
  
- **Solution**
- Resources
- Does it solve all the parts?

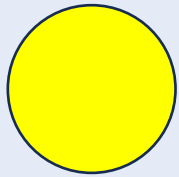
# Analysis

- Can you connect the evidence to your solution?
- Have you missed anything?
- Are there other solutions?

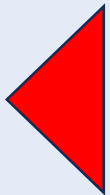
# Decision tree



- Decision node yes /no/ options



- Chance - probability of being useful high medium low



- Terminal end of chain



- Best ideas

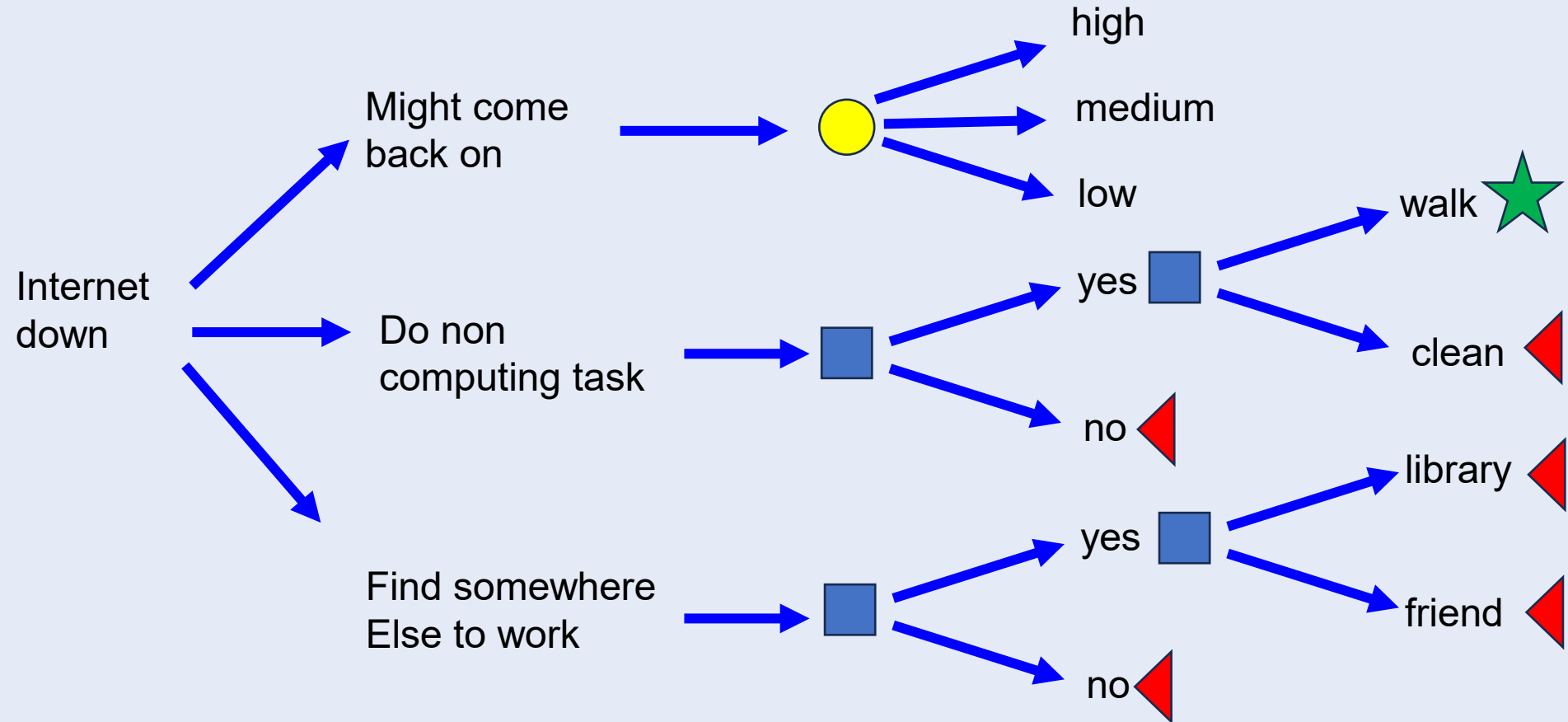


- Flow of thought



**Internet has gone down (including my phone) what do I do?**

# Decision tree



# SWOT

(Stanford university)

