



## Key Skills of Junior Cycle

# Managing Information and Thinking

## Managing Information and Thinking

### Managing Information and thinking

1. Being curious
2. Gathering, recording, organising and evaluating information
3. Thinking creatively and critically
4. Reflecting on and evaluating my learning
5. Using digital technology to access, manage and share knowledge

Here you'll find some tips and ideas teachers can use to help students develop skills related to managing information and thinking. No doubt you will find lots of additional ways to develop this skill. You will also notice that it links in with other key skills and with other resources on our website.



Pick one element related to managing information and thinking and read through its learning outcomes.

Then brainstorm (either alone or with a colleague) this question:

**Where do you see opportunities for developing this skill within your current day-to-day teaching?**



**Movie**

Watch these short videos which show students developing the skill of managing information and thinking in different classrooms



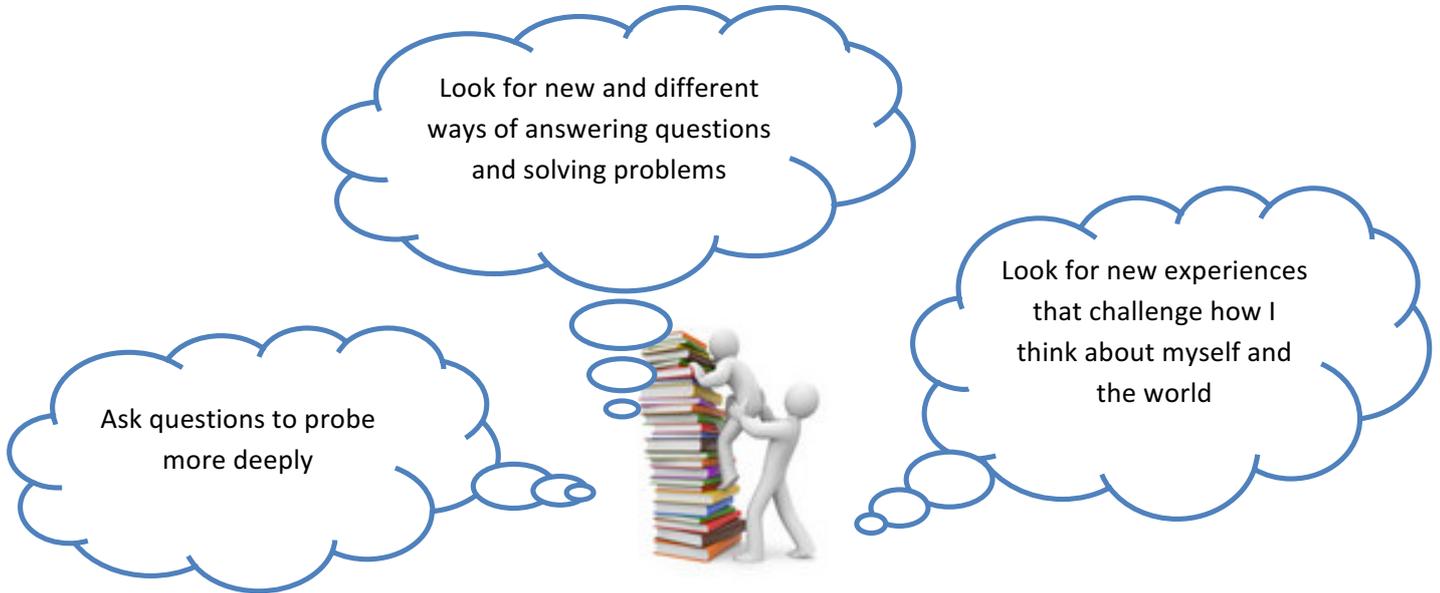
<https://vimeo.com/ncca/review/100586675/f2f95fc726> - History class

<https://vimeo.com/ncca/review/100578688/faf7d6e551> - Gaeilge class

<https://vimeo.com/ncca/review/100575713/0fae11a2d4> - Science class

# Being Curious

*The learning outcomes of this element are*



## Supportive Classrooms

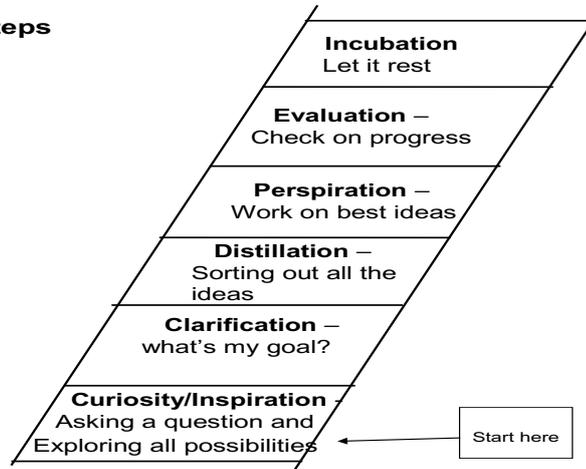
Let's begin by thinking about classroom **cultures**, because establishing the right climate is a crucial factor in encouraging curiosity. Students need a climate where they feel comfortable about being curious, asking questions and making mistakes.

### Characteristics of supportive classrooms

- It's OK to be wrong– we learn from our mistakes.
- Imaginative thinking is appreciated not just for the sake of it but for the purposes of our learning objectives.
- It's good to ask questions, envisage 'what might be' and to challenge assumptions.
- We congratulate each other for making connections and seeing relationships between things.
- We like to explore ideas and not just take them at face value.
- We make a habit of reflecting on our ideas, conclusions and actions.

The first step in the process of being creative is **curiosity**, as you can see in the steps below.

### Creativity – the steps



As a subject department, discuss a variety of ways in which you could stimulate students' curiosity in your subject area – e.g. through posing a problem for the students to solve, telling a story, showing an image, etc.



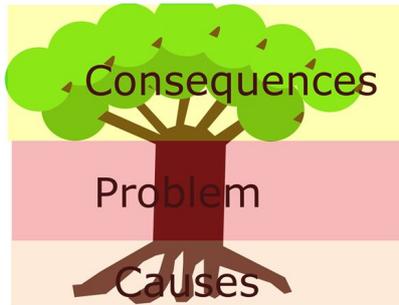
### Wordle - one way to stimulate curiosity.

Follow the link below to find an online tool that allows you to create a stimulus to raise students' curiosity about a new topic. Just paste in single words associated with the topic and the tool will create a word cloud. Use the word cloud to provide key words on a topic, to activate prior knowledge or understanding or to stimulate curiosity on a new topic. [www.wordle.net](http://www.wordle.net)

Using **images** is an effective way of stimulating curiosity about a topic and generating different ideas and perspectives. You can access lots of images at <http://images.google.com/> and <http://www.istockphoto.com/>

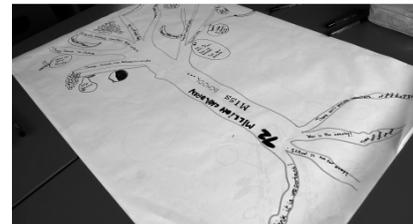
## QUESTIONING - Ideas to help students probe questions more deeply

### Problem Tree



A problem tree helps students to explore the causes, effects and possible solutions of an issue. Each group draws a fruit tree in outline on a large sheet of paper. They begin by labelling the trunk with the chosen question or problem. They use their new knowledge about the issue to label the roots with the causes of the problem, then they write the effects of the problem on the branches and finally they can add the fruit as possible solutions to the problem.

For an example of how to use this approach in the classroom look at this weblink:  
<http://www.oxfam.org.uk/education/resources/ebola>



### 5 Whys

This uses a process of asking 'why' at least five times to unpack a question. It is a particularly useful method to use when you are trying to help students move beyond looking at the surface of an issue as it prompts deeper analysis of the root causes.

