Critical thinking in practice

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**Introduction**

Critical thinking is widely agreed to be a good thing, perhaps because it is often taken to mean better thinking. Beyond that basic agreement there is a wide range of approaches and practice. As a result, it can be difficult to get a clear definition of what critical thinking means and what its purpose is, making it more difficult to plan and put into practice in the classroom. This practice guide is designed to fill that gap, with a short overview of critical thinking, some practical tools for developing critical thinking, and short cameos showing how teachers have developed critical thinking in their classrooms.

**Critical thinking: a model**

Effective critical thinking is neither an isolated skill, nor a generalized opportunity for thought. Rather it combines capability - the tools to think deeper, and the curriculum context to do so. There are already a number of programmes which help develop critical thinking, such as the popular Philosophy for Children. However, a key starting point for the GA’s approach is that critical thinking is best taught in context rather than in isolation, so it is a means of developing understanding and raising achievement in relation to the content of the curriculum. From that starting point we can begin to identify the different ingredients of critical thinking:

- **Becoming better at thinking**, for example through developing pupils’ ability to ask good questions and reflect on their learning. Here, critical thinking helps strengthen curiosity and the first stages of investigations.
- **Making better sense of information**, knowledge and ideas, such as by examining evidence, learning to distinguish fact from opinion and considering alternative solutions to problems. Here critical thinking helps build informed understanding.
- **Becoming a more open thinker**, such as by challenging assumptions through discussion and debate and considering the ethical issues in a changing world. Here, critical thinking helps pupils evaluate and become more autonomous learners, able to think through and reach their own well-founded opinions, based on evidence – which may also help make them more resilient to others’ opinions.
The diagram shows these three ingredients together. Although individual teachers may put more emphasis on one aspect or another, linking them together helps highlight that paying attention to all three aspects is helpful. Setting out the different aspects of critical thinking like this may also help us get a fix on progression: the natural starting point for younger pupils is likely to be ‘becoming better at thinking’, especially through developing questioning, perhaps moving anticlockwise through ‘making better sense of information’ and ‘becoming a more open thinker’. Moreover, there is a strong link between critical thinking and the enquiry process in a range of disciplines. Finally, a key characteristic of critical thinking is that it is organised: being systematic helps teachers and pupils. Attention to all three aspects is helpful across the curriculum in supporting pupils’ current learning, future employment and lives as knowledgeable and active citizens.

Critical thinking can also be thought of as the twin companion to ‘creativity’ as it helps hone and refine thinking towards an identified goal, considering different views and sources of evidence carefully in the process. In this sense, critical thinking ensures creative thinking has purpose; it balances convergent and divergent thinking and is most effective when focused and applied to real world problem solving.

This practice guide is based on the GA’s work with SSAT and the Association for Citizenship Teaching on the British Council’s Connecting Classrooms Programme. Over 800 teachers completed CPD in critical thinking and problem solving, based on a very effective plan, do and review model. The guide presents some of the critical thinking approaches used on the programme, together with teachers’ accounts of how they used and developed these, from Early Years through to A level and in a wide range of subjects. Teachers reflected on the impact of their work on critical thinking; a summary can be found here. Some common themes emerged:

- the great majority of teachers described significant impacts on their pupils’ learning, progress and achievement. Some reported a particular impact on less ‘academic’ pupils, as well as stretching the most able
- many reported improvements in pupils’ engagement, confidence and motivation
- many primary and secondary schools reported improvements in vocabulary, discussion and communication skills
- some teachers fed back on the transformative effect on their own creativity and classroom practice.

‘This project has opened up so many doors both academically and philosophically for the children’ Charter Primary School.
Becoming better at thinking: asking good questions

Pose, pause, pounce, bounce: a questioning approach.

How it works
Pose, pause, pounce, bounce is a simple questioning approach that encourages engagement, differentiation and deep thinking. It enables teachers to take calculated risks and to tease out the learning from pupils.

Activity idea
Pose: The first step is for the teacher to pose a question to the whole class. Insist on a ‘hands down’ approach and make sure that the question posed is both open and challenging.

Pause: Most pupils will take between 1 and 10 seconds to process a question. Generally, low level questions will take between 1 and 3 seconds, calculations will take between 4 and 6 seconds and high-level questions will take 6 to 10 seconds to process. However, on average, teachers wait between 0.7 and 1.4 seconds between posing a question and eliciting a response. Therefore, the ‘pause’ stage involves the teacher giving pupils time to think. To start with, you might tell them this is what you’ll be doing.

Pounce: Select a pupil to answer the question.

Bounce: Ask another pupil to comment on or to extend this answer.

Practice points
- The first few times that you use this technique you may want to prime the pupil that you are going to ‘pounce’ on for an answer and also the pupil(s) that you are going to ‘bounce’ to, to model how the approach works.
- Vary the pupils who take on the ‘pounce’ and ‘bounce’ role. It is tempting to pounce on the pupil that you know will provide the correct answer. However, you may get a more interesting and creative response if you don’t!
- Instead of selecting a single pupil, several pupils could be ‘pounced’ on to provide an answer. This could then be bounced to a pupil or pupils who select their ‘best’ answer and explain why they have chosen this as ‘the best’.
- There is no limit to the number of times the answer can be ‘bounced’ elsewhere. However, there will come a natural point where it is difficult for the answer to be improved and / or extended further.
- ‘Thunks’ – superficially straightforward questions that encourage you to think differently about the world – are useful questions to pose. Geography specific examples can be found here: http://geographynqt.blogspot.com/#!2014/07/geography-thunks.html or here: https://www.tutor2u.net/geography/blog/geography-thunks-get-you-thinking
Developing critical thinking through questioning: Stephen Ellis, St. Joseph’s Catholic Primary School

We wanted to strengthen the process of critical thinking in geography and history through the development of questioning techniques, improving the proportion of questions asked by pupils, who also show a growth mindset and a higher level of thinking through the use of the types of questions they ask.

After whole-staff CPD, we focused on no-hands questioning; using examples of critical thinking questions; ‘Think, Pair, Share’, and the Pose, Pause, Bounce, Pounce (PPPB) approach. Classroom assistants were trained to observe and feed back on the improvements in questioning. Comments by teachers on the PPPB strategy included:

- The children are positively engaged with the process. Creates excitement.
- It allows children more time to process the question and to think.
- It is good for role modelling answers to the rest of the class.
- Improves the children’s listening skills.
- It encourages children to consider alternative thinking and to build on that thinking.
- A greater variety of answers are now given in the classroom by the children.
- It has led to children debating the thinking of their peers.
- This works well with the higher ability children.
- The children’s answers can be linked to philosophy – ‘I agree...’ and ‘I disagree...’
- PPPB is not just constrained to geography and history; it has now become a successful cross curricular strategy.
- It forces the teacher to wait longer for children to process questions and to think.

Exploring questioning techniques to support critical thinking and develop ideas:
Carrie Carter, Chesterton Community College, Cambridge

I wanted students to develop ideas and think more critically about their responses to questions. I wanted them to explore sources of evidence and to think more critically about them being aware that they can be subject to bias.

‘Pose, Pause, Pounce, Bounce’ is an AfL questioning technique that’s great for finding out how much students have learned about a topic and encourages in depth thinking about a topic through discussion. A question is posed to the class, the class pauses to think about the question and reflect, use a soft toy or ball to throw to a random student to answer the question (pounce) and bounce to another student to develop the answer further.

What Went Well:

- Most students get a chance to speak and all students are engaged because they do not know who is next.
- No hands up approach.
- Less teacher talk.

Even Better If:
• Students have more time to pause as it allows them to think about what to say. Teachers usually find this difficult. I usually try to give 30 seconds to a minute.

**Give one to get one:** a strategy for engaging all pupils in class discussion

**How it works**

This is a useful strategy for identifying what pupils know already at the start of a topic or lesson, or for reviewing what they can remember at the end. It also ensures that all pupils are involved in discussion and can explain their ideas to others.

**Activity idea**

Ask pupils to draw a table – similar to this one – with ‘give one’ on the left side and ‘get one’ on the right.

<table>
<thead>
<tr>
<th>Give one</th>
<th>Get one</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Pose an open question. For example, ‘What buildings could a visitor find in our local area?’; ‘What river features do we know?’; ‘What are the different types of coastal management?’ or ‘TNCs bring more advantages than disadvantages. Do you agree?’ Pupils then spend a few minutes writing as many points as they can in response to the question in the left-hand side of their table. Each point should be written on a new line of the table.

