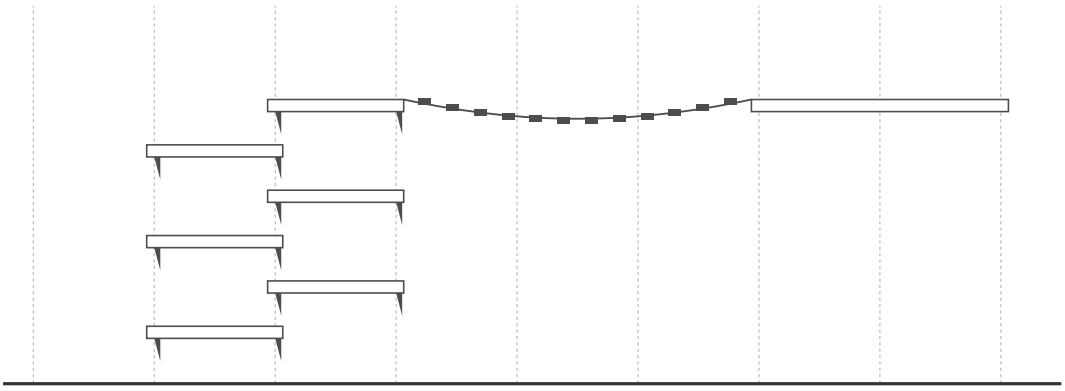
BUILT BY NUMBERS · BOOK 3

Cat Highways

The Weekend Builder’s Math for Wall Steps, Shelves, a Bridge, a Sisal Post and a Window Catio, Sized to Your Cat and Fixed to Hold the Landing



Square, level and costed before you drill.

SIZU RIATTO

How to use these sheets

Print as many copies as you like, and take a clean sheet to the wall so the book can stay away from the drill dust. **Template A** is the shopping list for both parts of the build: quantity, unit price, total and a box to tick when it is bought. **Template B** is the two-weekend plan, with the wait for the finish written in. **Template C** is the route sheet: your wall and your cat, every stud measured from one zero, where each step, the lookout and the post go, and the bridge.

Each sheet is explained, with the book's own highway worked in full, in the chapters: the cat in Chapter 1, the steps in Chapter 2, the parts in Chapter 3, the studs in Chapter 4, the landing in Chapter 5, the bridge in Chapter 7, the sisal in Chapter 8, the catio in Chapter 9, and the plan in Chapter 10. The calculators at **sizuriatto.com/calculators** do the same arithmetic with your numbers.

The last page, a winter shelter for outdoor cats, is meant to be given away: to a neighbor who feeds community cats, or to a local trap-neuter-return group.

These are planning sheets, not an engineering design. Find the studs and check for cables and pipes before you drill, and follow the product labels.

Template A — The Shopping List

A clean printable copy is at **mathworkbook.netlify.app/go/cat-shopping-list**.

Wall and cat: _____

Design weight of the heaviest cat: _____

Date of prices: _____

Part A, the wall highway

Material	Quantity	Unit price	Total	Bought
Boards for steps and lookout				
Board for the bridge slats				
Brackets (two per step, one per stud on the lookout)				
Post and its foot				
Structural screws into the studs				
Short screws, bracket to board				
Eye bolts, washers and nuts				
Sisal rope (post and bridge)				
Carpet or other grip				
Staples, glue, finish				
Total				

Part B, the window catio

Material	Quantity	Unit price	Total	Bought
2x2, untreated (box and door)				
2x2, treated (legs only)				
Plywood floor				
Welded mesh (opening no more than 1 in, 16 gauge)				
Exterior screws and staples				
Hinges, hook and eye, barrel bolt				
Total				

Template B — The Weekend Plan

A clean printable copy is at **mathworkbook.netlify.app/go/cat-weekend-plan**.

Helper: _____Where the cat will be while you work: _____

Weekend 1: the wall highway

Time	Job	Hours	Done / notes
	Landlord's yes (if renting); wall scanned for cables and pipes		
	Studs found and marked from one zero; route drawn		
	Cut boards, post foot and slats; sand the edges		
	Finish edges and undersides; carpet the tops		
	The wait: wrap the sisal post		
	Brackets into the studs; boards on, level		
	Bridge: eye bolts, slats on ropes, hang, set the sag		
	Post stood and anchored; every step tested by hand		

The wait. Finish dry and cured (as the can says) before the cat uses the shelves: _____

Weekend 2: the window catio

Time	Job	Hours	Done / notes
	Cut the 2x2s; build and square the box frame		
	Legs, braces, floor; finish the frame		
	Mesh stapled on; cut ends folded in; the door		
	Fixed at the window; screen out; shelf, shade, water		

First visits. Stay with the cat for the first few times in the catio. Date of first visit: _____

Template C — The Route Sheet

A clean printable copy is at **mathworkbook.netlify.app/go/cat-route-sheet.**

The wall and the cat

	The book's highway	Yours
Wall width and ceiling height	4.0 m × 2.44 m	_____
Stud spacing	406 mm (16 in)	_____
First stud from the left corner	387 mm	_____
Cat's weight; head and body	6 kg; 460 mm	_____
Landing check, 6 × the weight	353 N	_____
Rise between steps; first step	300 mm; 450 mm	_____

Studs, all from one zero

Stud	From zero, planned	From zero, found	Holds
1			
2			
3			
4			
5			
6			
7			
8			
9			

The pieces

Piece	Height to top	On studs	Length	Checked level
Step 1				
Step 2				
Step 3				
Step 4				
Step 5				
Step 6				
Lookout				
Post				

The bridge

	The book's bridge	Yours
Span; sag	1,168 mm; 120 mm	_____
Curve length; slats; gap	1,201 mm; 11; 18.6 mm	_____
Rope each side, with tails	1,801 mm	_____

Bonus: A Winter Shelter for Outdoor Cats

Not every cat has a wall to climb. If there are outdoor cats near you, community cats looked after by a neighbor or a trap-neuter-return group, a small shelter can get one through a cold night. It is the gentlest build in this book, an afternoon's work, and it runs on the same arithmetic as everything before it.

