2

The Process

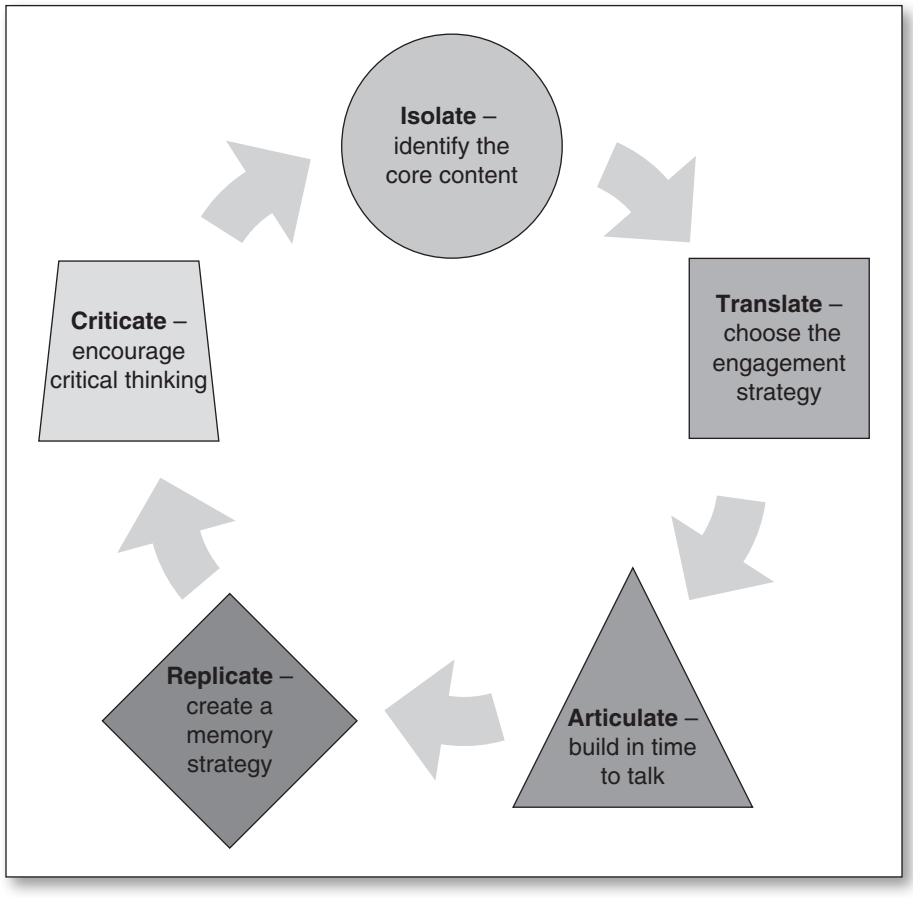
Transforming Core Content Into Dynamic Lessons

A Little Perspective

Before we start, let's be clear. You don't have to be creative, artistic, or imaginative to design your own dynamic lessons. Nor do you need a flamboyant personality or a dramatic talent to present them. As long as you understand your content and are willing to try something a little different, you can design and present engaging lessons that promote critical thinking in high school students.

If you feel slightly daunted at the prospect of designing a dynamic lesson, that's a very healthy reaction. It's the same reaction we have when it comes to doing anything unfamiliar for the first time, whether it's scuba diving, making a soufflé, or driving a truck. They're all pretty daunting until someone shows you *how*.

Five Steps to Designing a Dynamic Lesson



Separate the wood from the trees

STEP 1 Isolate—Identify the core content students need to remember as the foundation information to support critical thinking about this topic.

The first step is to identify the core information you want your students to take away from this lesson. This is likely to include

- **A key concept**: The single most important idea they must understand; may include a procedure, diagram, or process they have to be able to remember
- **New vocabulary**: Any unfamiliar terms they need to be able to use correctly

For example:

Lesson	Key Concept	New Vocabulary
Comparative study of texts in a pair of texts: Sonnets of Barret Browning F. Scott Fitzgerald's *The Great Gatsby* *English*	Understand context of Barrett Browning's *Victorian Age* & Fitzgerald's "Roaring '20s" plus inherent values; ability to demonstrate how shift in context leads to change in values	Binding notions, love, feminism, social mobility, optimism, religion, mutability, values
Different types of angles *Math*	Ability to identify the different types of angles	Right angle, acute angle, obtuse angle, straight angle, reflex angle, angle of revolution, corresponding, co-interior, and alternate angles
Offset surveys (field diagrams) *Math*	Transferring an actual block of land to a field diagram	Field diagram, offsets
Cell—surface area to volume ratio and rate of movement of materials in & out of cells *Science*	Efficiency of smaller cells in exchange of materials Surface area to volume ratio	Surface area to volume ratio, diffusion

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Lesson	Key Concept	New Vocabulary
First-, second-, and third-order levels *Science*	Ability to observe a lever & identify as first, second, or third order Position of load, fulcrum, effort in different levels FLE-123	Fulcrum, load, effort
Height on maps *Geography*	Ability to view landscapes in three dimensions	Contour lines, contour interval, aspect
Resilience of ecosystems *Ecology/Geography*	Ecosystems *bounce back* from stresses Dynamic equilibrium curve	Amplitude, malleability, elasticity, threshold, human modification
Business life cycle *Business Studies*	Each business goes through the stages of the business life cycle with identifiable characteristics Business life cycle diagram	Establishment, growth, maturity, postmaturity (decline, renewal, steady state), market share
Marketing—product positioning *Business Studies*	Positioning refers to the perception of the product/brand compared with competitors' products/brands in the mind of the consumer Product positioning matrix	Positioning, competitive advantage, perception
Circular flow of income *Business Studies*	The flow of income in the economy varies according to level of leakages/injections Circular flow of income diagram	Injections, leakages, recession, imports/exports, taxation, government spending, saving, investment, factors of production

Important: This information is the foundation on which everything else depends. This is what you teach in the first part of your lesson—or in the first lesson, if this is a multisession topic. Only this, and nothing else!

