This book has two primary goals – to show teachers how to teach their students to be more creative thinkers and to help them to develop their own creativity as teachers – and it shows teachers how to do these things in ways that don’t conflict with skill development and knowledge acquisition. In fact, teachers will learn how to teach for creativity in ways that result in improved skills and greater content knowledge. Teaching for creativity and creative teaching together will result in much higher levels of both student engagement and student learning.

The book focuses on three big, well-researched ideas related to creativity training – divergent thinking, intrinsic motivation, and the CPS model of creative problem solving – and shows how to apply these ideas in designing lessons that promote creativity as well as encourage the development of content-based skills and knowledge. The book is written in a way that makes it easy for teachers to make these ideas their own, with many examples for use in K-12 classrooms.
BEING CREATIVE INSIDE AND OUTSIDE THE CLASSROOM
ADVANCES IN CREATIVITY AND GIFTEDNESS

Volume 2

The second book in the Advances in Creativity and Giftedness series creates a level playing field for all those interested in the construct of creativity, but perceive it as being tautological, immeasurable or otherwise obscure. Unlike books that report on studies of creativity using paradigms from psychology or the learning sciences, this book addresses notions such as fluency, flexibility, elaboration and originality for a layman’s perspective and makes it accessible to classroom teachers and all those interested in ways of cultivating creativity.

Another refreshing feature of the book is its focus on teaching for creativity by examining the research base on divergent thinking, motivation and creative problem solving. It is my hope that teachers will be able to engage more in developing lesson plans that specifically include cultivatable aspects of creativity after reading this book.

I am pleased to present the second book in the Advances in Creativity and Giftedness series to the community.

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Being Creative Inside and Outside the Classroom
How to Boost Your Students’ Creativity – And Your Own

By

John Baer
*Rider University, USA*

and

James C. Kaufman
*California State University, San Bernardino, USA*
To Sylvia
— JB

For Cecil R. Reynolds —
Who at different points in my life has impressed me with
His fastball
His brilliance
His generosity
And his friendship
— JCK
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This book has two goals. The first is to show you how to teach your students to be more creative thinkers. The second is to help you to develop your own creativity, both in and out of the classroom.

It is not weighted down with detailed discussions of creativity theory or creativity research, although it is based on both. At times one needs to understand a theory in order to put that theory into practice effectively, but in those cases the focus is always on how to apply what we know about creativity, not on theory for theory’s sake.

This book is designed to be largely self-teaching, and it can be worked through either as part of a course or on one’s own. Note the words “work through.” There are many activities in the book to help you understand various ideas and techniques. Most of these activities are brief; all are important; and you really shouldn’t skip them.

We hope that you find this book interesting, exciting, and just a bit challenging. We are confident that it will help you and your students become more imaginative and more productive thinkers. We also believe that it will help you experience life — all of life — in the most creative and joyous way possible.

We want to thank the many students who have helped us develop and try out the ideas and activities included in this book. Much of what is here was originally created for use in the education classes taught by John, and our students have been generous in sharing ideas about how to refine and improve both the activities themselves and the ways in which we have presented them. In many cases their suggestions have led to significant improvements.

Finally, we would like to thank Roja Dilmore-Rios, Qin Li, and Roderick O’Handley for editorial assistance and David K. Hecht for his outstanding contribution. John wants to thank his daughter, Heather, and his wife, Sylvia, for their inspiration, encouragement, and creativity. Sylvia is the most gifted teacher he has ever known, and many of the ideas and techniques in this book are taken directly from her. Heather has recently become a teacher, joining the profession that her parents love so much. James wants to thank his wife, Allison, his son, Jacob, his parents, Alan and Nadeen, and the rest of his family and friends.
INTRODUCTION

The Zero-to-Ten Test of Creativity

Let’s start with a test of your creativity. Don’t get nervous: We just want you to rate your own creativity, in the privacy of your own mind, on a scale of 0-10. A score of 10 is reserved for the most creative people of all time — people like William Shakespeare, Albert Einstein, Emily Dickinson, Claude Monet, and Shikibu Murasaki (author of Japan’s — and the world’s — first novel, the luxuriantly romantic Tale of Genji). We needn’t agree on exactly who should be a 10 and who is merely a 9 or a 9.5. It’s sufficient that each of us can generate a list of people that we consider creative geniuses, people who can serve to anchor one end of our 0-10 creativity continuum.

Let the other anchor — a rating of zero creativity — be represented by a rock. (And make it a plain, ordinary, and most uninteresting rock, the kind even a geologist couldn’t love.)

THE ZERO-TEN TEST OF CREATIVITY

| | | | | | | | | | |
|-------------------------------|
| 0 1 2 3 4 5 6 7 8 9 |
| 10 |

a rock

W. Shakespeare

Think about it for a minute or two: Where on this scale would you rate yourself? None of us is a rock, and none of us is a 10 (at least not yet — generally ratings of 10 are only awarded posthumously!). So where on a 1-10 scale would you put yourself?

You may want to object that it’s not that simple, that you can’t just give yourself a number that stands for your creativity at all times and in all situations. And
you’re right: A very reasonable response to this test would probably be something like, “Well, it depends”—and the list of things it depends on is long (infinitely long, no doubt). But even though the Zero-to-Ten Test of Creativity is certainly too simple, it does have some redeeming features:

It makes the point that creativity is a continuum, not something that a person either has in abundance or lacks entirely. We’re all creative, to one degree or another, in many of the things we do.

It helps us realize that our creativity varies—from task to task, and even from moment to moment. This is something many psychologists and educators tend to forget. (Are you a 6 when painting but only a 4 when cooking? Maybe you’re a 3 in the morning and a 7 late at night, or a 5 when you’re alone and an 8 when you’re with a close friend.)

It can help us become aware of our own tacit understandings of what creativity is. Trying to respond to such a seemingly simple (or perhaps simple-minded!) question pushes us to think about our most basic ideas about what it means to be creative. In doing so, it can help make us aware of the limitations of one-dimensional or single-component conceptions of creative thinking.

It can help us see the limitations of testing creativity. The Zero-to-Ten test is about as valid and reliable as most of the creativity tests on the market—which is to say, not very valid or reliable at all. (It is, however, much easier to take and score.) Be forewarned: We’ll be giving you some other creativity “tests” as we go along as ways to introduce or explain new concepts. We think you’ll find these tests to be fun to take, but keep in mind that although they will tell us something about creativity, none of them is much more valid as a measure of your overall creativity than the Zero-to-Ten test.