Below are two examples...one from an Irish perspective and one from a wider context.

<p>Q: <b>Why</b> don't young people vote?</p> <p>A: Because politics is boring?</p> <p>Q: <b>Why</b> is it boring?</p> <p>A: Because it's got nothing to do with real life</p> <p>Q: <b>Why</b> has it got nothing to do with real life?</p> <p>A: Because politicians aren't interested in the kinds of things that are important to us</p> <p>Q: <b>Why</b> are politicians not interested in those things?</p> <p>A: Because our views don't matter to them</p> <p>Q: <b>Why</b> are young people's views not important to politicians?</p> <p>A: Because they know we don't vote</p>	<p>Q: <b>Why</b> is the child not able to go to school?</p> <p>A: Because her parents are too poor to pay the fees and buy the school books and uniform she needs.</p> <p>Q: <b>Why</b> are they too poor to pay for what she needs?</p> <p>A: Because her father works on a sugar plantation and earns very little money.</p> <p>Q: <b>Why</b> don't the workers do something about this?</p> <p>A: Because they are desperate for a job.</p> <p>Q: <b>Why</b> doesn't the government provide free education for all the children?</p> <p>A: Because the government has had to cut back on health, education and public services</p> <p>Q: <b>Why?</b></p> <p>A: In order to pay back IMF/World bank loans.</p>
--	--

## **Ideas to help student ask and answer questions differently**

*At the start of class or a new topic:*

Briefly, tell students what the new topic is about and ask them to identify what they already know. Make a note of these points and then ask students, perhaps working in groups at first, to generate a number of questions about the topic that they would like to find out. Then, at the end of teaching the topic, they can check back to see how many of their questions were answered.

Alternatively, ask the students to write down: *'The thing I'm most curious to learn about this topic is..., or , 'The question I'm most interested in answering is...'*

*At the end of studying a topic:*

Instead of giving students questions to answer that will check their understanding, ask the students to come up with a set of questions on the topic and then to question them in small groups.

### **In the 'hot seat'**

You may be familiar with the strategy of putting a student in a 'hot seat' taking the role of a character from fiction or from history, or of a person from another part of the world or facing a particular challenge. The class must think of questions to ask the character and the occupant of the 'hot seat' answers the questions from the character's perspective. For younger students, it is best if the teacher models being the person in the 'hot seat' until the students are familiar with how it works.

There are a few variations on this, such as preparing questions in advance, organising a panel discussion with the several guests in the 'hot seat' or seats. All of these work to get the students questioning and thinking from different perspectives.

### **The power of persuasion**

Another strategy to get the thinking going is to get the class to generate four possible answers to a question and to ask the students to vote on their preferred answer. Count the votes for each answer. Ask the students to sit with their preferred answer groups. Now the job of each group is to persuade others from different answer groups to come over to their

group. Give them some time to formulate their campaign strategy. Depending on the age of the class, the following questions may be useful to prompt debate:

- Who is going to speak? What argument will you use?
- Are you going to have a campaign slogan?
- Which other group will you target?
- Will you focus on the strengths of your own argument, or on the weakness of the opposition?

During the 'campaign' the teacher acts as chairperson, although this role may also be assigned, especially as the class becomes familiar with the strategy. In the course of the lesson, students may change sides or revert to original positions. Leave enough time at the end of the lesson to think about the campaign and the tactics used. A good follow-up homework task for further learning is for students to generate a paragraph or a statement beginning with: *I was persuaded because...*, or, *Answer A won because...*

### **Creating alternative answers**

This methodology can be used to enable students to generate and extend ideas, to become more flexible in their thinking and to look for alternative answers to questions rather than just settling for the first answer that comes up.

*Materials needed:* Copy of a text with a set of questions and a set of role cards per group.

1. Assign students to groups (3 or 4) with roles as follows:

*Reader* – Reads the text aloud to the group

*Checker for understanding* – Reads the questions to make sure that all group members understand how to answer each question

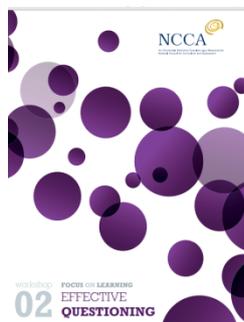
*Recorder* – Records 3 or more good answers to each question and circles the one the group likes best. Makes sure that the group members agree with the one that is circled.

*Reporter* - Reports back on behalf of the group to the class.

2. Explain the task – each group is to read the text, create at least 3 good answers to each question and then agree the best one.
3. When the groups are finished they can compare answers with a nearby group, or the teacher can take feedback from the Reporter or ask random students from each group to explain their group's answers.

(Adapted from Johnson, Johnson & Holubec, *Advanced Cooperative Learning*, p. 13:20)

## Promoting creative and critical thinking through questioning



You will find resources to help you improve your questioning at this link  
[www.juniorcycle.ie/assessment](http://www.juniorcycle.ie/assessment)

Click on 'ongoing assessment' and go to Effective Questioning

### Higher Order Thinking (HOT) questioning

If we want young people to become creative and critical thinkers we need to encourage them to develop higher-order thinking skills. One way to do this is to ask them HOT questions, which require them to think about the answer. Closed, lower-order thinking (LOT) questions are useful when you need to check for understanding during explanations or recap sessions. A downside of using quick fire LOT questions and the ping-pong approach is that students have no time to put an answer together. Many students know that someone else (and they usually know who) will answer and they just move into a spectator role.

You might like to use the questions on the following page to help you in varying your questioning and help you in asking more HOT questions.

**Bookmark** Copy this page onto card and cut it out to make a bookmark. Bring it to class to help you to vary your questioning approaches. (Adapted from Bloom's Taxonomy.)

### **Knowledge**

Who, what, why, where, when, which?  
Describe or define  
Can you find?  
Recall, select, list  
How did ... happen?  
What were the main?

### **Comprehension**

Describe in your own words  
Summarise what you have learned  
Classify, categorise the facts to show  
What is the main idea of?  
Compare and contrast  
Can you explain what is happening?

### **Application**

What examples can you find to?  
What facts show that?  
How would you organise ... to show?  
What would happen if?  
How could you use what we have learned?

### **Analysis**

Why do you think?  
What conclusions can you draw from?  
What would you infer from?  
What is the relationship between?  
Can you make a distinction between?  
Examine closely and explain how did?

### **Synthesis**

How would you improve/solve?  
Can you propose an alternative?  
How could you adapt/modify?  
How could you test?  
What would happen if?  
Can you predict?  
What solutions would you suggest?

### **Evaluating understanding**

What do you think about?  
What would you prioritise?  
What do you think is the most important?  
Why do you think ... is not/is important?  
What would you recommend?  
How could you solve/improve?  
How could you determine?

## Questioning - Common pitfalls and possible solutions

**Not being clear about why you are asking the question:** Don't ask questions just for the sake of it. Plan your questions well in advance. How about just asking one good question during class that will get students really thinking?

**Asking too many closed questions that need only a short answer:** It helps if you plan open questions in advance. If you have a very clear idea of the response you want, it is probably better to tell students by explaining it to them rather than trying to get there through this kind of questioning. Remember, if you ask open questions you must expect to get a range of answers.

**Asking too many questions at once:** Asking too many questions at once; answering questions yourself; failing to build on answers or tease out the thinking behind an answer, can lead to confusion.

**Asking difficult questions without building up to them:** This happens when there isn't a planned sequence of questions of increasing difficulty. Sequencing questions is necessary to help students to move to the higher levels of thinking.

**Asking a question then answering it yourself:** What's the point? This pitfall is often linked to another problem - not giving students time to think before they answer. Build in '*wait time*' to give students a chance to respond. You could say 'Think about your answer for 3 seconds, then I will ask for an answer.' Think-pair-share activities can help also.