Why?

Imagine a friend offers to take you hiking on the weekend. She picks you up and drives to a remote spot you've never been to before. As soon as you arrive, she leaps out of the car and hurries off down a

twisty path. You call out to her, but she ignores you. Frightened of getting lost, for the next hour, you scramble over increasingly difficult terrain, with your (soon to be ex-) friend always just slightly too far ahead for you to catch up. Along the way, you pass breathtaking views, but you're too stressed to really appreciate them. Suddenly, just when you think you really can't go on any longer, you round a corner and discover you're back at the car where your friend is unpacking a picnic lunch.

What should have been an enjoyable experience—an hour's circular walk with stunning views before a picnic—turned into a nightmare because your friend didn't tell you where you were going or what to expect. This is exactly what happens to our students when we include too much detail at the beginning of a lesson, as demonstrated in the following case study.

CASE STUDY

The purpose of a math lesson was to teach students to calculate the remaining area when a circle was cut out of a square. The teacher started well. "First we calculate the area of the square," but then started diving into detail: "So, how do we do that? Well, let's look at an example. Suppose . . . " The class was lost within seconds. When asked afterward, half the students said the topic was very tricky.

Next time, the teacher took a different approach. "There are three simple steps to calculating the remaining area: first, calculate the area of the square (A); second, calculate the area of the circle (B); third, subtract B from A." The class relaxed, immediately grasping the simplicity of the idea, and paid attention while the teacher expanded on each part of the process because they knew where this was going. Afterward, every student could recall the concept and thought it was pretty simple.

We need to start teaching every new topic from the perspective that our students can't process or remember details until they grasp the core information. Once they have this in their heads, they can connect new information to it and see those connections.

This is basic schema theory. For decades, cognitive scientists and psychologists have discussed the schema theory of human memory (Ausubel, 1967; Bartlett, 1932; Head, 1920; Piaget, 1926). The core idea is that humans organize new information around their previously

developed schemata, or "networks of connected ideas" (Slavin, 1988). In other words, you need to create some mental hooks for your students so that they can hang the detail on them. If you don't create the hooks first, the detail will "fall on the floor" and get lost in the morass of other information your students have never connected with.

Just like items discarded on their bedroom floors, your students will never be able to find this detail again! We need to make sure they have somewhere safe to store it so that they can put their hands on it in seconds.

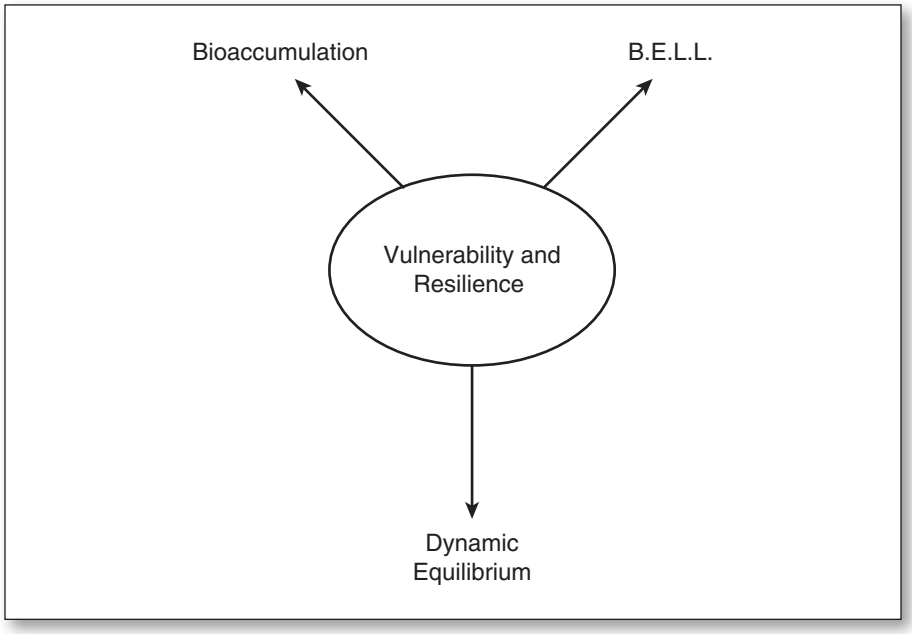
Nigel's Notes

In my first few years of teaching, I used to spend endless hours preparing my lessons by making copious notes about the topic/chapter to be taught. I rarely gave much thought to the actual core concept I wanted to get over to my students. I was driven by "being ahead" of the students—my notes were a security blanket so that I would not get "caught out." As a result, when I was in the classroom, I frequently got caught up in the detail and would lose track of what it was I was trying to teach. I call this the can't see the wood for the trees *syndrome.*

How?

If you've been teaching your content for a long time, you can probably recite the core information for most topics off the top of your head. If you're teaching something new, or find yourself struggling to let go of the details (left brainers, that might be you!), here are some strategies for isolating your core content. Read the chapter quickly if you need to, and then think about one of the following approaches:

- **Synopsis**—If you could only give your students a 50-word written summary, what would it say? Would you need to explain any of the vocabulary?
- **Discussion**—What information would your students need before they could ask meaningful questions about this topic? What new vocabulary might they need to use?
- **Mind map**—What would a mind map of the topic look like? (You may need to draw one.) The information in the first tier of lines is your core content. For example, the map below shows the first levels of a map describing the ecological study of ecosystems at risk of natural and/or human stresses.