Our level of creativity varies for many reasons, and in this book we’ll be exploring some of the causes of this variation. We’ll also look at ways to get it to vary in a positive direction—to move us, say, from a 4 to a 5, or from a 6 to an 8. And we’ll also consider ways to help children be more creative, both in and out of the classroom.

WHAT IS CREATIVITY?

The problem of definitions

That imp-god ambiguity

Giggles at befuddled definers

Who muddle in his double-ended funnel
While fools fall through
Free

This bit of wit is something that one of us found, believe it or not, on a restroom wall. While it may not qualify as great poetry, there is at least a little bit of wisdom in these five lines of graffiti. Certainly in the area of creativity, it is easy to become muddled in definitions and theories. And there may even be times that we might do better not to specify exactly what we mean.

Creativity is hard to define, even among psychologists who study it intensively. The fact that psychologists and others cannot agree on a single definition of creativity doesn’t mean that we can’t study it, however; in fact, one might argue that if it were easy to define, then we would understand it fully and there would be little studying left to do. It is, of course, important that each of us be as careful as possible to specify what we mean when we use the word, so that we can know whether we are talking about the same thing at all. But it’s also okay if our definitions allow a little “give,” if they provide some room for ambiguity. To use a geographical metaphor, a good definition of a hard-to-define concept like creativity might do better merely to point out the general direction of where one might find it, rather than to try to pinpoint its location precisely on a grid.

A DEFINITION

As clearly as simply as we can, here is what we mean by the word “creativity”:

Creativity refers to anything someone does in a way that is original to the creator and that is appropriate to the purpose or goal of the creator.

Now we will explain this definition, piece by piece.

Creativity refers to anything: When we say that creativity refers to “anything someone does,” we mean anything. People can be creative in the ways they lay out or weed a garden, write or interpret poems, arrange child-care schedules, plan a vacation, teach multiplication, or play tennis. Creativity isn’t limited to a few special, highly valued artistic or scientific activities. Nor is it limited to only a few outstanding ideas or works of art conceived by people who rate at least a 9 on the Zero-to-Ten test. We’re talking about what we might call “garden variety” creativity, the kind all of us have, use, and enjoy. If you’ve ever re-arranged your workspace to make it more efficient or pleasant, improved your grandmother’s recipe for tuna casserole to make it more even more tasty or more healthful, or figured out a new and workable way to keep telephone salespeople from interrupting you when you’re busy, then you’ve been thinking creatively.

Creativity refers to anything someone does: In our definition of creativity, we use the word “someone” intentionally to limit ourselves to human creativity. Machines may be able to think or act creatively (today? someday?) — in fact, this is a subject that we personally find quite interesting — but as fascinating as the possibility of computer-generated music or poetry may be, that’s not what we’re
talking about in this book. Nor are we considering the possibility of creative thinking by other (nonhuman) animals, although this may certainly be an interesting thing to ponder!

Creativity refers to anything someone does in a way that is original to the creator: By “original to the creator,” we mean that it doesn’t matter if someone else has already had the same thought, designed a similar gadget, or cooked an identical soufflé. As long as the person who creates is unaware of similar prior creations by others, it qualifies under our definition as creative. (This definition will work for the purposes of this book — to help teachers and parents and students think more creatively — but don’t try to use it at the patent office!)

This aspect of the definition doesn’t necessarily reflect what scientists may consider creative; indeed, one theory argues that creativity is entirely dependent on the context. In other words, if a novel or piece of art isn’t thought to be creative now, then it isn’t. If it’s thought to be creative one hundred years from now, then it would become creative at that time. Although this concept may be reassuring to people who feel like they are unappreciated and misunderstood artists, it’s not terribly helpful for trying to improve your own creativity.

Creativity refers to anything someone does in a way that is original to the creator and that is appropriate to the purpose or goal of the creator: This means that whatever it is that someone creates, it has to work. If a child playing the string game “Cat’s Cradle” invents a new way to finger one of the “cradles,” it’s creative if it works — not if it ends up in a knot. Imagine if you were to hire a company to build a patio for you, and they built it out of rotten salami. Is it different? Absolutely. But simply being original isn’t enough. A solution, idea, or painting has to work, and figuring out how well it works depends on one’s purpose in creating. This point may seem obvious, but it has often been ignored by psychologists and educators, who have tended to celebrate (and to give high creativity scores to) anything unusual. Sometimes just being different or even weird is fine, in and of itself, but weirdness that works is wonderful (and more deserving, we think, of the adjective “creative”!).

Of course, sometimes things “work” in ways we didn’t intend, at least consciously. And sometimes our goals change as we go. We don’t think we can generally know if a creative idea came as the result of conscious thought, unconscious thought, or serendipity, but we’re willing to give credit to the creators of good ideas, even if their creations or their usefulness are somewhat unexpected. Similarly, we don’t think there’s reason to quibble if someone creates something other than what they set out to create because their goals changed along the way. In Shakespeare in Love, we see William Shakespeare working on a new play called Romeo and Ethel the Pirate’s Daughter, to be filled with swashbuckling adventure. The final product turned out quite different — but still creative. If the creation is meaningful to the creator, then it fits our notion of “appropriate to the purpose or goal of the creator.”

This should provide at least a general idea of what we mean when we use the word “creativity.” There are many other legitimate ways to think about creativity, of course, such as equating “creativity” with “creative genius,” or counting as
creative that which is merely unusual, as we just discussed. We don’t want to suggest that other definitions are wrong; words can have many different but equally valid definitions. But we want to be clear up front about what we mean when we use the word “creative.”

**INTRODUCTION**

**TASK SPECIFICITY**

In trying to respond to the *Zero-to-Ten Test of Creativity*, one complaint you might have had was that it depends on the task. Let’s use an example from our own lives. John is a much more creative woodworker than he is a cook. He takes risks, tries new designs and techniques, and is often quite playful with the things he might dream up in his shop. In front of the stove, however, he tries to follow directions as closely as possible and becomes uneasy when those directions leave anything to his own judgment (e.g., “Season to taste” or “Boil 8-12 minutes, until tender”). John might be a 6 as a woodworker, but only a 2 as a cook. James is a tremendous baseball fan. When it comes to analyzing baseball statistics and drafting a fantasy team, James is quite creative — and, indeed, can still arrange the data to argue that Phil Niekro (remember him, Braves fans?) was the best pitcher of all time. But James couldn’t install an overhead light or nurture a garden or solve a chemistry equation to save his life.

This is common, and the idea that our creativity varies depending on what we are doing seems almost commonsensical. But it’s also commonsensical to think that some people are generally “creative types,” or that there are some personality traits that make some people more creative whatever they do. Common sense often contains mutually contradictory views, and common sense about creativity is no exception.

