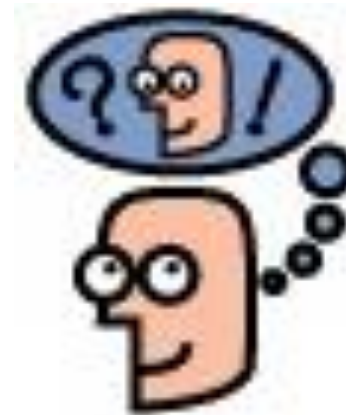


# Metacognition for the Classroom and beyond

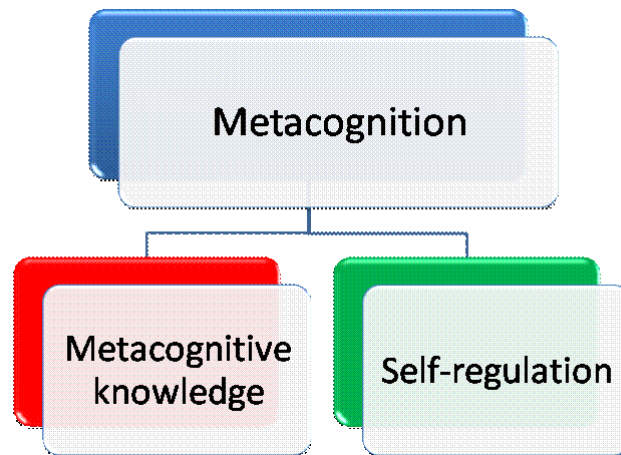
# Overview

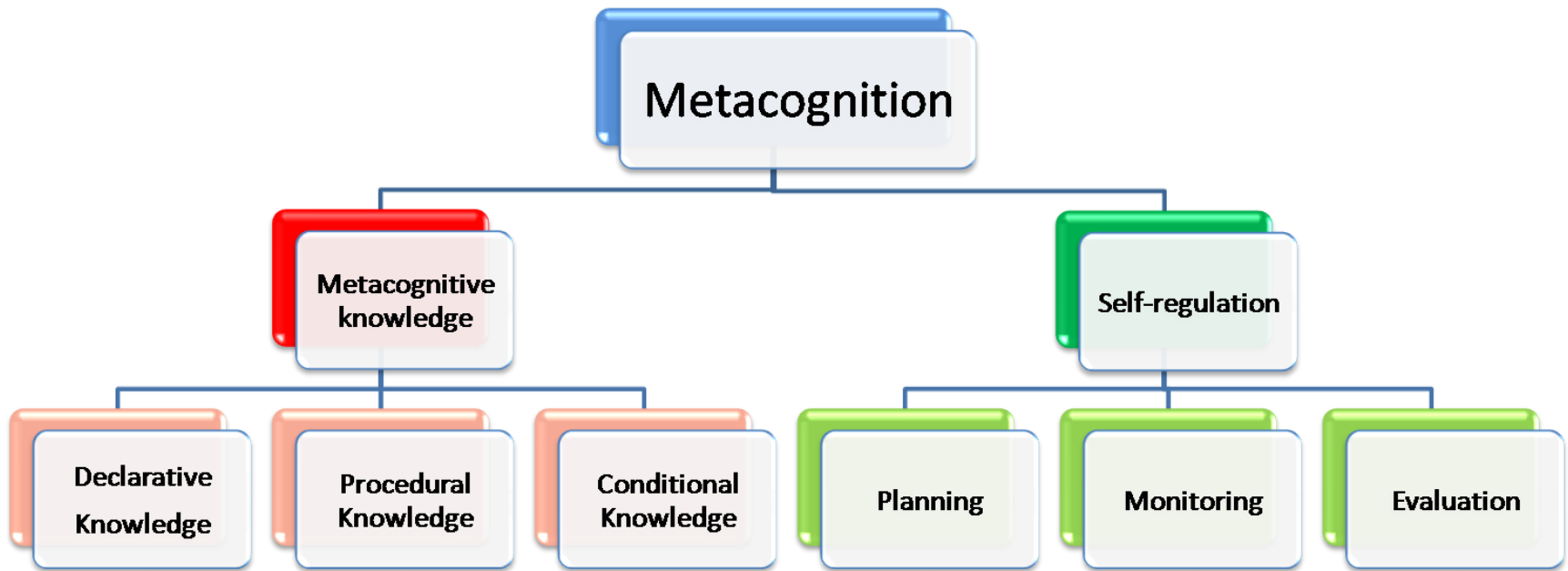
- What is metacognition & why is it important?
- How can metacognition help learners with SEN and exceptionally able pupils?
- A look at strategies to promote metacognition and higher-order thinking:
  - General approaches
  - Bloom's Taxonomy
  - SQ4R reading strategy
  - KWL charts
  - PMI
  - Concept maps
  - Self-evaluation techniques



# What is metacognition?

- “thinking about thinking”
- Knowledge and understanding of what we know and how we think, including the ability to regulate our thinking as we work on a task