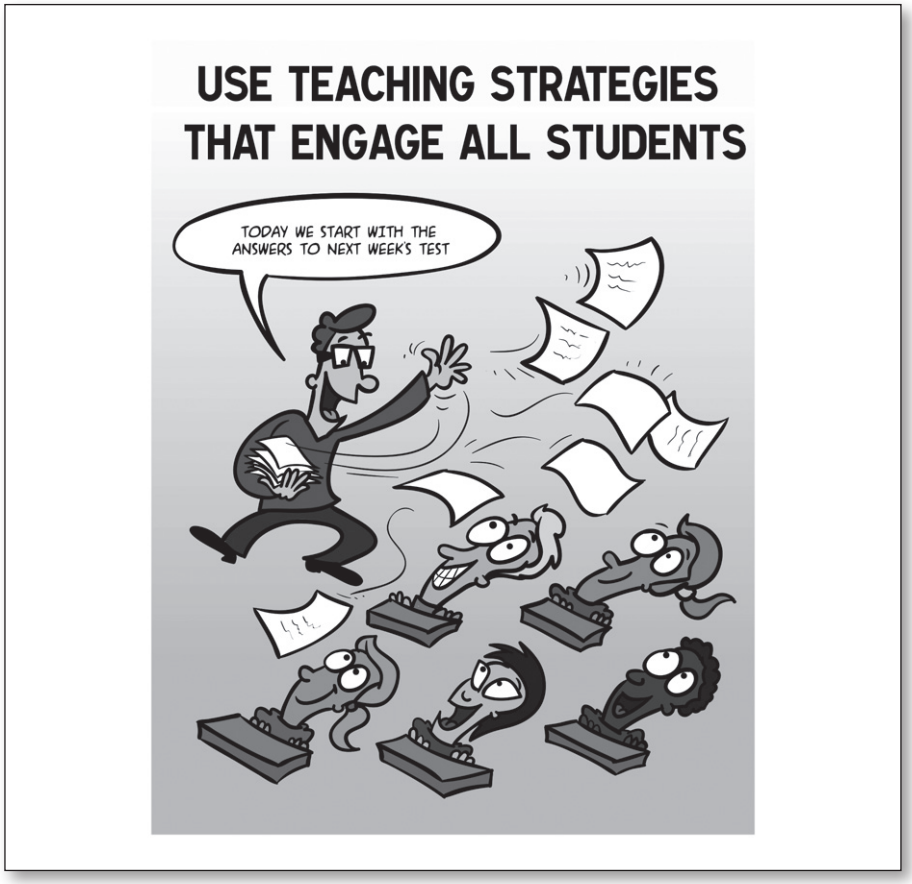


Engage their attention . . .

STEP 2 **Translate**—Choose a translation strategy to make this information come alive.

Now that you have identified your core content, you need to find a way to *quickly* get it into your students' heads. The next section of this book introduces numerous strategies for doing this. Right now, all you need to understand is the principle on which they are all based:

- **Engagement**—Use a translation strategy that naturally engages your students, so *all* of them pay attention and absorb the information.



Why?

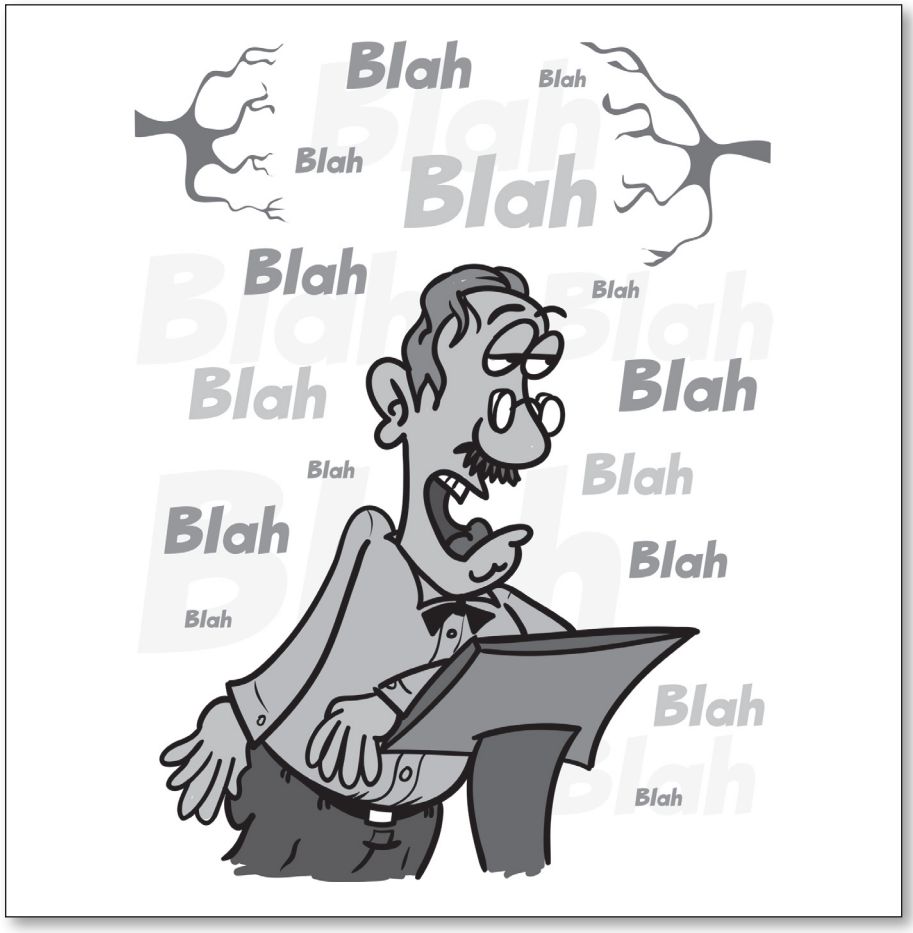
If we want every student to assimilate the core information quickly, we *have* to keep their attention *all* the time. This introduces one of the most important ideas in this book: *You cannot deliver core information as a lecture* because many of your students will fail to grasp it.