In fact, there is much reason to believe that creativity is very task specific. Research has shown that, in general, being creative in one kind of task does not predict how creative a person will be in any other task. It is true that there are some people who are highly creative in many things they do, and there are others who show only minimal creativity across a wide range of activities. But even if creativity on different tasks were distributed completely at random, we would expect to find some people with creative talent in more areas than others. That’s how randomness works. If you flip a coin 10 times, and then flip it 10 more times, and then flip it another 10 times, you wouldn’t expect to have exactly five heads and five tails in every set of 10 flips. Some sets of 10 would probably have more heads, some would more tails. If you made a very large number of flips, of course, you would expect the overall average to be about a roughly even number of heads and tails. And, indeed, a famous statistician named Karl Pearson once flipped a coin 24,000 times and got 12,012 heads — only 12 more than perfectly even! But it would have been completely shocking if every set of his 10 flips had produced an equal number of heads and tails. Similarly, most people have a mixture of higher creativity on some tasks and lower creativity on others, but not everyone has the same total amount of creativity. Our creativity in different tasks is not apportioned equally; rather, it seems that creative talent is distributed pretty much at random.
This is because the skills that underlie creative performance are very task specific. It is not surprising to learn that the skills needed to be a creative mathematician are different from those needed to be a creative metalworker. But the skills needed to be a creative poet do not appear to overlap those needed to be a creative painter. Even two types of creativity that seem to be very related — writing fiction vs. poetry — have their differences. Certainly, both poets and fiction writers are likely to be at least moderately well-read, have a talent for composing words together, and have a fairly rich vocabulary to draw from. Indeed, these talents are important in writing both poetry and fiction, but only because they help provide some of the most basic tools that a writer needs. These basic tools are necessary to achieve even a minimal level of competence as a writer, but neither is very predictive of creative performance once one has reached a modest level of achievement in both. There are plenty of well-read people with rich vocabularies who show little creativity when writing either poetry or short stories — perhaps they are successful journalists, instead. There are many others who evidence more creativity when doing one kind of writing than when doing the other; and there are a (lucky) few who show a great deal of creativity in both kinds of writing. Research has in fact shown that, although some creative poets are also creative short-story writers, this is true only to the degree predicted by chance (assuming similar educational backgrounds). Fundamental or essential skills necessary to perform a task at the most basic level are one part of the picture, but the skills that lead beyond such a basic level of competence to more creative performance tend to be very task specific. This is an idea that we’ll return to often throughout this book, but we will give special attention to how we might increase certain task-specific skills in the chapter on divergent thinking (Chapter 2).

We should note that there is some disagreement over whether creative thinking skills are quite narrowly task specific. In fact, there is a lively debate going on regarding this claim, and although we believe the evidence clearly favors task specificity in creativity, it’s possible that we are wrong. We have proposed a new model of creativity that reflects task specificity while also allowing for some “general” features. This model is called the Amusement Park Theoretical Model (APT model).

The APT model uses the metaphor of an amusement park. We start with the first level of initial requirements. What do you need in order to go visit an amusement park? Well, just off the top of our heads, you need some money in your pocket, a free day, and a way of getting there. Maybe if you’re trying to get to Six Flags or another place filled with roller coasters, you need to be a certain height. Similarly, there are some basic things that you need if you want to be creative. You have to have a basic amount of intelligence — there are few creative carrots. You have to have some level of some type of motivation; few people are creative while lying on a couch, except for those in psychotherapy. And there must be a suitable environment. It is a much different to be creative as a woman in Saudi Arabia versus in California.

Once you have decided to go to an amusement park, you must decide what kind of park you wish to visit. Maybe you are in the mood to go to a water park and
splash around. Or perhaps you are feeling more daring and want to ride scary roller coasters that plunge you down rapidly. Maybe you want to see animals or fish, or you want to visit a theme park centered on a cartoon character. Similarly, every aspect of creativity is part of a larger General Thematic Area.

How many General Thematic Areas are there? We’re still working on figuring it out. Howard Gardner, in his theory of multiple intelligences, suggests eight areas that seem a reasonable starting point (interpersonal, intrapersonal, spatial, natural history, language, logical-mathematical, bodily-kinesthetic, and musical). Other researchers have suggested different patterns — some of our own work has suggested verbal-artistic, visual-artistic, entrepreneur, interpersonal, math/science, performance, and problem-solving. Shelley Carson and her colleagues used ten domains for their Creativity Achievement Questionnaire: Drama, writing, humor, music, visual arts, dance, invention, science, culinary, and architecture.

Even once you have decided on what type of amusement park to visit, there are still many more decisions left. Even within one area, there are many different parks to choose from. (If you want roller coasters, do you choose Six Flags or Disneyland?) Within each of the General Thematic Areas are several more narrowly defined creativity Domains. Let’s say that language is one of the General Thematic Areas. Domains might include journalism, poetry, debate, writing plays, and so on.

Finally, there are the Microdomains. Imagine that you’ve met the initial requirements of finding an amusement park. You’ve selected animals as your General Thematic Area, and then narrowed the field down to the Domain of the San Diego Zoo. There are still more choices to make. Do you go see the gorillas? The koala bears? Maybe you want to ride the monorail to get a broad look at all the animals, or go to the souvenir shop and get a tee shirt. Similarly, each Domain has many different Microdomains. Within the Domain of psychology, for example, there’s social, developmental, clinical, cognitive, industrial/organizational, experimental, and so on.

Think of what you consider your most creative area. How specific can you get? What Microdomain might it fall under? How broad can you go? What type of General Thematic Area might include it?

One final point we’d like to make is that even if our model is completely wrong, even if task specificity turns out to be incorrect (no matter whether it is just a little bit wrong or totally wrong), it will do no harm to base your teaching on this idea. Even if you assume creative thinking skills are task-specific and they are, in fact, general, any creativity training or teaching should still work fine. As we will explain in Chapter 2, the only danger is in assuming that creative thinking skills are generic (that is, that they are not task specific). If we make that assumption and it turns out to be wrong, then we may waste much of our creativity-training effort.
CHAPTER 1

MOTIVATION

Why we do something is almost as important as the skills we bring to the task. We tend to be more creative when doing tasks that we enjoy and find interesting. And on the very same task, our creativity may vary depending on our motivation at the time. When we talk about motivation here, we’re being more specific than just meaning “being motivated.” We’re more interested here in what is sometimes called motivational orientation — what type of motivation drives us? Under conditions of extrinsic motivation — such as when we do things for rewards, when we expect our work to be evaluated, or when we are aware of being observed as we work, for example — our creativity decreases. When we are intrinsically motivated — that is, when we are doing something for the sheer joy of doing it or simply because we find it interesting — we tend to be more creative.

