

# Contents



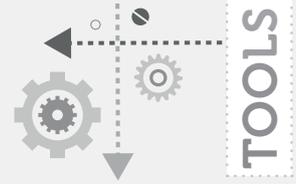
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# Introduction: The Value of Tools



As educators in the age of standards, we constantly hear calls for more effective teaching and learning practices. We are expected to increase student motivation to learn as we guide students through essential content knowledge and develop the skills they will need for success in the 21st century. Yet too often it seems as if these calls are coming from too many voices, hiding too many agendas, demanding too many contrary reforms. All of this makes the work of teachers more difficult than ever.

We call the techniques in this book tools because, in its most basic sense, a tool is anything that makes a job easier and work more effective. As teachers, one of the most important jobs facing us is ensuring that our classrooms are places where students are learning meaningful content, are motivated and are developing the skills they will need for future academic and vocational success. If we are to create classrooms where all students can succeed, then we will need to have a variety of techniques in our teaching toolbox.

This book contains over 100 classroom-tested tools, or simple teaching “moves” that teachers can use to foster active, in-depth learning. These tools are based on principles of effective learning and brain-based instruction, and require little or no planning. As such, the tools can serve as “on-the-fly” techniques whenever a learning episode begins to lag or new information needs to be processed, or they can be planned into a lesson or unit ahead of time in order to meet specific objectives. In either case, whether used spontaneously or as part of a pre-designed lesson, these tools will help students build essential learning skills such as:

- tapping into and using prior knowledge to learn new content;
- improving notemaking, vocabulary and writing skills;
- developing memory, review and practice skills;
- using questions and reflection techniques to deepen learning;
- developing meaningful products and performances;
- working cooperatively.

## What is Active Learning?

Perhaps the most basic premise upon which active learning rests is that there are many more ways to learn than by being told or by reading a textbook. Learning isn't about having information poured into our heads; learning requires thought. As Confucius noted, “Learning without thought is perilous.” Twenty-five hundred years ago, Confucius understood that learning is an active process. Much more recently, with current knowledge about how our brains learn best, many educators across the globe have worked to create “constructivist” classrooms. In a constructivist

classroom, teachers ask open-ended questions and use student responses to help guide students through active learning processes like discussion, elaboration, inquiry and metaphorical expression (Brooks and Brooks, 1993).

The common wisdom shared by Confucius and constructivists is this: In order to learn something well, students need to hear it, see it, ask questions about it and discuss it with others. Above all, students need to “do it”. They need to figure things out by themselves, generate their own examples, trust their own hypotheses, demonstrate their own skills, assess their own competencies, determine the qualities of their efforts, apply what they have learned to new situations and teach others what they have learned.

Active learning, then, means more than engaging students in activities; it is a cyclical process in which participants constantly move between periods of action and periods of reflection. We learn by doing, but we learn more deeply when we take the time to look back, to reflect upon our actions and to extract meaning from the data. The cycle then repeats itself again and again as we deepen and broaden our perspective.

Active learning is like a coil that constantly expands inward and outward. In that process, three actions are present:

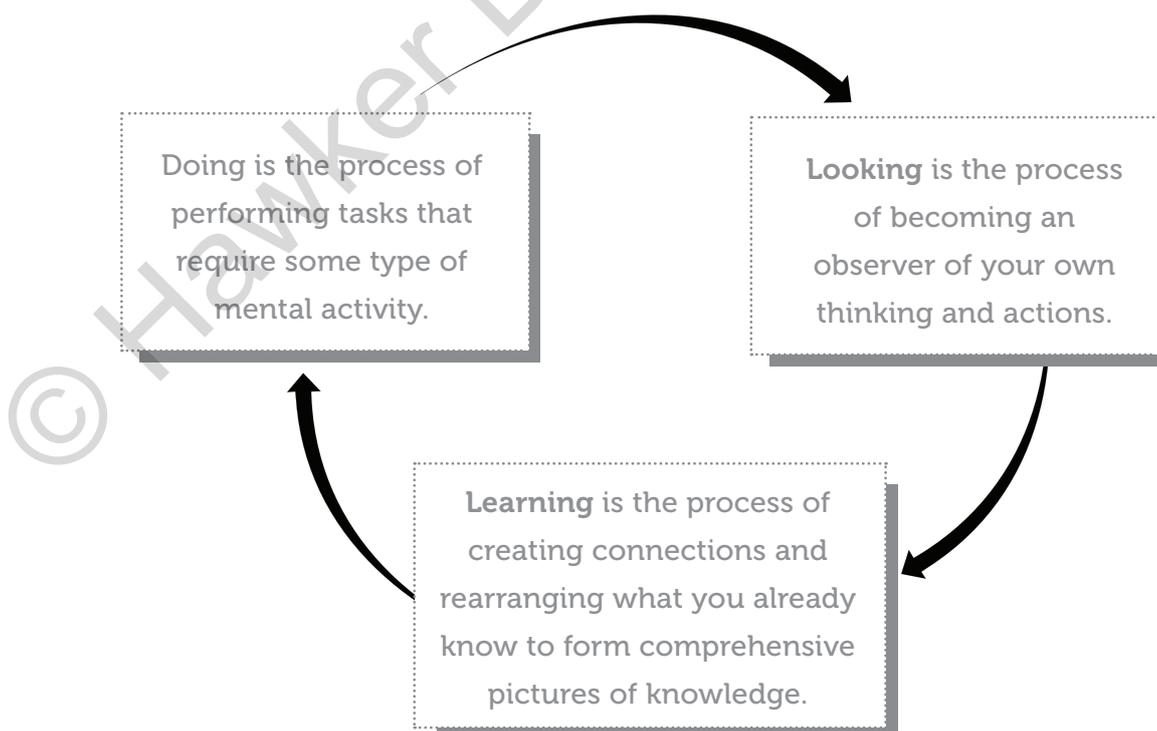
Doing is the process of performing tasks that require some type of mental activity;