**Dealing ineffectively with wrong answers:** Teachers sometimes worry that they risk damaging students' self-esteem by correcting them. It is a mark of respect to engage with someone who has given a wrong answer. There are ways of handling this positively, such as providing prompts and scaffolds to help students correct their mistakes or by asking students why they have given that answer, how they arrived at that conclusion or if there is anything they would like to add. You could also ask other students to extend the answer.

**Asking questions of the same students:** Without meaning to, we can find that we constantly direct questions to the same students (often the ones we know will provide us with the answers!). Having names of all students on lollipop sticks in a jar and plucking out sticks at random can overcome this hurdle.

**Not giving 'wait time':** Giving sufficient time for students to formulate an attempt at an answer is very important. How about giving your students an extra ten seconds to come up with an answer themselves? This can be the difference between students learning or not.

**Allowing students to wave their hands:** Students tend to stop thinking once a few in the class put up their hands. If we use the '*no hands*' rule, we encourage all students to think about the answer to the question as the teacher can choose anyone to answer.

## Consider using these kinds of questions

### Questions that require students to use their imaginations

What would happen if ...? Is there another way of doing this?

Imagine... Suppose...

What are some possible consequences...?

What if you were... Imagine yourself as...

### Questions that probe assumptions

What are you assuming?

What is Jenny assuming?

What could we assume instead?

You seem to be assuming \_\_\_\_\_. Do I understand you correctly?

All of your reasoning depends on the idea that \_\_\_\_\_.

Why have you based your reasoning on \_\_\_\_\_ instead of \_\_\_\_\_?

Why would someone make that assumption?

### Questions that probe reasons and evidence

What would be an example?

How do you know?

Why do you think that is true?

Do you have any evidence for that?

What are your reasons for saying that?

Are these reasons adequate?

Why do you say that?

What led you to that belief?

But, is that good evidence for that belief?

What would change your mind?

What other information do you need?

What would you say to someone who said that \_\_\_\_\_?

Can someone else give evidence to support that view?

By what reasoning did you come to that conclusion?

### Questions about viewpoints or perspectives

You seem to be approaching this issue from \_\_\_\_\_ perspective.

Why have you chosen this rather than that perspective?

How would other groups/types of people respond? Why? What would influence them?

Can/did anyone see this in another way?

What would someone who disagrees say?

What is an alternative?

How are Ken's and Joanne's ideas alike? How are they different?

### Questions about implications and consequences

What are you implying by that?

When you say \_\_\_\_\_, are you implying \_\_\_\_\_?

But, if that happened, what else would happen as a result? Why?

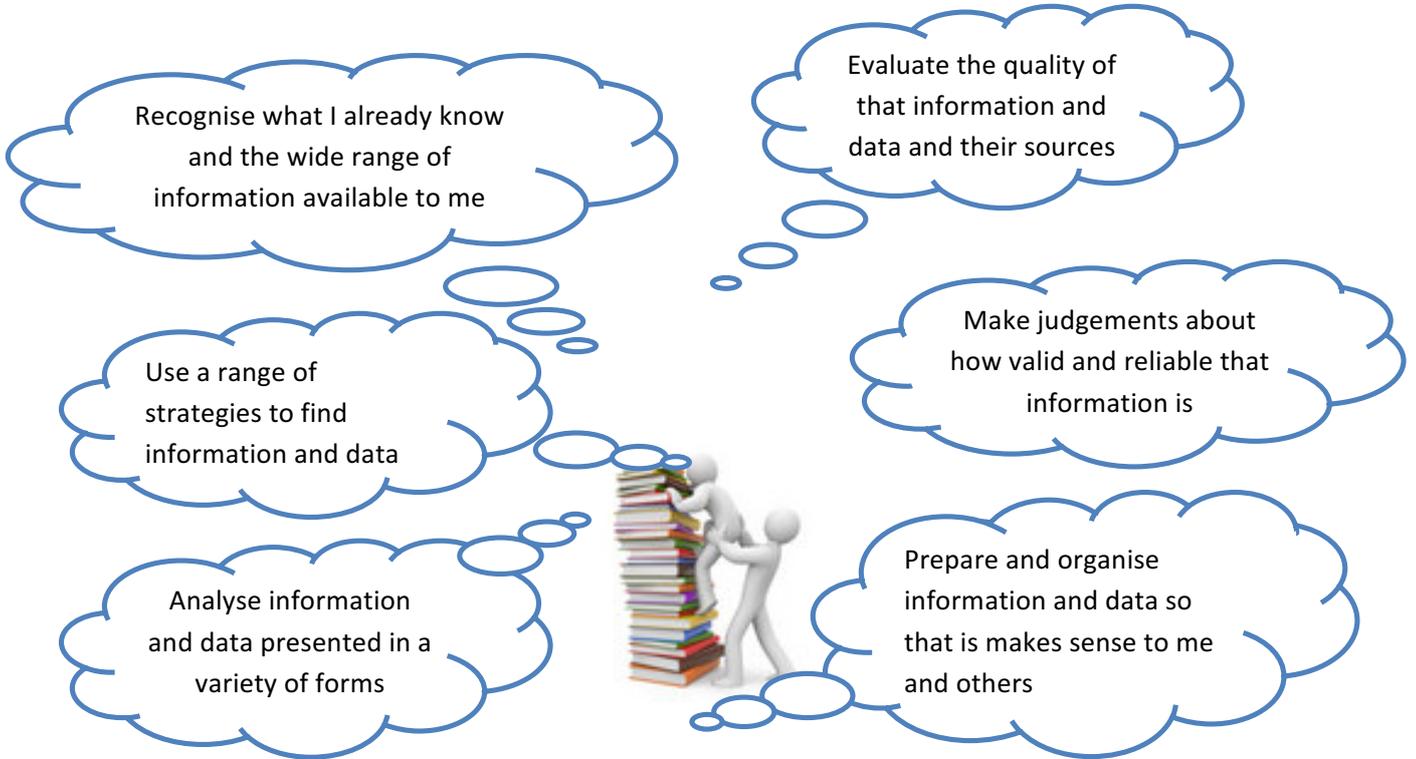
What effect would that have?

Would that necessarily happen or only possibly/probably happen?

If we say that \_\_\_\_\_ is fair, how about \_\_\_\_\_?

# Gathering, recording, organising and evaluating information

The learning outcomes for this element are



## Scanning and Skimming – Fast reading techniques

Skimming	Scanning
Useful when you want to get the gist of a text before in-depth reading.	Useful if you want to locate specific information. <b>e.g.</b> to find a number in a telephone directory or a date or name in a history book.
<p>Run your eyes down the page to</p> <ul style="list-style-type: none"> <li>spot new words or concepts so you can check the meaning before you start reading.</li> <li>read the first and last paragraphs to get the main points.</li> <li>look at the first sentence of each paragraph to get a feel for the content.</li> <li>check to see if there's a summary where you can note the key points.</li> </ul>	<p>Look for information which tells you</p> <ul style="list-style-type: none"> <li>what it's called</li> <li>what it's about</li> <li>will this be useful to me?</li> </ul> <p>This overview will help you decide whether you should read further, and how useful the document might be for your study.</p>



## Student activity

Brainstorm examples of when we might use scanning (e.g. looking up a phone number, finding a word in a dictionary, looking for specific information on a website, checking the football results in the newspaper, finding a date or quotation in a text book.). Then brainstorm examples of when we might use skimming (e.g. when you read a magazine and you are not interested in reading it word by word but skim to get the main stories).

### To practise scanning

1. Circulate a set of questions related to a topic currently of relevance to the students.
2. Remind your students that scanning means reading very fast to find specific pieces of information.
3. Explain that you will be showing a series of paragraphs on Powerpoint slides. The paragraphs contain the answers to the questions which have been circulated.
4. Students have 3 minutes to read all the slides, which will be moving quite rapidly.