If you use lecture as your primary delivery method, even dedicated students will find it hard to take in the information for more than

10 minutes. According to Jensen (2005, p. 37), "The human brain is poor at nonstop attention. It needs time for processing and rest after learning." Students who are fully engaged often take an interesting idea and mentally wander off making connections on their own, meaning they aren't listening to anything new the teacher might be saying! For less dedicated students, as most teachers have found to their cost, you will simply be giving them an opportunity to daydream, pass notes, and torment others. So don't give them the chance (Sprenger, 2009).

How?

Instead of lecturing, for this first part of the lesson, immerse your students in the learning process. Get them moving. Get them involved. Get them playing a game. Introduce elements of competition. Tell a story. Use multimedia. Create moments of self-discovery. Use lots of music. You'll find detailed explanations of all these ideas and many more in the rest of this book. For now, simply understand that you cannot lecture at this point. Later on, you can. But *not now.*



Let them talk

STEP 3 Articulate—Ensure that students have the opportunity to engage in vigorous, rigorous, and purposeful conversation about the content to increase understanding and develop ideas.

One of the quickest ways to make sure your students grasp core information quickly is to let them talk about it. At this stage, we're not looking for critical thinking, but simply for students to process the new information you've just introduced, make additional connections, and fill in any gaps.

Why?

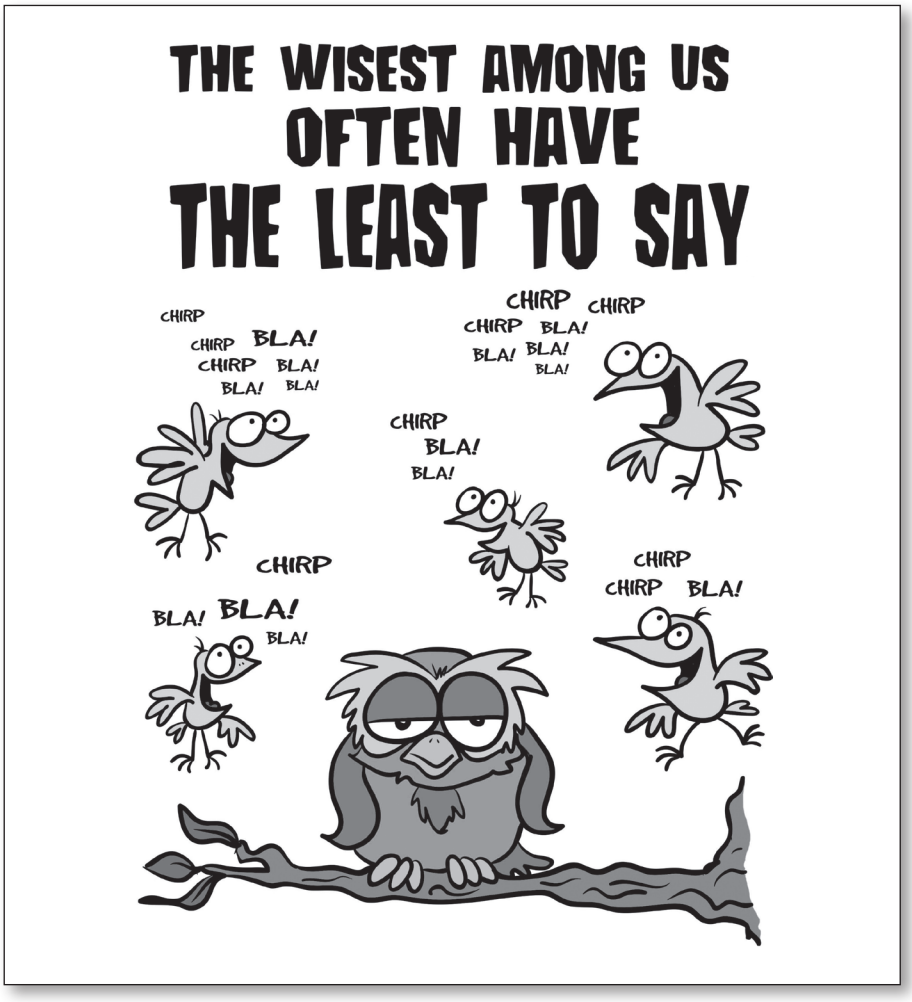
Before they can talk about a topic, your students must first think about it. Talking is a great way to make sure this happens. As human beings talk, we verbally process the information. Talking will allow your students to come to a better understanding of the new information. They will pick up and practice using its vocabulary; take a higher level of ownership for their learning; and recognize connections between new concepts, terms, and ideas. When all of these things happen, students are more likely to understand and remember the new information.