Looking is the process of becoming an observer of your own thinking and actions; and

Learning is the process of revising and synthesising learning into a meaningful whole.

The following graphic representation depicts the cyclical process of doing, looking and learning:

### The Active, In-Depth Learning Cycle



## What is In-Depth Learning?

Recent brain research (Caine and Caine, 1994) tells us that our brains produce two distinct types of meaning. The first type, called surface meaning, is similar to a definition we would find in a dictionary: a quick and general point of reference. While essential in helping us to develop a large storehouse of knowledge, surface meaning is neither comprehensive nor particularly engaging. It is a glimpse, a starting point, an invitation to look beneath the surface. The other type of meaning made by our brains is called deeply felt or deep meaning. Unlike surface meaning, deep meaning is rich and personally relevant because it has been constructed by our brains – actively processed; explored for its novelty and patterns; linked to experiences, feelings or ideas; and situated within a relevant context. Because it is self-constructed, deep meaning is pleasurable to the human brain; it creates that same sense of satisfaction we get when we stand back and admire something we've built or when we have pieced together all the clues in a murder mystery to accurately predict who committed the crime.

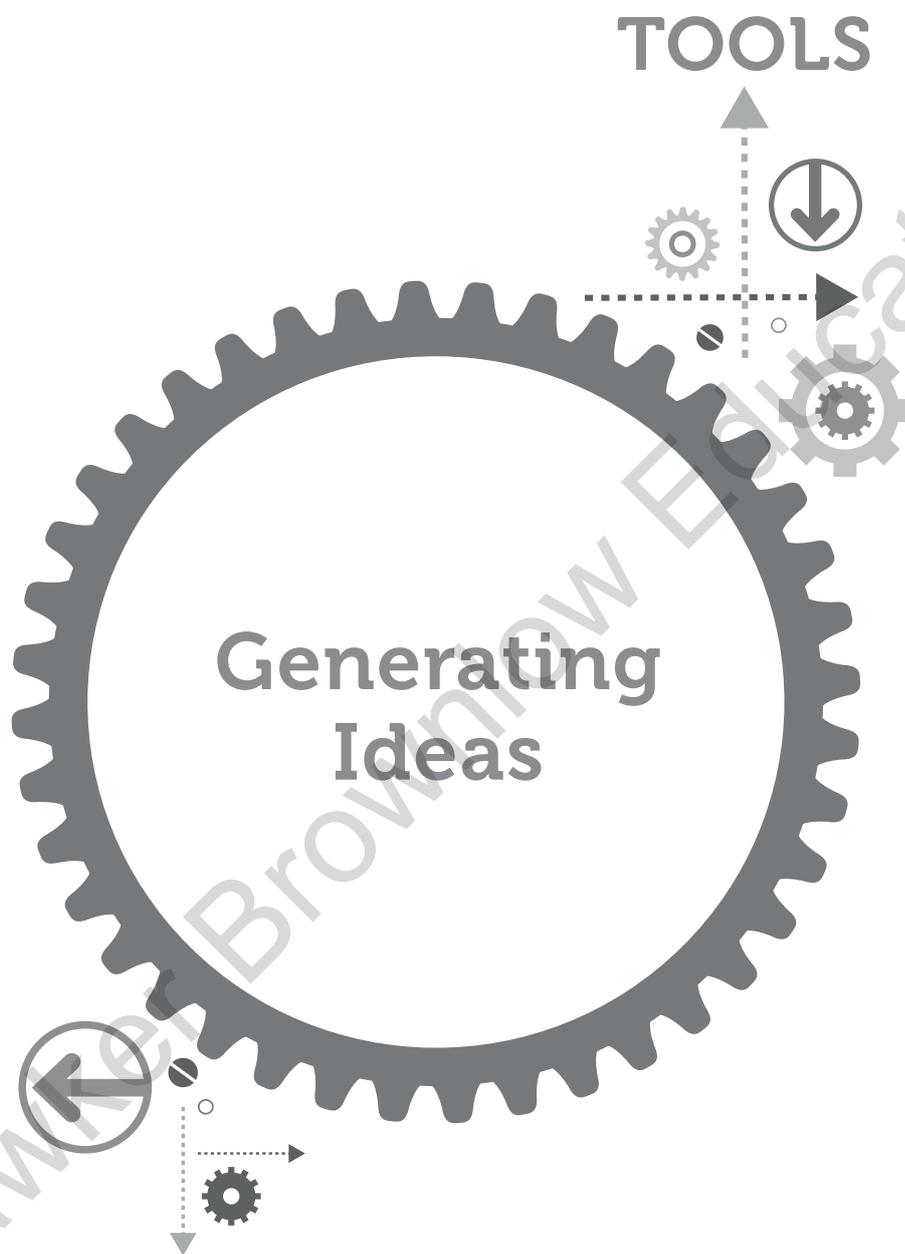
If we plough through a textbook description of a historical event, we will certainly scratch at the surfaces of several dozen topics. But little of this information will be relevant or long-lasting for students. Students will never “own” this information. Most likely, they will remember it for a time – probably until the test – and then forget it. The situation will be very different if we orchestrate learning so that students connect the concept of a war to their prior knowledge about how and why relationships break apart; develop visual depictions of essential concepts like invasion, factionalism and popular sovereignty; explore the mysteries of a conflict in cooperative inquiry teams; create visual organisers like timelines and compare and contrast organisers to condense and summarise key information; and work in Writer's Clubs to draft and revise historical thesis essays on whether the war was inevitable. In a classroom like this one, student learning is made deep in three ways:

