

THE TRUE LINE · BOOK ONE

The Secret of Square, Level & Plumb



How bricklayers, tile setters, and stone masons make walls true — without guessing.

A GIFT FROM VALLEY TILE · FOR CURIOUS BUILDERS AGES 8 TO 18

PRACTICE WITH A GROWN-UP

THE TRUE LINE

The Secret of Square, Level & Plumb

A True Line Book
Laid True · Ash's Yard

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A gift from Valley Tile
Northridge, California

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Written for young builders ages 8 to 18.
Free to read. Free to share with a family.

These methods are real. Tools can bite. Work with a grown-up.
Local building codes always beat a picture book.

The True Line · Six Books

Book One The Secret of Square, Level & Plumb

Book Two The Secret of the Fall

Book Three The Secret of the Waste Side

Book Four The Secret of the Scribe

Book Five The Secret of the Bed

Book Six The Secret of the Dry Room

How to Read a True Line Book

These books keep real trade secrets. Younger readers follow Ash and the pictures. Older readers use the green boxes and go outside with an adult. If you are sitting in a showroom, or in the car on the way to look at stone, the watching lists in the back will give your eyes something honest to do.

IF YOU ARE 8 TO 12

- Read the story first. Look hard at the pictures.
- Try the backyard tests with an adult.
- You do not need a job site. A hose, a board, and chalk are enough.
- New words live in the Word Chest at the back.
- If the house is being remodeled, watch one thing at a time.

IF YOU ARE 13 TO 18

- Read the green boxes. Those are working rules.
- Scale the numbers up. Bigger layouts, smaller percent error.
- Check your tools before you trust them.
- Saws, solder, drain chemicals, and live water are grown-up jobs.
- A trade is a promise: do the work true, even when no one is looking.



THE YARD

Where the Secrets Are Kept

Once, every town had a mason's yard. Dust lived in the air. String hummed between corners. Kids who hung around long enough learned that walls do not stand up by wishing. The old mason in this book is called Ash. The young builders are anyone who wants to know why a brick sits true. Ash says the same four words every morning: Level. Gauge. Plumb. Straighten. If you remember only one thing, remember this: gravity is the boss. Water finds the same height. A hanging weight finds the same down. Math finds the same square. The rest is practice. A mason's secret is usually a simple truth used carefully. A wall that is not true will not stand. That is as close to a sermon as the work needs.

Three Magic Words

Ash's extra secret: get any two of those three right, and the third often appears by itself. A level base plus a square wall gives you plumb corners. Builders have used this trick for thousands of years.

LEVEL

True across. Like a still pond. A window sill, a patio, a course of bricks, a counter waiting for stone.

PLUMB

True up and down. Like rain falling. A door jamb, a corner, a tall wall, a shower that does not lean.