Their task is to scan the text and locate all the answers to the questions. When the first slide appears the clock starts ticking.

### To practise skimming

1. Remind students that skimming means reading very fast to find only the main ideas of a text.
2. Circulate an article or a chapter from a text (containing at least 5-6 solid paragraphs). Students will have a short time to skim read the text and in doing so they must identify the main idea in each paragraph.
3. At the end of the agreed time (say 3 minutes) students must turn to each other and take turns summarising the key ideas in each paragraph. The first student says what was the main idea in paragraph one, the second student says what was the main idea in paragraph two, then the first student takes paragraph three, and so on until they have completed the text.

<http://www.studygs.net/attmot4.htm> is a 'How to Study' guide for students. Get the students to use their 'skimming' skills to pick out the main ideas in the guide. They can then copy and paste into a word document the tips they found most useful.



**Helping students to read actively, critically and analytically.** Read a short piece about how one teacher approaches this <http://www.accessexcellence.org/LC/TL/buchanan/actively.php>

### **Making judgments about how valid and reliable information is**

Open up the discussion using some of the following questions:

- Are you born with your opinions?
- Are your opinions shaped by other people? If so, which people influence you most and why?
- What else might shape your views? What about your daily experiences – what you do, what you learn in school, read in books or magazines, what you see on TV, internet, etc?
- How reliable is this information?
- Who/what has the most influence on what you think about things?



Invite students to map their own information network. Write their own name in the middle of a page and then draw arrows indicating different sources of information in their own lives. This can be followed by a ranking exercise, looking at which sources of information are most important for which areas of life.

Brain storm these questions –

- When is a piece of information valuable and what makes it valuable?  
Answers might include –when the source of information is trustworthy, when the information is relevant/useful, when it can be understood, when it relates to a person's life, etc.

Introduce the idea that not all sources of information are equally valid or useful with some of the following questions:

- Have you ever heard of a piece of information that saved a life?
- Have you ever received a piece of information that benefited you personally?
- Have you ever received false information?
- Did you ever act on information and wished you had not?

Adapted from *Education Action*. Action Aid Magazine, January 2005 [www.reflect-action.org](http://www.reflect-action.org)



## Helping students to evaluate the quality and source of website information

***When students are using the internet encourage them to think like a judge!***

- Examine the evidence.
- Ask questions.
- Consider the motives of people providing information.
- Trust no one until you have found good cause to do so.

***Use the WWW technique! WHO, WHAT, WHEN***

### **1. Who?**

Can you trust the source of the information?

- Who has written the information?
- What is the author's level of expertise in the field?
- Why have they written it - what are their motives?
- Are they a useful source for your research?

### **Tip**

If you are unsure about the author from the site itself, try a library or web search to find a list of previous publications, a CV or web page about them.

### **2. What?**

Can you trust the information? This decision requires some critical thinking.

There are some key criteria to bear in mind when evaluating the content of information:

- **Relevancy** - does the information help to answer your questions?
- **Validity** - are the arguments rational and logical, and supported by evidence? Can you differentiate fact from opinion?
- **Accuracy** - are the arguments well-reasoned, and is supporting evidence relevant and correct?
- **Bias** - What perspective is the author coming from? Are they giving both sides of the story? Or are they arguing from a particular position or with a particular motivation that might skew their writing? Do you need to find counter-arguments that give an alternative point of view?
- **Evidence** - what examples are given to support the arguments? Is all the evidence referenced with a source that you can check for verification?

### **3. When?**

The accuracy of your source may be affected by the date it on which it was published.

**Tip:** Look for a publication date on the title or home page, or last updated dates in the header or footer. **Example** If you were looking for a textbook or website about the impact of climate change, would you want information from five years ago, or from this year?

Criteria and questions that teachers and students may use to evaluate websites include:

<b>Source</b>	<p>Is the website hosted by a reputable source?</p> <p>Is there a header or footer showing who has developed the website?</p>
<b>Content</b>	<p>Does the website present accurate information?</p> <p>Is the language level suitable?</p> <p>Is the information presented in multiple formats? (Text, audio, graphics)?</p>
<b>Up to date</b>	<p>What is the website publication date?</p> <p>When was the information last updated?</p> <p>Is it still current, or outdated?</p>
<b>Authorship</b>	<p>Who has written the information?</p> <p>Has the author provided his/her contact information?</p>
<b>Bias/intention</b>	<p>Is the information presented unbiased?</p> <p>Can you distinguish facts from opinion?</p>
<b>Site design</b>	<p>Is the site well designed?</p> <p>Is it easy to find information on it?</p>

Adapted from  
*Information and Communication Technology in the Primary School Curriculum – Guidelines for Teachers*, page 110

Additional resources and assistance in evaluating suitable educational web resources is available through *Scoilnet* ([www.scoilnet.ie](http://www.scoilnet.ie))



## Helping students to organise information so that it makes sense

**Discuss** with a colleague, what are the advantages of students learning how to make their own notes, as opposed to the teacher providing notes?

### Helping your students to make their own notes

Clearly written, accurate notes help students to summarise and make sense of information for later study and review. Making notes can also help to keep students focused during class time. However good note-making is a skill that takes time and practice to develop.

### Teaching the skill of note-making

- Begin with 1<sup>st</sup> years by helping students to pick out and highlight the main ideas in a text. Highlighting is better than underlining as it forces students to decide what's really important.
- Ask students to summarise the key ideas in their own words.
- In pairs, get them to check to see if all the key ideas have been captured.
- When students are learning how to make notes it can also be useful to have some examples made by other students, which they can look at to see what they are aiming for.
- Until students become more skilled in note-making it is helpful if the teacher wraps up a note-making session by checking that all students have noted the main points of information. This can be done quickly on the board.



### Making notes—some tips for students

- Keep your notes neat and organised.
- Begin each note-making session on a fresh page, with the date and topic.
- Do not write down everything—just the important facts and key ideas.
- Use different coloured pens or highlighters to mark different points/topics.
- Use short sentences and phrases. Try not to copy directly from the text book unless it is a quotation, in which case use quotation marks.
- Use abbreviations or symbols such as e.g., i.e. &, =, w/ (with), w/o (without).
- Leave space in the left margin, or between ideas, in case you need to come back and add further information or comments.