Pupils walk around the classroom and find a ‘partner’. Each pupil ‘gives’ one of the points on the left-hand side of the table to their partner and ‘gets’ another point in return. They write this on the right-hand side of the table along with their partner’s name.

Pupils continue to swap partners until either the time runs out or they have filled in all of the cells in their table. It is important that each point they write is a new one i.e. they haven’t got it written already in their ‘give one’ side of the table, nor ‘got’ it already from someone else.

After the activity discuss with pupils whether they would answer the initial question differently, given the new information that they have received. Are there some points that are more important than others?

**Practice points**

• Depending on the nature of the question, you may want to put some sentence starters around the room to support pupils in constructing their initial points.

• You might want to ask if anyone was given a particularly interesting point. As pupils have written down their partner’s names, individual praise can be given.

• Playing music whilst pupils are walking around can liven up the activity but also provide a time limit: ‘You have until the end of this track to give and get as many points as you can.’
Double-develop: a strategy to encourage pupils to write in depth

How it works

The PEE strategy (Point, Evidence, Explanation) is one that is used in many subjects to encourage pupils to write clear and well-structured paragraphs. The ‘evidence’ and ‘explanation’ aspects in particular support pupils in developing their points. However, double-development of points – where the pupil takes this development a stage further – has been identified by Awarding Organisations as a specific strategy for encouraging pupils to write at the highest level at GCSE and A level.

Activity idea

A ‘so what?’ chain is one way to encourage pupils to double-develop their points. The pupil makes a statement (their point). They are then asked the question ‘so what?’ to help them develop this statement with and explanation and supporting evidence. The question ‘so what?’ is then asked again to support them in extending their answer further (see example).

Practice points

- Different parts of the chain can be given to pupils to make this activity easier or more challenging. For example, they could be given the points but independently come up with the ‘so what?’ explanations and evidence. Alternatively, they could be given all parts of the jigsaw on individual cards and work out a sensible chain and order of the points.
- Pupils could work in groups to develop ‘so what?’ chains for different points of the same answer. These could then be shared to create a class answer.
- Pupils could highlight different aspects of their (or a peer’s) answer in different colours. The point could be highlighted in one colour, examples in another and explanations in a third.
- It is important to ensure that the double-development is genuinely linked to the original point, rather than being a tenuous link or a completely separate, new point.
- The article ‘Developing written answers’ Simmons (2016) discusses ‘double-development’ in depth and provides further examples and strategies.
**Questions for critical thinking:** a way to structure more challenging questions

**How it works**

This is a question bank to help pupils improve their own use of more searching questions and think critically. It is loosely designed around the different stages in the enquiry process, so it is also a framework to support pupils’ independent in their investigations. It is based on the thinking in ‘Critical Thinking and Global Learning’ (Roberts, 2015).

**Activity idea**

<table>
<thead>
<tr>
<th>Focus on:</th>
<th>Questions for thinking:</th>
</tr>
</thead>
<tbody>
<tr>
<td>What we are investigating</td>
<td>• Is it useful to investigate this? Why?</td>
</tr>
<tr>
<td></td>
<td>• What do we understand by this?</td>
</tr>
<tr>
<td>The key questions to ask</td>
<td>• Which questions do I need to ask?</td>
</tr>
<tr>
<td></td>
<td>• Which other questions could I ask?</td>
</tr>
<tr>
<td></td>
<td>• Which are questions are most useful? Which are most important?</td>
</tr>
<tr>
<td>The sources of evidence</td>
<td>• Where is this information from?</td>
</tr>
<tr>
<td></td>
<td>• Who produced it and why?</td>
</tr>
<tr>
<td></td>
<td>• What is fact and what is opinion?</td>
</tr>
<tr>
<td></td>
<td>• Is it fair? Is it biased? What has been left out?</td>
</tr>
<tr>
<td></td>
<td>• What other evidence would be useful? Which other evidence should we see?</td>
</tr>
<tr>
<td>Thinking about reasons</td>
<td>• What reasons are given? What reasons did we think of?</td>
</tr>
<tr>
<td></td>
<td>• What arguments could I use? Which are the best arguments?</td>
</tr>
<tr>
<td></td>
<td>• Are there any arguments against?</td>
</tr>
<tr>
<td>What different people think</td>
<td>• What do I think? What do other people think?</td>
</tr>
<tr>
<td></td>
<td>• Who should have a say and why?</td>
</tr>
<tr>
<td></td>
<td>• Why do people have different views on this?</td>
</tr>
<tr>
<td>Who makes the decisions</td>
<td>• Who is making decisions about this? Which people or groups?</td>
</tr>
<tr>
<td></td>
<td>• Is anyone left out of making decisions? Why?</td>
</tr>
<tr>
<td></td>
<td>• Does anyone have most influence or power?</td>
</tr>
<tr>
<td></td>
<td>• Who might gain and who might lose from the decisions or changes?</td>
</tr>
<tr>
<td>Making conclusions</td>
<td>• Do the conclusions make sense?</td>
</tr>
<tr>
<td></td>
<td>• Do the conclusions match the evidence and the reasons?</td>
</tr>
<tr>
<td></td>
<td>• Does what we know now link with any other examples or work we have done?</td>
</tr>
</tbody>
</table>
Practice points

You could:

- display the question bank on pupils’ tables, on wall displays or on your whiteboard
- ask individual pupils or groups to choose questions to focus on during or towards the end of their work, to help them think, evaluate and reflect
- select a few questions for everyone to focus on, perhaps in rotation
- share questions around groups or individual pupils
- ask pupils to choose a question to reflect on in the plenary
- think of a few answers, then ask pupils to find the questions to match them in your plenary
- ask pupils to think of one or more of their own questions, perhaps one for each focus in the table above.

Questions for critical thinking in practice

Developing critical thinking in Year 6: Rajinder Puaar, Central Park Primary School, Newham

I wanted to enable children to question their own views and thoughts on a topic and to develop an understanding towards other people’s perspectives and to develop their higher order questioning skills. Our topic for geography was the Amazon Rainforest. We researched the environmental factors and physical and human impacts it had. Children also had a keen interest about the indigenous tribes and the impact on them. The children had previously researched and were aware that there were benefits of deforestation, but their opinions on the subject were very one sided.

Children were asked to research the ‘for’ side of deforestation and to create their own questions about areas they would like to find out more about. Examples of these questions were: Who makes the decisions about deforestation? Why do people have different views on this? Does anyone have more influence or power? What are facts and what are opinions? Lower ability children were given questions whereas more able children created their own. This research allowed children to have a balanced knowledge of both sides.

Next, we began by discussing the topic and looking at the ‘for’ and ‘against’ of deforestation. Children carried out a debate within small groups and spoke about how rebuttals could be used to create a counter argument. This helped orally practise their thoughts and ideas as well as listen to other’s ideas. Children finally used the enquiry framework to write up their balanced argument using all the knowledge and information they had gained from the lessons, higher order questions, research and debates.

Children thoroughly enjoyed learning about this topic. They thrived when creating their own questions to research as this gave them a focus to their learning instead of it being a stream of useless information from the internet. They also enjoyed sharing new pieces of information which they previously didn’t know. During the debate it was observed that children who generally didn’t like to participate were keen to share the points they had found or present a counter argument to someone else’s view point. The outcome piece of
writing produced was at a very high standard as children were so well educated on the topic that they relished sharing all they had found out. They were able to use a vast range of sentence starters such as: ‘It is believed’, ‘The research suggests’, ‘Some people suggest that’, as well as many other grammar and spelling objectives linked with English.

This was a very good opportunity for children to consider the viewpoints of others and to look critically at why things happen. The higher order thinking questions made the learning purposeful and ensured that children were looking for relevant information. Children seemed more engaged when they were allowed to pose their own questions and carry out their own research; it also improved the argument they presented as PEEL\(^1\) was used when writing.

**Developing questioning at the heart of all lessons:** Peter Lee, Mary Webb School and Science College

We focused at first on staff questions. Each lesson’s title / learning objective were posed as a question across geography lessons, which all students must answer during or at the end of the lesson, frequently leading into a homework task. Staff then created differentiated questions for each lesson; a ‘no hands’ policy was used in lessons to allow staff to direct questions to individuals. The 10-second rule was followed; if the student struggled to answer, we allowed the rest of that table to answer. Blooms taxonomy and ‘Thinking Dice’ were used widely by staff. Students were encouraged to take risks, to leave their comfort zone and ask challenging questions, which they did not know the answers to.