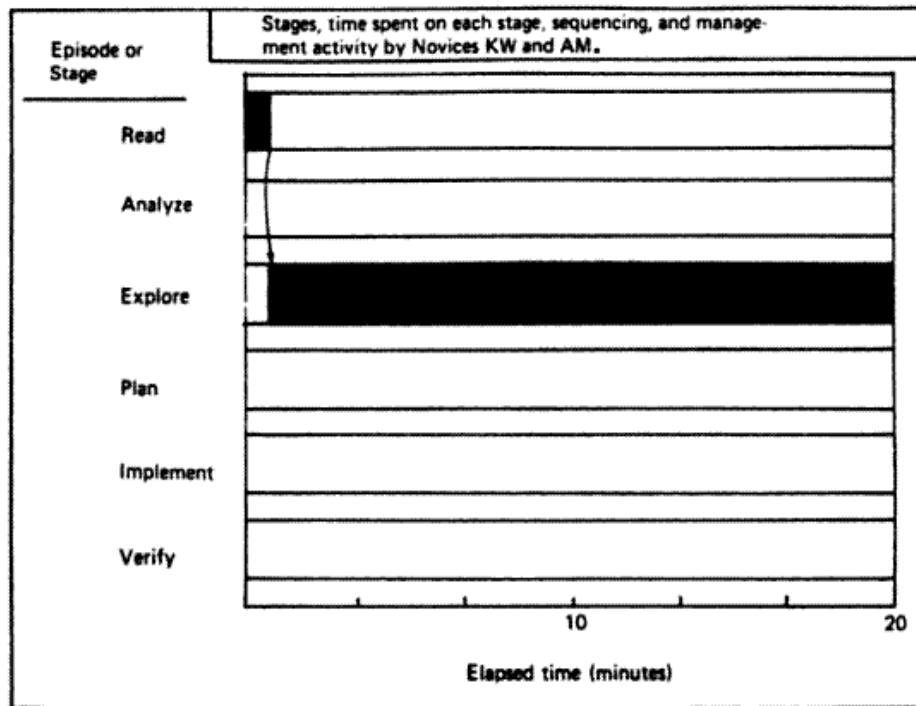


# Why is metacognition important?

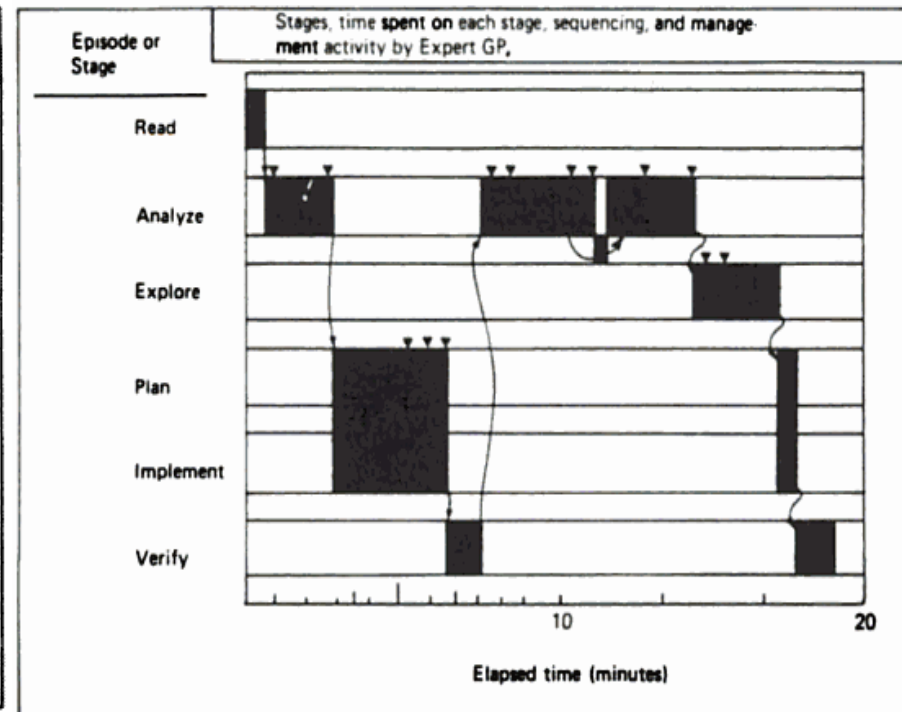
- ...if it happens of its own accord anyway?
- Shapes active rather than passive learners
- Gives pupils sense of control over learning
- Learning how to learn.
- Helps to promote “deep learning”

# Metacognition – turning pupils into experts

Novice problem-solvers



Experts

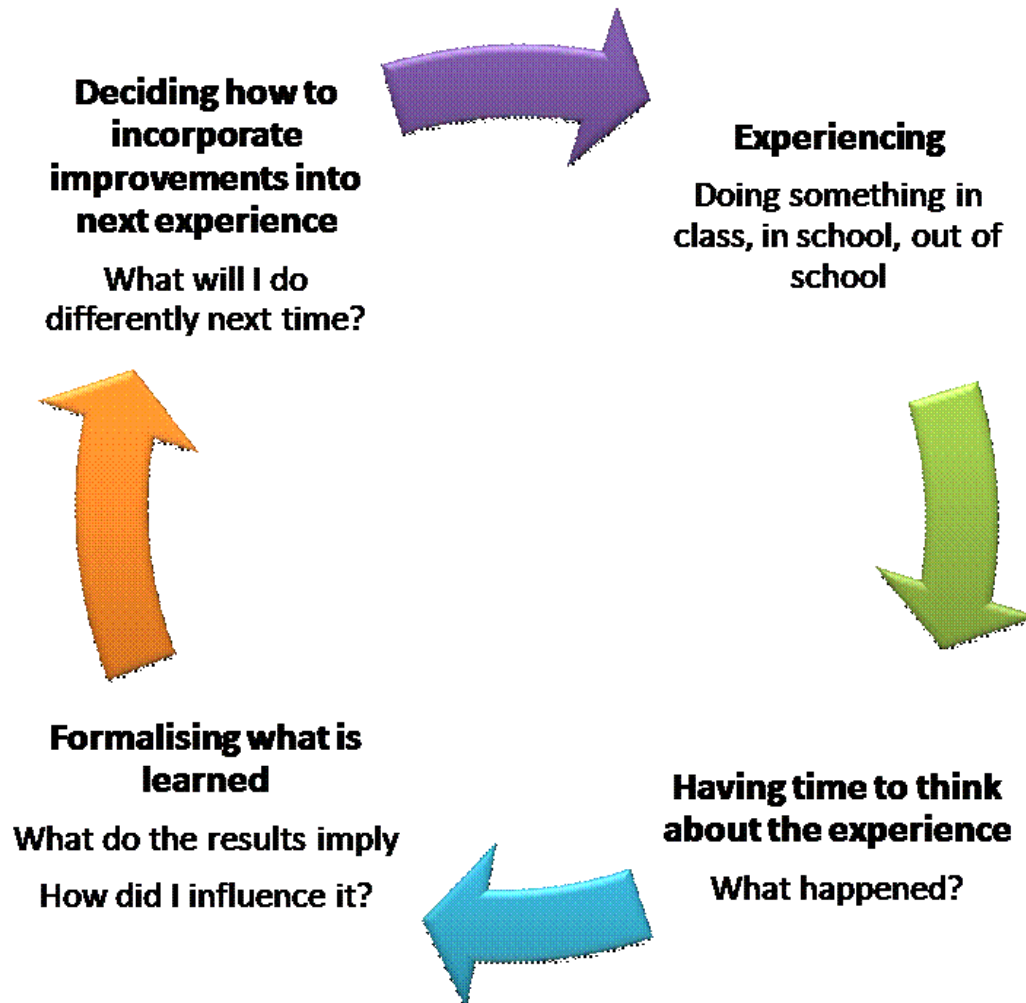


# Why is metacognition important?

- Learning how to learn.
- Helps to promote “deep learning”
- A key component of Assessment for Learning
  - emphasises the child’s active role in his/her own learning, in that the teacher and child agree what the outcomes of the learning should be and the criteria for judging to what extent the outcomes have been achieved...This level of involvement in shaping their own learning can heighten children’s awareness of themselves as learners and encourage them to take more personal responsibility for, and pride in, their learning

NCCA, 2007

# The Learning Cycle





# Metacognition and pupils with SEN

*The dyslexic child's disorganisation... undermines his ability to keep track of books, pencils and pieces of paper....It lurks unseen and plays havoc with his thinking, planning, hypothesising and testing, and even with his storage and retrieval processes, all of which need help, through support and strategies if he is to succeed.*

