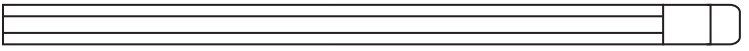
CHAPTER 2:
ANATOMY OF THE #2 PENCIL

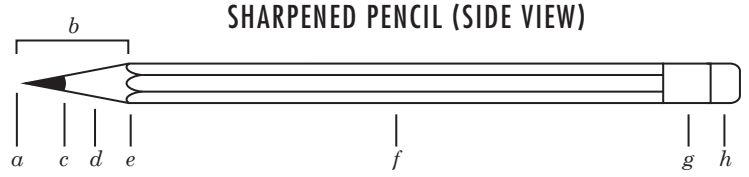
It is assumed the reader is already somewhat familiar with the #2 pencil. Let the remarks below serve only to further refine his or her understanding in the context of best sharpening practices.[1]

The typical #2 pencil is made of cedar. It is 7 ½" long, with a wooden shaft measuring 6 ¾".[2]

UNSHARPENED PENCIL (SIDE VIEW)



SHARPENED PENCIL (SIDE VIEW)



a. THE TIP of the pencil is the marking surface farthest from the eraser.

b. THE POINT of the pencil, for the purposes of this book, refers to the cone whose end is the pencil's tip and whose base is the upper limit of the unshaped shaft. This

[1] Much of the information for this chapter was gleaned from Henry Petroski's exhaustive, magisterial *The Pencil: A History of Design and Circumstance* (New York: Alfred A. Knopf, 1989), a volume which belongs on every pencil enthusiast's shelf. There are few questions about the history and engineering of pencils whose answers cannot be found between its covers.

[2] The latter measurement refers only to the exposed length of the shaft; some of the wood is hidden within the ferrule, which is clamped around it.

means the point is composed of exposed graphite *and* cedar. (Conservative readers may object to this nomenclature; I trust they will become convinced of its utility as our book unfolds.)

c. THE COLLAR TOP is the boundary between cedar and graphite.

d. THE COLLAR is that part of the point with no exposed graphite. If one thinks of the exposed graphite as a balancing visual analogue to the eraser, the collar serves as a visual analogue to the ferrule.

e. THE COLLAR BOTTOM is the boundary between the bottom of the cone and the top of the untooled shaft. (On hexagonal pencils, it is defined by scalloped edges where the shaft's planar surfaces taper into the exposed cedar point; cylindrical pencils feature no such scalloping along the collar bottom.)

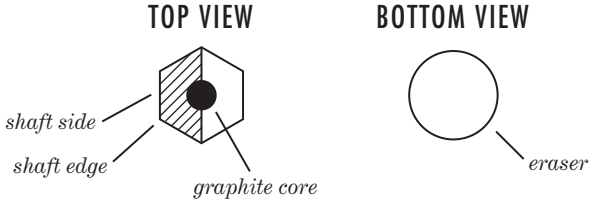
f. THE SHAFT is the wood casing surrounding the graphite core. It is also known as the body of the pencil. For #2 pencils sold in the United States, it is most often hexagonal.

g. THE FERRULE is a crimped piece of metal connecting the shaft of the pencil to the eraser.

h. THE ERASER is a mystery.

A pencil's "lead" is actually made from a mixture of graphite, clay, and wax, with a bonding agent applied to seal it inside the wooden shaft.[3] This process was first

[3] Early graphite deposits were misidentified as lead, and the appellation stuck.



developed by the Frenchman Nicolas-Jacques Conté in the late 18th century — an innovation that led to France's dominance of the pencil trade for years.

The amount of clay in the mixture determines the hardness of the lead — the more clay, the harder the point and the lighter the line. There is still no single international standard as to pencil-lead gradations. This book (and my business) focuses exclusively on #2 pencils, sometimes called HB pencils.

For years, I assumed pencils "got graphite" by having it injected into their hollow shafts. In fact, a close look at the unsharpened, or "raw" end of a pencil will usually reveal differences in color and/or grain of the opposing halves. This is because pencils are composed of two grooved pieces of cedar with a length of graphite sandwiched between them.[4]

EQUIVALENTS BETWEEN U.S. AND INTERNATIONAL PENCIL GRADATIONS, AS DEVELOPED BY CONTÉ AND THOREAU

U.S.	World
#1	B
#2	HB
#2 ½	F
#3	H
#4	2H

[4] Readers may be familiar with the phenomenon of alternating light and dark bands in a traditional ribbon of pencil shavings. This pleasing effect is the result of mismatched cedar halves in a single pencil.