There are some tasks that are rarely done for fun (or because we are intrinsically motivated). Most people, for example, don’t love to file their taxes or scrub their toilets, and their own motivation is extrinsic. Several other tasks are rarely done for any reason other than for fun — few people play video games or write poetry for the money involved.

But for many of the things we do — such as writing this chapter — our motivations are mixed and may vary from time to time — sometimes even moment to moment. We may be working away, motivated only by the intrinsic interest of finding ways to put ideas into words that you will understand — and then to receive a call from our publisher, eager to hear how it’s coming along. In such an instant, extrinsic motivation zooms up and crowds out any intrinsic motivation… thereby depressing creativity. Unless we do something about it, that is: There are ways to “massage” our own motivations, to get ourselves in a more creative (intrinsically motivated) frame of mind. We’ll explore those in some detail in the chapter about motivation.

This isn’t to suggest that extrinsic motivation is always bad, however. Sometimes it’s the only motivation we have, and it can often keep us going through our less inspired moments when our work seems just like, well, work. When John does his woodworking, which he usually enjoys immensely, he sometimes gets tired. James writes plays in his spare times, and often runs smack into writer’s block. It’s at times like these when John remembers how much his daughter liked the chest he built for her last year, or how much his wife will enjoy the bookcase he’s working on right now. It’s in these moments that James envisions the audience clapping after one of his plays is performed. Extrinsic motivation is also important for building skills that we might use more creatively some time in the future. In the chapter on motivation we’ll consider not only how to increase and maintain intrinsic motivation, but also how to use extrinsic motivation creatively.

THE JOY OF CREATIVITY

We believe that one of the great joys of being alive comes from thinking creatively, whether that results in a new solution to a problem, an amusing story, a better-
running engine, or a tastier soufflé. Even when there is no discernible result — when the soufflé experiment flops, or the innovative idea is one we decide not to pursue — we may nonetheless be engaged in a creative-thinking process that will lead us, in a roundabout way, to a soufflé that is even better than we had hoped, or to an idea that we do choose to develop. Creative thinkers sometimes have to take a long-term perspective; and, in the meantime, the joy of exercising our creative-thinking skills can help make the activities we engage in feel interesting and worthwhile.

It is not the goal of this book to help teachers, parents and students think more creatively for any particular purpose. We’re not trying to increase the number of Nobel Prizes among our readers, nor are we trying to improve the overall productivity of the U.S. work force. We would be happy if either or both of those things happened, of course (and delighted to think that this book had played some role in such events), but if that’s all that happened, we would not have achieved our primary goal.

What we hope to do is to enrich the lives of our readers (and their children and students) by helping them think more creatively — simply because thinking creatively makes us more joyful, more interesting to ourselves and others, more alive to life and its possibilities. If it also helps you (and your children and students) write better poems, cook better soufflés, or solve more challenging problems — and we are sure it will do all these things — these are more on the order of fringe benefits. The primary goal of this book is to provide parents, teachers, and children greater pleasure as the result of becoming more creative thinkers.

Our method will be to tell you briefly some important research findings at the beginning of each chapter and then to show you in some detail how to apply those findings in your life, your home, or your classroom. We won’t be giving you long lists of citations of research reports; if you want that, we refer you to the end of each chapter, where we will recommend scholarly books on creativity that should be available in most college libraries. The focus here will be on applications: How to translate research into practice.

OVERVIEW OF THE BOOK

The rest of this book is divided into four chapters:

Divergent Thinking

Divergent thinking refers to wide array of techniques for coming up with ideas. Brainstorming is the best known of these techniques, but there are many others. This chapter will look at divergent thinking from a task-specific perspective, teach a wide range of techniques for idea generation, and provide a variety of ways of getting “unstuck” when working on seemingly intractable problems.
CHAPTER 1

Motivation

There are many ways to increase students’ (and teachers’) intrinsic motivation and to help them overcome the negative effects of uncontrollable extrinsic constraints, which will be explained in this chapter and demonstrated using a diverse set of examples. The chapter will also consider the “hidden costs” of rewards and evaluation. Both providing rewards and making evaluations are necessary and often invaluable in many teaching contexts, but they are also known to depress creativity, at least in the short-term. This chapter will help you understand how to use extrinsic motivation to build skills without having a long-term negative impact on the creative use of those skills.

Creative Problem Solving Models

There are several well-respected problem-solving heuristics — general models or guidelines — that can be helpful in solving a wide variety of “real-world” problems. This chapter will explain when and how to use these, teach you the most effective of these models, and explain how to teach this “CPS” model to students.

CONCLUSION

How do these ideas go together? The final chapter of the book will summarize and tie together the ideas presented in the three main chapters about divergent thinking, motivation, and the CPS model of creative problem solving.

Each of the three main chapters will begin (as did this Introduction) with some kind of test as a way to introduce a key idea. A brief discussion of theory will follow, leading up to the heart of the chapter: How to use the idea to help you and your students be more creative.

BIBLIOGRAPHY

This Introduction touches on many topics that will be discussed in greater detail in later chapters, so we’ll save the references related to those specific topics (divergent thinking, motivation, and creative problem solving models) for those chapters.

For a more academic overview of the general topic of creativity, James and Robert Sternberg has collected a very interesting volume of scholarly articles entitled The Cambridge Handbook of Creativity (Cambridge University Press, 2010). For those who want to know what is happening on the cutting edge of creativity research, the Journal of Creative Behavior, Psychology of Aesthetics, Creativity, and the Arts, and Creativity Research Journal are the best sources of up-to-date scholarship on creativity.

If you wish to pursue the idea of task-specific skills, you might try our recent edited book, Creativity in Different Domains: Faces of the Muse (Lawrence Erlbaum, 2004), John’s book Creativity and Divergent Thinking: A Task-Specific
Approach (Lawrence Erlbaum, 1993), Robert Sternberg, Elena Grigorenko, and Jerome Singer’s Creativity: From Potential to Realization (APA, 2004), or Howard Gardner’s Intelligence Reframed: Multiple Intelligences for the 21st Century (Basic Books, 2000). Gardner’s book is a bit easier to read as an introduction to this idea, although his topic is not creativity per se, but thinking of all kinds. Our two books are more technical, but also more up-to-date.
CHAPTER 2

DIVERGENT THINKING

A QUICK TEST

For this test you’ll need a pen or a pencil, plus a watch or some other way to time yourself so you’ll know to stop after two minutes. Ready? Here’s the task:

List as many different possible uses for empty egg cartons as you can.

(We encourage you not to just skip this “test” and read on. Take two minutes, give it your best effort, and then come back and read what follows.)