Goldup & Ostler, 2000, p.319

# Metacognition and pupils with SEN

- Pupils with SEN tend to
  - have less metacognitive knowledge about learning
  - Fewer learning strategies that they can use
  - Are less flexible in applying metacognitive strategies independently
  - Have difficulty with the self-regulatory aspects of learning on-task
- BUT metacognitive skills training can compensate for working memory problems and metacognition is partly independent of IQ

# Which aspects of metacognition do pupils with SEN find difficult?

1. Recognising task requirements
  - Give explicit instructions
  - Cue pupils to analyse tasks
2. Selecting and implementing strategies
  - Planning skills, selecting appropriate strategies, deciding how completion will be judged
3. Monitoring and adjusting performance
  - Build time into a lesson to stop and monitor how task is going

# Metacognition and Exceptionally Able pupils/ Dually Exceptional pupils

- Better metacognitive knowledge but not better at self-regulation
- Good working memory means that they may bypass planning
- Failure can be stressful – learning to evaluate performance valuable – LEARNING CYCLE
- A chance to help dually exceptional (eg gifted and with needs) pupils show their full potential?

**PROBLEM: HOW CAN WE HELP THIS BIRD TO  
FLY AGAIN?**



# Strategies for promoting metacognition in the classroom

1. General approaches
2. Specific strategies

# Misunderstanding Thinking...

- PUPILS think that:
  - It is like breathing or heartbeat
  - It “just happens”
  - It is out of our control

**NOT TRUE!!!**
- Thinking is a skill that can be *learned*, *practised*, *developed* and *improved*.

Thinking skill is not the same as:

- Intelligence
- Being “brilliant” at school work
- Gathering lots of information
- Being good at speaking out in class

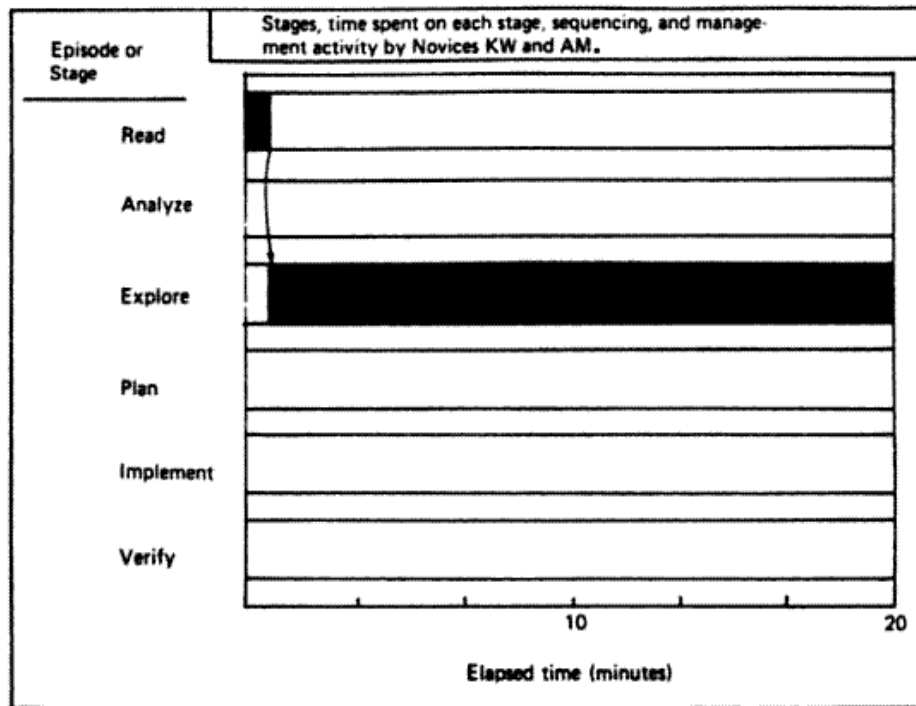
# Four ways to promote metacognitive awareness

