1-Page Book Summary of Peak

Peak: Secrets From the New Science of Expertise explores how humans develop skills and the process by which peak performers in music, athletics, and countless other fields develop their abilities. While it may seem as though figures like Chopin, Beethoven, or Roger Federer rely solely on an innate talent that makes their extraordinary feats seem effortless, what they do actually requires a great deal of effort. Indeed, the secret to their success was practice. They practiced a lot and they practiced the right way.

Most of us think of “practice” as the simple repetition of a task. And, to be sure, this kind of practice will yield some results. If you're learning how to play tennis, for example, you'll probably be able to iron out your most embarrassing mistakes and figure out how to serve the ball somewhat competently. But this approach actually stunts your learning. Once you reach your accepted level of performance, you'll plateau and stop improving. To truly improve, you need to change how you practice.

Purposeful Practice

Purposeful practice is distinct from merely repetitive practice in a few specific ways.

1. **Purposeful practice has well-defined, specific goals.** If you're learning to play a piece of music, your practice regimen shouldn't be “I'll just play for an hour every day.” It should be, “I'll play the piece until I can do it without any mistakes three times in a row.” The key to purposeful practice is putting a series of small steps together as you work toward a longer-term goal. Each subsequent step challenges you just a bit more than the previous one.

2. **Purposeful practice demands complete focus.** You need to give the task at hand your full attention and keep your mind
3. **Purposeful practice involves feedback.** You need someone who can guide you, praise you when you do something right, tell you precisely how you’re falling short—and how you can improve.

4. **Purposeful practice requires you to step out of your comfort zone.** You’re never going to improve if you only do the things that are already easy for you. Once you’ve gotten comfortable, it’s time to challenge yourself further. The quality of practice matters much more than the quantity.

For example, research has shown that doctors who have been practicing for 30 years actually do worse on certain measures of performance than their colleagues who are only a few years out of medical school. This is because the senior doctors aren’t engaging in purposeful practice. Most of their day-to-day activities keep them squarely in their comfort zone: they aren’t being challenged at all.

Purposeful practice can be remarkably effective. Anders Ericsson, author of *Peak*, once conducted an experiment to see how many digits a test subject, named Steve, would be able to memorize and recite in a numerical string. At first, Steve couldn’t memorize strings longer than nine digits. It seemed that he had reached some sort of natural plateau.

**The author decided to try purposeful practice to help Steve push through this barrier.** He would present Steve with five-digit strings: if Steve repeated it back correctly, the author would add one more digit to the string to make it six digits. If Steve got it wrong, the author would drop the length of the string by two digits. And it worked: in a few days, Steve managed to memorize an 11-digit sequence, two better than his previous record. After hundreds of sessions, Steve was able to successfully recite back 82 digits!

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**Deliberate Practice**

Truly effective practice goes a step beyond purposeful practice, to *deliberate* practice. Working hard and pushing yourself beyond your comfort zone, by themselves, are not enough. Deliberate practice builds on the principles of purposeful practice, but it applies them in a systematic, rigorous framework that leads to the kind of performances we see from acknowledged experts. Unlike purposeful practice, deliberate practice isn’t about fulfilling your potential—it’s about building it, making possible what was once impossible.

With deliberate practice, you are working with highly developed and well-accepted training methods that have been proven effective in getting results. These methods have been honed and perfected by those who came before you into a near-science. With purposeful practice, if you push yourself, you might see improvement. With deliberate practice, you’ll become an expert.

There are a few key features of deliberate practice.

1. **Deliberate practice can be measured precisely.** Whether it’s a win/loss record in chess or your finish times in a sprint, there are objective ways for you to evaluate your performance.

2. **Deliberate practice is competitive.** This provides aspiring experts with a motivation to keep practicing and improving. You want to be the best in your field.

3. **Deliberate practice is time-tested.** You’re not trying to do something that no one else has ever done before. Instead, you’re operating in a field where best practices have been developed over a long period of time—even centuries. You’re following the template that experts before you have followed successfully.