**STRENGTHS**

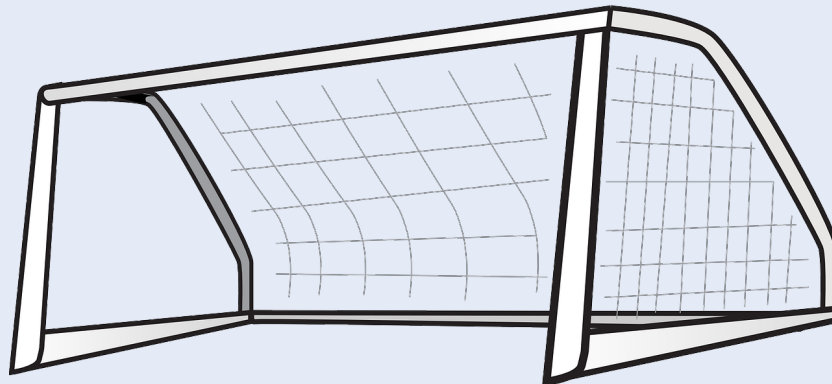
**WEAKNESSES**

**OPPORTUNITIES**

**THREATS**

# Goals

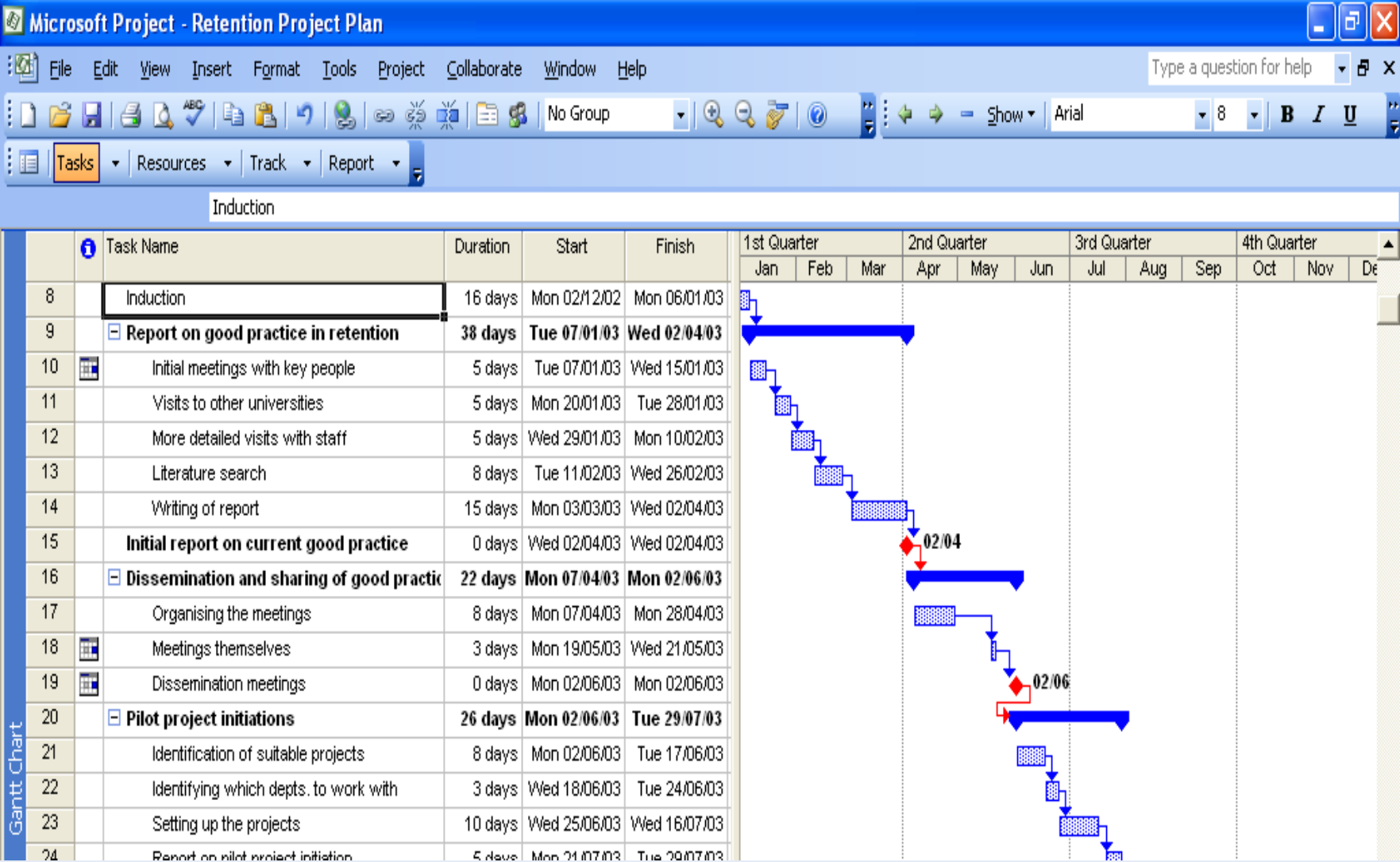
- **SMART**
  - Specific
  - Measurable
  - Achievable
  - Relevant
  - Time-Bound
- **CAN DO**
  - Control
  - Achievable
  - Necessary
  - Defined
  - On schedule