- Tell pupils about metacognition and model the processes in your own work

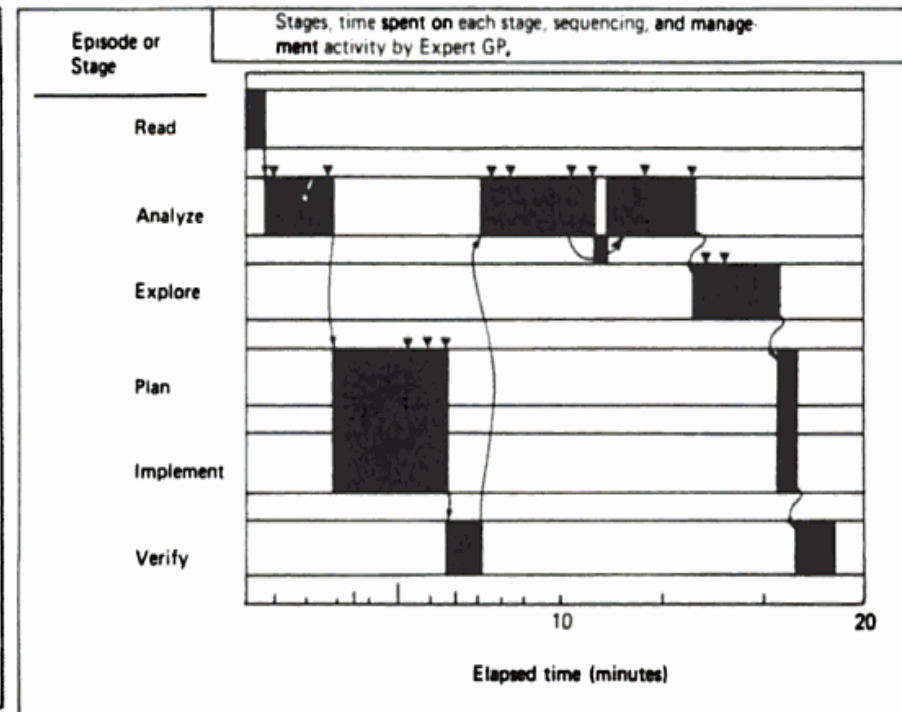


# Metacognition – turning pupils into experts

Novice problem-solvers



Experts



# Four ways to promote metacognitive awareness

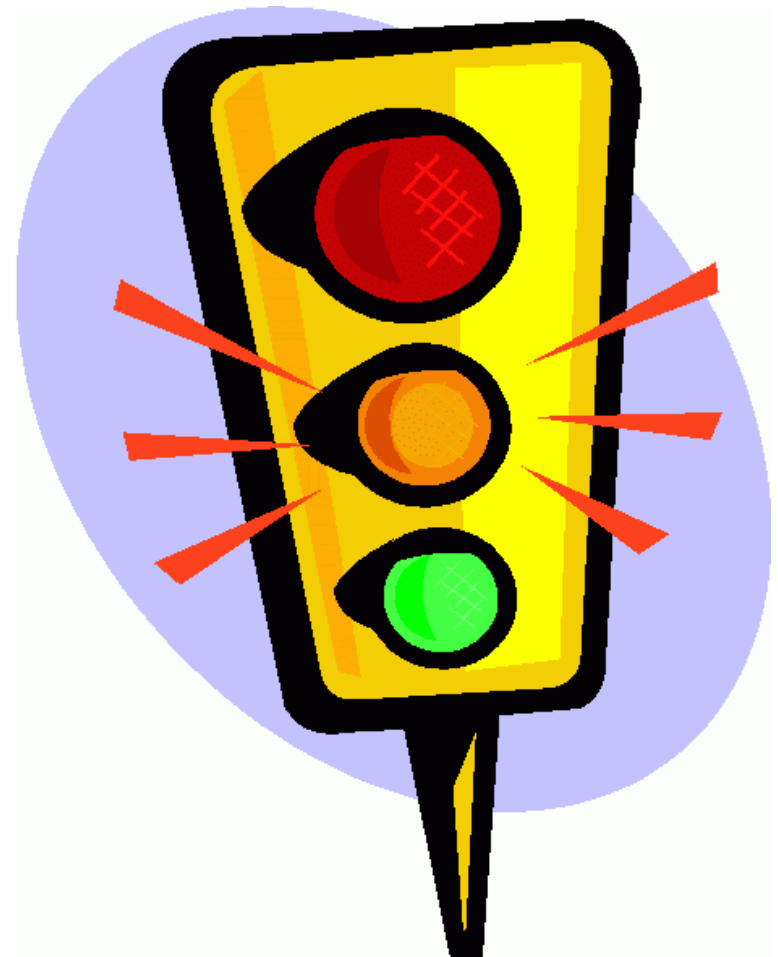
- Teach pupils about the types of strategies they can use to learn & study

Strategy	How to Use	When to Use	What is it for?
<b>Skim/Survey</b>	Search for headings, highlighted words previews, summaries	Before you read a long piece of text	Gives an overview of the key concepts, helps you to focus on the important points
<b>Slow down</b>	Stop, read and think about information	When information seems important. If you realise you don't understand what you have just read.	Improves your focus on important information.
<b>Activate prior knowledge</b>	Stop and think about what you already know about a topic.	Before you read something or do an unfamiliar task.	Makes new information easier to remember and allows you to see links between subjects. Information is less daunting if you already know something about the topic
<b>Fit ideas together</b>	Relate main ideas to one another. Look for themes that connect the main ideas, or a conclusion	When thinking about complex information, when deep understanding is needed.	Once you know how ideas are related they are easier to remember than learning as if they are separate facts. Also helps to understand them more deeply
<b>Draw Diagrams</b>	Identify main ideas, connect them, classify ideas, decide which information is most important and which is supporting	When there is a lot of factual information that is interrelated	Helps to identify main ideas and organise them into categories. Reduces memory load. May be easier to visualise

# Four ways to promote metacognitive awareness

- Help pupils to learn to regulate their thinking as they work on a task

<b>Planning</b>
What is the nature of the task?
What is my goal?
What kind of information and strategies do I need?
How much time and resources do I need?
<b>Monitoring</b>
Do I have a clear understanding of what I am doing?
Does the task make sense to me?
Am I reaching my goals?
Do I need to make changes?
<b>Evaluating</b>
Have I reached my goal?
What worked?
What didn't work?
Would I do things differently the next time?



# Four ways to promote metacognitive awareness

- Show that you value metacognition in your classroom/mentoring relationship.

## 3-2-1 Summary

What are **three** ideas that have captured your attention from today's class?

What are **two** questions that you are still thinking about related to these topics?

What **one** thing will you remember long after this class is over?

## Minute Paper

Please answer each question in one or two sentences:

What is the most useful, meaningful, or intriguing thing you learned from today's class discussion?

What questions do you have about today's discussion that you would like answered before we move on?

# HOT skills & developing questioning

- McGuinness (2006) defines higher-order thinking as

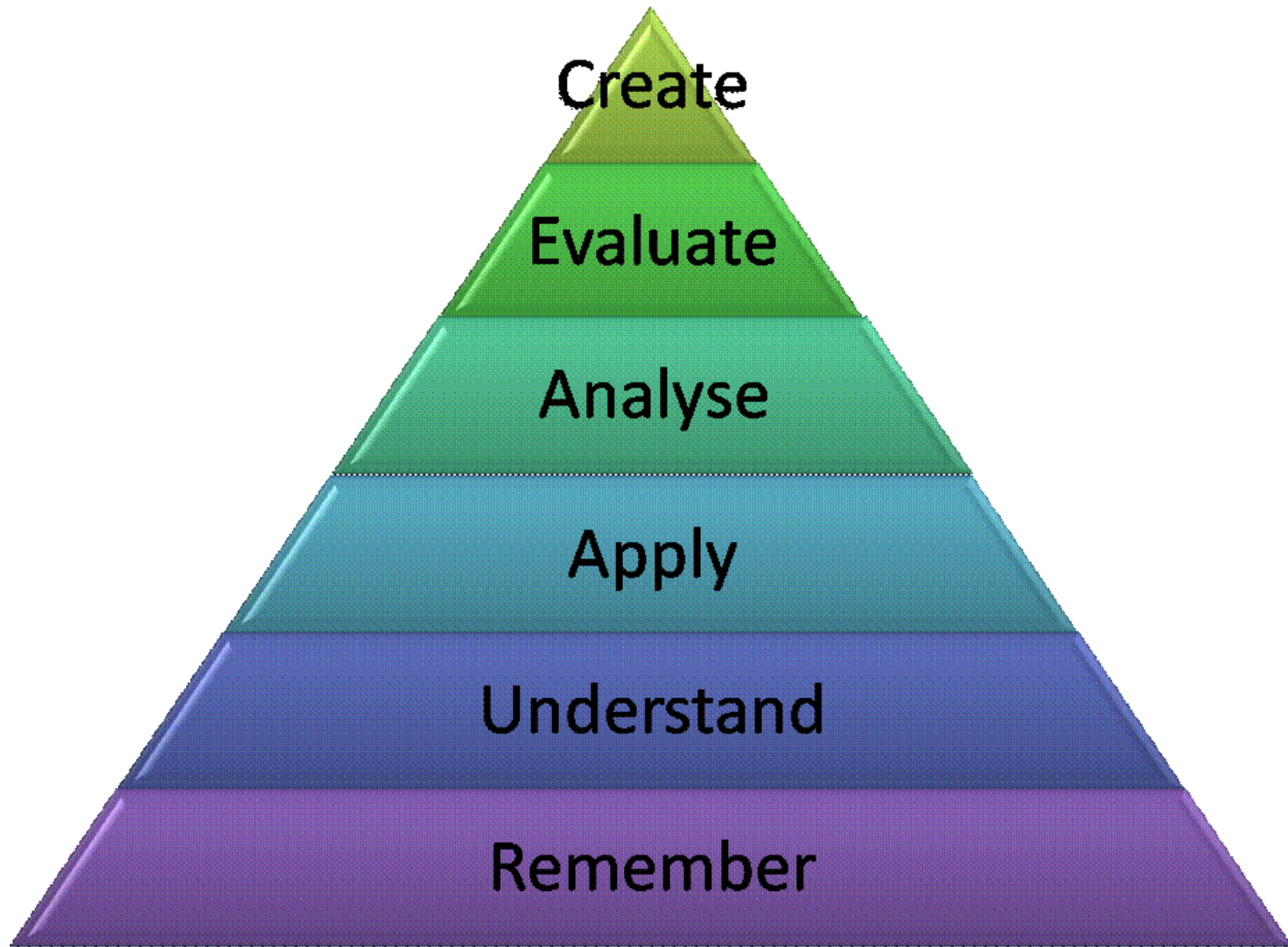
*“the need for learners to go beyond the mere recall of factual information to develop a deeper understanding of topics, to be more critical about evidence, to solve problems and think flexibly, to make reasoned judgements and decisions rather than jumping to immediate conclusions”.*