Images and sources were used widely for students to study and to generate questions. Model examples were used to help. We stressed the importance of not having to know the answers to their questions. For homework they swapped questions and had to answer each other’s questions, which caused some excitement and interest. The responses were diverse; showing that the students did think more and more widely, they challenged their own perceptions and they showed a broader and deeper understanding of the topic.

We have used the Question Generator at all levels to help students show a deeper understanding of topics and issues by generating challenging questions about topics they have studied or were to begin studying. As a result:

- The quality of questioning by staff and students has improved significantly; students are much more at ease asking questions and using a variety of sources across geography, history and RE.
- Understanding has improved across the range of abilities. Students are thinking more critically and maturely about sources, topics and issues. They are comfortable at

\(^1\) Point, Evidence, Explanation, Link.
setting challenging questions, as they understand it is a powerful tool to help them to understand and achieve.
- Students are more inquisitive when presented with evidence and sources.

**Question Generator: A fantastic way to set up pupil-led enquiry**

**How it works**

The question generator is a framework which helps pupils of all ages to ask better and deeper questions as part of an enquiry. They create and apply questions using the vertical and horizontal axes (see Appendix).

**Activity ideas**

Using the question grid and a stimulus, for example an image, word, artefact, or place, pupils work in pairs or groups to create a range of questions. They generate question stems by using one word from the vertical and one word from the horizontal axis, e.g. ‘What is’, ‘Where did’, ‘When could?’ Some cells can’t be filled in using the stems consecutively, but can work better with a space, e.g. ‘How might things have been different if the bus had been one minute earlier?’ How, why and the conditional questions tend to generate questions which require a more thoughtful, deeper response.

It is easy to build this into a pupil led enquiry: one way is to ask the group to circle their five ‘best’ questions. This might involve a discussion about what constitutes a good question, either one that elicits an exact factually response (closed) or enables pupils to think laterally and with a range of possible answers (open). There should be clear evidence of collaboration, communication, reasoning and decision making as the group rationalise which five questions to choose. The next step is to ask the groups to rank their five questions based on which they’d most like to find the answer to; again stimulating collaborative reflection, argued reasoning and decision making. This process will help pupils buy in to the investigation.

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2 With thanks to Jess Glenn-Batchelor from Lincoln Minster School for the original idea.

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**Practice points**

- You can use the grid to generate lots of questions about a topic or aim to complete the grid with at least one question in each cell.

- You can differentiate by using fewer sentence starters, for example you could simplify the grid for young children, as on the right, or by emphasising ’might’, ’could’, ’should’ etc.

- For younger pupils counters can be placed in the cells rather than questions written as each one is discussed by the group... this way the teacher has a reference point when speaking with that group.

- Teachers can also use the grid, individually or as part of a staff meeting, as a planning tool by using at the start of a topic or when planning a fieldtrip.

<table>
<thead>
<tr>
<th></th>
<th>was</th>
<th>could</th>
<th>if</th>
</tr>
</thead>
<tbody>
<tr>
<td>What</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>When</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>How</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Why</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**The question generator in practice**

**Improving Year 1 children’s questions:** Alison Pryce, Guilsborough CEVA Primary School, Northamptonshire

We wanted to improve the quality of questions that Year 1 children were using to ask about a topic. I devised a simplified grid to use with Year 1 students. We had already worked on the question words, but I hoped adding the ’were... did... could... might...’ extensions would generate more thoughtful and interesting questions to consider. I used the question stems across the curriculum – particularly in English and RE as well as in geography.

Once the structure had become embedded children became quite adept at thinking of higher level questions when the stems were available as a prompt. They were able to ask interesting questions of a volcanologist who came in to talk to them about their topic. It was worth investing the time at the start to introduce the grid and why it was useful. The questions asked by even the lower ability pupils were much improved after only a few weeks, and they were beginning to think about how they would go about finding the answers to these questions. The higher achieving children enjoyed challenging themselves as to how many different stems they could think of a question for.

**Developing questioning in Key Stage 3 geography:** Nick Langmead, Braunton Academy, and Gareth Godwin, South Molton Community College

Students have tended to find the ability to demonstrate deep thinking difficult. Therefore, our aim was to develop their ability to question concepts and challenge ideas. This is particularly a problem for our students who must be able to demonstrate this in depth for success at GCSE Geography, with a greater focus nowadays on detail and justified thinking.
We discussed the levels of critical questioning our students produced in Key Stage 3 lessons and assessment pieces. It was common that all students in our schools found geography stimulating, but equally many said that they didn’t use thinking time effectively or felt that responses to questioning led to less targeted or detailed developed responses. When we analysed, in many cases the types of questions being asked were often low order questions. We had all been introduced to the questioning tool matrix previously and had sporadically used it in lessons to challenge students but hadn’t utilised it effectively across the whole of the key stage. This tool enabled all students the ability to begin to unpick reliability, viewpoints, and challenge their ideas. Their questions were insightful and demonstrated the students had really thought about the types of deeper questions to focus upon. We were impressed with the detail and thought in their questions. It created great discussion, with critical thinking clearly demonstrated (and) a clear shift towards higher order questions. Students were felt to be more engaged and focused as they became used to the tool, having a clear focus to challenge and extend ideas to improve understanding and responses. Students have been questioned through student voice and in all cases they have felt that their ability to question to a deeper level with focus and insight has increased.

Using info-graphics to facilitate Key Stage 3 independent learning: Year 9
Development topic: Laura White, Roundhay School, Leeds

I found a number of info-graphics on development topics (McDonalds, poverty, ownership, development indicators, HIC/LIC country studies) and recapped open and closed questions with students. Timing was critical for the success of the lesson, so I used an egg timer and had clear instructions for each task displayed on the board:

Task 1 – 10 minutes: interpret and read info-graphic in pair.
Task 2 – 10 minutes: create 10 questions about the infographic, using the question matrix
Task 3 – 10 minutes: swap 10 questions and infographic with another pair
Task 4 – 5 minutes: review pair A’s resources and questions
Task 5 – 5 minutes: review pair B’s resources and questions
Task 6 – Discuss as a group of four which questions were best, how they can improve their questioning techniques
Task 7 – Each group of four must share one improvement of their questioning with the class, using an example of their work

This task could have extended into many lessons and there is much more scope detailed later in the text of improvements for next time.

Pupils were empowered to lead their own learning and were able to initiate their own progress; there was much more improvement in the less confident students. Less able students were able to use the motivation and knowledge of the more able students to access all tasks and be part of the whole activity. I made sure to explain the activity in context of the new GCSE and A Level specs and how important is their interpretation skills of maps and graphs for analysis.
Making better sense of information

Flat Chat: a silent open-ended activity that stimulates visible thinking for all.

How it works

For this activity\(^3\) you can use a range of stimuli such as an image, artefact, poem or other written source to generate discussion; you’ll need some large sheets of paper for pupils to record this. Flat chat aims to remove as many external pressures and influences as possible allowing uninhibited, anonymous contributions to discussions from all. This is strengthened by having no fixed point around a sheet and being able to contribute to a second (and possibly third) sheet without the need to discuss what is recorded on that sheet. The contributors have the remit to be open minded, risk takers and to record anything that they think can be connected to the stimulus: although you can encourage ‘why’ and ‘because’ there are no incorrect answers. Pupils are empowered as they take the ideas generated forward, not necessarily their own.

Activity idea

Introduce a stimulus, this can be a picture, artefact, place, statement, infographic, person...

Step one – this is conducted in silence

1. As a group (4-6) stand around a piece of sugar/display paper.
2. Individually record down anything that is connected to the stimulus
3. Continuously walk around the paper to read, add to and challenge annotations added by others in the group.

Step two – this is conducted in silence

1. Each group moves on to a different piece of paper that has already been annotated with a different group’s thinking. You could use the jigsaw strategy, so that each pupil from the home group goes to a different piece of paper for step two, then reports back at step three.
2. Repeat step one.
3. If time and circumstance allow this can be repeated again.

Step three – out loud

1. Groups return to their original paper and discuss and reflect on: what is on their sheet, what has been added and what was on other sheets that they contributed to.