Most #2 pencils are hexagonal. The design is justified by logistical and utilitarian concerns: Manufacturers realized the same piece of wood yielded more hexagonal shafts than cylindrical shafts; hexagonal pencils are less likely to roll off slanted drafting tables.[5]

You should always inspect a pencil before sharpening it. The early history of pencil production was marked by inconsistency of manufacture and outright fraud (some pencils' leads only extended a few inches into the shaft; by the time the user sharpened a pencil enough to realize the deceit, it was too late). In our own time, as more and more pencils are produced abroad with an eye on minimizing cost, we are beset with low-quality examples of the classic #2 pencil, and it behooves us to inspect them for any deficiencies that would render sharpening attempts futile.[6]

---

[5] Similarly, the flattened rectangular shaft of a carpenter's pencil makes it safe to deposit on a sharply sloped roof.

[6] Alas, the most common complaint about modern pencils concerns a shortcoming that cannot be easily ascertained by visual inspection alone: Poor-quality leads that break during sharpening, or upon application on the page. As the quality of a pencil's lead is determined by the quality of its component materials, it would be the gifted sharpener indeed who could appraise it solely by deconstructing it with his or her eyes!

However, there is one visual signifier that often predicts lead quality: The words "Made in USA" (or a European country) typically bespeaks a higher-quality pencil than "Made in China" (or "Made in Mexico"). This rule is not a product of jingoism (your author is American), but rather the cold facts of current pencil-manufacturing realities. Japanese pencils are also good.

A further point regarding lead-breakage: The single thing a pencil-user can do to increase the sorry likelihood of his or her lead breaking is dropping his or her pencil; the graphite core is vulnerable to internal shattering, which may not make itself known until the compromised section of graphite is revealed during the sharpening process. This is not to say we should coddle our pencils — they are, after all, tools to be used, and with vigor at that — but treating them with appropriate decorum cannot help but engender their finest possible utility.

The hexagonal shaft of the pencil must be straight, as bowing can lead to "shudder" in hand-crank sharpeners and irregular collars produced by pocket sharpeners. Rolling a pencil under your palm on a flat surface should reveal any bowing.

Make sure the graphite core is centered within the wooden shaft. An off-center lead will produce a point that gets progressively more difficult to sharpen evenly. Employing a pocketknife (see Chapter 4) will afford greater flexibility in pointing an errant core, but even still, the pencil user will have to moderate his or her pressure while applying that side of the point which runs closest to the edge of the shaft. Best to simply discard those pencils with cores that are more than 25% off-axis.[7]

The raw top of a new pencil should be free of paint. The iconic yellow (or black[8], or blue[9]) shaft of a pencil is colored by dipping it into a vat of paint; any paint that adheres to the raw end of a pencil bespeaks of irregularities in the finishing process, which, in turn, suggests irregularities in earlier stages of production — irregularities that indicate unfortunate compromise in matters more significant than aesthetics!

Remember: A pencil point enjoyed by the writer may not be suited for the draftsman; the ideal point for the standardized-test taker laboring in an over-lit classroom may not please the louche poet idling on a windswept

[7] Percentage is approximate and based on personal experience.
[8] I'm thinking of the infamous Palomino Blackwing.
[9] I'm thinking of German Faber-Castell pencils, which display the company's colors.

IRREGULAR PENCIL POINTS — A TAXONOMY

Irregular pin tip

Irregular collar bottom

"Throat" (exposed by irregular collar top)

"Creeping collar"

"Headless Horseman" / "Louis XVI"

peak. No point can serve all needs. The unsharpened pencil is, in contrast, an idealized form.[10] Putting a point on a pencil — making it functional — is to lead it out of Plato's cave and into the noonday sun of utility. Of course, life outside a cave runs the risk of imperfection and frustration. But we must learn to live with these risks if we want enough oxygen to survive.

Let us now walk together into the sunlight.

[10] Most vintage-pencil collectors will not deign to include sharpened pencils in their collections.