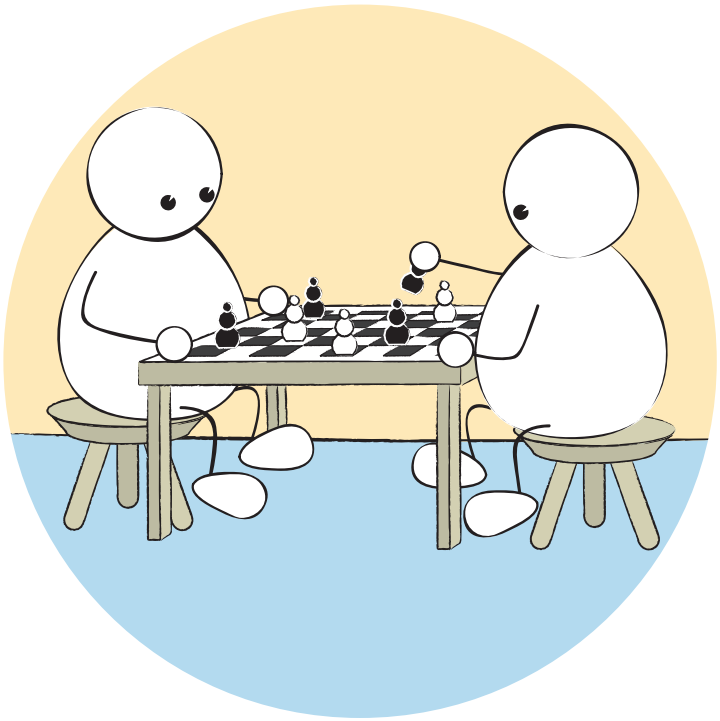
BLP
Building
Learning Power

Putting Reasoning into Learning



Learning Diary

To accompany the online unit: Putting Reasoning into Learning

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1 Reasoning - a well formed habit

A well formed Reasoning habit involves being ready, willing, and able to:

- Resist jumping to conclusions
- Seek justifiable evidence to shape sound, well-honed arguments.
- Scrutinise your assumptions
- Seek evidence and counter evidence, look for false steps and carefully draw conclusions.
- Remain suspicious, doubting and self-doubting in order to avoid unwarranted certainty.
- Convey your logical thinking clearly, through dialogue, symbols, analogies, prose and pictures.
- Make sure things are on track and make improvements along the way.

So, at a less abstract level, students need to learn the inclination to resist impulsive responses; to respond logically and thoughtfully; to apply logic by explaining, justifying and, ultimately, proving what they think; to utilise a range of reasoning tools; and to develop strategies for presenting their reasoning to others persuasively. When looked at from these diverse angles growing reasoning moves well beyond encouraging a student to 'think it through'.

2 Five big culture shifts

Five big culture shifts to get you started. Ask yourself – how might you:

	In place	Going to try
• Enable pupils to go beyond describing and explaining to justifying and proving;	❑	❑
• Create opportunities for pupils to present their reasoning to others;	❑	❑
• Make pupils aware of different types of reasoning;	❑	❑
• Ensure that pupils value rigour and precision;	❑	❑
• Encourage pupils to support their ideas with evidence, and to reconsider ideas in light of counter evidence.	❑	❑

3 The six principles that lie behind teaching for Learning Power

1: Visible learning…Surfacing learning

❑ In place ❑ Going to try

You make it clear to pupils which learning habits and processes they are using. You try to make every aspect of the learning process as visible as possible through the language you use and through the words and images you display on the walls.

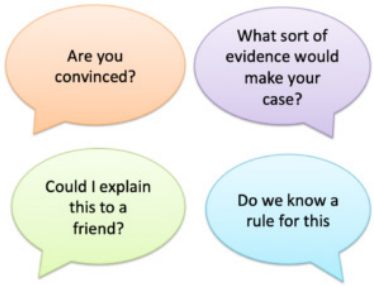
Use displays of reasoning behaviours such as:

If – Then suggestions:

If I believe that I have proved something, **then** I will go back over it to check that I have not made any errors or false assumptions.

If I feel certain about an issue, **then** I will check for any counter evidence.