\(^3\) Based on Ron Richart’s ‘Chalk talk’:  [http://www.rcsthinkfromthemiddle.com/chalk-talk.html](http://www.rcsthinkfromthemiddle.com/chalk-talk.html)
Practice points

- You can track individual pupils by ‘allowing’ them to write using their favourite gel pens. This can be especially powerful for pupils who are elective mutes and reluctant contributors.
- As ‘teacher in role’ you can add in some points. Doing so in the form of questions works well, as does taking a counterpoint position or devil’s advocate stance.
- ‘Freeze’ and get everyone to add a question to the sheet.
- For younger pupils encourage the use of symbols and pictures, as well as single words rather than fully formed sentences.
- This can work as paired work if the literacy levels are low; however, it can mean that one person’s thoughts are heard more than another’s.
- An enhanced version might ask all or some members of the group to contribute from a specific, or alternate, viewpoint.

Flat chat in practice

Flat chat in EYFS, Joanne Tibbs, Mosborough Primary School, Sheffield

I really liked the ‘Flat Chat’ idea, but working with a class of Foundation children, aged 4-5 years old meant that what they could physically record (e.g. write or draw) was limited. I wanted to use the concept of ‘Flat Chat’ encouraging children to comment, describe and question each other in a way appropriate to the age range I teach.

I decided to use real objects as a stimulus to promote talk and provided a talk frame to help to scaffold talk for the children. This was done using a ‘Rainbow Talk Fan’ which provided a framework for talk which focussed on the senses primarily but also incorporated a sentence starter for ‘I think’ and ‘I feel’ (based on emotional feelings).

I recorded a session early on in the project and then towards the end of the project (see below). The children’s language evidently developed over that time and the language structures were more embedded and natural. Children were able to describe things in greater depth, share their thoughts and feelings with one another and build upon what others had said. This approach has given me one strategy to teach critical thinking with young pupils, and it can be used for a multitude of subjects.
Enabling all children to take the role of questioner, Hollie Pitchford, Duke of Norfolk CofE Primary School, Glossop, Derbyshire

The children were introduced to the ‘Flat Chat’ activity, firstly during an English lesson then in other lessons across the curriculum such as a history lesson focusing on Victorian Schools. In the English lesson the way we deliver the writing and grammar objectives is through linking our work to a high-quality picture book or text. This was the first lesson using the book The Lost Happy Endings. The first lesson in a topic is usually a ‘hook’ lesson that engages the children with the story. The flat chat activity was, in this case, used alongside our way of delivering lessons and was used as the hook.

Pictures from the book were placed around the classroom and the children had time to silently move around the room thinking about the pictures and thinking to themselves what the story may be about. After that, the children started the flat chat activity, asking and answering questions and sharing their ideas in groups. It was a different way to introduce a new story as the children were only able to draw on the newly-introduced images and their own questioning skills. I got the children to write in a different colour ink from others in their group, this ensured that I could check all children had participated.

This also provided me with the chance to demonstrate the type of questions that they could be asking about these images so did help me with the fourth aim which was, to model and
encourage better quality of questions/ higher order questions. However, this activity was useful as it helped me see that this is an area the children will need to have much more experience of as they were naturally asking the lower order questions and will need much more scaffolding to become better questioners.

Pupils enjoyed the activity and were all focused and on task. Following discussions that followed the activity, the children are now much more aware of the value and importance of being questioners. After the activity, because the questions are recorded, it enables us to pick out questions that are deeper (higher order) questions and that we can celebrate then explore them as a class.

**Flat chat for essay preparation in Year 13** Jessica Franklin, Milton Keynes Academy

I wanted students of all abilities to work together to improve their knowledge and question the knowledge of one another. The aim was to deepen their understanding and debate the thoughts and opinions of others.

I gave all students (including myself) a large sheet of paper with Mary I in the middle and an exam question to focus their knowledge. We all had a different coloured pen and four minutes to write down as much knowledge that we had within that four minutes surrounding the enquiry. We then swapped sheets and repeated the process adding detail to points and questioning points. This happened six times as there were six students and you could clearly see who had written what due to the colour differentiation. I reduced the time by 30 seconds for each swap. We then discussed our findings and categorised different points into specific arguments for and against the enquiry.

This actually turned into a brilliant essay plan that students used to answer the enquiry. Students said that they formulated points that they wouldn’t have considered without the activity and found the visual source very useful in structuring their work. I would consider increasing the time as opposed to reducing it each time to measure whether it makes any other impact.

There was significant engagement from pupils and even the quieter ones debated points as they had written them down, and as everyone knew whose pen belonged to whom they felt a need to defend their argument. There was an improvement in the essay results from weaker students but not much from higher ability, despite them feeling as though they were better prepared. I think this was a brilliant technique which encouraged great historical debate and encouraged deeper thinking with regards to essay structure and approach. The ownership of written points worked well.
Silent Debate: a directed activity that develops decision-making and reasoning skills.

How it works
This sorting tool supports pupils in making decisions about a set of images/statements, drawing on their powers of reasoning to inform and persuade the wider group (see possible examples opposite). Silent Debate allows pupils to express opinions based on their experiences and beliefs but also to expand their knowledge to better inform their choices. It benefits those pupils who are used to expressing themselves in class, and particularly those who don’t normally put forward their opinion.

Activity idea
Place 10 (+/-) statements/images around the room, each stuck in the centre of a large sheet of flipchart paper.

The pupils will be working independently and in silence. They visit as many of the sheets as possible in the time given to add their comments and reasoning to each anonymously. They are encouraged to build on the contributions of others either in support or respectful challenge.

After the time has elapsed, allow extra time for pupils to revisit those sheets that they contributed to early in the activity, to see if the subsequent contributions support or challenge their initial thoughts and whether they influence their thinking moving forward.

Practice points
- Make sure you debrief the activity.
- You could ask pupils to create headings or captions for each sheet.
- A balance or opposing opinions on a sheet might require further discussion or research.
The Geographical Association: Critical thinking in practice

Overall, are there any omissions or possible alternatives that should be considered?

One or more of the sheets might stimulate a debate where roles are assigned, stances taken and delivered before a voting process is followed.

You could ask the class to rank images/statements in terms of how well they fit the criteria.

What if one image/statement summed things up perfectly; what would it show/say?

The starting criteria could be changed slightly: what impact would this have on the outcomes? For example, by altering the above example to include words such as ‘tropical’, ‘destruction’ or ‘animals’ the responses might vary from those originally made.

You might include some images/statements that are way off base and use the session for Assessment for Learning.

You could ask some pupils to take on different roles as they complete the task: does everyone see things from the same perspective?

Starting points can range across the curriculum, e.g.:

- ‘Which stretches should the class do in preparation for a PE lesson?’
- ‘Which statements would you include in your assessment criteria for...?’
- ‘Which photos of Widnes should we include in a brochure entitled Come to Widnes?’
- ‘Which facts should we include in a report about the Polar regions?’

Silent debate in practice

Increasing the frequency and quality of questions asked by pupils Shaftesbury Park Primary School, Battersea

The aim was to increase the status of critical thinking within teaching and to embed it into the International Primary Curriculum (IPC) subjects, as well as maths, reading and literacy. We set up a project to increase the frequency and quality of questions asked by pupils; as a result, lesson observations have seen an increase in teaching practices that promote and celebrate questioning from pupils. There has also been an increase in the quality and frequency of question asked. Anecdotal evidence also suggests pupils achieving greater depth of understanding of taught subjects. The techniques employed by staff as result of the training were:

**EYFS.** In both reception classes and nursery, they used questioning from the pupils as part of their ‘Entry Point’ for IPC. This formed a number of questions that they put on display that is subsequently leading their learning throughout the topic. In addition to the questions poster, they hung up question starters for each activity station, to be used by support staff to start enquiring and to model questioning for pupils and promote enquiry-based learning

**Key Stage 1.** Years 1 and 3 focused on giving pupils enough time for each pupil to answer a question. They have also tried asking pupils to build on fellow pupils’ answers. In Year 2,
they used a prop in the form of an artefact to intrigue pupils into asking questions before completing research and enquiries lessons to find answers.

**Key Stage 2.** In Year 4, the teachers promoted questioning by trying to fill a ‘question bucket’ in which a stone is dropped in every time a pupil asks a question to form a collective goal of asking lots of questions. To ensure they keep expectations high for the quality of questions, they have introduced the ‘question of the week’.