**Get students to try out the two column method of note-taking as set here**

<http://www.nbss.ie/node/249>

## Using online texts & resources to develop students' note-making skills

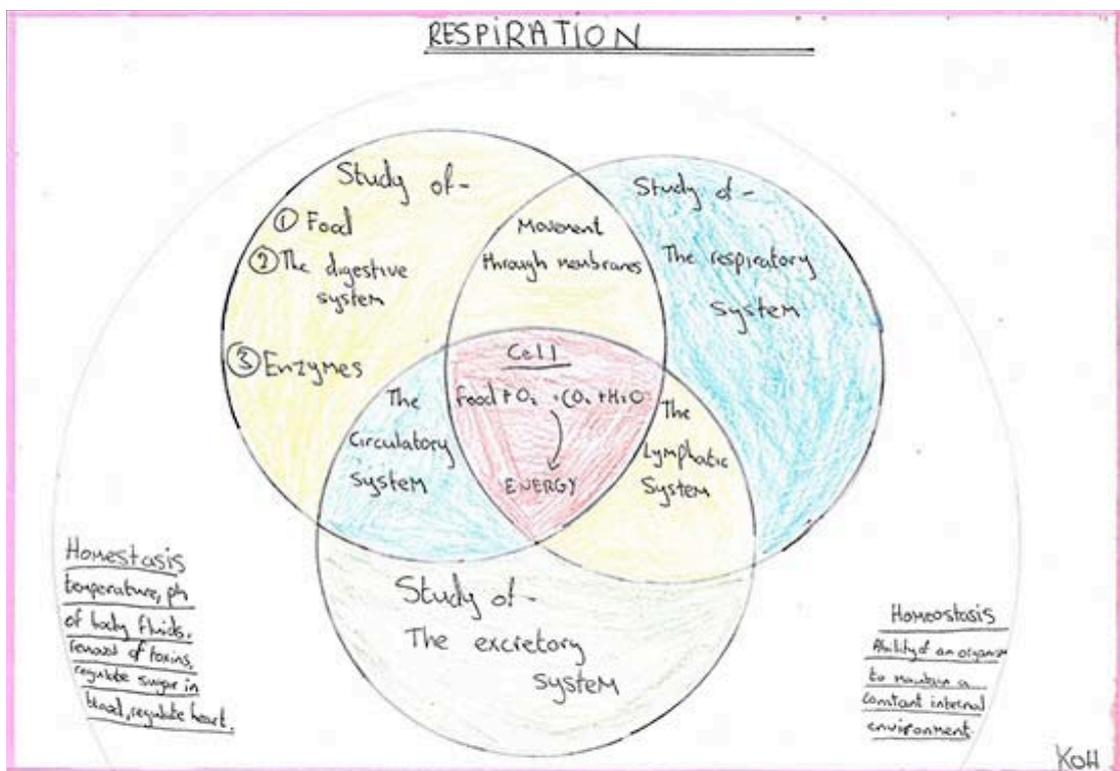
Most publishers now have their textbooks digitally available online. Display the textbook on the whiteboard/screen. Ask students through the interactive tools to highlight key words/phrases. There is also a facility to add annotations. This provides an excellent opportunity to collaborate on note-taking skills. Students then highlight their own texts in the same way until they are confident to do so independently.

## Graphic organisers – a visual way to organise information

A graphic organiser can help students to develop their skills of information processing by enabling them to record, organise or summarise information in different ways.

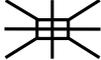
A graphic organiser is usually a one-page template with blank areas for the student to fill in. Graphic organisers help students make sense of information. They also help to organise ideas, check understanding, and assist recall. They help teachers too, as they show students' understanding of a topic and can help you to see any gaps in their understanding.

When students are using graphic organisers for the first time, it might be helpful to have a sample drawn on the board for the class to fill in together.



Graphic organiser on respiration

# Sample Graphic Organisers

- |    |  |                 |     |  |                            |
|----|--|-----------------|-----|--|----------------------------|
| 1. |   | Ranking Ladder  | 8.  |   | Cross Classification Chart |
| 2. |   | Step            | 9.  |   | Two Venn Diagram           |
| 3. |   | Chain of Events | 10. |   | Three Venn Diagram         |
| 4. |   | Sequence Charts | 11. |   | Four Corner Organiser      |
| 5. |   | Funnel          | 12. |   | Starburst                  |
| 6. |   | Fishbone        | 13. |   | Tri Pie                    |
| 7. |  | Brain drops     | 14. |  | Research Grid              |



SECOND LEVEL  
SUPPORT SERVICE  
SEIRBHÍO TACÁIDHEA  
DARA LEIBHÉAL

## Using Graphic Organisers in Teaching and Learning



A graphic organiser is usually a one-page template with blank areas for the student to fill in with ideas or information. These links provide useful templates and ideas on how you can use graphic organisers:

<http://pdst.ie/sites/default/files/GraphicOrganiserFinal.pdf>

[http://www.nbss.ie/sites/default/files/publications/summarising\\_maps\\_-\\_comprehension\\_strategy\\_handout\\_copy\\_2.pdf](http://www.nbss.ie/sites/default/files/publications/summarising_maps_-_comprehension_strategy_handout_copy_2.pdf)

## Mind Mapping – how might this be useful?

A mind map differs from a graphic organiser in that students create it themselves. The teacher needs to model the process but every student must create their own mind map. It is a personal learning document. No one can map another person's mind!

A mind map is a useful way to help students come up with new ideas or make sense of complex topics or see how pieces of information fit together. This can also be a useful technique to improve the way your students take notes. More than this, mind maps encourage creative thinking and they hold information in a format that students find easy to remember and quick to review. They are more compact than conventional notes, often taking up one page.

Popularised by Tony Buzan, mind maps abandon the list format of conventional note-taking. A good map shows the 'shape' of the subject, the relative importance of individual points, and the way in which facts relate to one another. As such, they help students to connect information.

To make notes on a subject using a mind map, draw it in the following way:

1. Write the title of the subject you're exploring in the centre of the page, and draw a circle around it.
2. As you come across major ideas or subheadings of the topic (or important facts that relate to the subject) draw lines out from this circle. These can be drawn with a different colour.
3. As you "burrow" into the subject and uncover another level of information (further subheadings, or individual facts) belonging to the subheadings above, draw out further lines linked to the subheading lines.
4. Finally, for individual facts or ideas, draw lines out from the appropriate heading line and label them.

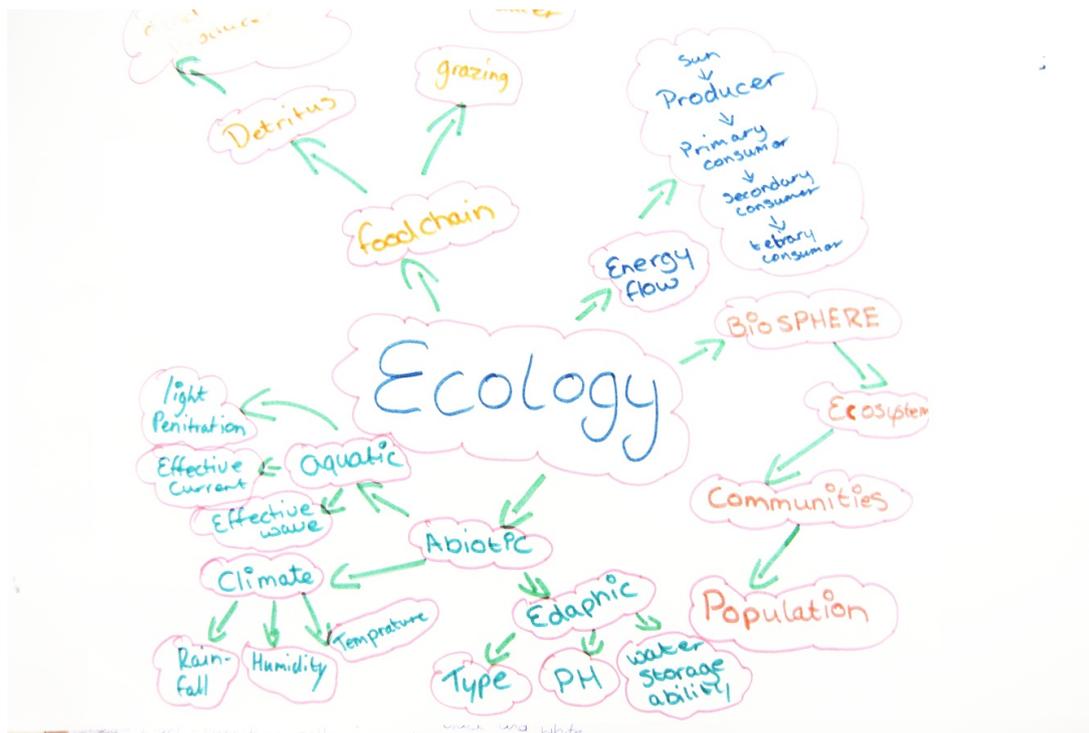
A complete mind map may have main topic lines radiating in all directions from the centre. Sub-topics and facts will branch off these, like branches and twigs from the trunk of a tree. The above information is adapted from [www.MindTools.com](http://www.MindTools.com).