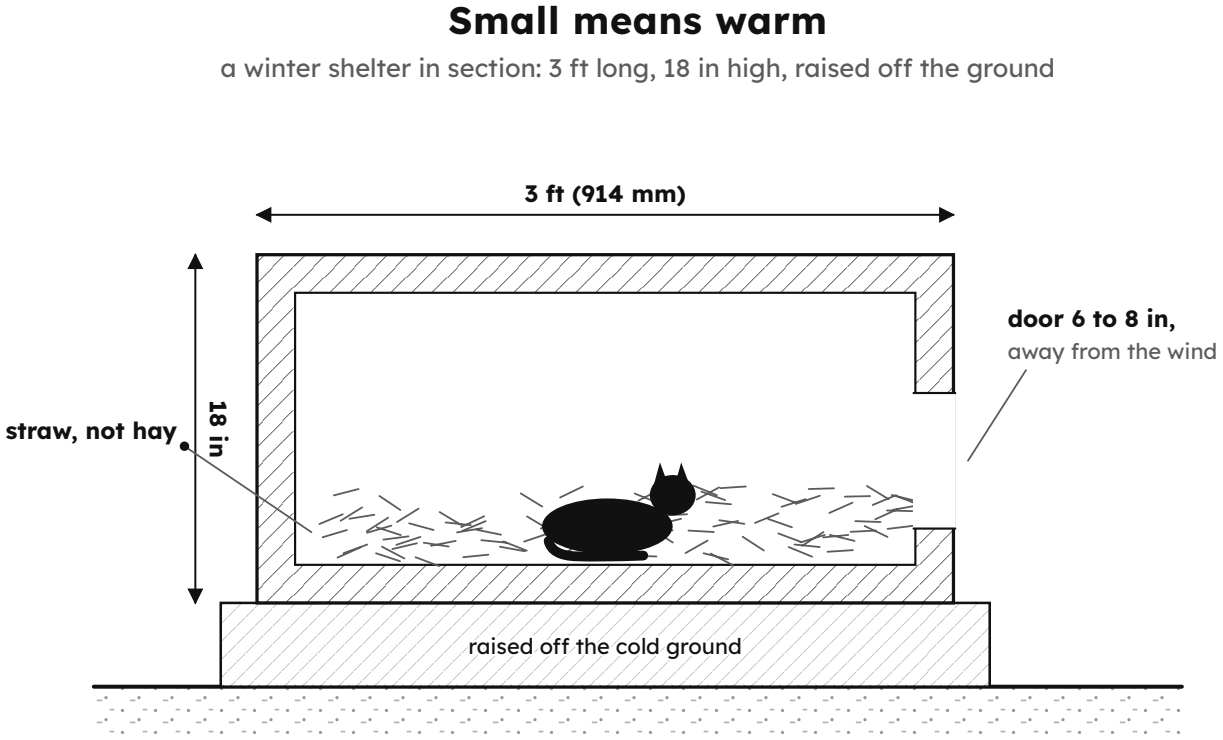


Figure 1: A winter shelter, in section

The size: small means warm

Alley Cat Allies, a US charity that works with community cats, suggests a shelter about **2 ft × 3 ft** and **at least 18 in high**, big enough for three to five cats to huddle. That is 3 × 2 × 1.5 = **9 cubic feet**, about **0.25 m³**.

Why not bigger? Because the only heater in the box is the cats. A cat warms the air around it, and heat leaks out through the walls,

so the less wall there is, the warmer the inside stays. Work out the surface of the box:

> $2 \times (3 \times 2 + 3 \times 1.5 + 2 \times 1.5) = 2 \times (6 + 4.5 + 3) =$ **27 sq ft**

Now make it "roomier", 4 ft × 3 ft × 2 ft:

> $2 \times (4 \times 3 + 4 \times 2 + 3 \times 2) = 2 \times (12 + 8 + 6) =$ **52 sq ft**

The big box holds about **2.67** times as much air, and loses heat through about **1.93** times as much wall, with the same cats inside to warm it. Small means warm.

The details that matter

- **The door: 6 to 8 in wide.** Big enough for a cat, small enough to keep larger animals out. Face it away from the wind, or put a baffle (a short inside wall) behind it so the wind cannot blow straight in.
- **Straw, not hay.** Straw stays dry and lets the cats burrow. Hay soaks up water and goes mouldy, and so do blankets and towels, which then chill the cat instead of warming it.
- **Off the ground.** Stand it on a pallet or a couple of bricks, so water stays out and the cold ground does not draw the heat away.
- **Somewhere quiet.** Away from traffic and footpaths, in a dark or sheltered spot.

The cheapest version is two plastic storage tubs, one inside the other, with straw packed between them, a foam board under the inner tub, and a door cut through both. Alley Cat Allies publishes step-by-step plans; if a local group looks after the cats near you, they will know what works in your climate, and they may well want your shelter.

Source: Alley Cat Allies, "Providing Shelter" and their outdoor cat shelter plans (checked November 2026).