In Years 5 and 6, they incorporated reciprocal reading techniques for discussions throughout the curriculum subjects as well as reading. They also have been using silent debates to engage pupils in IPC lessons and in literacy and ensure all pupils have a ‘voice’ in debates and discussions.

**The Challenging Geography of Amazonia,** Michael McCarthy, St. Joseph’s Catholic Primary School, Wandsworth

We wanted to engage Year 4 children in deep learning through the critical thinking strategies using ‘Great questions’ and ‘Silent debates’, to deepen their understanding of a controversial issue from different viewpoints. The methodology was to involve children in a silent debate on deforestation to develop their understanding of the different viewpoints and support the children to ask a higher order questions using high quality images and bird’s eye view video clips, which add to the pupils’ understanding of the rainforest.

- All the children in Year 4 were introduced to the principles of the silent debate and as a result became aware of the different viewpoints around deforestation in Amazonia; the children were able to write about one issue relating to deforestation and contribute to a silent debate.
- The critical thinking strategies enabled the children to think more deeply, ask more higher order questions, enabling them to write a balanced argument for a control on deforestation in Amazonia. Beforehand, the children were not always able to appreciate the complexities associated with deforestation; most would have been single minded in their view. As a result of the critical thinking strategies, the majority were able to view the issue of deforestation from a number of viewpoints.
- The children were asking more questions than the teacher as a result of the critical thinking strategies. Lesson observations indicated that the pupil/teacher questioning ratio moved from 50:50 to 60:40.
- Most of the children were able to identify the main human activities that led to deforestation and were able to understand how some economic activities supported human life in Amazonia, and how human activity harms the Amazonian ecosystem.
- We managed to create a comfortable environment where being right doesn't always matter ensured that it isn't always the quickest and most confident pupils who make those contributions. And whatever line of questioning the teacher chose, the children had to be prepared to do some analysis of how they work. This had a profound impact of the self-esteem of some learners.
Using ‘Silent Debate’ to Deepen Peer Responses  Mary Wright, St Andrew’s CE Primary, Oxford

We were finding that children found it hard to actively respond to each other’s ideas. Often, they used language they had been taught to use in responses, such as ‘I agree with XXX because…’ but then followed with a disconnected idea. Discussions would often become stilted, as children found it difficult to let go of an idea if they had not been able to share it, so children often started their contributions with ‘Going back to XXX’s point…’ – which could be a point made five minutes ago, disrupting the thread of the argument.

One Year 6 class in particular were full of ideas and enthusiasm, but they were not skilled in following arguments/responding to one another. I thought Silent Debate might be a way to allow the children to each express their ideas, and then respond to one another, allowing whole-class involvement without the frustrations of a whole class discussion. For our first sessions I chose a mixture of topics and chose context-free issues for the majority of questions, allowing children to contribute regardless of their general knowledge. However, I also included two questions relating to current issues (‘Should you need a qualification to become president?’ and ‘Should we have a second BREXIT referendum?’), which in the end, were by far the most popular. I modelled appropriate contributions, set behaviour expectations then let them go. After the first session, I modified my practice slightly. I created more structure – sequencing the debate into sections: comment time, where everyone could write down their initial ideas; reading time, where children put their pens down and browsed the questions silently reading others’ comments; and respond time, where children were encouraged to respond to others’ responses. In a second session, we used questions relating to prejudice, in response to some playground incidents involving children using inappropriate language.

Once a question had been debated we displayed the ‘poster’ created, and children returned to it, often to re-read each other’s’ ideas. For some children, particularly the more-able writers, a silent debate ensured that they had time to carefully consider their ideas and articulate them carefully. Their responses to one another showed maturity, and their arguments developed well. However, for less-mature children, their comments show a lack of understanding of basic issues, and other children found it difficult to respond to them unless the teacher intervened to clarify their statements.

All children responded enthusiastically to the debate. They all wanted to contribute their ideas, and even children who struggle to write more than a few sentences in most lessons were happy to write on each question. We identified ideas which could deepen/strengthen practice: giving a child a ‘devil’s advocate’ role to encourage broader ideas; starting from a newspaper article/information text to ensure all children have the basic contextual knowledge to be able to respond; and having a silent debate as a longer-term feature of the classroom – a place where children can add ideas over a period of a few weeks, cumulating in a whole class discussion.
Establishing Critical Thinking Skills in GCSE. Bethany Byers, Brakenhale School, Bracknell

My aim was to encourage our Year 11 students in thinking independently and critically about their fieldwork and answers given regarding this in Paper 3.

A common issue we have faced with regarding students for this new paper is that they are typically fearful and wary of thinking of their fieldwork as something they can think critically about and generally taking ownership of it. They find it very hard to think independently and critically about their fieldwork as this, in their eyes, shows a weak field study, yet this ability to think critically gains many more marks in the exam. The students find it difficult to come up with their own suggestions of weaknesses and potential improvements of the fieldwork without a high level of teacher support, so the purpose of this project was to empower the students to think freely about their own field study independently critically. The overall aim is to create a critical thinking culture in the classroom. After a baseline exam, I began implementing the two areas of this project:

1. Embed critical thinking frameworks and tools into the daily structure of my Year 11’s lessons.

I picked two simple but very effective methods, using visual scales for ‘To what extent...’ questions, and the introduction of structure grids for 9 mark questions.

Using these methods, I noticed improved essay structure and higher levels of critical thinking in the questions I have marked. The answers generally are more well balanced and students are using higher-level skills, such as justification/evaluation, and more confidently answer the ‘To what extent ...’ questions.

2. I wanted to change how I was facilitating critical thinking when doing pre or post exam prep and review, in order to push students to think more critically when writing their exam answers.

I designed a framework I could use for all exam feedback/prep, and although in the project I have used this mainly for Paper 3 improvement, it has been designed so that it can be adapted to Papers 1 and 2 also. The basic PowerPoint has four stages, all of which aim to encourage the student to think in a critical manner about one specific question.

- **Stage 1 – Thinking critically alone.** The students were given a table in which had a variety of statements about their fieldwork; some of the

<table>
<thead>
<tr>
<th>Agree or Disagree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Results of pedestrian counts are not helpful for my conclusions at all.</td>
</tr>
<tr>
<td>Land use maps categories are always good at showing exactly what is there (They are representative).</td>
</tr>
<tr>
<td>Counting people in a pedestrian count could be made less reliable by the people doing the counting (This is called human error).</td>
</tr>
<tr>
<td>Having a very large number of categories on a land use map is always good thing.</td>
</tr>
<tr>
<td>The time of year we did the fieldwork impacted our results reliability.</td>
</tr>
<tr>
<td>Doing the pedestrian count at different times did not impact our results.</td>
</tr>
<tr>
<td>The EGA was helpful in proving my hypothesis.</td>
</tr>
<tr>
<td>The EGA categories included everything I needed to fully assess the environments quality.</td>
</tr>
<tr>
<td>Everyone in my group agreed on the EGA scores.</td>
</tr>
<tr>
<td>I was fully able to prove or disprove my hypothesis using my methods.</td>
</tr>
<tr>
<td>My results from the EGA can be 100% trusted.</td>
</tr>
<tr>
<td>My results from the landuse map can be 100% trusted.</td>
</tr>
<tr>
<td>My results from the pedestrian count can be 100% trusted.</td>
</tr>
<tr>
<td>The timings of the fieldwork day worked well and I got everything done that was needed.</td>
</tr>
</tbody>
</table>

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statements were purposely controversial and all designed to make them think critically about their fieldwork. All the statements in the table related to one specific exam question that I was giving feedback about. Initially they were asked to tick or cross the box dependant on whether they agree or disagree with the statements. I found this first task helpful as every student had to engage and figure out what he or she thought about their fieldwork independently, without actually realising they were doing that!

- **Stage 2 – Silent debate.** Students now had to justify why they thought what they did. The statements were written out on A3 around the room and they had to silently write down what they thought about each statement and why. This was excellently helpful in my cohort of students, as many of them can be reluctant to contribute in class. The anonymity of the task meant the comments written were much freer and critical in nature, creating balanced and justified debate.

  ![Silent debate](image.png)

  **Silent debate**

  Now we are going to go around the room and silently write our opinion on the sheets of paper. You MUST give a reason why you think what you do.