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DIVERGENT THINKING
CHAPTER 1

You may have heard variations of this kind of task, such as listing uses of bricks, boxes, or tin cans. These are standard creativity test questions. We’ll tell you how they’re scored later, but first let’s give you one more task. For this one you also have two minutes:

- List as many different ways as you can to stay cool on a hot day.

(Again, take a moment — just two minutes — and actually write down all the ideas you can think of for how to stay cool on a hot day.)
Okay, now you have two lists and you want to know how they’re scored. Then you’ll know how creative you are, right?

Wrong. You already know, if you read Chapter 1, that there’s no good way to test creativity, and that includes standard creativity tests. So we’re not going to give you a score — it simply wouldn’t mean anything. But we will tell you how these tests are scored, because the scoring is based on four components or sub-skills, which together make up the skill of divergent thinking. Measuring these component skills doesn’t result in reliable creativity test scores, as we’ll see, but understanding these four skills will help us learn some important things about creative thinking, and also help us develop our own creative thinking skills. What we’re about to tell you about the components of divergent thinking will also allow you to ace most creativity tests, should you ever need to take one. These tests are so unreliable that a few minutes instruction is enough to double or triple most people’s scores! Indeed, this is one reason why you won’t see these types of tests given along with the SATs and GREs — the College Board and Educational Testing Service spend thousands of dollars to keep their tests from being “coachable.” Creativity tests have a long way to go before they could withstand courses designed to improve people’s results.

(By the way, if you didn’t try either of the two tasks, we encourage you to stop reading for a few minutes and do them. It will help give you a feel for some of what follows, and they’re also both good exercises for building some of your creative thinking muscles.)

A BRIEF HISTORY OF DIVERGENT THINKING AND ITS FOUR COMPONENT SKILLS

Guilford’s Structure of the Intellect Model

Joy P. Guilford first proposed divergent thinking over half a century ago in his “Structure of the Intellect” model. Guilford recognized that thinking is far more complex than the fairly limited set of skills tapped by the intelligence tests of that day (and by many of the tests of this day). Guilford’s model included 120 different thinking skills in a complex three-dimensional taxonomy of cognitive skills. Guilford’s goal was to create a map that would contain — and to some degree explain — all possible varieties of human thought.

A key group of these factors are those he called “divergent production” skills. He believed these skills (which have in more recent years come to be called divergent thinking skills, rather than divergent production skills) are important parts of creative thinking. Divergent thinking is a kind of thinking that aims not at producing correct answers, but rather at coming up with a wide variety of unusual, original, or even off-the-wall ideas.
Creative genius

There is a great intuitive appeal to the idea that divergent thinking is related to creative thinking. Divergent thinking’s goal of producing different, unusual, even bizarre ideas — ideas that “diverge” from the norm — matches the notion many of us share of what creative geniuses are like. Think of the stereotype of a mad scientist, or of a tormented artist who sees a different world than the rest of us (or who marches to the beat of a different drummer, to borrow Thoreau’s brilliant metaphor that has now become a cliché). Creativity as madness, or at least as being extremely if not painfully different than the rest of humanity, remains a popular idea in our culture. This stereotype has great staying power, yet the truth is much more mundane. Are creative geniuses “mad”? Sometimes. Indeed, new research on this topic (some by James) indicates that poets, particularly female poets, are particularly prone to mental illness. But many other writers are not particularly likely to be mentally ill, and the results are similarly unclear — and often contradictory — among other artistic professions. Scientific genius, despite images of the “mad scientist,” seems to have little relationship to higher-than-average rates of mental illness. The stereotypical image of the mad genius is nowhere near as prevalent in real life, and the actual data are (as is usually the case) more complex than can be summarized in a quick paragraph. Certainly, there is nothing about the mad genius concept that can provide support for a divergent thinking model of creativity.

Garden-variety creativity

But it’s not creative genius we’re trying to understand here anyway. Indeed, most creative geniuses don’t particularly want to be understood. Our task is to make sense of, and find ways to enhance, the garden-variety creativity of all of us less-than-tens on the Zero-to-Ten Scale. Can divergent thinking help us? It still has an intuitive appeal, even without mad scientist stereotypes. After all, doesn’t one need to have an idea that is at least a little bit different to be creative? Certainly divergent thinking must play some role in creative thinking.

Divergent thinking versus convergent thinking

Divergent thinking is often contrasted to “convergent” thinking, which refers to thinking that focuses (or “converges”) on a single correct answer. Convergent thinking is what is measured by most intelligence and achievement tests. Guilford was the first major theorist to argue that divergent thinking — the ability to produce many (not necessarily correct) ideas, to produce unusual and original (but, again, not necessarily workable) ideas, and to take an idea and spin out elaborate variants of the idea — was every bit as important as convergent thinking. Convergent thinking produces correct answers, but divergent thinking produces interesting, imaginative, and potentially creative ideas.
DIVERGENT THINKING

The Structure of the Intellect Model and divergent thinking today

Guilford’s 120-factor model still has its adherents today, but it hasn’t exactly revolutionized intelligence testing, which is still based mostly on models using only one or a few convergent thinking factors. One of the few exceptions is the Woodcock-Johnson III, which has a subtest called Ideational Fluency. This subtest, which consists of quickly naming many different things that fit a specific category, is very similar to some of the Torrance Tests. Guilford has influenced many important cognitive theories, however, including Howard Gardner’s currently popular theory of “multiple intelligences.” Guilford’s ideas have also spawned a whole new genre of ability testing.

Because divergent production skills were hypothesized to be important in creative thinking, divergent thinking and creativity gradually became synonymous, and divergent thinking tests came to be called simply creativity tests. Something important is lost, however, when divergent thinking and creativity are confounded. Divergent thinking leads to potentially creative ideas, but there’s much more to creativity than being unusual or original, as we will see. Indeed, imagine for a moment we ask you to solve a mathematical proof — to demonstrate, let’s say, the transitive property — and you write down, “The rain in Spain stays mainly on the plain.” Is this unusual? Unquestionably. Is this original? Absolutely. But perhaps a better conception of creativity would also incorporate the concept of whether it addresses the question being asked.

The components of divergent thinking

Divergent thinking has four components, each of which is typically scored separately on a creativity test:

- **Fluency** refers to the number of different ideas one can produce.
- **Flexibility** refers to the variety among the ideas one produces.
- **Originality** refers to how unusual are the ideas one produces.
- **Elaboration** refers to richness of detail in the ideas one produces.