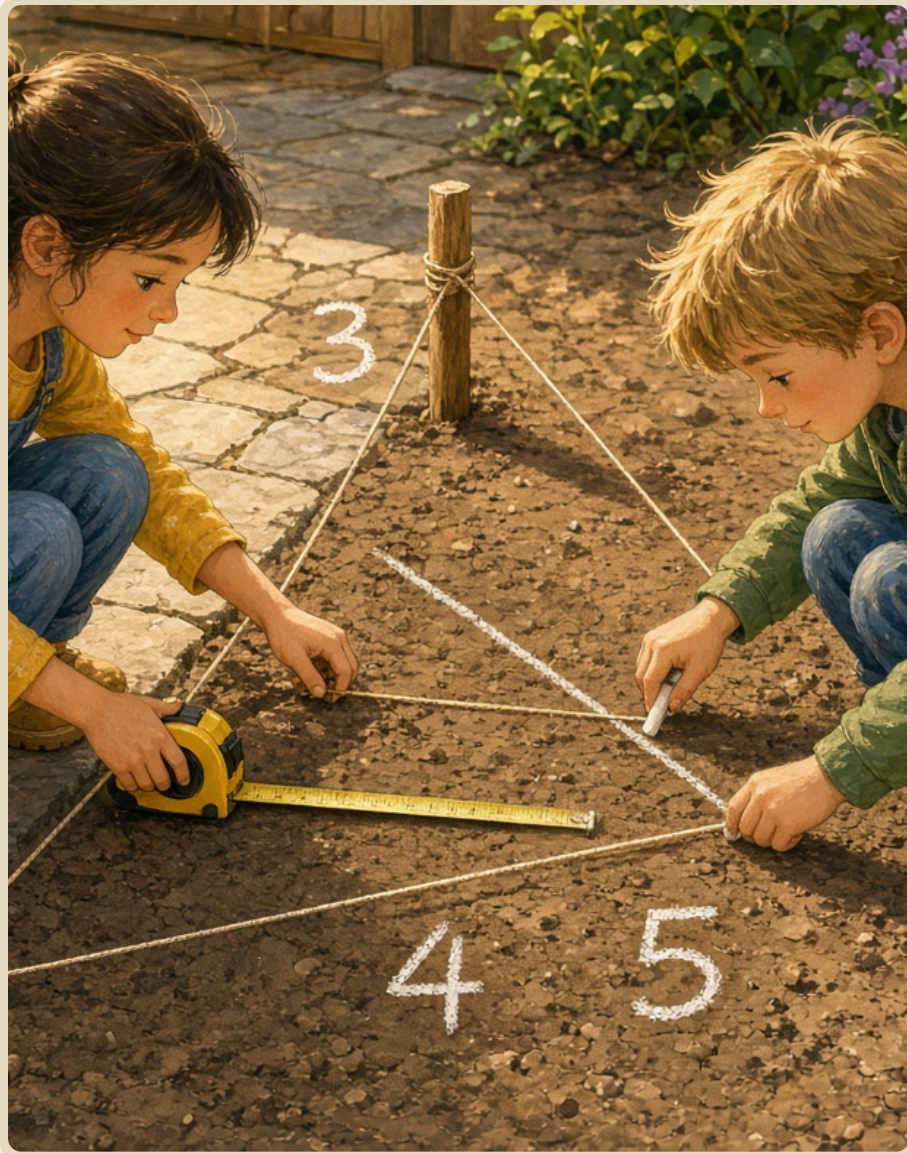
SQUARE

A perfect corner. Ninety degrees. Not almost. Not “close enough if you squint.”

THE ORDER

On a lead — a built-up corner — do it in this order every time: level the course, gauge the height, plumb the face, then straighten the units between.

The 3-4-5 Secret



Ash scratched a triangle in the dirt. “Three this way. Four that way. Five across. If those numbers match, the corner is square. That is not a guess. That is a law.” A thinker named Pythagoras wrote it down. Egyptians stretched knotted ropes long before him. Farm kids still do it with a tape. Tile setters do it in kitchens. It is the same trick.

TRY THIS

On a sidewalk or packed dirt, measure 3 feet one way and 4 feet the other from a corner. The diagonal must be 5 feet. If it is short, swing the side out. If long, swing it in.

FOR OLDER BUILDERS

Any multiple works: 6-8-10, 9-12-15, 12-16-20. Use the largest triangle that fits. Bigger baseline, smaller percent error. Keep the tape on the same edge of every mark.

Why 3-4-5 Works

In a right triangle the two short sides and the long side keep a tidy rule. Square the two short sides and add them. You get the square of the long side. $3 \times 3 = 9$. $4 \times 4 = 16$. $9 + 16 = 25$. $5 \times 5 = 25$. The square corner lives between the 3-side and the 4-side.

3-4-5

Small jobs, tabletops, boxes, a sample board in a showroom.

6-8-10

Garden beds, sheds, a bathroom layout on the floor.

9-12-15

Patios, rooms, a kitchen run before cabinets land.

12-16-20

Foundations, big layouts, a whole house footprint.

The Equal Diagonals Trick



“A rectangle has a hidden test,” Ash said. “Measure corner to corner both ways. If the two long X lines match, the shape is square — even if the sides look a little wonky.” This is how a setter checks a room before the first tile hits the mud. The walls may lie. The diagonals do not.

TRY THIS

Make a rectangle with four sticks and string, or use a sandbox. Measure both diagonals. Push a corner until the two numbers agree.

FOR OLDER BUILDERS

This is the fastest whole-layout check on slabs, decks, and first courses. Matching diagonals prove a rectangle. Then confirm one corner with 3-4-5.



CHAPTER FOUR · AN OLD, OLD SECRET

The Rope Stretchers

Long before steel tapes, surveyors in Egypt were called rope stretchers. They pulled knotted cords tight so the rope would not sag, then laid out fields and temple foundations. A cord divided into twelve equal parts can be folded into a 3-4-5 triangle. Stretch it. Stake it. The corner that appears is square. The same idea still lives in every mason's tape, and in the chalk lines snapped across a bathroom floor in the Valley. You do not need a pyramid. You need a taut line, honest numbers, and the patience to check twice. Work that is true outlasts the person who laid it. That is one way a trade serves something larger than a paycheck.