4. **Deliberate practice is done under the tutelage of teachers and coaches.** With deliberate practice, you’re working in a field whose high level of development and venerable history of best practices have produced a highly skilled and sophisticated cadre of professional mentors who can guide you every step along your path to expertise.

5. **Deliberate practice demands maximal effort**, which is often unpleasant.

**Deliberate practice is how experts become experts.** In a study of violin students at the Berlin University of the Arts, a team of researchers set out to determine whether the best performances were the product of deliberate practice or innate talent. Given the extreme difficulty of playing the violin, it requires a great deal of solitary practice time to master the instrument. It is crucial to practice outside of scheduled sessions with one’s teacher. While acknowledging that it wasn’t fun, the students saw practice as being crucial to their development as musicians, so they kept to it.

**The researchers found that the only major difference between the students they had deemed “good,” “better,” and “best” was how much time they devoted to solitary, deliberate practice.** They calculated that the “good” students would practice an average of 3,420 hours on the violin by the time they turned 18; the “better” students would practice an average of
5,301 hours; and the "best" students would practice an average of 7,410 hours. There were no shortcuts to becoming an excellent violinist. All of the top achievers had devoted several thousand hours of practice to the instrument: none of them were "prodigies" who simply surpassed their peers without putting in any practice.

There are no big leaps or breakthroughs with deliberate practice. What looks to an observer like a sudden leap forward is actually just the last in a series of baby steps.

**Mental Representations**

Critically, deliberate practice depends on effective mental representations, which show you how to do your task properly and correct yourself when you make mistakes. **Mental representations are templates that correspond to objects, ideas, or anything else that the brain might be thinking about.**

You may not realize it, but you use mental images every day. Think about a famous image, like da Vinci's Mona Lisa. When someone mentions it, you can "see" the painting in your mind's eye—this is a mental representation. Mental representations are key to memory, pattern recognition, and all the other highly developed abilities needed to be a top-ranked pitcher, chess player, or pianist, providing meaning and context that aids us as we assimilate and process information.

A key part of forming good mental representations is the ability to recognize patterns where others see only random and formless data. **Most of us are only seeing a collection of trees: experts see the forest.**

In one experiment, soccer players were shown video footage from a soccer match and then asked to predict what was going to happen next on the field. The results showed that the more accomplished players were more accurate in their predictions of what the next move would be than were the less accomplished players participating in the experiment. The better players were able to take a full assessment of the conditions on the field and see patterns that enabled them to predict what the optimal next move would be. They had a mental representation of which players' movements mattered the most, to whom they ought to pass the ball, and so on.

Deliberate practice and mental representations reinforce one another: **the more skilled or knowledgeable you become in a given subject through deliberate practice, the more effective your mental representations will be—and vice versa.**

The story of Russian chess master Alexander Alekhine shows how mental representations can drive extraordinary performance. He was one of the world's best in "blindfold" chess—a version of the game in which one of the players does not have the board in front of them, and must make all their moves and strategic calculations from memory. Through his mental representations, Alekhine had developed the ability to visualize the entire chessboard in his memory and move the pieces around in his head.

Alekhine's aptitude for blindfold chess grew out of his extensive, deliberate practice in standard, non-blindfold chess. Like many chess masters, his abilities in blindfold chess were a product of the years of experience he had in the game: because he knew it so well, he had the ability to draw an extraordinary mental representation of a chessboard.

**Applying the Principles**

While it's true that applying the principles of deliberate practice is most effective in fields like classical music and chess, you shouldn't take that to mean that you can't apply them anywhere else. **Deliberate practice can improve your performance and that of your organization, in whatever field you're in.**

But it's only possible if you and your organization let go of the idea that individual ability is solely determined by genetic characteristics. This belief isn't true: deliberate practice matters much more than raw talent or ability. Indeed, apart from people who suffer from severe physical or mental limitations, **with the right practice, just about anyone can improve in any area they choose.** You also have to recognize that it's about more than just repetition or hard work. **Simply "trying harder," by itself, will not yield the desired results.** There's usually a right way and wrong way to do something. If you're doing something the wrong way, but "trying harder," you won't see much difference (and, in fact, you might make things worse by doubling down on your faulty approach).