One’s score on test items like the ones that you tried at the beginning of the chapter — listing uses of an egg carton and ways to stay cool — is a sum of the scores received on each of these four dimensions. Having each component contribute to the total score seems reasonable enough, assuming the theory is correct. (More on that later.) But the scoring procedure is actually rigged, unavoidably, in favor of fluency, so that what matters most is simply the number of responses in your list. Let us explain.
Scoring fluency

In scoring fluency, there is no check on the appropriateness of the ideas listed. In response to the question about how to stay cool on a hot day, “Standing in front of an air conditioner,” “Watching a scary movie that makes you shiver,” and “Wearing egg cartons for shoes” each would score one fluency point. It doesn’t matter that of these three ideas, one is totally banal and another makes no sense. “Wearing egg cartons for shoes” would neither keep you cool nor be a very useful way to use egg cartons, but it would score one fluency point for either of the two questions (ways to stay cool and ways to use egg cartons). Scoring fluency also ignores the difference between appropriate but banal ideas (“Standing in front of an air conditioner”) and more imaginative ideas (“Watching a scary movie that makes you shiver”). It simply makes a raw count of the number of items in the list.

So here’s the trick to scoring high on the fluency scale: Write as fast as you can, write as many things as you can, and don’t worry if what you’re writing really makes any sense. According to the systems for scoring these tests, as long as the ideas are in some marginal way related to the topic, it doesn’t matter if they really make any sense. If you’re asked to think of different possible uses for a brick, feel free to say “for meatloaf,” “to prevent tooth decay,” or “as a buffalo.” It all counts.

Scoring flexibility, originality, and elaboration

But what about flexibility, originality, and elaboration? Scoring these involves fairly complex procedures, but one thing is true of all three: The more ideas you have in your list, the higher your score is likely to be. For example, under originality, the basic scoring idea is to give points to each idea on the list based on the frequency of that idea on the lists of other people who have taken the test. But simply by having many ideas on your list — even not very unusual ones — your score goes up. This is justified theoretically by the notion that a greater quantity of ideas should lead to more high quality ideas, and there’s some truth to that idea. The more ideas one has, the more likely one will have an original, or even a truly creative, idea. Indeed, in real life, according to much research, the best novelists (i.e., the ones who win the most prizes) also tend to be the ones who have written the most novels. The scientists who have the most impact on the field are the ones who produce the most.

But the fact of the matter is that scores on flexibility, originality and elaboration scales correlate so highly with fluency scores that several experts have argued against bothering with the more complicated scoring procedures. It’s much easier, and about as accurate, simply to count the number of responses (the fluency score) and let it go at that.
But if divergent thinking tests aren’t good measures of creativity, why is divergent thinking important?

You now know how to score high on a creativity test, but you also know that scores on these tests really aren’t important (unless, of course, you’re a fourth grader trying to get into a Talented and Gifted program somewhere, in which case these scores, invalid and easily faked as they are, still play a major role). Is there any real value to the idea of divergent thinking?

The answer is yes, there is something important about the idea of divergent thinking, something that will help us both understand creativity better and become more creative thinkers. Divergent thinking tasks, by themselves, do not yield a valid creativity score, and divergent thinking isn’t a single skill (or four skills) that can be taught and practiced in one context and then applied in any context one encounters, as we will see below. But if we combine the ideas of task specificity and divergent thinking, the result is a powerful new way of thinking about creativity that will help us become more creative thinkers. Understanding divergent thinking and its component parts won’t help us measure creativity, but they can help us understand the nature of creativity and provide us ways to improve our creative thinking and that of our students. For that reason, it is worthwhile examining the skills that make up divergent thinking carefully.

A sample divergent thinking scorecard

To help you better understand the four divergent thinking skills of fluency, flexibility, originality, and elaboration, it will be helpful for you to see how these are typically scored on a divergent thinking test. It would be both an ethical and a copyright violation to list the exact scoring rules for an actual divergent thinking test item, of course. However, we can give you a general idea of how such items are scored using one of our own divergent thinking questions and creating a scoring system for it like the ones used on actual divergent thinking tests. We’ll use the “test” question that you answered at the beginning of this chapter:

List as many different possible uses for empty egg cartons as you can.

Here is a short list of possible responses:

- storing eggs
- storing a rock collection
- packaging material to keep fragile things from getting crushed
- homes for cockroaches
- homes for honeybees, who could use the 12 egg spaces to create 12 small but connected honeycombs
- shoes for walking on hot sand
- building material for houses
- musical instruments
- kindling to start fires
Now let’s score it. (Remember, this is not part of a real divergent thinking test, so there are no norms to compare the scores we obtain with anyone else’s score.)

**Scoring fluency**

Let’s start with fluency. There are 10 different responses, so the fluency score is 10. Some of the responses are very similar, like storing eggs, rocks, and buttons, but none are identical, so each counts one fluency point. (If we had listed both “storing rocks” and “storing stones,” however, that would only have scored one fluency point.)

**Scoring flexibility**

What about flexibility? Here we are looking for different categories of responses. Responses 1, 2, and 10 are all about storing things, so that counts one flexibility point; 4 and 5 are about places to live, so that counts another flexibility point; and each other response is in its own category, so that scores five more points for a total of seven flexibility points. For each question on a real divergent thinking test there is typically a list of different categories of responses in the scoring manual to help one score flexibility, but it’s generally fairly easy to divide responses into categories even without such a list.

**Scoring originality**

To score originality, a real scoring manual would be helpful, because what divergent thinking test developers do is give their test questions to hundreds, or possibly thousands, of people and count how often a particular response is given. (This group of people is called the “norm group.”) Then in the scoring manual they list all the responses given by all the people and the frequency of those responses (sort of like the television show “Family Feud,” on which people try to guess how often other people respond in certain ways to a question, except that with a divergent thinking test you score more points if you don’t say what everyone else has said). For example, very common responses like using the egg cartons for storage (numbers 1, 2, and 10 above), to make homes for animals (numbers 4 and 5), or as a packaging material (number 3) might get zero originality points. Using egg cartons for a building material, a musical instrument, or kindling (numbers 7, 8, and 9) might score one originality point each. And using egg cartons for shoes (number 6) might score two originality points. Extra points are awarded for responses that are so unusual that no one in the norm group made such a response.
**Scoring elaboration**

You might have noticed that the response “homes for honeybees, who could use the 12 egg spaces to create 12 small but connected honeycombs” is far more elaborate (and interesting) than the response “homes for cockroaches.” This is where elaboration earns points. For each element of elaboration, one elaboration point is scored. The “homes for honeybees” response would score at least two elaboration points, one for “use the 12 egg spaces” and one for “create 12 small but connected honeycombs.” The “walking on hot sand” part of the “shoes” response (number 6) would earn one elaboration point, as would the “keep fragile things from getting crushed” part of the “packaging material” response (number 3).