While drawing mind maps by hand works well, software tools like [MindGenius](http://www.MindGenius) and <http://www.imindmap.com> are useful tools. This link provides free software for mind mapping <http://freemind.sourceforge.net/wiki/index.php/Download>



Movie

This short video (2 mins 50) explains the basic ideas of mind mapping: <http://www.youtube.com/watch?feature=fwrel&NR=1&v=wLVV0XN7K1g>



Sample mind map on Ecology

### Picture it

Asking students to represent information in the form of a picture or poster can be very useful.

In English class, students might create a picture to show the imagery in poetry, the key moments in a story, and so on. In other subjects such as CSPE, Science or Geography, students might take digital pictures to represent key concepts and share them with the class.



## Thinking creatively and critically

*The learning outcomes of this element are*

Question ideas and assumptions, both my own and other peoples'

Make connections between what I already know and new information

Make estimations and predictions and compare them with others

Adjust my thinking in light of new information



**Discuss:** What do you think 'creativity' looks like?



Many writers speak about creativity having these characteristics:

First, creativity always involves thinking or behaving **imaginatively**.

Second, this imaginative activity is **purposeful**: that is, it is directed to achieving an objective.

Third, these processes must generate something **original**.

Fourth, the outcome must be of **value** in relation to the objective.

Discuss the characteristics suggested by this definition. Do you agree? What would you add?



**What does the research say about creativity?**

If you would like to read a summary of what the research has to say about creativity in learning follow this link

<http://www.journeytoexcellence.org.uk/resourcesandcpd/research/summaries/rsfosteringcreativity.asp>

Or check out [www.ltscotland.org.uk/creativity](http://www.ltscotland.org.uk/creativity)

## **How to spot creativity in the classroom**

When students are thinking and behaving creatively in the classroom, they are likely to be:

### **QUESTIONING AND CHALLENGING**

Creative students are curious, question and challenge, and don't always follow rules. They:

- ask 'why?' 'how?' 'what if?'
- ask unusual questions
- respond to ideas, questions, tasks or problems in a surprising way
- challenge conventions and their own and others' assumptions
- think independently.

### **MAKING CONNECTIONS AND SEEING RELATIONSHIPS**

Creative students think laterally and make associations between things that are not usually connected. They:

- recognise the significance of their knowledge and previous experience
- use analogies and metaphors
  - generalise from information and experience, searching for trends and patterns
- reinterpret and apply their learning in new contexts
- communicate their ideas in novel or unexpected ways.

### **ENVISAGING WHAT MIGHT BE**

Creative students speculate about possibilities. They:

- imagine, seeing things in the mind's eye
- see possibilities, problems and challenges
- ask 'what if?'
- visualise alternatives
- look at and think about things differently and from different points of view.

### **EXPLORING IDEAS, KEEPING OPTIONS OPEN**

Creative students explore possibilities, keep their options open and learn to cope with the uncertainty that this brings. They:

- play with ideas, experiment, try alternatives and fresh approaches
- respond intuitively and trust their intuition
- anticipate and overcome difficulties, following an idea through
- keep an open mind, adapting and modifying their ideas to achieve creative results.

### **REFLECTING CRITICALLY ON IDEAS, ACTIONS AND OUTCOMES**

Creative students are able to evaluate critically what they do. They:

- review progress, ask 'is this a good...?' 'is this what is needed?'
- invite feedback and incorporate this as needed
- put forward constructive comments, ideas, explanations and ways of doing things
- make perceptive observations about originality and value.

The above text is adapted from *Creativity – find it, promote it*, Qualifications and Curriculum Authority, London, 2004

### The main messages about creativity in learning

- Most individuals believe they are not very creative. However, creativity is not just about special people doing special things. We all have the potential to be creative and creativity is a skill that needs to be developed.
- Creativity embraces both hard and soft thinking. The most powerful creative thinking occurs when the left and right hemispheres of the brain combine to act as both 'artist' and 'judge'.
- The use of collaborative learning groups helps to foster creativity.

*'Imagination is more important than knowledge.'* Albert Einstein



### **Discuss** with your colleagues

How could you provide opportunities for promoting students' critical thinking in a planned lesson or activity?

### **Key features of critical thinking**

- We are interested in thinking about our thinking and in practising critical thinking.
- We are prepared to challenge our own beliefs and assumptions.
- We understand that explanations should be testable.
- We don't reject ideas for the sake of being negative but we suspend judgement until we can justify claims being made.
- We understand that reason plays an intrinsic role in our decisions and judgements.
- We are aware of the need to be respectful of others' thinking and beliefs.



Look at this 5 minute video to gain a quick understanding of critical thinking: <http://www.youtube.com/watch?v=6OLPL5p0fMg&feature=fvwrel>

---

**Movie**

## A critical thinking checklist

### These prompts could be used to promote critical questioning in your class

- √ **CLARITY:** Could you elaborate further on that point? Could you express that point in another way? Could you give me an illustration? Could you give me an example?  
Clarity is the gateway standard. If a statement is unclear, we cannot determine whether it is accurate or relevant. In fact, we cannot tell anything about it because we don't yet know what it is saying.
- √ **ACCURACY:** Is that really true? How could we check that? How could we find out if that is true?  
A statement can be clear but not accurate, as in "Most dogs are over 136 KG in weight."
- √ **PRECISION:** Could you give more details? Could you be more specific?  
A statement can be both clear and accurate, but not precise, as in "Jack is overweight." (We don't know how overweight Jack is, 1kg or 200 kg )
- √ **RELEVANCE:** How is that connected to the question? How does that relate to the issue? A statement can be clear, accurate, and precise, but not relevant to the question at issue.
- √ **DEPTH:** How does your answer address the complexities in the question? How are you taking into account the problems in the question? Is that dealing with the most significant factors? A statement can be clear, accurate, precise, and relevant, but superficial (that is, lack depth).  
For example, the statement "Just say No" which is often used to discourage children and teens from using drugs, is clear, accurate, precise, and relevant. Nevertheless, it lacks depth because it treats an extremely complex issue, the pervasive problem of drug use among young people, superficially. It fails to deal with the complexities of the issue.
- √ **BREADTH:** Do we need to consider another point of view? Is there another way to look at this question? What would this look like from a conservative standpoint? What would this look like from the point of view of...?  
A line of reasoning may be clear accurate, precise, relevant, and deep, but lack breadth
- √ **LOGIC:** Does this really make sense? Does that follow from what you said? How does that follow? But before you implied this and now you are saying that; how can both be true?

## Pose a problem

1. Pose a problem to be solved or a question to be answered in relation to a topic – e.g. How does place influence the spread of disease? Should scarce water resources in Kenya be used for growing flowers for export or for growing food crops? If plants need sunlight to make food, how come the biggest plants don't grow in deserts?
2. Ask students to identify what they already know about the topic.
3. Students generate hypotheses.
4. Information gaps are identified.
5. Using a variety of resources students are asked to acquire new knowledge that will help inform the problem-solving process or find the answer to the question.
6. Students apply new knowledge.
7. At the completion of the task, students reflect on the new knowledge acquired and also on the ways in which their own thinking evolved during the process (e.g. what made me change my mind about...? What were the flaws in our thinking that were leading us in the wrong direction initially?)