- Deep learning & “expert” pupils

- Developing higher-order thinking skills is part of teaching pupils *how* to learn



# Bloom's Taxonomy



Higher-order thinking

# Bloom's Taxonomy

## Create

Generating new ideas, products, or ways of viewing things  
Designing, constructing, planning, producing, inventing.

## Evaluate

Justifying a decision or course of action  
Checking, hypothesising, critiquing, experimenting, judging

## Analyse

Breaking information into parts to explore understandings and relationships  
Comparing, organising, deconstructing, interrogating, finding

## Apply

Using information in another familiar situation  
Implementing, carrying out, using, executing

## Understand

Explaining ideas or concepts  
Interpreting, summarising, paraphrasing, classifying, explaining

## Remember

Recalling information  
Recognising, listing, describing, retrieving, naming, finding

# Suggestions for using Bloom's Taxonomy

- Introduce it to a class, small group etc
- Get pupils to research the levels
- Keep it visible throughout the year
- Signpost your questions
- A tool for differentiation?
- Simplify if needed



**Create**

(Evaluate, create)

**Use**

(understand, apply, analyse)

**Recall**

(remember)

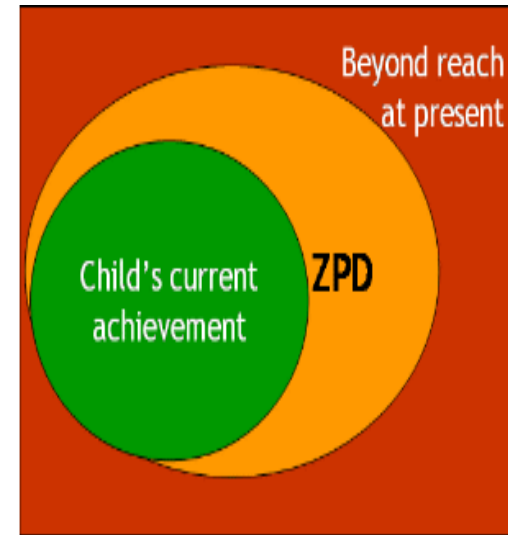


This world-famous thinking skills framework is used in thousands of schools to support the development of independent, creative thinking and personalised learning.

TASC can run alongside BLOOMS taxonomy. It gives children a really clear process to follow when investigating or problem solving.

Children use lower and higher order thinking skills. They experience more of the thought process, therefore have greater ownership of the task in hand.

TASC challenges are designed to help children to work out of the ZONE of PROXIMAL DEVELOPMENT – just enough challenge to make them think, not too much to freak them out!



*The ZDP is the gap between what a learner has already mastered and what he or she can achieve when provided with educational support.*

**Learn from Experience** – lessons/skills to take forward.

**Gather / Organise** – consider the best way to record your ideas – tables/lists/spiders.

**Communicate** – share your presentation.

**Evaluate** – Judgements against success criteria.

**Decide and Implement** – Choose how you are going to do it.

**Identify** – the most important pieces of information and develop a list of success criteria.

**Generate** – record all ideas.



# Asking questions in the classroom

- How many questions do you ask in one class period?
  - On average 50.6 (pupils ask 1.8)
- Which level of Bloom's Taxonomy would you say most of your questions come from?
  - The majority come from the Remember level
- How long do you wait for an answer from a pupil?
  - Many teachers wait less than 1 second



# Wait time 1 & Wait time 2

- Research indicates 2 key places where pauses greatly increase quality of responses:
- WT1 – immediately after you ask a question
- WT2 – immediately after pupil responds
- Pupils
  - Give longer & more complex answers
  - Support answers with evidence
  - Ask more questions
  - Talk more to other pupils & “piggyback”

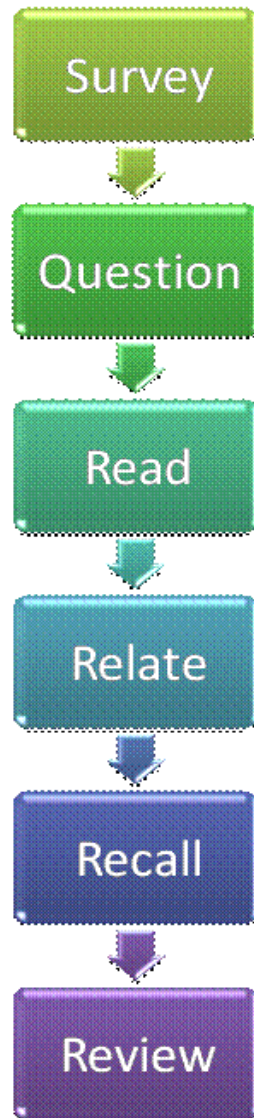
# Asking questions in the classroom

- Remember questions are good for establishing understanding & allowing pupils to “rehearse” facts.
- Questions should then move to upper levels of Bloom’s Taxonomy
- Best questions are planned beforehand
- A few complex & probing questions are preferable to many “shallow” ones

# Asking questions → making meaning

- A change from viewing asking a question as displaying your weakness to seeing questions as active links between old and new information
- Get pupils to devise their own questions based on Bloom's Taxonomy levels
- Pair-problem solving
  - Differentiating for able learners & learners with SEN
- Skip to the end of the textbook chapter!