Or useful reminders such as:



2: Dual focus teaching…blending content and process

❑ In place ❑ Going to try

You design activities that combine the dual objectives of 'what' will be learned and 'how' it will be learned. You make sure students know that the content they are learning is a way of giving their minds a useful workout. (The content is the vehicle for learning)

For example: A simple, straightforward way of showing the purpose of learning objectives or goals…simply add SO THAT at the end of the objective. The SO THAT is similar to the why. It aims to offer a wider reason for pursuing the learning objective. So an objective becomes…

Be able to xxxxxxx So That. . . . add the wider purpose

Continue to put the 'how' before the 'what' in constructing objectives or intentions.

As a team, using xxx reasoning (the how) be able to….(the what.)…. so that…(the relevance)……

3: Emotional engagement…Capturing attention

In place ❑ Going to try ❑

Your lessons are designed to intrigue your pupils. Pupils don't put in the effort unless their energy and attention are captured by what they are doing. You capture your pupils' emotional engagement by giving them more of a stake in the process of learning.

Quick learning challenges to warm up/ tune-in to relevant learning muscles

Challenge: " There are nine little pigs in a field.

By drawing two squares how can you give each pig its own pen?"

5 minutes to complete

Use Coaching Questions with "could be" or "might be" language. "How differently can we draw the squares?" "Can we draw squares outside the box?"

4: Handling uncertainty…Challenge

In place ❑ Going to try ❑

You have realised from your own life that what is engaging tends to be what is challenging. Since you see education as a preparation for a learning life, you help pupils to learn how to handle increasing degrees of complexity and uncertainty.

For example: Spot the mistake.

Offer pupils examples of written work with different numbers of mistakes in them. Challenge them to work in pairs to correctly identify the mistakes in each example. When complete tell pairs if they have found the right number of mistakes but if not don't discuss which, if any, they have overlooked. Ask for explanations of the errors and how they can be avoided.

5: Relationships…Working together

❑ In place ❑ Going to try

Learning is both a sociable and a solitary activity, and you offer your pupils opportunities to experience both. You develop interdependent learners who know how to handle themselves in collaborative groups and able to move around in the social space of learning to best effect.

For example: Sorting how decisions are made.

What could groups do when they can't agree on the logic of the situation? Try this three stage approach to reaching a consensus.

Once a range of alternative ideas/strategies have been identified:

Stage 1 – a few minutes whole group discussion. If one idea emerges as everyone's favourite, then a consensus has been reached. If no single idea has everyone's support, move to stage 2

Stage 2 – Now, try for a compromise involving some 'give and take'. Look at two or three of the most popular ideas, and encourage pupils to ask:

- What changes are needed for one of these ideas to be acceptable to everyone?, or failing that . .
- Which one would we all be willing to try, for a short time, to see how it works out. Then back to stage 1. Decide: pursue/ change tack. If there is still no agreement. . . .

Stage 3 – the last resort – voting. Show of hands, or a secret vote. Or:

- Label the different possibilities A/B/C/D etc
- Each person nominates their top three
- Tally scores and the idea with the greatest number of 'hits' is the group's preferred solution.

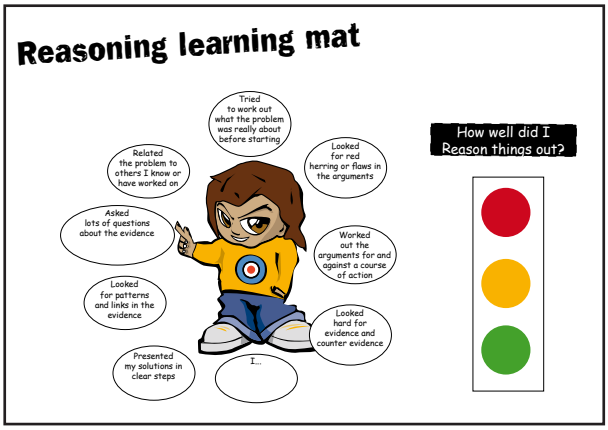
6: Reflection and responsibility…Taking charge

❑ In place ❑ Going to try

You understand that pupils have to learn how to manage and organise their own learning and that the way to do this is by giving them increasingly demanding opportunities to do so. You orchestrate pupils taking charge of their learning by expecting them to plan what they do, distil meaning from it, and revise it accordingly.