  X – “I disagree because ....”

  Now we are going to summarise the debates back to the class. Be ready to feed back.

- **Stage 3 – Consolidation.** As a group or in pairs they had to summarise the arguments given on the A3 pieces of paper and feedback whilst the rest of the class filled in a table related to the specific exam question the points fed into. In the case of my example, reliability vs non-reliability of fieldwork conclusions.

  ![Table](table.png)

  For one of your geography enquires, to what extent were the results and methods of this enquiry helpful in reaching a reliable conclusion? (9 marks)

<table>
<thead>
<tr>
<th>Very Reliable</th>
<th>Reliable</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
</tr>
</tbody>
</table>
• **Stage 4 – Structure grids.** I then used a simple exam answer structure grid to allow the students to write their own independent answer, based on the critical thought developed throughout the lesson, yet through the structure grid the answer would also have a clear structure.

I feel my project has had impact on attitudes, the culture in my classroom as well as progress. There is still much more which could be achieved; I would like to use this exam feedback lesson in more than just paper 3 questions.

I re-tested the students on each question and found that using the exam question lesson and the smaller tools I have built into all lessons has:

- Increased willingness to participate
- Allowed students more confidence in their own opinions
- Helped students access higher level skills such as justification and evaluation
- Helped create a culture where students independently attempt to solve problems in their fieldwork
- Increased Paper 3 scores.

Students’ average mark increase: 4 marks
Students who increased their question score: 91%
Becoming a more open thinker

Becoming aware of deep structures: a directed activity that encourages pupils to be more cognisant of the critical thinking process

How it works

The process of critical thinking can be more important that the final answer or solution. Being aware of how we think helps to clarify the deep structures that we use to organise our thinking. Whilst teachers may give these structures to pupils, this activity enables pupils to discover these structures for themselves and gives them ownership over them.

Activity idea

Put a question on the board (with a suitable image) that is relatively contentious. The example given here is ‘is palm oil production a bad thing?’

Pairs of pupils should also be given pieces of paper which contain information relating to both sides of the argument. In this case, some pieces of information which suggest that palm oil is a bad thing and others which suggest that it is a good thing.

Explain that you would like them to use the pieces of information to answer the question but that you are not really interested in their answer. What you are interested in and what you would like them to feed back is how they went about tackling the question.

Give pupils about 10 minutes to tackle the activity and follow this with discussion: What did they do first? Did they agree with each other about the approach? Did the pairs tackle it in similar or different ways?

Practice points

- As pupils have all the information that they need to answer the question in front of them, this activity can be done with limited prior knowledge of the topic. However, it is important to draw out from pupils the importance of subject knowledge in being able to answer the question effectively.
• Some aspects pupils may consider include scale (local, national and global), stakeholders, the range of impacts (social, economic, environmental) and / or a combination of these.
• Pupils should develop understanding that the world is often complex, with a range of considerations, not a simple binary (such as for/against or cost/benefit).
• To make this activity more challenging (or as a revision activity) pupils could just be given the question without the statements.

Odd One Out: helping identify commonality and reflect on difference.

How it works
Odd one out is a simple comparison tool taking three objects, places, people, stories, settings, theories etc to develop an understanding of what, how and why similarities, differences and connections exist. It makes a good starter (see below) and a good plenary.

Activity idea
Set A, B and C as three things that could be compared and contrasted. Pupils record their thoughts as follows:

• At each point of the triangle pupils think of something that sets that thing apart from the other two. For example, at A they might write that the school hall has a stage or a wooden floor, (neither of the other two can share this feature). Repeat this for points B and C.

• Along each edge they record something that the nearest two points have in common, that the third doesn’t have. For example, between A and B might be: have lines marked on the floor, a climbing frame etc.

• The central area of the triangle is for something that all three have in common. For example, rubbish bins, children, teachers, etc.

Alternatively, you can set this up in sets, comparing three, four or even five items. For example, which is the odd one out for this set in physical geography:

<table>
<thead>
<tr>
<th>hydraulic</th>
<th>abrasion</th>
<th>saltation</th>
<th>attrition</th>
</tr>
</thead>
</table>

Practice points
• Is there a fourth place, story, image that would link in well?
• Any connections should be accepted if pupils can explain the ‘commonality’.
• Can further links be made, other than those first suggested?
• This has great transferability and can be used to compare three numbers, three fairy tales, three pieces of art work, three people, three scientific concepts etc
• Ask reflective questions, such as: Why might links exist? Did they always exist? Will they always exist?

**Odd one out in practice**

1950s Art: Eduardo Paolozzi Collages, Abigail Scotchbrook and Jan Cook, Fairlawn Primary School, Lewisham

Our aim was to encourage children to look at and explore art in new ways. We challenged them to deepen their understanding of art through the ability to reflect on an artist’s choices and possible motives. Using an Odd One Out activity, the children were asked to find similarities and differences between three collages by Eduardo Paolozzi.

It was interesting and surprising to see how many different responses the groups came up with. The children really took the time to study the pictures, considering what they represented and began to think about why the artist had created them in that way.

This activity slowed down the speed of the children. They could not complete the task instantly (there were no right or wrong answers) and this forced them to take their time and use their collaboration skills to consider all the ideas in the group. There was lots of discussion within the group, listening to each other and taking time to examine closely each picture. I was surprised by all the different things that the children noticed and how well they compromised to complete the odd one out grid. They showed good focus, listened respectfully to each other, collaborated well and also really enjoyed the activity.

The children then created their own collages of their faces. The class is not usually very confident in making their own, individual artistic choices but it seemed that the activity had boosted their confidence and also allowed them to reflect deeper on their collage. The activity impacted on the pupils’ ability to tackle a final art project confidently.

The variety of the final pictures was both surprising and inspiring. In future, I would like to get feedback from the children as to whether they felt this activity helped their learning.
Using props and enquiry to investigate past climates  Adam Briggs, Charlton School, Telford.

I wanted a Year 9 geography class, who had just started their GCSE, to work more independently (from the teacher), construct their own questions and undertake research. I also wanted to create a method that was easy to recreate and thus use in future lessons.

When students came in to the room they had to think about this question:

Students in groups were given a prop/ source of information such as a fossil, picture of an ice core, two paintings of the ‘Little Ice Age’, a woolly mammoth toy and a picture from the Shropshire Hills Discovery Centre; and a cross section from a tree that had been cut down in my garden! Each group was given five minutes to come up with a list of questions and were asked to identify an additional two relevant questions from ‘Questions for Critical Thinking’ At this stage they did know that each prop was somehow a form of evidence about past climate. Each small group then had time to find out the answers to their questions from using either the laptop, textbook or information sheets provided. It was important that each group divided the roles to ensure that when they collated their findings they could answer all questions.

Students then fed back their findings in small groups to ensure that they had coverage of all of the techniques. In order to assess learning students completed the following exam question: ‘Explain how two types of evidence can help reconstruct past climates (4 marks)’. Students were focussed on their learning and were able to use the resources productively to answer their questions. When constructing their own research questions they came up with inventive, but relevant, enquiry questions which not only covered the course requirements but went beyond this. The exam-styled question was marked and it showed evidence that most students had learnt at least one method in sufficient detail, with the majority getting 4 out of 4. The topics were then discussed at the start of the following session with students having to do ‘close the gap’ or write an additional explanation.

Students worked well in groups and were able to ask intelligent questions. The tight time limit also ensured that they worked well in their groups and set relevant roles and responsibilities. The fact that they then had to teach some of their peers added an additional layer of accountability. From marking the students’ responses at the end of the lesson it was evident that the majority of students had an in-depth knowledge of the topic they were responsible for. It was therefore important that I revisited the topic the following lesson to ensure a broader depth of knowledge. All students engaged in the lesson and were able to feedback on their findings to their peers. The use of props did add an extra layer of interested and intrigue.
**Plus Minus Interesting (PMI):** organising thoughts and ideas for reflection.

**How it works**

PMI is a framework that helps categorise and examine ideas, concepts and experiences⁴. It encourages pupils to look at things from more than one perspective, enabling more informed decision making and moving away from an all-or-nothing way of thinking.

**Activity idea**

Provide an idea, concept or action, such as ‘moving to the city’, and ask the pupils to work individually or collaboratively to record their thoughts under the three headings of the table: Plus, Minus and Interesting.