**What do divergent thinking test scores tell us?**

On an actual divergent thinking test, separate scores for fluency, flexibility, originality, and elaboration might be reported, together with a combined divergent thinking score. This score might then be compared to scores earned by others to produce a percentile score that allows you to compare your score to the scores of a large group of others. As you can probably see, knowing the general scoring rules makes it much easier to get a high score, even if the question is not known in advance. Rather than thinking carefully and trying to give only the very best or most interesting responses, one should simply rush to list as many things as possible. The fact that just this little bit of coaching can enable someone to get a much higher score is one reason these tests are not very valid.

Another problem with using divergent thinking tests as measures of creativity is that divergent thinking is just one part of creativity. Divergent thinking is an important contributor to creative thinking, but without skill in evaluative thinking — skill in selecting ideas that are actually workable — one is unlikely to produce much that would be considered creative.

Perhaps the biggest problem with divergent thinking tests, however, is the fact that such tests fail to take into account the task specificity of creativity. One might be very creative when it comes to recycling things (something the question about using empty egg cartons in creative ways might measure) but not at all creative when it comes to planning a science experiment, designing a quilt, or writing a play. Because both creativity and divergent thinking appear to be very task specific, skill in divergent thinking on one task is not likely to predict divergent thinking skill on other, very different tasks.

**A task-specific view of divergent thinking**

No one knows where creative ideas come from. As we explained in Chapter 1, the skills that help us think and act more creatively vary greatly from task to task. A person may have a high degree of ability to use many of the skills helpful in writing creative poetry. But this same person may have very few of the skills needed to write a creative short story. (Or, of course, one may have much — or
little — talent in both areas.) This is true even within what might ordinarily be thought of as the same “domain” — such as the verbal domain, which would subsume both poetry and story writing, for example. It is also true in other fields, such as the domain of graphic art, or the domain of mathematics. Creativity appears to be task specific.

**Is creativity task specific?**

In our opinion, yes. As we’ve indicated earlier, we allow in our Amusement Park Theoretical Model for some general creativity factors. We also want to emphasize that this issue is not close to settled — new research is still being carried out to explore these questions in more detail. There are many respected psychologists who study creativity who would argue with our point of view. But, as we will discuss, past research seems to indicate creativity is domain-specific and — most importantly — we will argue that assuming domain specificity is the safest and most practical course of action.

Research has repeatedly demonstrated that creative performance in one kind of task within a given domain is often not predictive of creativity on other tasks in the same domain. Typical studies ask people to produce two or more different products (such as poems, descriptions of pictures, and short stories; or sketches, clay sculptures, and collages) and then examine if the people who are creative on one task are more or less likely to be creative on other tasks. When the various products are given to expert judges to rate for creativity, two interesting results consistently emerge. First, the judges, even though they work totally independently of one another, tend to agree to a remarkable degree on the creativity scores they give. (For those of you who like to attach numbers to things, the inter-rater reliabilities are generally in the .75 to .95 range.) Second, the scores achieved by individuals on different tasks vary widely. (The judges, of course, do not know who made which product. Products are identified only by numbers, which are coded so that only the experimenter can match the various products created by a single individual.)

Knowing a person’s creativity “score” on one task does not help us predict that person’s score on other tasks — even tasks within the same general domain. It does help us predict creative performance in the future on the same kind of task, however. The people in any group who write the most creative poems this year are generally the same ones who will write the most creative poems if tested again a year later. This trend makes sense; indeed, most abilities that involve intelligence or thinking tend to remain consistent over time.

Research has also shown that if a student is trained on focused divergent thinking activities, the benefits are usually quite narrow — the student will only improve on those specific activities. On the other hand, divergent thinking training that uses a wide range of topics in its training exercises produces a much more general improvement in creative performance. In the latter case, the magnitude of the improvement may not be as great as in the case of narrowly targeted training, but it influences performances across a wide range of task domains.
This task specificity of creative performance is true of young children, and it’s also true of adults. The only limitation on this generalization is that in some domains, a certain level of training, skill, or knowledge may be necessary to do any of the tasks in that domain. Imagine, for example, trying to perform any level of neurosurgery with no prior experience! Still, among those with that prerequisite level of skill or knowledge, creativity on different tasks in the domain is usually randomly distributed.

Although we don’t know exactly what these creativity-relevant skills might be for any particular task, divergent thinking theory gives us an important clue, at least when we are talking about the “garden variety” creativity that we all share. The four components of divergent thinking, when considered as task-specific skills, are very useful tools in understanding and promoting creative thinking. We should note that what follows may, or may not, apply to genius-level creativity. We simply don’t know, although it’s a good guess to assume that it applies in those special cases as well.

Why it is wise to assume that creative thinking skills are task specific

Unless one is absolutely sure that creative thinking skills (like divergent thinking) are not task specific, it makes sense for teachers or anyone who wants to improve their creativity to assume they are. We’re not saying this just because we believe the evidence for task specificity is stronger than the evidence for more generic creative thinking skills. Even if one thinks that it is likely that creative thinking skills are more generic than task specific, it makes sense to act as if the task specificity hypothesis is the correct one. Let us explain why. (Let us also say that this is somewhat complicated, and if you don’t need to be convinced, nothing will be lost by skipping ahead to the next section on Nurturing task specific divergent thinking skills.)

The basic idea is this: Even if the task specificity hypothesis is wrong, nothing will be lost by basing your creativity training on that assumption. If the task specificity hypothesis is correct, however, and you base your training on the assumption that divergent thinking skills on one task will transfer to any other creativity-relevant task, then much of your effort to improve your (or your students’) divergent thinking skills may be wasted. We will give two examples to clarify this point.

Example 1: Suppose you want to improve your divergent thinking skill on a wide variety of tasks. The task specificity hypothesis would lead you to practice divergent thinking using a wide variety of tasks (let’s say, computer programming and writing poems and building model airplanes). In contrast, under the generic divergent thinking hypothesis it wouldn’t matter what tasks you used. They could all be very similar in content (such as writing haikus and sonnets and limericks).

The result is that if the generic hypothesis is correct, then the content of the exercises one uses doesn’t matter and nothing is lost by making the incorrect (task specificity) assumption. Maybe you’ve done a little more work than you had to do,
but nothing worse. But if the task specificity hypothesis is correct and you choose all exercises from the same task domain (which the generic hypothesis allows you to do), then the loss will be significant, as any improvement in divergent thinking will be limited to the single task domain from which the exercises are chosen. So in our example above, your improvement would be limited to writing poetry.