For example: Use learning mats

at the start of this process to prompt the use of and reflection on reasoning.



Using two images to seek evidence and to develop inferential reasoning skills.

Lesson title: **Episod** **Objectives:**

	Teacher Action	Pupil Action	Learning Behaviours	Teacher Talk
Episode 1	.What time of day is it? **Use** Think Pair Share to encourage students to explore the image with a view to deciding. **Use** 'What makes you say that?' encouraging explanations rather than opinions **Conduct** class discussion to explore hypotheses. **Conduct** class discussion about how the question cannot be answered for certain.	1 minute in silence to consider the evidence (think) 1 minute to explain to a partner what they are thinking and why. (pair) 5 minutes whole class discussion.(share) 2 minutes to debate whether there is sufficient evidence to answer the question	Encourages students to hypothesise, with very little evidence on which to base the hypothesis, to explain their thinking to others, and to understand that the evidence is insufficient to answer the question.	What makes you say that? Can you give me a bit more on why you think . . . What are you noticing? Convince me How can you be sure What do we know for certain about the time of day?
Episode 2	**Use** Think Pair Share to encourage students to identify differences and similarities. **Ask** pairs to share the differences they have noticed. **Ask** if anyone has a difference that nobody else has noticed? **Record** / gallery differences / similarities arising from the discussion.	1 minute to study the 2 images. 2 minutes to share similarities and differences with a partner. 2 minutes class discussion to collate the outcomes.	Encourages.students to be patient to notice similarities, differences and obscure differences, to share their ideas with others, and finally to contribute their ideas to a class list of similarities and differences.	What are you noticing? What is still the same? What are the differences? Anyone else spot that? Which differences are most important? Least important? On what grounds?
Episode 3	**Organise** table based discussion – which similarities and differences are most important/relevant here? **Lead** whole class debate on which image came first **Lead** whole class discussion on whether there is sufficient evidence to make a definitive decision, leading in to a discussion about what we really do know.	1 minute to discuss in table groups which differences are most important. 2 minutes to debate which image comes first. 2 minutes to decide on whether there is sufficient evidence to answer the question 1 minute to reflect on what we do KNOW about the 2 images.	Encourages students to organise the evidence in order of importance, to debate with others, to present their reasoning in order to convince, and finally to reflect on whether the evidence is sufficient to draw warranted conclusions	What is and is not important? What is your evidence for . . ? Is it possible to decide this? What do we know – for certain How is that different from what we think we know?
Episode 4	Pose a new/different question...what time elapsed between the 2 images? Organise table based discussions on: a) the relative importance of the evidence; b) the elapsed time Lead whole class discussion to weigh the evidence and counter evidence.	1 minute on tables to consider whether the important similarities and differences in Episode 3 are still the important ones now that the question has changed. 3 minutes to discuss and decide on the time elapsed. 2 minutes to debate and hopefully come to a class consensus. Or not !	Encourages students to identify key evidence and counter evidence; to present their logical arguments to others; to consider the arguments of others in reaching a consensus	What is most important here? Does changing the question change the importance? What is your point? What is the evidence for that? What does that tell us? (PEE) How might we resolve this?
Episode 5	Organise 4's to discuss and agree, with evidence, their proposed 'time window'. Organise 8's to debate and agree. Lead whole class discussion to explore the arguments and counter arguments.	2 minutes for each table to agree their preferred time window, based on all of the evidence. 2 minutes for 4's to become 8's with a view to agreeing their collective answer. 1 minute to explore differences and counter arguments.	Encourages students to reach consensus through reasoned argument; to present their reasoning; to reconsider their line of thinking in light of others' arguments.	What lead you to think that? Which bits of evidence did you find most compelling? Who thinks differently? Can we come to a consensus on this? Do we buy this? What is our best guess?
Episode 6	Organise pair reflection time on what has been learned about reasoning. Enable students to collate post its in a gallery Help students to distil their learning about Reasoning. Produce a display to distil what has been learned about Reasoning.	2 minutes in pairs to reflect on and share what has been learned about reasoning. 1 minute to write on 2 post its two things that they have learned about reasoning. 1 minute to gallery their post its and consider what others have learned.	Encourages students to clarify and reflect on what has been learned about the process of Reasoning.(The type of reasoning being used and the words being used to guide it.	What do we know now that we did not know before? Did we find **justifiable** evidence? **The** most important thing we have learned about Reasoning today? What sort of reasoning words did you use? (because, therefore, proof, justify Imagine a world without Reasoning