In fact, if you don't pause frequently to let your students talk, they will find it difficult to take in all the information. As Kagan and Kagan say in their book *Kagan Cooperative Learning* (2009, p. 6.17), "Frequent processing distinguishes successful from unsuccessful teachers. Why? Working memory can only hold a limited amount of information. More information beyond about ten minutes is like pouring water into a glass that is already full." They go on to point out that if, instead of continuing to lecture, we stop at this point and let our students talk about the content, they will tag the information in their long-term memory. Then, after processing and storing the information, students can clear their working memory so they have the capacity to take in and retain new ideas (Kagan & Kagan, 2009, p. 17).

Clearly, this requires a change from traditional Red Light teaching, where the ratio of teacher to student talk has been 80:20, or even higher in favor of the teacher. This is predicated on the idea that we need to hear more from the one with the most knowledge. But perhaps we should invert that idea. If talking supports thinking, processing, understanding, and recall, then

surely we need to hear more from the people with the most to *learn*.

Here's another radical idea: Giving our students the answer should be a last resort, done only after all avenues of discussion have been exhausted. We're so used to our position as "the fountain of all knowledge" that telling students the answer comes with the territory. But it shouldn't. An answer students come to as a result of their own discussions, thinking, and reasoning is an answer they both understand (by definition) and remember (because of all the processing required to get there). The amount of energy and time required to transfer information from short-term memory to long-term storage is directly related to how well they can recall it later (Jensen, 2005, p. 16).



Nigel's Notes

My nine-year-old son was struggling with math. He was still very much at the concrete stage of his mathematical workings and increasingly frustrated at not "getting it." One day my wife and I tuned in to a conversation he was having with his six-year-old sister in the car. My son was taking his sister through the rules of addition and subtraction, using examples. As the conversation went back and forth, I could almost see the lightbulbs going on in both children's heads. I wondered how much more quickly he'd have grasped the concept if he'd talked about it in class.

How?

Frequently, your translation strategy will automatically promote conversation and discussion, for example, when solving a puzzle, deciding where components should be placed on a map or diagram, or making up quiz questions. However, there will also be places where you set up conversations. This can be as simple as saying, "Turn to the person sitting next to you and find out what they think is the most likely explanation. You have one minute—go!" Or it can be far more explicit and structured.

For example:

- "In your group, come up with a series of True/False questions to test the rest of the class on this topic. You have three minutes—go!"
- "With your partner, come up with 5 to 10 questions you would like to see answered."
- "In your group, devise a question you think I could *not* answer!"
- "For each letter of the alphabet (or parts of it in groups), come up with a key word or idea related to what we have studied."

If students are not already in groups or pairs, find a quick and random means of creating them. Giving the order to "Form a group of four or five" usually dissolves into chaos and leaves unpopular students on the edges. Instead, try giving students a ticket with a symbol or number as they arrive. Then, when it's time for group discussion, their first task is to go to the part of the room where they can see the same symbol or number. Or, if you have time, ask them to

find the students with the same card. This takes a bit longer but is a good brain break, usually creating laughter and lots of movement—both highly useful in keeping the human mind focused. As Kagan and Kagan (2009, p. 1.5) put it, "We can only sit so long before we become exhausted from inhibiting our impulses to move."

It's quite easy to find opportunities for students to talk, yet many teachers hesitate to put this idea into practice. Frequently, teachers feel threatened by a classroom full of talking students. We ask ourselves: "Are the students on task?" "Is my classroom too noisy?" "Am I still in control?" "Am I doing my job?" The question we're really asking is, "Will my students stay on topic?"

The short is answer is, no, of course they won't. The truth is, from time to time, most students will veer off-course during small-group discussions. But we can minimize this by

- walking around the room, listening in, asking questions, and generally guiding conversations; or
- asking groups to come up with a specific response (a question, an observation, an answer, the three most important points) they have to share with the group at the end of the discussion, providing a focus point and an incentive to participate.

However, we need to recognize that, when we first give students permission to talk, particularly if a friend is in the group, they often start off topic. "Wow, did you hear what happened on the bus this morning. . . . " This is not the moment to step in angrily. In most cases, they'll soon get it out of their system. Simply let the conversation run its course and they will return their focus to the topic at hand. If after a minute they're still off-topic, it may now be time to guide them gently back on track.

Another hurdle to implementing this part of the process is that, in many schools, a noisy class is seen as a signal that the teacher has poor classroom-management skills. If this is true of your school, you might want to preempt criticism by notifying colleagues of your new teaching strategy. Perhaps you could couch it in the following terms: "Given that the new curriculum is focusing on critical thinking, I'm trialing a different approach to lessons this term. Part of each lesson will include robust discussion and debate, so you can expect a certain level of noise from my classroom."

Whether you are struggling with your own doubts or those of others, you can take comfort in the fact that letting your students talk is a surefire learning strategy.

Help them remember . . .

STEP 4 Replicate—Deliberately build in a memory strategy to enhance recall.

While your translation strategy will embed strong recall of your core information, you also need to deliberately build in a memory strategy with each lesson. And you need to be absolutely explicit about it. In other words, there should be a moment, toward the end of the lesson, when you say: "Now, let's look at *how* we're going to remember this." Then you introduce one key memory strategy that will act as a trigger for the concept and associated detail.

Why?

Most students have no inkling of the many powerful techniques human beings can use to memorize information. Over the course of their years in education, students usually pick up a few basic memory strategies: mind maps, acronyms or acrostics, and, most frequently, repetition. However, they are only introduced to these ideas occasionally and as a side issue. Rarely does a teacher include a deliberate memory strategy as an automatic part of every lesson plan.