In a regular 9-5 job, the key is to **transform regular time at the office into an opportunity for learning and skill-building.** This gets everyone in the company used to the **idea of practicing itself—it just becomes a normal part of the business day.**

**Mock scenarios are particularly good for professional skill-building.** They allow team members to practice over and over again, receive lots of feedback, and perfect their skills without the usual costs of failure. These sorts of simulation programs have proven particularly effective in medicine.
In diagnosing breast cancer, for example, radiologists are tasked with interpreting x-rays to determine whether cancerous cells are present or not. But they're rarely ever told if their analysis was correct, as the results are typically sent to the patient's personal doctor. Based on what we know about the need for feedback, this is not a recipe for improved performance. One way to correct this...

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Here's a preview of the rest of Shortform's Peak summary:

**Peak Summary Chapter 1: The Right Kind of Practice**

We are in awe of the world's peak performers in music, athletics, and countless other fields. People like tennis star Roger Federer, Olympic vaulter McKayla Maroney, or history's brilliant composers like Beethoven, Chopin, and Rachmaninoff seem to us to be otherworldly figures, overflowing with an almost divine talent. Surely these individuals must be in possession of some rare gift, some innate spark that the rest of us simply don't have.

But that isn't the case at all. How did these people become so good at what they do? The answer may seem banal, but it's true: they practiced. They practiced the right way, they practiced with the right people, and they practiced a lot. Moreover, across all these fields, the principles of effective practice are the same, because they involve the same mental processes. The specific techniques may differ, but the basic process of challenge and improvement is the same: ballerinas and laparoscopic surgeons both become great using the same basic process. And because we can look to the great achievers of the past and present and study their success, we have a blueprint: we, too, can achieve new heights of performance.

We've all heard the phrase “practice makes perfect.” The more you work at something, the better you'll get at it. But is this true of all kinds of practice? Will mere repetition of the same task over and over again really improve your abilities? Or is there a certain kind of practice that truly challenges you to reach greater and greater heights of achievement, one that unlocks your true potential?

Most of us think of “practice” as the simple repetition of a task. And, to be sure, this kind of practice will yield some results. If you're learning how to play tennis, for example, you'll probably be able to iron out your most embarrassing mistakes and figure out how to serve the ball somewhat competently. You can go out and play tennis with your friends and be able to hold your own (or at least not embarrass yourself). But still, some weaknesses in your tennis skills persist and certain elements of the...

**Shortform Exercise: Practicing Better**

Think about how to improve your performance with better practice.

Have you ever trained for a long period of time to achieve a particular milestone? Describe the situation in a few sentences.
Human beings are meaning-making creatures. We strive to find order, coherence, and narrative amid the jumble of information we are confronted with every day. By giving the world meaning, we are able to process and make sense of what would otherwise be a baffling barrage of inputs and sensations. We know what flowers or blades of grass are when we encounter them because we have set ideas of what those things are. It is through harnessing the power of these mental representations that you can begin to unlock the vast, untapped potential of your mind.

We see this with verbal memory. It is very difficult to memorize a random jumble of words. But when these same words are arranged into a grammatical and logically coherent sentence, most people are able to easily recite it back. This is because the sentence gives us a mental representation of the content within it: it provides context and meaning, which aids in memory. This ability to recognize meaningful patterns underlies the success of some of the world's peak performers.

Creating the Template

What are mental representations? At their most basic, mental representations are templates that correspond to objects, ideas, or anything else that the brain might be thinking about. You may not realize it, but you use mental images every day. Think about a famous image, like da Vinci's Mona Lisa. When someone mentions it, you can "see" the painting in your mind's eye —this is a mental representation. They are pre-existing patterns that are held in long-term memory, enabling us to overcome the limitations of short-term memory.