Reasoning	1) Frames of mind	2) Self talk	3) Applying reasoning	4) Reasoning tools	5) Presenting reasoning
Embodies	Meta reasoning. Thinks about how to improve reasoning.	"Not getting it wrong is a huge part of getting it right."	Instinctively applies high level reasoning to practical situations in order to achieve ___ outcomes.	Uses Devil's advocate techniques to explore and provoke new ways of thinking.	Presents their reasoning persuasively/convincingly in ways that engage and inform.
Organises	Seeks to reduce uncertainty/ avoid unwarranted certainty.	"Can I detect a flaw here? I want to be sure I'm getting it right. I might have to re-evaluate that assumption."	Thinks about and avoids common traps and fallacious forms of argument. Looks for counter evidence.	Evaluates pros and cons, looks for alternative solutions. Employs 'if then' reasoning.	Presents abstract thought using many forms of expression to show meanings and proof.
					
Values	Seeks to reduce uncertainty using justifiable evidence.	"How could I tell if this were true? This is because..."	Proves. Seeks evidence to support their thinking (even though their thinking may not be right/valid).	Uses deductive reasoning (uses a general rule to understand specific problems). "because…therefore."	Conveys their ideas through both symbols words and diagrams.
					
Responds	Asks questions, makes propositions.	"Is that the right answer to ...because? I reckon…"	Justifies, Convinces. Can justify (but not prove) what they are thinking. Considers different methods to solve a problem.	Speculate, conjecture, spot patterns, visualise, work backwards.	Shows how they worked something out and explains why they think that.
					
Receives	Uses casual trial and error.	"Does this go with that?", "What did I do?", "Is this the same as that?"	Describes, Explains. Can explain what they are thinking but not why they think it.	Guess, estimate. Compare and contrast.	Tells what they do or think and offers some reasons for what they did.
					
Lacks	Jumps to conclusions.	None.	Unaware of the need to reason.	Unaware of reasoning tools.	Unable to explain what they are thinking or why they think it.

Capture your learning enquiry as a question

Before filling in the enquiry question, think again about

- What you want pupils to get better at. This could be with regard to any of the four areas of culture.
- What you want to do vis introducing aspects of the learning culture that you consider will have an impact on pupils.

Over a 4 week period will

(What I'm going to do)

improve/develop/enhance

(Pupil behaviours/achievement etc.)

in my identified group of pupils?

Put a little enquiry plan together

1. Aspects of Learning culture I'll work on	Relating	Talking	Constructing	Celebrating
2. Particular issues I want to focus on				
3.How I intend to spread/organise the changes I want to make over the next four weeks 1 2 3 4 Tackle Time line				
4. The whole-school culture issues I have agreed to experiment with.				

Monitoring, I'll watch out for:	
Changes in my practice • • •	Changes in pupil behaviour • • •
Name	Class Date

6 Team Reflection and Planning Personal Action Reporting

Evidence from my reasoning experiments that I will report to the team at the next meeting

improved ability to describe what they are thinking
increased willingness to explain why they think something
greater inclination to think before taking action
willingness to undertake problem solving activities
inclination to support their answers with evidence
more inclined to want reasons or proof
increased preparedness to work methodically
improved ability to justify what they believe
willingness to construct well-honed arguments
use a broadening range of reasoning strategies
others you may have observed…

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TLO Limited have worked closely with Professor Guy Claxton since 2001. Together we have sought to create a dynamic programme for translating and extending his ideas into effective practice, in ways that can benefit every classroom and every young person. Schools, teachers and children have participated in every stage of this exciting journey of development. Our growing range of publications, face to face and on-line training and other on-line materials and training is the fruit of this endeavour.

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