**Example 2:** In contrast to Example 1, let’s say that you wish to improve divergent thinking on one single narrowly defined task — for example, cooking. The task specificity hypothesis would lead you to choose many exercises within this one task domain — baking bread, grilling shrimp, sautéing vegetables, scrambling eggs, etc. The generic hypothesis, in contrast, argues that it doesn’t matter what kinds of divergent thinking exercises you choose. You could improve your divergent thinking in teaching your dog to sit or inventing a children’s toy. Again, the penalty for being wrong is negligible for the task specificity hypothesis, but potentially large for the generic hypothesis.

We hope this makes it clear that, although the question of task specificity in creativity is still unresolved, it nonetheless makes sense (until there is such resolution) simply to adopt the task specificity approach. Creative thinking often involves working under a cloud (or a rainbow!) of ambiguity. Although we’re fairly confident that further research and expert opinion will continue to move the field of creativity in the direction of task specificity, we’d argue that the question doesn’t have to be fully answered. You can go ahead with your creativity training with full confidence that your efforts will not be wasted.

### Nurturing task specific divergent thinking skills to increase creativity

To increase your divergent thinking skill (and your creativity) on a particular task, you should concentrate your practice on things that relate in some way to that task. For example, if you are only interested in improving your creativity (or your students’ creativity) in the area of graphic design, then you should do lots of divergent thinking practice using graphic design questions and materials. But if you are interested in improving your creative thinking skills in general, then you should use a wide range of divergent thinking exercises covering many diverse topics.

We’ll be looking somewhat intensively at three examples of areas in which one might want to be more creative: poetry writing, graphic arts, and a geography activity. There’s nothing special about these topics — almost any topic could be used — but we hope they provide a sense of the range of ways one might practice divergent thinking.

Because we want to indicate how one might target divergent thinking activities in a single domain, we have looked at several abilities related to each of the three examples. In your classroom, you will often be far more opportunistic in your choices of divergent thinking topics, using both topics that relate directly to what you are studying and choosing topics just for fun. One common divergent thinking activity is to have students list anything they know (or think they know) about a topic they are about to study. This can serve at least three purposes: activating
students’ prior knowledge about a topic, providing a quick assessment of what they know and don’t know about the topic, and developing their divergent thinking skills in an area of interest.

In a sense, we will be starting with more difficult examples — difficult because we have tried to identify specific divergent thinking skills that relate to three particular abilities of interest — and then moving on to some easier examples (which we’ll provide in a list of topics at the end of the chapter). Divergent thinking needn’t be targeted at a specific ability, as we have done in the three examples we’ll be using for the next several pages, nor must it have any particular goal. Almost any divergent thinking activity has the potential to enhance creative thinking in some domain, even if it isn’t readily apparent what that domain might be. To give a simple example, one might practice divergent thinking by making a list of words that include the letter “v,” or a list of three-syllable words that don’t include the letter “e.” What kind of creativity might that improve? Well, it might make one better at games like Scrabble. Or one might do what one author did and structure an entire novel — more than 300 pages — around the idea of writing without using the letter “e”! (This “e”-free book was originally published in German, and then a translator used the same no “e” rule for the English-language version. In an essay about the monumentally difficult task the author of this book and its translator had taken on, a New York Times book reviewer discussed the idea of having freedom within constraints, much as a poet might choose to be constrained artificially by conventions of rhyme or meter. But writing without the letter “e”? What a severe constraint to put on one’s self?)

We hope the three examples that follow provide a sense of ways divergent thinking skills can be developed in a variety of domains. These are only examples, however, not prescriptions for the way you should teach divergent thinking in your classroom or practice it yourself. The topics you choose for divergent thinking practice should fit your interests and those of your students. They should relate to the kinds of abilities you want your students to develop and that you want to develop yourself. And they should be the kinds of activities that you and your students find fun and challenging.

Example 1: Creativity in writing poetry

Let’s start with an example. Suppose you want to be a more creative poet. What are some of the skills that a poet might need? Here are a few abilities that we think would help:

Creating interesting and meaningful metaphors

Thinking of words that have identical ending sounds/ (rhyme), similar ending sounds (assonance), or identical initial sounds (alliteration)

Forming rich images that suggest many different things

Having ideas and thoughts that can have an effect on other people
This certainly is only a beginning, and depending on the kind of poetry you want to write, the list would change (and might not include even some of the things on this list at all; people who want to write Haikus will not need rhyming skill). But it will serve as an example.

Let’s start with alliterative skill because it’s rather easy. If you want to improve a skill, it makes sense to practice it. (Practice doesn’t make perfect — at least not for most skills, in which perfection is a rather fuzzy concept anyway — but it will still help.) How might one practice to improve skill at alliteration?

Here’s where what we know about divergent thinking comes in. The first thing we would want to do is to increase fluency. To do this, you could practice things like generating lists of words that begin with specific sounds. You might choose words randomly (e.g., by opening a book and pointing, or by picking a word from a billboard one passes) and then try to think of as many words as you can with the same initial sound. This is something you can do anywhere, like when you’re stuck in traffic or waiting in line at the checkout counter (e.g., “check-out, champion, cheese, chase, choosy, Cheshire, cheek, chin, Czechoslovakia, China, chair, chariot, cheetah …”).

Fluency in alliterative skill is a start. What about flexibility, originality, and elaboration? To improve flexibility, you could set yourself the task of thinking of very different kinds of alliterative words, such as allowing yourself only one word in a given category (in the example for the previous paragraph, you wouldn’t allow both “cheek and chin” or “Czechoslovakia or China”). Or you might specify a rule about the numbers of syllables in the words, such as all three-syllable words, or specify that each word must have either one more or one fewer syllable than the preceding word.

Perhaps more interesting in the case of alliteration, you might strive for originality — searching for words that few others would think of. In the list of words starting with “check-out,” “Czechoslovakia” is perhaps most unusual simply because it doesn’t start with the same two letters as the others, and “chinaberry” would have been a more unusual word for this list than “China” simply because fewer people would tend to think of it. There’s not a specific rule in this case, only a reminder to one’s self to look for unusual, original words.

Elaboration? You might simply strive for it (not simply “cheese,” but “cheese beginning to develop age spots”). Or you might try some combinations, such as “chasing a cheetah in a chariot.”

The point is that, although there’s not a generic skill of divergent thinking that will help you be more creative whatever you do, there are many task specific divergent thinking skills that one can improve. Just as we can think of exercises to help us become more adept at alliteration, so we can with other skills that matter to us, such as finding metaphors or creating rich images. We’ll give some examples for these two skills in a moment, but first let’s look at two other examples — improving divergent thinking in graphic arts and in a geography activity.