This begs the question: Why not? Why don't we show students how to memorize the information they need to pass the test? With practice, even less able students can successfully memorize large amounts of information easily and quickly (Allen, 2008, p. 13). Surely, making this happen should be a standard element of every lesson.

The fact that it's not comes down to a combination of factors. Some teachers still believe, erroneously, that memory strategies are for elementary students. Others have simply never seen what's possible. Until the teacher training curriculum includes a large module on this vital educational technique, memory strategies will remain sidelined. However, that's no reason why *your* students shouldn't benefit from them.

Teach your students memory strategies, and you give them the key to learning success. Once they discover they can remember lessons easily and effortlessly, they also find a new enthusiasm for learning. The positive emotions that result from discovering how easily they can remember key ideas often sparks students to engage more deeply in future lessons, and subsequently learn more, even without any additional effort on the part of the teacher (Kagan, 2000, p. 26).

How?

Some excellent books are dedicated to specific memory strategies, so we will not go into them in detail here. (For more information on

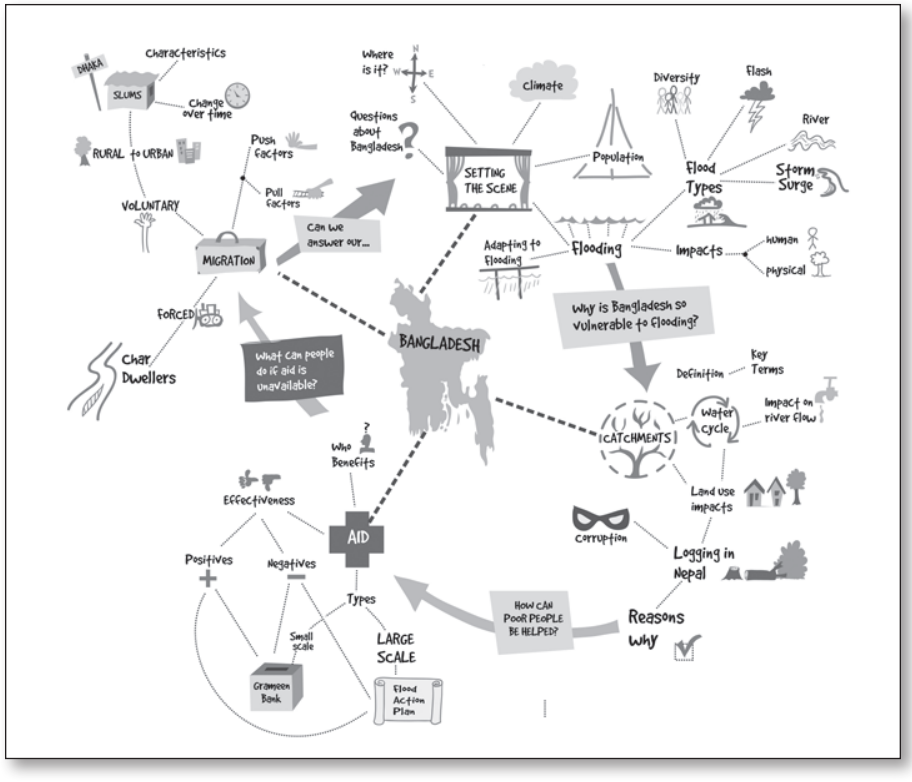
these books, check the list provided at the end of this chapter.) But here are the ones you should be aware of, with some references to help you find out more about them:

- **Acronyms**—Words made out of the first letters of the key ideas to be remembered. For example, the word HOMES is often used to teach students the five Great Lakes. Acronyms help to *chunk* information so students don't have to remember a great deal of information all at once. You can make up your own, or, even better, get your students to make some up themselves.
- **Acrostics**—Series of words in which the first letters of each word form a useful word or phrase. Perhaps the best-known acrostic from music class is Every Good Boy Does Fine—representing the notes on the lines of the treble clef. Another one from math class is Please Excuse My Dear Aunt Sally, representing the order of operations to be done in a math problem—Parentheses, Exponents, Multiplication, Division, Addition, and Subtraction.
- **Stories**—Analogies that help students remember a concept (see Nigel's Notes for a great example) or act as mnemonic devices, where the teacher weaves the items students need to recall into a strange story**.** Formulas, processes that have distinct steps, and specific lists all lend themselves easily to this storytelling memory device. Simply take a series of concepts, terms, or ideas like these and link them in an unbroken, integrated sequence that creates a chain of connections. Building visual imagery into the story will make it even easier for your students to remember.

Nigel's Notes

I had a great Economics teacher at school and he enthused us even in the driest of economic theory. I distinctly remember his telling of the story of diminishing marginal returns. He didn't frame it that way; he simply related the story of a man lost in the desert for several days without a drink when out of nowhere a truck appears filled with crates of his favorite soft drink. The man devours the first can of drink in his quest to quench his thirst; his thirst is so great that a second and third can get devoured with almost equal relish. However, with each subsequent can the man's thirst is not only quenched, but he begins to feel a little off color, even sick of the thought of another of his favorite drink. We as students drank in the story, laughed at the mental picture conjured up by our storytelling teacher, and felt sick as we "drank" each further can of soft drink. At the end we were given the academic language to fit with the story, and more than 30 years later, the law of diminishing marginal returns is still alive in my brain!