# The SQ4R method for reading



# KWL Grids

## Ireland in World War II

<b>K</b> <b>(What I know already)</b>	<b>W</b> <b>(What I want to know)</b>	<b>L</b> <b>(what I have learned)</b>

# KWL Grids

## Ireland in World War II

<b>K</b> <b>(What I know already)</b>	<b>W</b> <b>(What I want to know)</b>	<b>L</b> <b>(what I have learned)</b>
Dates of WW 2		
Hitler & The Holocaust		
Role of GB & USA		
“The Emergency”		

# KWL Grids

## Ireland in World War II

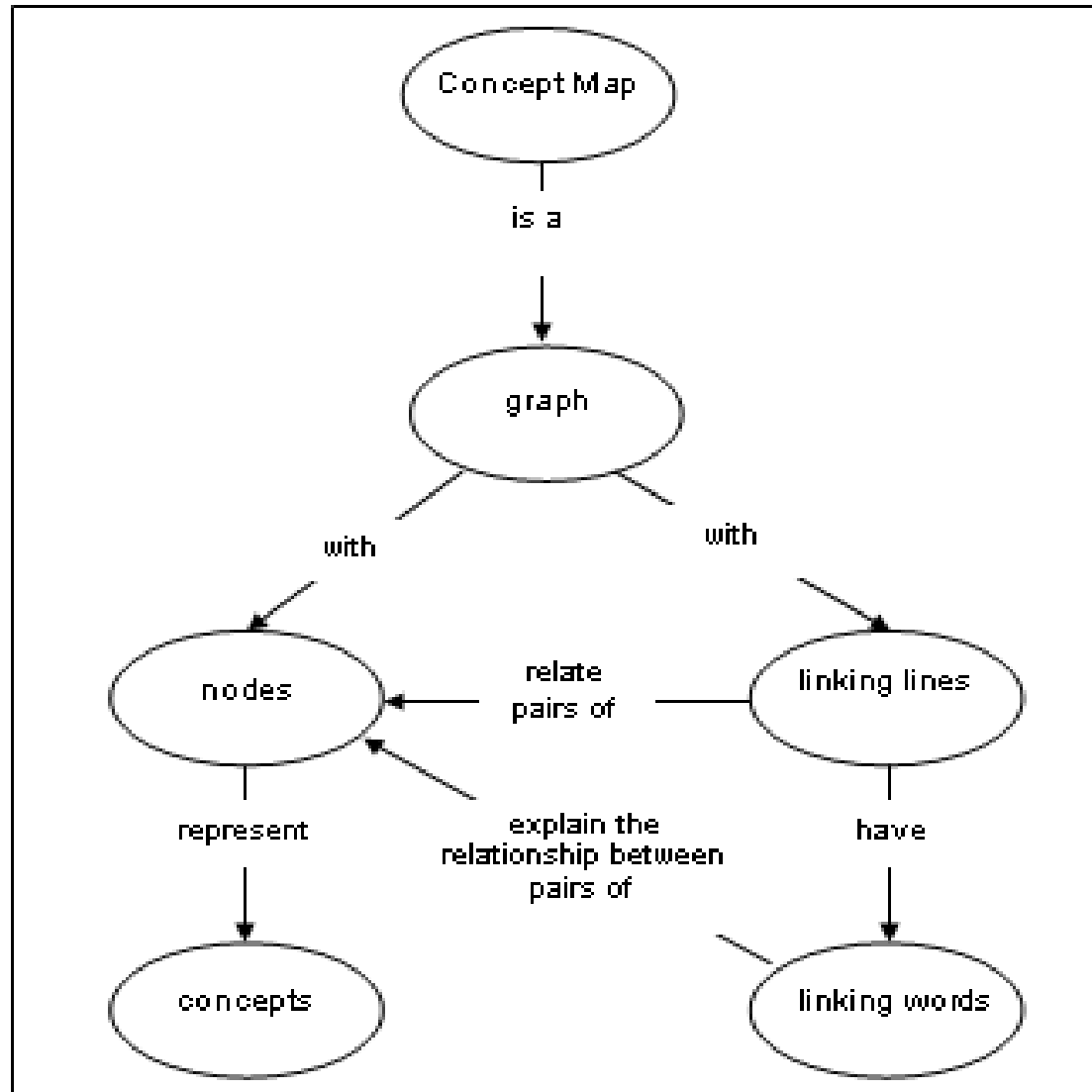
K (What I <b>know</b> already)	W (What I <b>want</b> to know)	L (What I have <b>learned</b> )
Dates of WW 2	Why called “The Emergency”?	
Hitler & The Holocaust	Why did Ireland decide to stay neutral?	
Role of GB & USA	Impact on life in Ireland?	
“The Emergency”	Impact on Ireland’s domestic & foreign policy?	