1. *Students are building a permanent base of essential content knowledge.* A quick survey of the activities will show that instruction is focused on helping students construct a meaningful understanding of the central topics and concepts, the enduring ideas that are at the heart of studying the war.
2. *Students are motivated to learn and to do their best work.* All brain research tells us that the search for deep meaning is a constant and pleasurable activity for the human brain. Giving students multiple opportunities and avenues to explore topics and demonstrate understanding (e.g. visual representations, inquiry, visual organisers, essays, discussion, Writer's Clubs) is a powerful way of motivating learners and energising the classroom.
3. *Students are developing essential learning skills.* Education can no longer be exclusively about content knowledge. A large body of research investigating the links between education and contemporary careers (Resnick, 1987, Reich, 1992, Murnane and Levy, 1996) indicates that the new world we live in requires students to develop the skills of real-world problem solvers. In addition, tests and standards have also placed a premium on skills like interpreting multiple documents, analysing visual information, summarising and developing evidence-based arguments. The emphasis placed on skills in this history unit (e.g. conducting an inquiry, developing visual representations and organisers, summarising information,

working cooperatively, drafting and revising, developing a thesis) means that students are not only learning how to succeed in and out of school, but also how to grow as learners.

We have written this book to provide you with specific, practical tools that you can use in all subject areas and at all levels to enliven your teaching and enrich your students' learning experiences. Using these tools and teaching students how to use them on their own will help you transform your classroom into a place where active, in-depth learning is the norm. But just as important, these tools will make the difficult work of teaching students easier and more effective. We hope that you find these tools useful and rewarding as you engage in the process of inspiring students to become active, in-depth learners.

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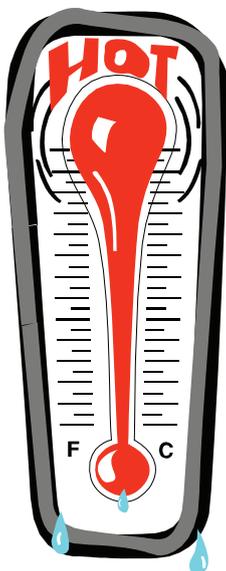
## Think, Pair and Share

**Purpose:** A simple technique for getting students to think and communicate cooperatively in a short amount of time.

**Procedure:** The teacher poses a question for students to consider. The students generate responses and share them with their neighbours in pairs. The teacher then collects the students' ideas.