- **Lyrics**—Where students write new lyrics to a well-known song using key words from a lesson. When they hum a few bars from the song, the information tumbles into their brains! (Jensen, 2001, p. 20).
- **Memory pegs**—The idea here is to learn a set of actions and images for each number 1 through 20. To *peg* an idea, students simply start with the well-known action for that number and then slightly change the action into something that will trigger a memory of the idea (Allen, 2008, p. 22). Students who learn this simple technique find, to their amazement, that they can easily recall large amounts of information. See Chapter 5 for a list of the pegs and how to teach them.
- **Mind maps**—Mind maps make excellent study notes. Get your students to include their own graphics, and put a reminder graphic in their written notes to correspond with the symbol on the map. Then, when they see the symbol, their brains will flick to the written content as well.



Make sure you use a variety of memory strategies. If you insist on students creating an acrostic for every lesson, they'll quickly become bored. Mix it up and try to match content against a bank of strategies at your disposal.

Checking in to Gauge Memory Strategy Effectiveness

Once you start using memory strategies, it's important to check that they are actually working. Here are some ideas for quickly assessing student understanding, either at the end of the lesson you've just taught (Exit Checks) or at the beginning of the next one (Entry Checks).

Exit Checks

- **Brain Check 1**—Place a chart on the wall next to the door with the concepts as titles to the appropriate number of columns. As they leave, ask students to score their understanding of each in each column/concept, 1 being "I really got it" and 5 being "What was that all about?"
- **Brain Check 2**—Rather than gauge each concept individually (as described above), ask students to rank each concept from 1, the "best understood," and then in ascending order to the least understood.
- **One thing before you go**—For a more informal check, stand at the door and state, "No one leaves until they tell me something they have learned today!" Students enjoy the humor behind this and clamor to tell the teacher something of importance as they leave.
- **Tick or Cross**—Provide each student with two slips of paper about five minutes before the end of the lesson, one slip with a green tick on the left side and the other with a red cross on the left side. On the green-tick slip, students write in what they have really understood over recent lessons in sentence or point form, while on the red-cross slip, they itemize the concepts they do not yet quite understand. Next lesson, use the results of your check to set the context for what you're about to cover. For example, you could say, "I went through your ticks and crosses last night, and I obviously need to go over . . . " or "As a class you ranked . . . concept as the least understood, so today we will revisit it and try to improve everyone's understanding."

Entry Checks

- **Speed test**—Give groups of students a piece of flip chart paper with the key vocabulary words from the previous lesson. Challenge them to come up with definitions for or examples of these concepts as quickly as possible.
- **Picture me**—If the previous lesson contained a key diagram, challenge groups of students to reproduce it on a piece of flip chart paper. After 1 minute, allow "cheating" where students have 20 seconds to run around the room and "steal" other people's ideas. After 3 minutes, put all the charts up on the wall, and decide which team got closest to the correct version.

Entry and Exit Checks are good instruments of formative assessment, offering insights into what worked and what didn't, so the lesson can be improved next time. They also serve as useful bridges across lessons, helping to preserve the continuum of learning as well as helping students to make the connections between lessons.

Encourage critical thinking . . .

STEP 5 **Criticate—**Plan strategies for encouraging critical thinking.

*To criticat*e is not a verb, but perhaps it should be! Once your students know and understand the core information, they are in a position to start thinking about it—critically. This means, as set out in Chapter 1, we need to get our students

- understanding the logical relationships between ideas;
- assessing, appraising, and evaluating various lines of reasoning;
- detecting inconsistencies, mistakes, and errors in arguments;
- identifying the relevance and importance of ideas; and
- reflecting on their own beliefs, principals, standards, and values.

We want our students to apply and extend their understanding in other contexts and to develop a deeper understanding of the concept (Costa, 2008).

Nigel's Notes

I remember my older brother's advice when as a young boy I was studying earnestly for an exam, parrot learning all the information. He said, "You're trying too hard. Just try to understand what you're studying and you'll remember it." While he didn't call it critical thinking, that's what he meant. Eventually, I stopped learning things by rote and instead started finding out how and why they worked. To my astonishment, I found it easy to remember the facts I'd previously spent hours trying to remember.

Why?

As critical thinking is an increasing part of the curriculum, the most obvious answer to this question is: Because you need it for the test! However, there are higher educational reasons for encouraging critical thinking, which are explained brilliantly on a website created by the Department of Philosophy at the University of Hong Kong: http://philosophy.hku.hk/think/critical/ct.php. On the site, Dr. Joe Lau and Dr. Jonathan Chan answer the question "Why study critical thinking?" With kind permission, their eloquent response is reproduced below.

- **Critical thinking is a domain-general thinking skill**. The ability to think clearly and rationally is important whatever we choose to do. If you work in education, research, finance, management or the legal profession, then critical thinking is obviously important. But critical thinking skills are not restricted to a particular subject area. Being able to think well and solve problems systematically is an asset for any career.
- **Critical thinking is very important in the new knowledge economy.** The global knowledge economy is driven by information and technology. One has to be able to deal with changes quickly and effectively. The new economy places increasing demands on flexible intellectual skills, and the ability to analyze information and integrate diverse sources of knowledge in solving problems. Good critical thinking promotes such thinking skills, and is very important in the fast-changing workplace.
- **Critical thinking enhances language and presentation skills**. Thinking clearly and systematically can improve the way we express our ideas. In learning how to analyze the logical structure of texts, critical thinking also improves comprehension abilities.
- **Critical thinking promotes creativity**. To come up with a creative solution to a problem involves not just having new ideas. It must also be the case that the new ideas being generated are useful and relevant to the task at hand. Critical thinking plays a crucial role in evaluating new ideas, selecting the best ones, and modifying them if necessary.
- **Critical thinking is crucial for self-reflection**. To live a meaningful life and to structure our lives accordingly, we need to justify and reflect on our values and decisions. Critical thinking provides the tools for this process of self-evaluation.