Mental representations provide meaning and context that aids us as we assimilate and process information. Language itself is a complex network of mental representations, with words (which are abstract) representing real-world things. A word like dog, when a child first hears it, means nothing; it's just a catch-all label for something that shares a set of common characteristics (i.e., dogs are furry, they walk on all fours, and pant).

(Shortform note: Mental representations...)

Principles of Deliberate Practice

Truly effective practice goes a step beyond purposeful practice, to deliberate practice. Working hard and pushing yourself beyond your comfort zone, by themselves, are not enough. Deliberate practice builds on the principles of purposeful practice, but it applies them in a systematic, rigorous framework that leads to the level of performance we see from experts. Unlike purposeful practice, deliberate practice isn't about fulfilling your potential—it's about building it, making possible what was once impossible.

With deliberate practice, you are working with highly developed and well-accepted training methods that have been proven effective in getting results. These methods have been honed and perfected by those who came before you into a near-science. With purposeful practice, if you push yourself, you might see improvement. With deliberate practice, you'll become an expert. There are a few key features of deliberate practice.

Deliberate practice is defined by five characteristics that separate it from purposeful practice.
1. **Deliberate practice can be measured precisely.** Whether it's a win/loss record in chess or your finish times in a sprint, there are objective ways for you to evaluate your performance. It is informed and guided by the past achievements of great performers in a given field and an understanding of what exactly it is these individuals did that made them great. There are defined standards of excellence with deliberate practice—a mental representation of what ultimate success looks like.

2. **Deliberate practice is competitive.** This provides aspiring experts with a motivation to keep practicing and improving. You want to be the best in your field.

3. **Deliberate practice is...**

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**Peak Summary Chapter 4: Deliberate Practice in Your Professional Life**

So far, we've been analyzing the performances of individuals in elite or esoteric fields—classical music, blindfold chess, digit memorization. Obviously, most of us aren't trying to be orchestra musicians, chess masters, or digit memorization champions. But you can apply the principles of deliberate practice and mental representations to many everyday fields to improve your performance. In time, you can improve to the point where you can train others and bring them up to your level of performance—strengthening your entire organization.

**Rejecting the Myths**

Improvement is only possible if you and your organization let go of some popular myths about practice and human importance.

The first is the highly deterministic idea that your abilities are limited by your genetic characteristics. This is the old idea about "natural" talent: some people simply have it, and others don't. It shows up in the defeatist statements people make when they don't immediately achieve what they set out to: "I can't manage people," "I'm just not that creative," or "I'm just not a math person." We know this isn't true: outside of people who suffer from severe physical or mental limitations, with the right practice, just about anyone can improve in any area they choose.

The second myth is the Gladwell-inspired idea that if you do something enough times, or for long enough, that you'll automatically improve. But this is just a naive form of practice: repeating the same thing in the same way over and over again is hardly a recipe for success, no matter how many times you do it. While no one would deny the importance of hard work, this is far from being the only part of the equation. Simply "trying harder," by itself, will not yield the desired results. There's usually a right way and wrong way to do something. If you're doing something the wrong way, but "trying harder," you won't see much difference (and, in fact, you might make things worse by doubling down on your faulty approach).

Most people engaged in business or regular 9-5 jobs don't devote outside time to...
remember, the best teachers are not always themselves the best performers. Indeed, many experts make terrible teachers.

(Shortform note: We see this in sports all the time, with great players who prove to be utter flops as coaches. Wayne Gretzky, for example, is widely regarded as the greatest player ever to play in the National Hockey League. But he was a disappointment as a coach, posting a decidedly mediocre .436 win percentage over four seasons as head coach of the Phoenix Coyotes.)