The Water Snake



Ash handed the kids a clear hose. “Water is wiser than we are. Fill the hose. Keep out the bubbles. The water at both ends will always rest on the same invisible shelf — even around a house.” Before lasers, this is how a whole foundation found one height. It still works when the batteries die.

TRY THIS

Fill a long clear tube with water. Hold the ends up. Mark the water height on two posts far apart. Those marks are level with each other. Cap the ends when you walk.

FOR OLDER BUILDERS

Keep the middle of the hose lower than both open ends. Read the middle of the meniscus, not the wet rim. A hose level still beats a cheap laser around corners and over long runs.

The Hanging Stone



A pointed weight on a thin string is called a plumb bob. Plumb comes from the old word for lead. Hang it. Wait. The Earth pulls the weight straight down. That line is the truest vertical you can have. A door that is not plumb will never close the same way twice. A shower wall that leans will fight the tile for the rest of its life.

TRY THIS

Tie a metal washer or small weight to string. Hang it beside a door frame. Measure the gap at the top and the bottom. If the gaps match, the frame is plumb.

FOR OLDER BUILDERS

Check a corner on two faces. Wind makes a bob wander — wait for it to settle. Over a full story, a plumb line is still more honest than a short spirit level.

The Singing String



Ash built two corners first, like little towers. Then he stretched a tight white line from one to the other. “We do not lay bricks to the last brick,” he said. “We lay them to the line. The line is the boss of the wall.” A good line is a standard outside yourself. You do not argue with it. You come up to it.

TRY THIS

Plant two stakes. Stretch string tight between them. Crouch and look along the string. Any sag or bow shows at once. That is how a mason “sights” a course.

FOR OLDER BUILDERS

Build the leads (corners) first, then fill the middle to the line. On long runs, a mid-span support called a trig stops the line from drooping. A sagging line builds a banana wall.

The Story Stick



Ash marked a long board with every course: one brick plus one mortar joint, over and over. “This stick remembers the story of the wall,” he said. “Window sills, door heads, the top of the wall — all on one pole. Both ends grow together.” Guessing each course by eye is how one corner grows taller than the other. The stick will not forget.

TRY THIS

On scrap wood, mark every 3 inches, or every brick-plus-joint you choose. Use the stick to keep two stacks of blocks the same height. No guessing.

FOR OLDER BUILDERS

A story pole (gauge rod) is how opposite corners stay in step. Mark finished-floor height, openings, and bond beams on the same stick so you hit them without measuring every course.

The First Course Tells the Truth

Before mortar, Ash laid a whole row of bricks dry on the footing. He slid them. He frowned. He started again so the ends would not finish on a skinny little sliver.

DRY LAY FIRST

Place units with no mortar. Prove the pattern, the joint size, and that both ends look fair.

CORNERS BEFORE MIDDLE

Build the leads. Check them. Then stretch the line and fill in.

FIX THE BASE, NOT EVERY BRICK

If the footing is a little out, correct on the first bed. After that, copy the first course.

DO NOT CHASE A WALL

Working from only one end lets error pile up. Two good corners keep the wall honest.

The Tile Setter's Cross



Rooms lie. Walls are rarely square. Tile setters do not trust the walls. They snap two chalk lines that cross in the middle of the room — perfectly square to each other — and build the field from the center out. If you are watching a bathroom floor go in, look for that cross before you look for pretty tile. The pretty part is the last part.

TRY THIS

Find the middle of opposite walls. Snap a chalk line. Make a second line square across it with 3-4-5. Dry-lay tiles from the crossing. If an edge cut is a skinny sliver, shift the grid by half a tile.

FOR OLDER BUILDERS

Industry rule of thumb: no cut smaller than half a tile when you can help it. Square the tile field to itself or to the most visible wall. Let hidden edges absorb the building's mistakes.

Stone Has Its Own Manners



Stone is heavier and ruder than brick. Ash showed them strings that leaned inward — a batter — so a garden wall would sit like a person with good feet. Long through-stones tied both faces together so the wall would not become two skinny walls pretending to be one. In a showroom, a slab looks calm. In a wall, stone wants to roll, twist, and lean. The mason's job is to give it manners without fighting its nature.

TRY THIS

Build a tiny dry-stone edge in the garden. Biggest stones at the bottom. Each stone should touch its neighbors. Step back often and look.

FOR OLDER BUILDERS

Offer a stone dry, mark the high spots, dress them, then bed it. Wedges hold it while you pack. Through-stones and batter frames keep rubble walls from leaning out as they grow.

Never Trust a Tool You Have Not Tested

Ash flipped his level end for end on the same brick. “If the bubble tells two stories, the tool is lying. Check the tool before you check the wall.”