# PMI : Plus Minus Interesting

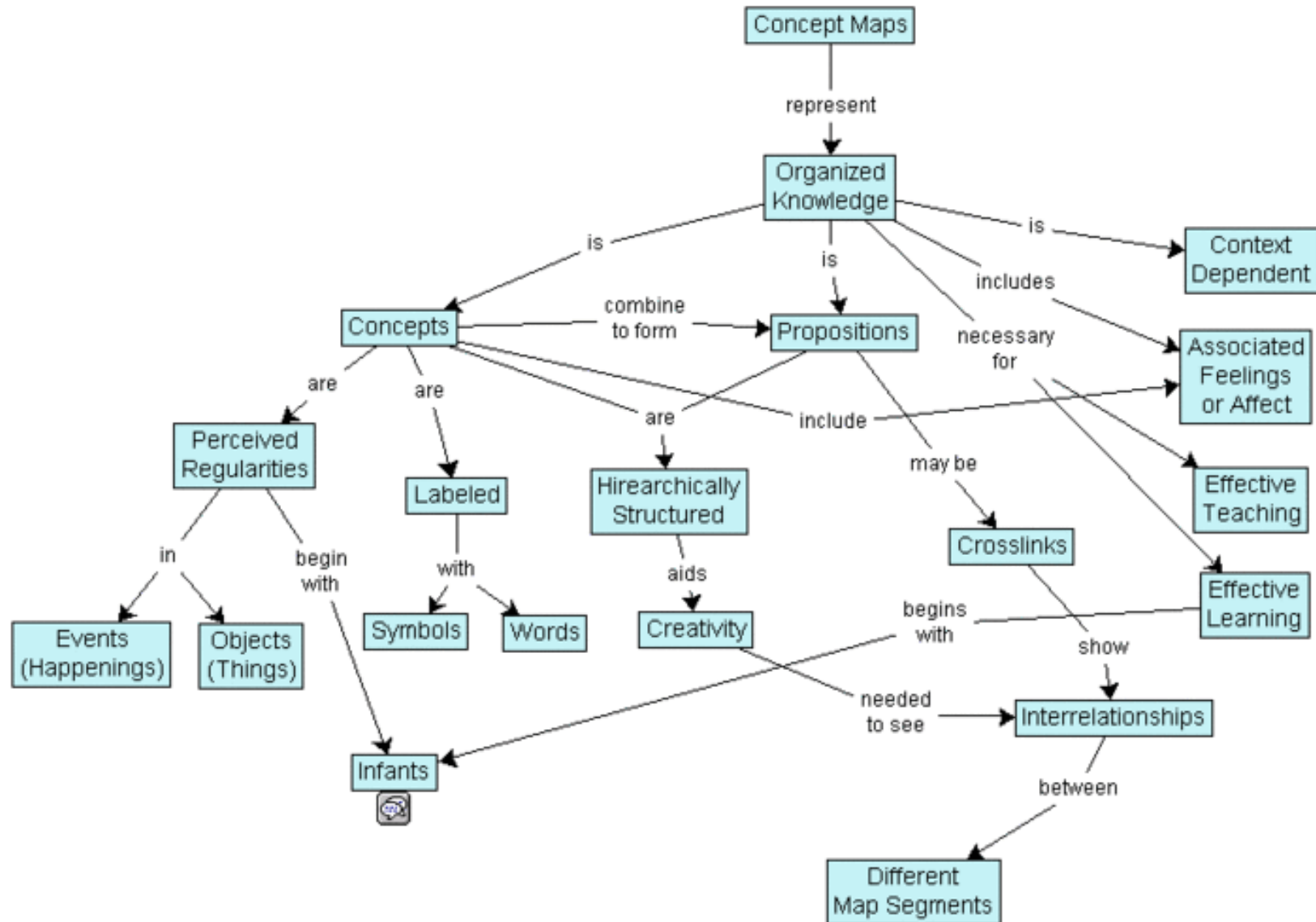
- Take three minutes to think about this question; 1 min for positives, 1 min negatives and 1 min for anything interesting that strikes you
- What if the human body had a third arm?
- What if children were paid a wage to come to school?



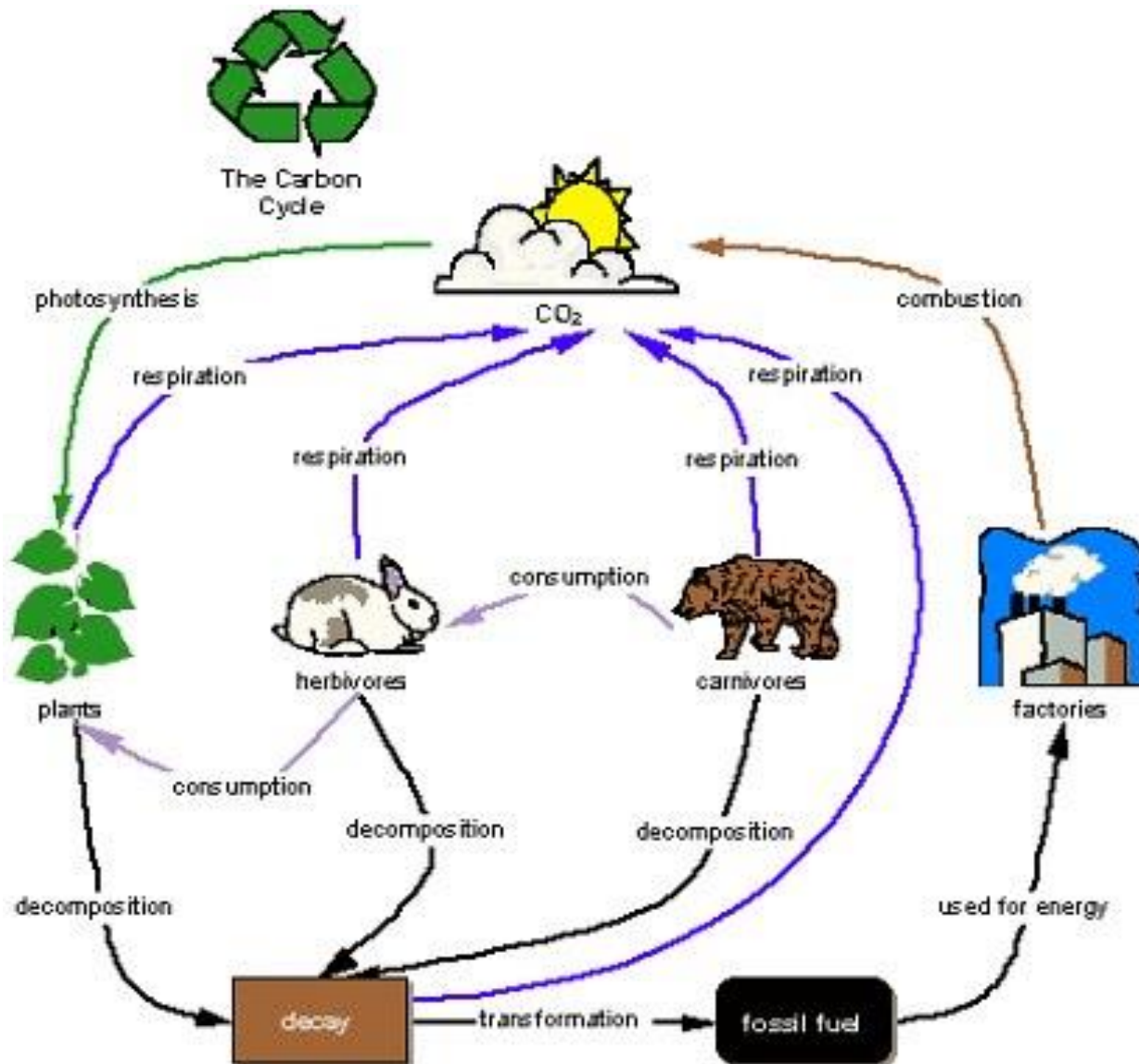
# What is a concept map?