After compiling their lists, the pupils should critically examine and analyse their thoughts, for example reflecting on the table’s contents in terms of impact, consequence and possible knock-ons resultant from any interconnections.

**Practice points**

- Be mindful that things are rarely as simple as plus-minus or for and against: the ‘interesting’ and ‘reflection’ elements of the tool allow a broadening of thinking.

- There is also weighting to consider. In the example above, can emotive listings such as the loss of a way of life or moving away from family and friends be compared to travelling a shorter distance to work?

- The tool’s outcome can set up a debate where pupils research and develop the two sides (+) of an argument before presenting their reasoned arguments.

- Try to complete a PMI in role: who might see coastal erosion as a positive?

- This activity can act as a great wall display containing either something from the news or linked to class learning, pupils simple write their P-M–Is on individual post-its and place these in the boxes over a week or so to enable everyone time to reflect and add in their thoughts.

- A PMI can act as part of continuous formative assessment.

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⁴ Developed by Dr Edward De Bono
**PMI in practice, with silent debate**

**Open questioning, debate and discussion** Sarah Stevenson, Trinity Primary School, Lewisham.

We wanted to improve questioning by making them open, continuing and analytical (for teacher and pupil). We also wanted to develop speaking and listening in the classroom, particularly discussion and debate.

We used the class topic of Rivers for several discussions, e.g.: How rivers impact the surrounding environment – what could be the ‘positives, negatives and interestings’ of living near a river? Does it depend on the local area? What about different countries? What about the same river but in different regions?

We took a Year 3 class trip to Deptford Creek where the children learnt about the industries around the river: why they were there, how they have changed over time, why they have changed. The children created their own risk assessment for the trip where they identified potential risks and discussed likelihood and severity of those risks.

The children participated in a ‘silent debate’ based on our local environment, including the River Quaggy [which flows into Dartford Creek]. Children had to make decisions about scenarios such as ‘Scientists wanting to use 300 goby fish every year from the Quaggy for medical research’. Before completing writing tasks, children would share ideas using the Kagan style A&B partner talk, as well as Mix, Pair, Share to ensure all children were speaking and listening.

The children were engaged in every task as they all involved openness, and the children’s voices and opinions were all heard. The use of A&B partner talk, already embedded in my classroom, is an effective way of ensuring children are all speaking and listening with an element of structure. ‘Positive, negative and interesting’ tasks have been very effective at getting children to think deeply and reflect about one situation and consider more than one point of view.

Considering other points of view has also been achieved through the silent debate. Children wrote on Post-Its® rather than on a communal piece of paper, which combated children being influenced by other’s opinions before they formed their own. After they had all filled out their Post-Its®, they walked around and stuck it on the corresponding piece of sugar paper. Once this was done, a group had to sort the Post-Its® into two columns which ensured that they read others’ opinions in order to be able to sort them.
### Making better arguments

#### How it works

Pupils often mistake argument for disagreement, rather than a means of putting forward a reasoned proposition, which seeks to persuade and is based on evidence. It is asking a great deal of pupils to create reasoned arguments without support and modelling. Argument frames are designed to structure and work through the different stages in making an argument, so help pupils’ understanding, their ability to articulate and communicate their reasoning, as well as a focus for discussion and analysis. As with most such frameworks, the aim is to hardwire the approach in pupils’ thinking, for example to include arguments and counter-arguments, remember evidence and sources, so they can use it independently.

#### Activity ideas

- You can use argument frames in two ways:
  - Start with a proposition or question, e.g.: Should we ask parents not to drive pupils to school? Was Henry VIII a good king? Does palm oil production benefit Indonesia? Pupils investigate sources of evidence, using the frame to gather and summarise ideas and reach a conclusion.
  - Use the argument frame to analyse, discuss or compare someone else’s argument about an issue, and perhaps to counter it.

- You might want to start with a simple frame then move to a more demanding one – or start in detail and then withdraw the support.

- You can use the frames as a notepad, before putting together an oral or written argument. Younger pupils can work in groups or as a whole class, pulling together their thinking at the front.
• Older pupils will find the approach useful for making and writing balanced arguments, for example to tackle command words such as examine, evaluate and justify in their exams.

Making better arguments in practice

Understanding complex data and challenging validity through argument frames

Andrew Peploe, Head of Geography, Casterton College, Rutland

The plan was to give students across Years 7 and 9 large amounts of information on the topics of extreme weather and availability of water, which they then had to use to answer an enquiry question. It was designed to allow them flexibility in the data they used to answer the enquiry but required them to distinguish what is valuable and what is not. Part of the reason for this was to address some of the issues surrounding ‘fake news’ and the belief in some young people that everything they read on line is true.

Students were split into groups of four or five, chosen carefully to mix abilities. Each group was given a pack from various sources that included copious amounts of information in the form of maps, graphs, tables, photos, quotes, opinions and others. Students were given two options of enquiry question, that were similar but one had an extra level of difficulty built in (see example). More groups chose the harder green than the red.

The aims were undoubtedly achieved. The time frame that the students had to work in needed to be extended as a result of the depth of the conversation. There was clear evidence of the students challenging the validity of the sources (not always correctly, but that wasn’t really the point). They worked exceptionally well collaboratively, especially the Year 7s, and the overall outcomes were detailed and sensible. The impacts were:

• Enhancing abilities to work with peer to overcome disagreements
• To challenge data presented and not take everything as fact
• The level of engagement with the task was higher than normal
• The sense of achievement in the outcome was greater.

By using the argument frame, it pushed students into the art of thinking critically about what is in front of them.

How should Castleton develop in the Future? Keeley Donnelly, St Mary’s RC School Chesterfield

In preparation for the changing GCSE we wanted to revamp our units of work in Key Stage 3 in order to give a progression of skills and tools to tackle answering questions more critically.

As part of Year 7 unit of work, we make a study visit to Castleton in Derbyshire. Our focus through this work is to learn about National Parks, the Peak District and data collection and
analysis. This is all framed around the idea that places change. The way Castleton changes in the future can be influenced by us as planners and geographers and so four scenarios are presented for discussion.

1) Castleton needs to invest in the transport system.
2) Castleton needs to encourage more tourism to the area.
3) Castleton need to encourage more mining and industrial development of the area.
4) Castleton should stay the same.

After data collection, including people counts, traffic surveys, land use maps, spotting vulnerabilities and issues on a map, data collection and analysis took place. The final section of work is the write up: the argument is the key basis for the writing.

A silent debate on four large pieces of paper allowed all students to express their opinion. Positive and negative points were then added up as a class to see what we thought – opportunities for more analysis. This reinforced the fact that there was no right or wrong answer and gave the pupils the confidence to write what they think.

An argumentation framework was then provided for students to capture all important thoughts based on the silent debate. This was used as the prompt for the final piece of writing, (similar to EDUQAS / WJEC problem solving paper matrix).

The whole unit was mainly assessed by the write up and having a class who were weaker and didn’t like writing.
was challenging. I gave them the option of a marker in their books in order to judge the level of detail needed. Whatever they decided was right as long as both sides of the argument were discussed and backed up and they managed to write at least as much as the marker suggested. This idea of both sides of the argument was reinforced using the visual aid of ‘Crabby patties’ – Sponge Bob always cooks both side of the burger....

Not all students wished to use the marker. Many were fine just to have a visual guide. Some however followed the marker to the line.

All students were ultimately able to offer a balanced opinion based on some evidence they had collected. Many pushed their writing and elaboration of ideas due to the marker. Some produced a conclusion for the first time in their work. I felt that all students completed the unit of work knowing more but also having developed techniques to tackle this style of questions in the future.

**Improving written arguments at GCSE,**

Rachel Akenhurst and Frankie Morgan, Dorothy Stringer High School, Brighton

We wanted to support and improve students’ answers to 8-mark questions, as previously they only included one side of the argument.

Students first answered a question un-aided, then were given feedback. They were introduced to the argument frame to structure their responses, then answered a similar question. This had a positive outcome: all students improved their marks, particularly the disadvantaged students; it gave them confidence to answer the question well and helped them created a balanced argument.

**Developing evaluation and analysis skills in A level Geography essay writing using critical thinking techniques:** Hina Robinson, The King John School, Benfleet, Essex

I wanted to encourage Year 13 students to think more critically about essay titles and improve how they analyse evaluate within essays; the emphasis on these skills is a lot more than students have ever experienced before. A new approach was needed to support those students in improving evaluation and analysis.