THE FLIP TEST

Set a level on a surface. Read it. Turn it 180 degrees on the same spot. The bubble should agree.

THE SQUARE FLIP

Draw a line along a steel square. Flip the square and draw again. Two lines should become one.

THE SAG LOOK

Sight down a mason’s line before you trust it. Mid-span droop builds a smile into the wall.

THE HOSE RULE

No air bubbles. Hose below both ends. Recheck after you move, because water sloshes.

Three Real Projects

The Square Sandbox

Ages 8+

Build or check a rectangular planter. Use 3-4-5 on one corner and equal diagonals on the whole box. If both tests pass, you have a true rectangle. That is enough geometry to start a house.

The Level Clothesline

Ages 10+

Use a water hose to mark the same height on two posts that cannot see each other. Stretch a line between the marks. Hang a plumb bob from the line to see true down.

The Centered Tile Sample

Ages 12+

On a scrap board or a small floor sample, snap a square cross. Dry-lay 16 tiles from the center with spacers. Shift until edge cuts are fair. That is a real setter's layout.

What to Watch in a Room

If the bathroom or kitchen is open, do not get underfoot. Stand where you are told. Watch one secret at a time. The work is older than the house.

THE FIRST LINE

Look for chalk or a tight string before the first tile or brick is set. The line is the boss.

THE HIGH CORNER

Ask which corner or which floor spot is the high one. Everything else climbs to it or is cut to it.

THE DRY LAYOUT

Tiles or bricks sitting with no mud yet. That is the pattern being proven, not decorated.

THE TOOL CHECK

Watch someone flip a level. If they trust a tool they have not tested, the wall will remember.

THE LEFTOVER CUTS

Skinny slivers at a doorway mean the grid was not shifted. Fair cuts mean someone cared.

THE CLEAN FLOOR

A good crew leaves the site tidier than they found it. That is also a trade secret.

Questions Worth Asking

There are no trick answers. Talk with a grown-up. Write on the practice page if you want.

01 Why is a wall that leans still a kind of lie, even if nobody notices at first?

02 If two of the three — level, plumb, square — are right, why does the third often appear?

03 The Egyptians used knotted rope. You have a tape. What did not change?

04 When is “close enough” not close enough in a house people will live in?

05 Ash says the line is the boss. What else in a good life works like that — a standard you come up to, not an opinion you argue with?

Draw the Cross

In the grid, mark the middle. Draw two lines that cross square. Sketch a field of tiles from the center. Shade any edge cut that would be a skinny sliver, then shift the grid and try again.



Keep the line. Check twice. A gift from Valley Tile.

The Word Chest

Batter

A planned lean, usually back into the hill, so a wall is thicker at the bottom.

Bed joint

The horizontal mortar joint a unit sits on.

Bond

The pattern that ties units together so joints do not stack into a weak line.

Course

One horizontal row of brick, block, stone, or tile.

Gauge

Keeping course heights even. The story pole is a gauge tool.

Head joint

The vertical mortar joint between two units.

Lead

A built-up corner used as the master for the rest of the wall.

Line / mason's line

The taut string that units are laid to.

Meniscus

The curved top of water in a tube. Read the middle of it.

Plumb

Exactly vertical.

Story pole

A stick marked with every course height and important openings.

Through-stone

A long stone that reaches through a wall and ties both faces.

Trig

A clip or block that supports a long mason's line so it does not sag.

Wind / winding

A twist in a surface, as if opposite corners are both high.

The Builder's Promise

Craft is courage plus care. These secrets are real, but stone is heavy, mortar can burn skin, and cutters can bite. A young builder works with a grown-up until the habits are as true as the wall.

- 01** Ask an adult before mixing mortar, cutting tile or stone, or lifting anything heavier than a school backpack.
- 02** Wear closed shoes, gloves when a grown-up says so, and eye protection for chipping or cutting.
- 03** Do not climb unfinished walls. Do not work under hanging stone.
- 04** Wash dust off your hands. Stone and brick dust do not belong in lungs — cutting is a grown-up job with the right mask.
- 05** Leave the site tidier than you found it. That is also a secret of good trades.
- 06** Keep your word the way you keep a line. A house is a long promise.

ASH'S LAST WORD

A true wall is a kind of honesty you can lean on. Measure twice. Look once more. Then set the piece and do not fuss it to death.



THE LINE IS STILL THERE

Level. Gauge. Plumb. Straighten.

THE TRUE LINE · A GIFT FROM VALLEY TILE · AGES 8 TO 18 · PRACTICE WITH A GROWN-UP · CHECK TWICE