How?

Most critical thinking takes place toward the end of a unit of study or at the culmination of a particular task. Lower order thinking has taken place earlier in the process; now it's time for you to guide your students toward a higher order level of analysis by using the following strategies:

- **Teacher modeling**—According to Epstein (2008, p. 42), "To help children become creative thinkers and problem solvers, teachers must exercise critical thinking themselves." So, share your own

thought processes with your students—literally, talk them through your thinking as you try to solve a problem. For visual learners, support this by *unpacking* your thoughts on the board in a flow diagram. Reflect out loud about how the content relates to a real-world situation or to your own values; voice your concerns about a potential flaw in or limitation of an idea; or talk about why you believe this information is more (or less) important than the material you discussed last week. After a few weeks, whenever students give an answer, prompt them to share their thinking with the class. This should become the default response mode in your classroom. Rather than

"The answer is . . . ," you should expect

"The answer is . . . because . . . however, if . . . "

- **Questions from you**—Pose team questions that make your students think about and discuss the content. Avoid questions with yes/no answers.

Purpose of Your Questions	Example Questions
Encourage students to think about how the ideas might connect to other learning	• Where else have you seen this pattern? • What is this an example of? • What does this remind you of?
Prompt students to come up with a line of reasoning	• Why would someone choose to act this way? • What would happen if? • Why did this happen?
Encourage students to find errors in an argument or seek substantiation of a belief	• When wouldn't this be true? • Does this idea always hold true? • What makes you think this is true? • What if this factor changed? Would it still be true?
Help students to understand how the idea relates to the real world or might be important	• How could you use this idea to solve a problem in your own life? • In what careers might you need to understand this concept? • When would understanding this concept save your life/make you rich?
Encourage students to make value judgments about the new information	• Do you agree with this idea? • Why/why not? • What would you do if . . . ?

- **Questions from them**—Ask your students to develop thoughtful questions about the topic beyond the factual or simplistic. Again, modeling is required. Get them to think about "What if?" questions. This is a great opportunity for collaboration within groups where the meeting of minds not only aids a deeper understanding but helps to develop thinking. Once students have developed their own questions, they can challenge other groups to answer them, or you can use them to lead a whole group discussion.
- **New context**—Applying the concept in another context will certainly test their depth of understanding. At the start of the next lesson, set up a simulation that requires students to apply their knowledge.
- **Newsroom**—Ask your students to act as a newspaper team to create stories about the content covered. Assign stories to each team, requiring them to think about and research the core content. Each team will need to appoint an editor, researchers, writers, and a layout designer (responsible for headlines and visuals). You act as the managing editor, reminding them of deadlines and approving content. At the end of the process, students can vote for the best newspaper produced.
- **Video thinking**—Video clips or whole documentaries offer great potential to prompt critical thinking. Here are some options:
  - Show the video once, with the setup that there will be questions afterward. Then give students or teams the questions and challenge them to see how many questions they can answer. Next, show the video again for them to fill in the gaps.
  - Show the video once and get the teams to come up with questions for other teams to answer. Repeat the two-stage process above.
  - Show the video in sections, posing "What happens next?" questions before revealing the next segment.
  - Use the video as a research resource, where students self-regulate its viewing, stopping and starting it until they have discovered the answers or made their decisions.

- **Lights, camera, action**—Use an online forum to allow small groups of students to plan, storyboard, write, direct, edit, film, and present short documentary-style films on the topic being studied.

Over time, your students will begin to recognize the difference between lower and higher order thinking. This will open up avenues for students to apply and extend their understanding, ultimately leading to them "cutting the apron strings" attached to the teacher.

How Green Light Strategies Align With the Process

Green Light Strategies		High School Application	
Connections	Creating a hook on which students can hang new information	ISOLATE	
Movement	Physically engaging students in the learning process	**Games**	T R A N S L A T E
Drama	Theatrics, story-telling, and students acting out the learning	**Stories**	
Novelty	Harnessing something *different* to capture students' attention	**Props** **New technology**	
Socialization	Student-to-student discussions, processing, and debriefs	ARTICULATE	
Memory **Visuals**	Pegs, association, acrostics, and rhyming Posters, mind maps, doodles, and drawing	REPLICATE	
Tone	Music	DELIVERY	
Emotion	Laughter, curiosity, and anticipation		

USEFUL BOOKS ABOUT MEMORY AND MEMORY STRATEGIES

The Complete Idiot's Guide to Improving Your Memory. Michael Kurland & Richard Lupoff. Alpha Book, 1999.

Don't Forget. Danielle Lapp. Addison-Wesley, 1987.

The Great Memory Book. Karen Markowitz & Eric Jensen. Corwin, 1999.

Improving Your Memory. Richard McAndler. Gill & MacMilliam, Ltd., 2002.

Kevin Trudeau's Mega Memory. Kevin Trudeau. William Morrow, 1995.

Memory. Elizabeth Loftus. Addison-Wesley, 1980.

Remember Everything You Read. Stanley D. Frank, Ed.D. Random House, 1990.

Total Memory Workout: 8 Easy Steps to Maximum Memory Fitness. Cynthia R. Green, Ph.D. Bantam, 1999.

Use Your Perfect Memory. Tony Buzan. Penguin Books, 1990.

Your Memory. Kenneth L. Higbee, Ph.D. Marlowe & Company, 2001.