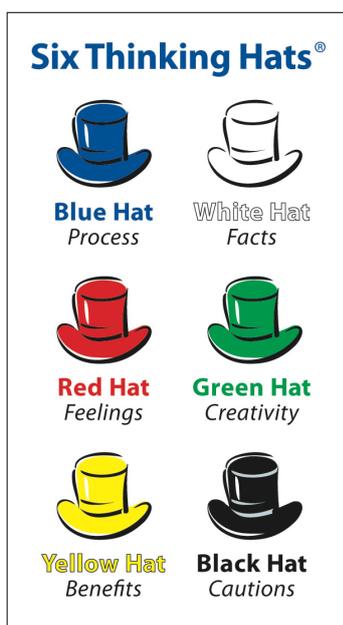
## Brainstorming

Brainstorming is a technique which involves generating a list of ideas in a creative, unstructured manner. The goal of brainstorming is to generate as many ideas as possible in a short period of time. The key tool is "piggybacking," or using one idea to stimulate other ideas. During the brainstorming process, ALL ideas are recorded, and no idea is disregarded or criticised. After a long list of ideas is generated, these can be prioritised as most/least important, most/least helpful, most/least unusual/creative, plus/minus, etc. They can also be ranked 1-5 in order of importance or in the order in which they might be useful in planning an essay.

**Carousel brainstorming** is another useful technique.

1. The class is arranged into small groups. Each group has a different colour marker.
2. The teacher poses a question on a flip chart.
3. The flipchart question is passed from group to group. (To speed up the process you may have a number of pages going around).
4. Each group must add two original suggestions.
5. The flipchart page(s) are displayed for all to see.
6. You can see which group has suggested each idea (by colour) and ask them more about their idea.

## Using the Six Thinking Hats



The Six Thinking Hats approach can be used to address almost any problem-solving activity you might encounter in the classroom. Assigning each thinking style a color serves as a visual cue to help students recognize the thinking skill they are using. The six different hats students might wear, and the kinds of thinking they represent, are briefly described below:

*Blue Hat:* Sum up all that is learned.

*White Hat:* Discuss the facts and other objective information about the problem.

*Red Hat:* Share feelings and emotions about the issue.

*Green Hat:* Consider creative ideas that come from looking at the problem in a new way.

*Yellow Hat:* Consider positives, or advantages, of the situation

*Black Hat:* Present negative aspects, or worst case scenarios, regarding the situation.



### Further reading and websites

<http://www.journeytoexcellence.org.uk/resourcesandcpd/research/summaries/rsfosteringcreativity.asp>

Or check out [www.educationscotland.gov.uk/learningandteaching/approaches/creativity](http://www.educationscotland.gov.uk/learningandteaching/approaches/creativity)

[www.criticalthinking.org](http://www.criticalthinking.org)

*Creativity; find it, promote it.* QCA 2003

*Creativity in Education & Learning* Copely, Arthur J.2001

*Learning: creative approaches that raise standards,* Ofsted, Jan 2012

## Managing my learning

The learning outcomes for this element are

...

Reflect on and review  
my own progress

Use a range of tools to  
help manage my  
learning

Identify blocks or barriers to  
my learning and suggest ways  
of overcoming them

Keep believing that  
with continued effort I  
can succeed

Set realistic targets



Movie

### *Handling mistakes and failure*

Part of managing learning is the ability to be resilient when we encounter difficulties. Listen as Brian Boyd discusses the importance of perseverance, and how young people can be taught to see failure as a positive aspect of learning:

<http://www.journeytoexcellence.org.uk/videos/expertspeakers/handlingfailurebrianboyd.asp>

### Managing Myself - Setting and achieving personal goals



Watch this short video to see students in Cork setting personal goals and discussing how they can overcome barriers to their learning.

<https://vimeo.com/16246088> (4 mins 16)



## Getting started with your students -

Practical ideas to help students  
reflect on their learning



## Journaling

Invite students to keep a learning journal or create a blog about themselves and their learning with some prompt questions guided by the teacher. This can help them to identify learning goals, record evidence of success and reflect on their learning needs.

### Some useful prompts

***This week (or today)***

*I learned...*

*I was surprised by...*

*I was interested in...*

*What I liked most was...*

*What I found difficult was....*

*When I needed help I got help from ....*

*Something I did well...*

*The thing I'd most like to improve is ...*

*My target for next week/next time is...*



### Quick ideas for encouraging reflection

- Award marks for reflection on tasks, perhaps 10%
- When students are submitting their written work, ask them to write 2-3 points on the challenges they experienced. Alternatively, you might just ask them to draw either a smiley face or an unhappy face to indicate their experience of completing the task.
- Keep a Reflection Journal for recording reflections on successes, challenges, recording goals and targets. Focus their thoughts by giving them the language of reflection i.e. *Thoughts, Feelings, Challenges, Goals, Successes*. You might also provide some specific questions. These allow students to recognise how far they

have progressed and is therefore confidence building. You may allocate a percentage for this in their assessment. Encourage them to personalise these journals.

### Some useful techniques which take just a few minutes at the end of class

**Turn to a partner** and take turns sharing – ‘*The thing I learned today is...*’ and/or ‘*the skill I developed today is...*’

**One minute reflection** – *Something I learned, a question I still have, something I’m not sure about.*

**Complete three sentences** (preferably in the learning journal) – *What was good about this class, what didn’t go well, what are my own thoughts on how I’m learning?*

### Having a conversation about learning with your students

Some useful questions

- What’s going well? And not so well?
- Have you noticed what helps your learning and what blocks it or makes it difficult?
- Are you noticing any patterns in your learning?
- What will your next steps be?
- What do you need to help you?
- What would a teacher need to know about you to help you learn better?



**Or you could use a simple worksheet at the end of class, such as the following...**

One thing I learned today ...	I enjoyed ...

I found it difficult to ...	I might have learned better if...
In my next class I aim to...	



### **Perseverance and managing failure**

**Movie** Listen as Brian Boyd discusses how students can be taught to see failure as a positive aspect of learning.

<http://www.journeytoexcellence.org.uk/videos/expertspeakers/handlingfailurebrianboyd.asp>

### **Contracting grades with your students – another way of target setting**

When you contract grades, your students sign a contract which outlines the requirements to receive an A, B or C. Do not give options for lower grades. The student selects which grade he or she will receive and then must complete those requirements satisfactorily. From the start of class, your students know what they need to accomplish, and they know that their success is completely dependent upon themselves. This can help them become more focused and self motivated learners.

### **Get your students thinking about positive learning habits**

You might Google a summary of *The 7 Habits of Highly Effective Teenagers*, by Sean Covey to begin a conversation with your students or watch this rap in which students present these ideas. <http://www.youtube.com/watch?v=bAYZBS40lcc>



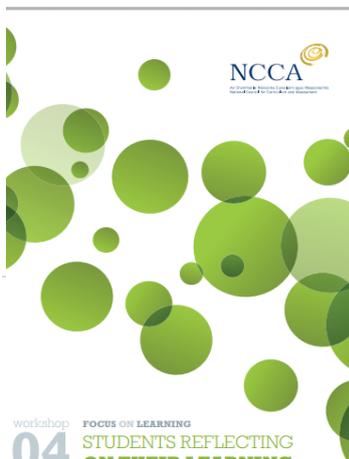
Why not brainstorm a list of good habits for your subject?