# Solution

- List of tasks
- Allocate resources
- Allocate time
- Allocate people
  
- Pebbles (achievable small steps)
- Milestones (big steps forward)

# Gantt



# Evaluating

- How do you know your solution is the right one?

# Evaluating

- What three things are good about the solution?
- What three things could be better?
- What advice would I give myself?



# Phoenix the plan

Did you solve the whole problem?

What would you like the resolution to be?

Can you picture it?

How much of the unknown can you determine?

Can you derive something useful from the information you have?

Have you used all of the information?

Can you separate the steps of the problem-solving process?

Can you determine the correctness of each step?

What creative techniques can you use to generate ideas?

Can you see the result?

How many different results can you see?

Can you intuit the solution?

Can you check the result?

# Phoenix the plan

How many different ways have you tried to solve the problem?

What have others done?

What should be done?

How should it be done?

Where should it be done?

Who should do it?

What do you need at this time?

Who will be responsible for what?

Can you use this problem to solve some other problem?

What is the unique set of qualities that make this problem what it is and no other?

What milestones can best mark your progress?

How will you know when you are successful?

# Sharing - Avatar

- One way to help the communication is to think in a lot of detail about your audience
- Avatars are you thoughts about the characteristics or knowledge of your audience





# Audience



- One way to help the communication is to think in a lot of detail about your audience
- Avatars are your thoughts about the characteristics or knowledge of your audience

**What questions would you use to define your audience's needs?**

# Avatar questions

- Who are my audience?
- Why are they interested in this topic?
- What do they know already?
- What don't they need to know?
- What biases do they have?
- What are they enthusiastic about?
- What are they going to use the information for?
- How much detail do they need for each step?

# Discussion activity

- There will be 2 specific questions in chat pods for you to explore some of the elements we have discussed further
- ***I great at solving problems when...***
- ***I am going to try...***
- You are welcome to add your thoughts and we will then pick up some of the themes and talk through them
- Chat does have names on but the recording will be anonymised so you will appear as 'user number'

# Take home message

- Break the problem down
- Take it step by step
- Know your audience
- Sometimes there isn't a perfect solution only a good enough one



# Feedback please

Please use the following link to provide feedback to help the studenthublive team to continue to improve what we do

- <https://forms.office.com/e/RpXa4Hx9Qp>

# Selected upcoming events



- 27 Feb 7 pm Introduction to essay planning
- 04 Mar 7 pm Developing your essay planning
- 06 Mar 11 am Really understanding questions
- 11 Mar 11 am Critical thinking (beginners)
- 17 Mar 11am Critical thinking (intermediate)
- 19 Mar 11am Creative problem solving
- 20 Mar 7 pm Introduction to essay writing
- 25 Mar 11 am Critical thinking (Advanced)
- 26 Mar 7 pm Developing your essay writing
- 27 Mar 11 am Q & A ask the student support team

For more information on all past and upcoming events, go to <http://studenthublive.open.ac.uk/>