When looking for your teacher, try to avoid overly subjective criteria (online ratings sites like ratemyprofessors.com, for example, are notorious for being biased in favor of teachers who are fun, personable, or physically attractive, rather than effective teachers).

You should find someone who has established skills and a strong background in the field you wish to pursue, and one who will help you develop your own mental representations and focus on the specific areas in which you need the most improvement. You may also need to switch teachers at some point, especially if you notice that you have stopped improving.

If you don't have a teacher, can't find one, or can't afford one, you can still apply most of the principles of deliberate practice to your...

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**Shortform Exercise: Setting Up Deliberate Practice**

Think about how you can more effectively use the principles of deliberate practice.

What are your biggest sources of distraction when you’re trying to practice?

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**Peak Summary Chapter 6: The Process of Expertise**

How do the world's top performers do what they do? In this chapter, we're going to examine what is required to fully tap into the potential of the human mind and body. This is usually a process that people begin when they're still children, continuing through adolescence and into early adulthood until true mastery is attained. But expert performers don't just stop when they reach a certain level of skill. They keep going, constantly striving to improve their practice routines in the quest to get better and better.

**Childhood**

In a study at the University of Chicago, one researcher looked at top achievers in music, swimming, tennis, mathematics, neurology, and sculpture. He found that they had common childhood experiences which exerted a meaningful impact on their subsequent records of achievement.

As children, they had all been introduced to their field of interest in a fun, playful way. Their parents provided them the time, attention, and encouragement to engage with it further. Indeed, the study found that the parents themselves were likely to be highly achievement-oriented. Crucially, the parents supplemented the child's initial curiosity-driven motivation with praise.

The children at this stage didn't engage in deliberate practice—yet. But they did creatively come up with activities that incorporated some elements of training. The hockey great Mario Lemieux, for example, regularly skated around with his two older brothers on a makeshift “rink” in the basement of the family home (using a bottle cap as a puck and kitchen spoons as hockey sticks). Like Lemieux, many future experts had older siblings to look up to and use as models for improving their own performance. Even the great Wolfgang Amadeus Mozart had his older sister, Maria Anna, who inspired him to pursue music.

For people who went on to dominate in fields like advanced mathematics or neurology (which, unlike chess, music, or hockey, are fairly inaccessible to young children), the parents **introduced the children to the general idea of intellectual pursuit, rather than the...**
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Peak Summary Chapter 7: The Prodigy Myth

One of the most enduring beliefs is the idea that some people are born with natural talent that enables them to excel in a particular field with comparatively little effort. In fact, innate characteristics play a much smaller role in determining performance than most people believe. Great performers and great performances are the product of long, careful, and deliberate practice. The idea of prodigies is revealed as being largely a myth, now that we have an understanding of how deliberate practice works.

There is usually a wide variability in the performance level of beginners in most fields. Some seem to excel easily, while others struggle at the outset. This also contributes to the idea that some people are just born with innate talent. But this is false. One study of young chess players, for example, showed that the amount of chess practice performed by a student was far more correlated with high scores than raw intelligence (as measured by IQ scores).

In fact, among the best-performing players, high IQ was negatively correlated with high scores in chess. The researchers found that the lower-IQ members of this elite group within the study were more likely to devote time to deliberate practice—and practice simply counted for far more than intelligence. The quality of mental representations that these elite players developed through deliberate practice was a far more important factor in their success than anything else, rendering other characteristics far less statistically significant.

The idea of prodigies is highly appealing. People want to believe in something magical or divine and reject the notion that so many wonderful parts of the human experience can be explained through science, reason, and observation. But while such a belief does speak to the unquenchable human need for mystery and wonder, it is actually quite limiting. Accepting that some people simply have natural talent and others don't might discourage you from even trying to fulfill your dreams: “I’m not good at this, so why bother?”

And it can become a self-fulfilling...
Shortform Exercise: Takeaways from Peak

Think about the main takeaways from *Peak*.

Briefly explain why the belief in “natural talent” can be destructive and harmful.