## Reviewing their own progress

### Why not try some of these strategies?

- At the end of class – Ask students to give a one minute summary of what they have learned.
- Get students to practice the habit of reflecting on their learning through the use of a learning journal or blog
- Ask students to peer explain a topic in pairs or small groups. This is a good way of checking students' understanding.
- In small groups, students take turns teaching different topics that have been studied in class. One person in each group acts as the 'teacher' while the others act as questioners. Roles can be swapped around for different topics so that everyone gets a chance to be the teacher.
- Table Quiz – Students work in groups to develop questions on different topics which can be used in a table quiz to assess learning.
- Play 20 Questions – In small groups students have to question each other on a topic.
- Play Team Games Tournament (developed by Barrie Bennett)

[http://www.instructionalleadership.ie/Co-operative\\_Learning.aspx](http://www.instructionalleadership.ie/Co-operative_Learning.aspx)

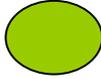
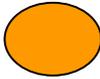
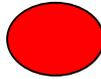


For further ideas on how you can encourage students to manage and reflect on their learning go to [www.juniorcycle.ie/assessment](http://www.juniorcycle.ie/assessment) and click on *ongoing assessment* for materials entitled

***'Students reflecting on their learning.'***

## Traffic lighting

Another simple and effective idea is for students to use traffic light markers to label their work, green orange or red according to whether they think they have good, partial or little understanding of a topic. Students can then recognise the areas of learning where they need to concentrate their efforts or where they may need help. In some cases, students can be grouped so that students who have a green light beside a topic can help students with an orange or red light by peer teaching that topic or explaining the problem.

Traffic light learning log				
Date:	Insert subject:	Good understanding	Some understanding	Very little understanding
<b>Topics</b>	List the main topics studied during the past week/month under each subject and decide how well you understand each topic by ticking a light			

## Using digital technology to access, manage and share information

*The learning outcomes of this element are*

Source, share and evaluate information that I find in different technologies and digital media formats

Understand how to use content and present it differently while respecting copyright

Use digital tools to expand my thinking and source information

Use different technologies and digital media tools to give and receive feedback



A teacher can generate lots of ideas in any subject by **using images** from online newspapers or galleries. For example, the following picture contains a photograph of three Olympic winners on receiving their medal.

Students could.....



- Create a caption for each photo
- Predict what happens next
- Write a piece in a particular language style

- Describe how the athletes are feeling



Using **images** is an effective way of stimulating curiosity about a topic and generating different ideas and perspectives. You can access lots of images at <http://images.google.com/> and <http://www.istockphoto.com/>

or check out an online newspaper that has a picture gallery such as:

<http://www.telegraph.co.uk/news/>

<http://www.irishtimes.com/blogs/gallery/2013/03/08/international-womens-day-2013/>

## **Presenting and managing Information**

Projects can be created with **powerpoint**.

1. Encourage students to insert hyperlinks to the sites they have researched.
2. Insert animations/soundbites/video clips that will arouse the interest of the audience. This will encourage the student to focus on the target audience for their presentation. They will also have to edit the length of the piece for maximum effect so it will eliminate the irrelevant material.
3. The style of the powerpoint should suit the topic. This can ask students to consider to tone, mood and style.

## **Creating crosswords**

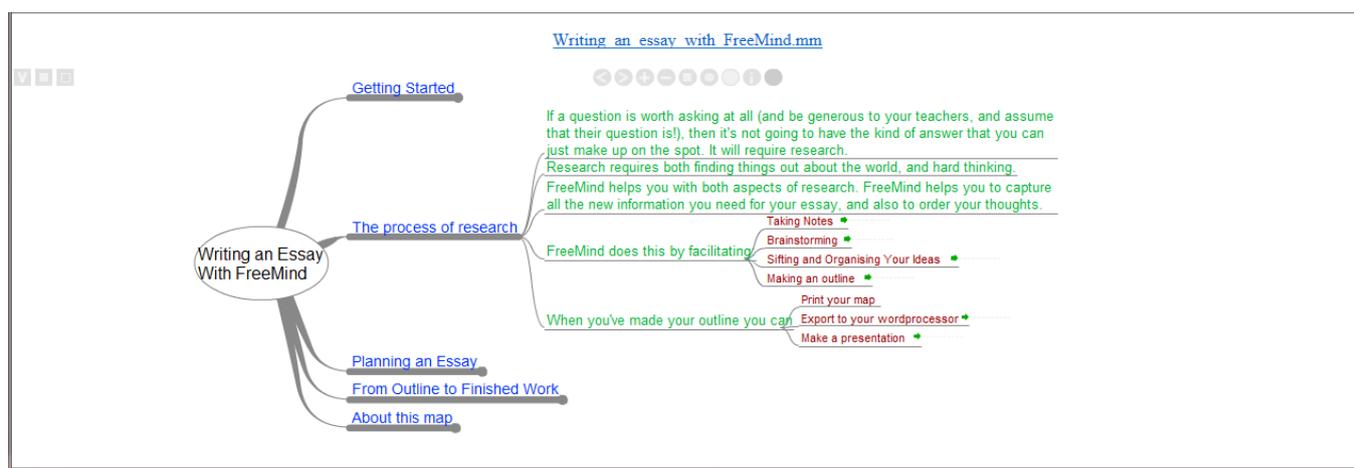
As well as being a handy interactive tool for teachers, <http://www.crosswordkit.com/> is great for stimulating students' creativity in managing their information and learning. They can create crosswords on a given topic as a revision exercise for their peers. Likewise they can solve puzzles created by other students.

Also check out [www.brainpop.co.uk](http://www.brainpop.co.uk) for ideas.

## Mind-mapping

<http://freemind.sourceforge.net/wiki/index.php/Download>

This is a mind-mapping tool that allows teachers and students to manage and organise information at a planning stage. The heading/title is written in the 'Parent Node'. Each point is then placed in a 'Child Node' which in turn has 'Sibling Nodes' that can be used to link related points. A handy feature is to insert a hyperlink into the child/sibling node. This encourages students to fully investigate a point by attaching evidence to it. So a plan on an essay might look something like this example:



Source-

[http://freemind.sourceforge.net/wiki/extensions/freemind/flashwindow.php?initLoadFile=/wiki/images/9/9c/Writing\\_an\\_essay\\_with\\_FreeMind.mm&startCollapsedToLevel=5&mm\\_title=Writing\\_an\\_essay\\_with\\_FreeMind.mm](http://freemind.sourceforge.net/wiki/extensions/freemind/flashwindow.php?initLoadFile=/wiki/images/9/9c/Writing_an_essay_with_FreeMind.mm&startCollapsedToLevel=5&mm_title=Writing_an_essay_with_FreeMind.mm)

## Further online resources for teachers and students

[www.scoilnet.ie](http://www.scoilnet.ie) A regularly updated site containing videos, quizzes, interactive games and syllabus guides as well as hundreds of links to specific resources for most subject areas.

[www.tes.co.uk](http://www.tes.co.uk) Although this site is based on the British curriculum the resources are also useful

## Making it my own



Take a little time to think about how you can incorporate some of these ideas into your practice.

Consider maintaining a diary or blog noting your actions and how your students are responding. There is no need for this to be a secret.

Why not involve the students, and ask them to keep a journal too, and discuss it with you? And it would be great to share your experiences with some of your colleagues.

### Next steps

1. Review and list all the ideas in this resource or those you gathered whilst watching the short videos.
2. Identify one idea or a manageable number of ideas that you feel you could develop and which would improve your students' learning in a significant way.
3. Plan how you will develop those aspects with identified classes over a period of time. You might even consider how you might establish baselines for pupils' learning which will allow you to judge impact and learning gain.
4. Over the next month, keep a diary/blog to record changes in the way you help students manage their learning, agree outcomes and goals for students; the ways in which you carry out assessments of learning and the ways in which you record and use the data arising.
5. Record also any benefits you notice for students and for yourself. Share your reflections with appropriate colleagues.

Use or adapt the reflection sheets (appendix)

Don't forget to send us your ideas about what works!

## Teacher Reflection sheet

Class:

Topic:

Date:



Teaching approach tried:

1. Give a brief description of the task you set for the students
2. What was the impact on the students? How did they respond?
3. What key skills were evident?
4. How might you improve this approach or adapt it for future use?

## Student's reflection sheet

Class:

Topic:

Date:

Give a brief description of how you participated in class today



The main thing I learned is...

I liked/didn't like this way of learning because...

The skill/s I developed were...