Students were given an essay title and asked to identify individually what the question was actually asking. They fed back to each other and as a class we identified the two sides to the argument in the essay. The class was then divided into two groups – each group taking one side of the argument. They worked within their groups for 15 minutes to come up with the key points for their argument and evidence/examples to back up each point. They then each paired up with someone from the opposite group to argue their point. The other student was encouraged to use the question bank to peer assess the points made. From this
point, students wrote a paragraph of the essay (using the PEEL technique – point, example, evaluation, link back to the question). They had to use the previous tasks to develop the evaluation of the point made.

This was repeated a few weeks later with another essay title; however, this time silent debating was used to argue the opposing points and question them.

The aim was generally achieved, though at varying paces. Some students found this worked for them after trying it for the first time; others needed a little practice for it to impact on the quality of their essay writing. Students were engaged with this as it involved working with other students in the class. When they feel that their understanding of what to do with an essay title is improving then engagement improves as they see their won progress. It gave most students more confidence going into the exam.

**Bridging the information gap** between where pupils get it from, and where teachers would like them to: a directed activity which encourages pupils to think about the quality of the evidence which they use.

**How it works**

Teachers tend to have very clear views about where pupils should go to find information and that sometimes there is a disconnect between this idealised view and where pupils actually find their information. However, with further probing it also transpires that, superficially at least, these two lists are not wholly different. For example, both include ‘the internet’, ‘books’ and ‘other people e.g. parents’. Therefore, rather than directing pupils towards sources of information they are unlikely to engage with, there is instead a need for teachers to recognise and value pupil sources of information and for pupils to be more critical about those that they use.

**Activity idea**

Ask pupils to work in small groups to write two lists: ‘places where I get my information from’ and ‘places where my teacher would like me to get my information from’.

A discussion could follow the task focusing on whether each group has the same sources of information on their lists, whether the two lists are similar or different and what the issues and barriers are to accessing information from the ‘teacher’ list.
Recognising that they are likely to continue to access sources of evidence on the ‘pupil’ list, pupils could work together to create a poster which ensures that they are thinking critically about the quality of the evidence from these sources that they gather.

They could peer-assess by using another group’s poster to critically evaluate the quality of a piece of information. Is the poster easy to use? Are there things that they could add which would enhance the criticality?

**Practice points**

- It is easy to dismiss pupil sources of evidence as unreliable. However, there are some great sources of information on Twitter, YouTube and even Wikipedia.
- If the ‘teacher’ list and ‘pupil’ list are completely different, consider the characteristics of the sources of evidence on the ‘teacher’ list. Do any on the ‘pupil’ list share these characteristics? How might the gap between the two lists of sources be closed?
- This activity could equally be done with teachers as part of a department meeting or INSET. What do their lists look like?

**Bridging the information gap in practice**

**Digital literacy and critical thinking:** Ruth Harding, North Leamington School.

I wanted to develop the students as critical consumers of information on the internet. 86% of the class use the internet when researching tasks for home learning, therefore it is of vital importance that students critically consume the information they read and that they can discern the reliability and bias in a source.

The students were asked, as home learning, to find an article on the internet. It could be anything to do with geography; this was to give them the freedom to research something they were interested in. They were given a list of questions that they had to assess their article against, based on the [Questions for Critical Thinking](#) resource. They could choose how many of the questions to use.

**Section 1: Nature** – What type of source is it?

- What type of information is this source?
- Does it intend to be read as fact?
- Is it claiming to be fact or opinion?

**Section 2: Origin** – When and who produced the source?

- Where is this information from?
- Who produced this source? Who is making decisions about this? Which people or groups?
- What other evidence could be useful? What other evidence should we see?

**Section 3: Purpose** – Why was the source produced?

- Why was this source produced?
- What is fact and what is opinion?
• Is it fair? Is it biased? What has been left out?

**Challenge:**

• Do the conclusions make sense? Do they match the evidence and the reasons?
• Which are the best arguments? Why?
• Who might gain and who might lose from the information in this article?

Students then discussed their articles as a whole class and I then marked the work. There were some excellent answers; in these the students were critically assessing the article and were exploring the balance of fact and opinion. Those who were not as successful either trusted the source too much e.g. ‘It’s from the National Geographic so it must be correct’ or asserted that, because the article had facts in it and was based on science, there were no opinions presented in the article.

To move forward it would be helpful to explore how opinion can be presented through facts and how people can manipulate data to present certain facts. It would also be useful to spend more time on authorship of articles. The students have understood that some websites are more credible than others, but in the future learning could be moved on to assess how to read credible journalism and pick out facts and opinions. To move this on, it would be useful to use these questions regularly with the students for research tasks so that they become a resource they are familiar with and can use independently. Students were not as a confident presenting their findings to the class as they have been in other tasks; using the resources regularly should help to overcome that.
References

Web
GA critical thinking site https://www.geography.org.uk/critical-thinking

Acknowledgements
Brakenhale School, Bracknell
Braunton Academy and South Molton
Community College, Devon
Casterdon College, Rutland
Central Park Primary School, Newham
Charlton School, Telford
Charter Primary School, Gloucestershire
Chesterston Community College, Cambridge
Dorothy Stringer High School, Brighton
Duke of Norfolk CofE Primary School, Derbyshire
Fairlawn Primary School, Lewisham
Guisborough CEVA Primary School, Northamptonshire
Mary Webb School and Science College, Shrewsbury
Milton Keynes Academy
Mosborough Primary School, Sheffield
Roundhay School, Leeds
Shaftesbury Park Primary School, Battersea
St Andrew’s CE Primary, Oxford
St Mary’s RC School Chesterfield
St. Joseph’s Catholic Primary School, Wandsworth
The King John School, Essex
Trinity Primary School, Lewisham

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## Appendix

### Question generator

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<td><strong>What</strong></td>
<td><strong>What is</strong> it that people do at the park?</td>
<td><strong>What did</strong> I (we) do at the park, last time I (we) visited?</td>
<td><strong>What was</strong> the park like in winter?</td>
<td><strong>What could</strong> be done to stop littering?</td>
<td><strong>What if</strong> there was a skate park?</td>
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<td><strong>What</strong></td>
<td><strong>What is</strong> the best part of the park?</td>
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<td><strong>What was</strong> the in the park 10 years ago?</td>
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<td><strong>What if</strong> you could change the park ... what would you do?</td>
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<td><strong>Where</strong></td>
<td><strong>Where is</strong> my local park?</td>
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<td><strong>Where can</strong> people get a drink?</td>
<td><strong>Where</strong> would you go if there wasn’t a park?</td>
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<td><strong>Where</strong></td>
<td><strong>Where is</strong> the play area?</td>
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<td><strong>Who</strong></td>
<td><strong>Who is</strong> likely to use the park most?</td>
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<td><strong>Who was</strong> the park named after?</td>
<td><strong>Who could</strong> improve the park?</td>
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<td><strong>Who</strong></td>
<td><strong>Who is</strong> responsible for keeping it clean and tidy?</td>
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<td><strong>Why</strong></td>
<td><strong>Why is</strong> the park a great place to go?</td>
<td><strong>Why did</strong> is the field so green</td>
<td><strong>Why was</strong> it flooded last week?</td>
<td><strong>Why can</strong> people play safely at the park?</td>
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<td><strong>How</strong></td>
<td><strong>How is</strong> the park used?</td>
<td><strong>How did</strong>?</td>
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<td><strong>How</strong></td>
<td><strong>How is</strong> the park maintained?</td>
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<td><strong>When</strong></td>
<td><strong>When is</strong> the park at its busiest?</td>
<td><strong>When did</strong> the park first open?</td>
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<td><strong>When could</strong> the park be at its most colourful- why?</td>
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Sample argument frames:

**Enquiry question:**

Argument or **statement**

**Reasons** and evidence **for** the statement

Arguments **against**

**Conclusion**
Enquiry question:

**Argument or statement.**

**Reasons** for the argument or statement

**Conclusion**

**Source/s** of the argument or statement

How reliable is the source?

**Evidence** for/r against

**Arguments** against

Useful phrases:
- several reasons are
- by contrast
- the most important
- several factors have contributed to
- is (partly) explained by
- the evidence suggests
- there seems to be a strong/weak argument for