**Example:** *Based on our demonstration, think about how the boiling of liquids is different from the freezing of liquids. Discuss your ideas with your neighbour and be ready to share.*

### STEPS



1. The teacher poses a question.
2. Students think and construct a response.
3. Students share their ideas with a neighbour.
4. The teacher records students' ideas.



## Give One, Get One

**Purpose:** A technique used to initiate physical movement, to promote divergent thinking and to generate many ideas quickly.

**Procedure:** The teacher poses a question and asks the students to record two responses. Students stand up and move around the room to make connections with other students. Every time a student “connects” with a new student, he or she needs to give the student a different idea and get another idea in return (new ideas should be added to student’s original list). If both participants have the same ideas, they need to work together to generate a new idea. They then can continue their journey, connecting with other students. The teacher provides the students with a goal for the number of different ideas to collect and a time limit within which they have to collect them. It is important that students are reminded to work with only one student at a time (before they move to another student). Students should *not* form small groups to collect ideas. The point of the strategy is for students to meet other students and to move from one person to another, sharing and revising ideas.

### STEPS

1. The teacher poses a question.
2. Students generate two ideas.
3. The teacher establishes a goal (number of ideas) and time limit (time to collect ideas).
4. Students stand up and “connect” with one other student to give an idea and get a new idea. (If both students have similar ideas, they brainstorm together to generate a new idea.)
5. Students return to their seats when they have met the goal for number of ideas. (They can share ideas in small groups and try to generate two or three additional ideas.)
6. The teacher collects and records ideas to be explored.

**Example:** *How is a leaf like a factory? Generate two (2) ideas. Move around the room, sharing ideas until you have given and collected six (6) additional ideas in two minutes.*

# Divergent Thinking

**Purpose:** A tool to help students think creatively, divergently and originally.

**Procedure:** Divergent Thinking involves visualising, or creating multidimensional pictures in the mind; imagining or seeing possible relationships, causes and effects; and using metaphoric language to describe and symbolise relationships. Divergent Thinking encourages students to explore ideas; list possibilities; improve or change something; expand or extend; place information in new contexts; regroup information; rename; invent; suspend disbelief; and suspend criticism or evaluation until ideas have been generated. It is used when you want students to generate many possible ideas or responses to the same question/problem.

## STEPS

1. Teacher poses an open-ended task, question or problem: “How many possible ways ... ”
2. Students try to stretch mentally by going beyond their basic ideas.
3. Teacher establishes criteria for creative thought:
  - Fluency=number of ideas
  - Flexibility=number of different categories generated (EARTH and MARS would be two answers, but one category)
  - Originality=number of unique ideas
4. Teacher uses intuitive feedback to extend student ideas: “That’s a possibility ... ”; “Who has another idea?”; “What if we used this?”

**Example:** Here is a sheet with twenty-five circles on it. You have three minutes to generate as many ideas as you can about what each circle represents to you. Write one idea in each circle. Remember to think fluently, flexibly and originally.

*Question Stems for Divergent Thinking***Use the following question stems when you want your students to exercise:****Fluency** (creating as many ideas as possible)

- How many different ways can you ... ?
- What words or ideas come to mind when ... ?
- How is a \_\_\_\_\_ like a \_\_\_\_\_ ?
- What words/ideas come to your mind when I say ... ?
- Think of an object – any object. What new associations come to mind for the ideas or object you've been thinking about (e.g. new uses of a pencil when associated with music, space travel, a house, etc)?

**Elaboration** (developing more ideas from current ideas)

- Based on what you've written, what other ideas come to mind?
- If you think of \_\_\_\_\_ like an object, what other associations come to mind?
- When grouping your ideas, what new groups come to mind when you think of time, location, purpose, the material from which things are made, the forms in which ideas come, etc?

**Flexibility** (breaking ideas down into non-overlapping groups)

- Group these \_\_\_\_\_ by similarities.
- What new items can be added to the original or the relabelled groups?
- Using different metaphors, expand the content of your groups (e.g. How is a river like a book? A rose like a shoe? The west like the east? The sun like a man? The moon like woman? A pond like consciousness? etc).

**Originality** (thinking of things/groups unique to this activity)

- Provide a different ending for ...
- Provide a different beginning for ...
- Combine the following unrelated words into a meaningful sentence.
- Given a purpose and adequate data, design a plan to accomplish this purpose.
- Prepare a map using the following geographical data.
- Combine the following lines, shapes, etc, into a meaningful pattern.
- Design a symbol for ...
- Create an icon that signifies ...
- Given the following metaphor, create a poetic image for ...
- Combine the characters from three different stories and write your own story.