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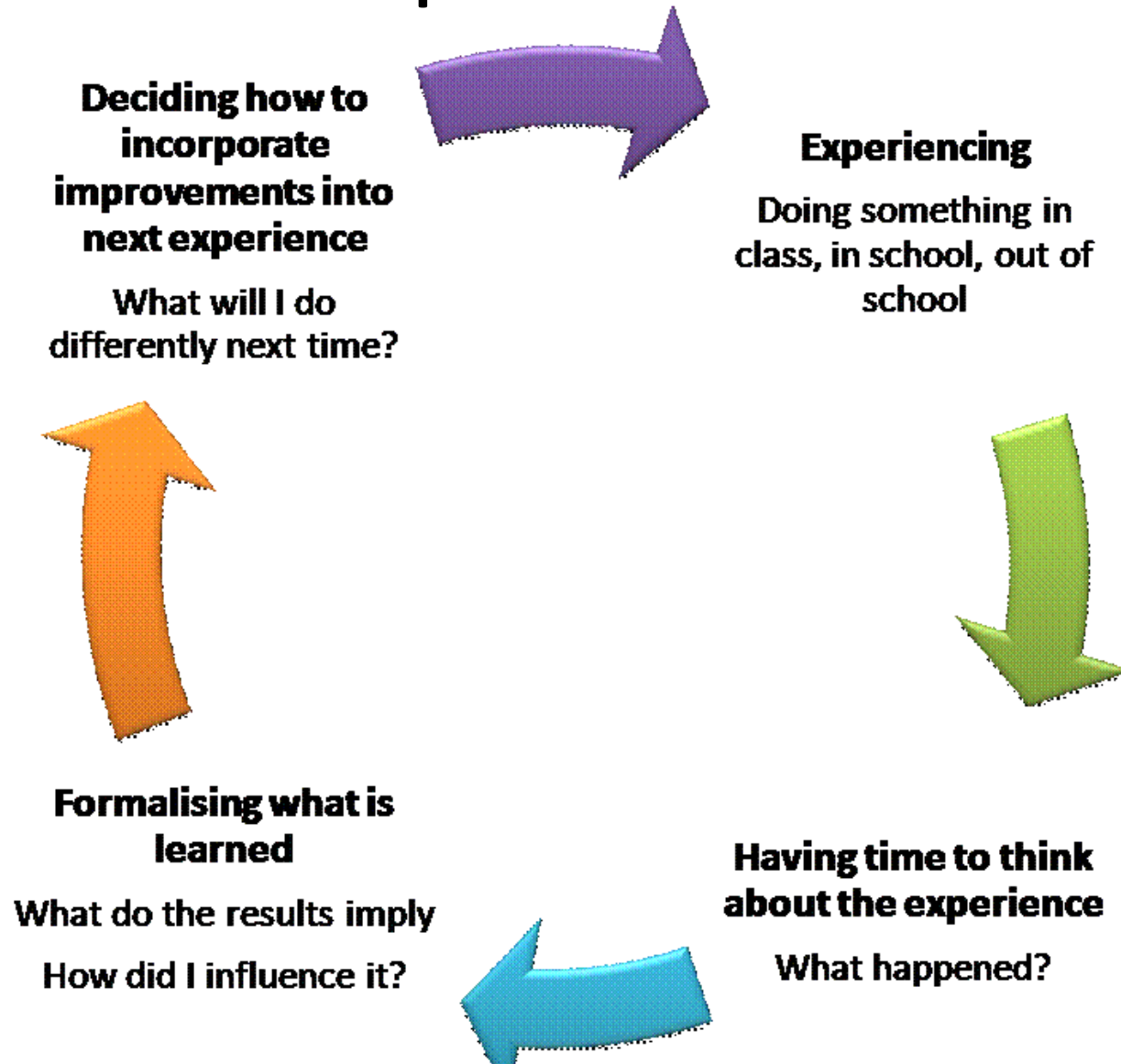
# Advantages of concept maps

- Minimal writing, suitable for pupils with SEN
- Precision of expression required
- Indicate pupils' understanding of a topic
- Opportunity for planning, revising & evaluation
- Helpful study guides
- A new way to test?

# Build your own concept maps from these terms...

Cats	Omnivores
Dog	Sheep
Pet	Lion
Tail	Herbivores
Mammal	Humans
Wild	zoo
Meat	endangered
Carnivore(s)	wool

# Helping pupils to evaluate their own performance



# Helping pupils to evaluate their own performance

- The role of motivation: mastery vs. Performance
- Be explicit about learning objectives
- Set aside class time for pupils to evaluate their work – and follow it up
- Mid-task reflection time
- Ask for revisions?
- Explicit prompts – homework wrappers

# Using questionnaires to help pupils think about their own metacognition

- Metacognitive Awareness of Reading Strategies (MARSİ)
  - 30 items – global, problem-solving, support strategies
- Junior Metacognitive Awareness Inventory (Jr. MAI)
  - 18 statements relating to strategies such as activating prior knowledge, planning, evaluation, monitoring



# Using questionnaires to help pupils think about their own metacognition

- Not possible to reliably test how “metacognitive” somebody is
- Self-report questionnaires are open to bias
- A good starting point for introducing metacognition to pupils?
- A talking point about ways to improve, strategies to work on – how, when, where, why?

# Summing up

- Teaching metacognitive skills can be beneficial to pupils with a variety of learning needs
- These strategies inter-link and can be used flexibly in many settings
- There is lots of opportunity to modify the strategies to match your teaching & learning objectives.

He who learns but does not think is lost

Chinese Proverb

# Questions relating to each level of Bloom's Taxonomy

# Questions for Remembering

- What happened after...?
- How many...?
- What is...?
- Who was it that...?
- Can you name ...?
- Find the definition of...
- Describe what happened after...
- Who spoke to...?
- Which is true or false...?

# Questions for Understanding

- Can you explain why...?
- Can you write in your own words?
- How would you explain...?
- Can you write a brief outline...?
- What do you think could have happened next...?
- Who do you think...?
- What was the main idea...?
- Can you clarify...?
- Can you illustrate...?
- Does everyone act in the way that ..... does?

# Questions for Applying

- Do you know of another instance where...?
- Can you group by characteristics such as...?
- Which factors would you change if...?
- What questions would you ask of...?
- From the information given, can you develop a set of instructions about...?

# Question for Analysing

- Which events could not have happened?
- If. ..happened, what might the ending have been?
- How is...similar to...?
- What do you see as other possible outcomes?
- Why did...changes occur?
- Can you explain what must have happened when...?
- What are some or the problems of...?
- Can you distinguish between...?
- What were some of the motives behind..?
- What was the turning point?
- What was the problem with...?



# Questions for Evaluating

- Is there a better solution to...?
- Judge the value of... What do you think about...?
- Can you defend your position about...?
- Do you think...is a good or bad thing?
- How would you have handled...?
- What changes to.. would you recommend?
- Do you believe...? How would you feel if. ..?
- How effective are. ..?
- What are the consequences..?
- What influence will....have on our lives?
- What are the pros and cons of....?
- Why is ....of value?
- What are the alternatives?
- Who will gain & who will loose?

# Questions for Creating

- Can you design a...to...?
- Can you see a possible solution to...?
- If you had access to all resources, how would you deal with...?
- Why don't you devise your own way to...?
- What would happen if ...?
- How many ways can you...?
- Can you create new and unusual uses for...?
- Can you develop a proposal which would...?