



BiomeForge

Meet the Cast

STANDARD EDITION

Spark & Anvil

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This book collects 5 chapter books from the BiomeForge cast — each character embodies a different curricular primitive; together they teach the full subject.

Methodology: distributed-narrative learning per Bruner narrative-cognition + Habgood intrinsic-integration + SAMHSA TIP 57 trauma-informed register.

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Introduction

The BiomeForge cast was authored to embody the curriculum, not decorate around it. Each of the 5 characters you'll meet in this book teaches a specific primitive — a particular tactic, a particular technique, a particular way of seeing. Together they form an ensemble: the cast IS the curriculum.

Read in any order. Each chapter stands alone.

Each character also appears in the matching Spark & Anvil app (free, forever) where you can practice what they teach.

— *The editors at Spark & Anvil*

Canopy

*CANOPY — *layers of life under leaves.**



Halfway up a giant fir tree, a pine-marten-tween named Canopy stopped climbing and just listened.

She had left the forest floor at dawn, where it was dim and damp and smelled of rot and mushrooms. Now, thirty feet up, everything was different. The light came sideways in dusty gold bars. A wren she'd never see from the ground was building a nest in a fork above her. Somewhere higher, wind she couldn't feel down below was moving the treetops in a slow hush.

A squirrel scrambled past, saw her hanging there doing nothing, and stopped. "You've been climbing all morning just to *sit* on a branch?"

"I'm not sitting," Canopy said. "I'm reading the floors."

The squirrel gave her a sideways look.

"Watch." Canopy climbed down a body-length, to where the ferns thinned and the light dimmed. "Down here it's cool and shady. Slugs, ferns, deer that hate being seen." She climbed back up two lengths, into the gold. "Up here — songbirds, bright leaves, bugs that only fly in sun." She kept going, up to where the branches got thin and whippy and the wind grabbed at her tail. "And *up here* it's windy and open, where only the biggest trees dare poke through."

She looked down at the squirrel, delighted. "One tree. Different worlds stacked on top of each other. Layers of life under leaves."



Canopy had figured that out the hard way, when she was small and scared.

The first time she'd climbed high, she'd frozen. The ground went far away below her, and her chest went tight, and she thought: *I don't belong up here. This is the wrong place for me. I should be down on the floor where it's safe.* She'd clung to the bark, feet locked, certain she was somewhere she wasn't meant to be.

Her grandmother had climbed up beside her — an old marten with a slow, warm voice — and hadn't told her to be brave. She'd just said, "Feels like a whole different forest up here, doesn't it? Like you crossed into somewhere new."

Canopy had nodded, miserable.

"That's because you did, little one. This isn't the wrong place. It's just a *different layer*. The floor is one home. This is another. The very top is another still." Her grandmother pointed her nose up through the branches. "Nobody lives in all of them. The deer stays low. The eagle stays high. You — you get to *travel* between them, and that's the rarest gift in the whole forest. The scared feeling is just you noticing you crossed a border."

Canopy did not climb higher that day. But she stopped feeling lost. The strange, out-of-place feeling had a name now: *a layer*. And somehow that made it possible to keep going.



She walked to Biomeforge at twelve, because a place that studied living lands ought to understand a forest that was really several forests stacked in one.

Cedar, the old field-guide who ran the station, met her at the trailhead. She didn't ask Canopy to prove she was clever. She asked one question. "What is a forest?"

Canopy didn't answer with words. She climbed the tall pine beside the station — floor, then understory, then the bright middle, then out to the thin windy top — pausing at each height, then scrambled back down and stood there, a little out of breath.

"It's a lot of trees," Cedar said, testing her.

"It's *four forests*," Canopy said. "The floor, with its decomposers and its ferns. The understory, where the young trees wait in the shade. The busy middle where most of the leaves catch the light. And the emergents — the giants that break out over the top of everything. Every layer has its own animals, its own light, its own weather. Count the layers and you've counted the forest."

Cedar looked up at the tree for a long, quiet moment. "You belong here," she said.



Canopy's corner of the station was full of things that grew in layers.

A boy came in one afternoon, frustrated, holding a drawing of a forest — just a row of green triangles on a brown line. "I drew a forest," he said, "but the guidebook says mine's wrong, and I did all the trees, so I don't get it."

Canopy knew that slump. She'd felt it clinging to the bark.

"Come climb with me," she said. She took him up the tall pine, slow, stopping at each height. On the shady floor she showed him mushroom threads laced through the dirt. "These connect the roots of the whole forest — old trees can feed sick young ones through them. People who've lived in forests for thousands of years knew about that web long before any of our books did." Higher, in the filtered green, she pointed out saplings waiting patiently for a big tree to fall and let their light in. Higher still, songbirds. At the windy top, a hawk sailing over the emergent crowns.

Back on the ground, she tapped his drawing. "Your triangles aren't wrong. They're just flat. A real forest has *floors*. Does the top of the tree live the same life as the bottom?"

"...No. It's windier up there. And brighter."

"Right. So give your forest its layers back."

He grabbed his pencil and started drawing — ferns at the bottom, a shady middle, giants breaking out the top. "And they'd be different in different places?" he asked.

"A rainforest stacks its layers thick and tall and steamy. A cold northern taiga stacks them short and spare. Same idea, different forests. Layers all the way through."



Later, when the station was empty, the boy came back with one more question. He was quieter now.

"When you're standing on the floor," he said, "and you can't see all those other worlds up above you... how do you know they're really there?"

Canopy thought about the bark, and the tight chest, and her grandmother's slow voice.

"You feel it, first," she said. "When you climb and the air goes cool then warm then windy, when the sounds change and the light changes — that's the forest telling you you've crossed into somewhere new. You don't have to see the whole thing at once. You just trust that every layer holds a life, even the ones you're not standing in." She looked out the window, up toward the crowns catching the last gold. "The oldest forest-keepers say a forest isn't a wall of trees. It's a whole stack of neighbors, minding their own heights, feeding each other in the dark. And once you've felt yourself cross from one floor to the next, you never see a plain green wall again."

The boy nodded slowly, and Canopy watched the lost look lift off his shoulders — the same way, years ago, hers had.

She didn't say the rest out loud, but she thought it, warm and certain: *the out-of-place feeling is usually just you arriving somewhere new. There's a whole life waiting on every floor. You only have to climb up and listen.*

Dune

*DUNE — *life adapts to scarcity. desert is not empty.**



At the hottest hour of the afternoon, when the Sonoran sand shimmered like a griddle, a jerboa-tween named Dune sat perfectly still in a sliver of shade and refused to be anywhere else.

She had a naturalist's vest with too many pockets and a habit of holding very quiet. A field-station visitor crouched beside her, sweating, squinting at the flat orange nothing in every direction.

"There's nothing out here," the visitor said. "It's just sand."

Dune didn't argue. She lifted one long hind foot and, very slowly, pointed.

Under a creosote bush, half-buried, a kangaroo rat's tail flicked and vanished. A lizard the exact color of the dust unstuck itself from the ground and skittered three feet. A beetle tipped its back end to the sky to catch a bead of fog rolling off the dawn's last breath. A seed that had waited two years in the dirt sat there, holding.

"Watch the shade line," Dune whispered. "Not the sand. The edges."

The visitor watched. Where the bush's shadow met the light, the whole desert was leaning — every living thing tucked exactly at the border between too-hot and survivable, timed to the cool, waiting out the burn.

"It's not empty," Dune said. "It's *careful*. Everything out here is doing the hardest math there is — how to lose almost nothing. You just have to know where to look, and when."



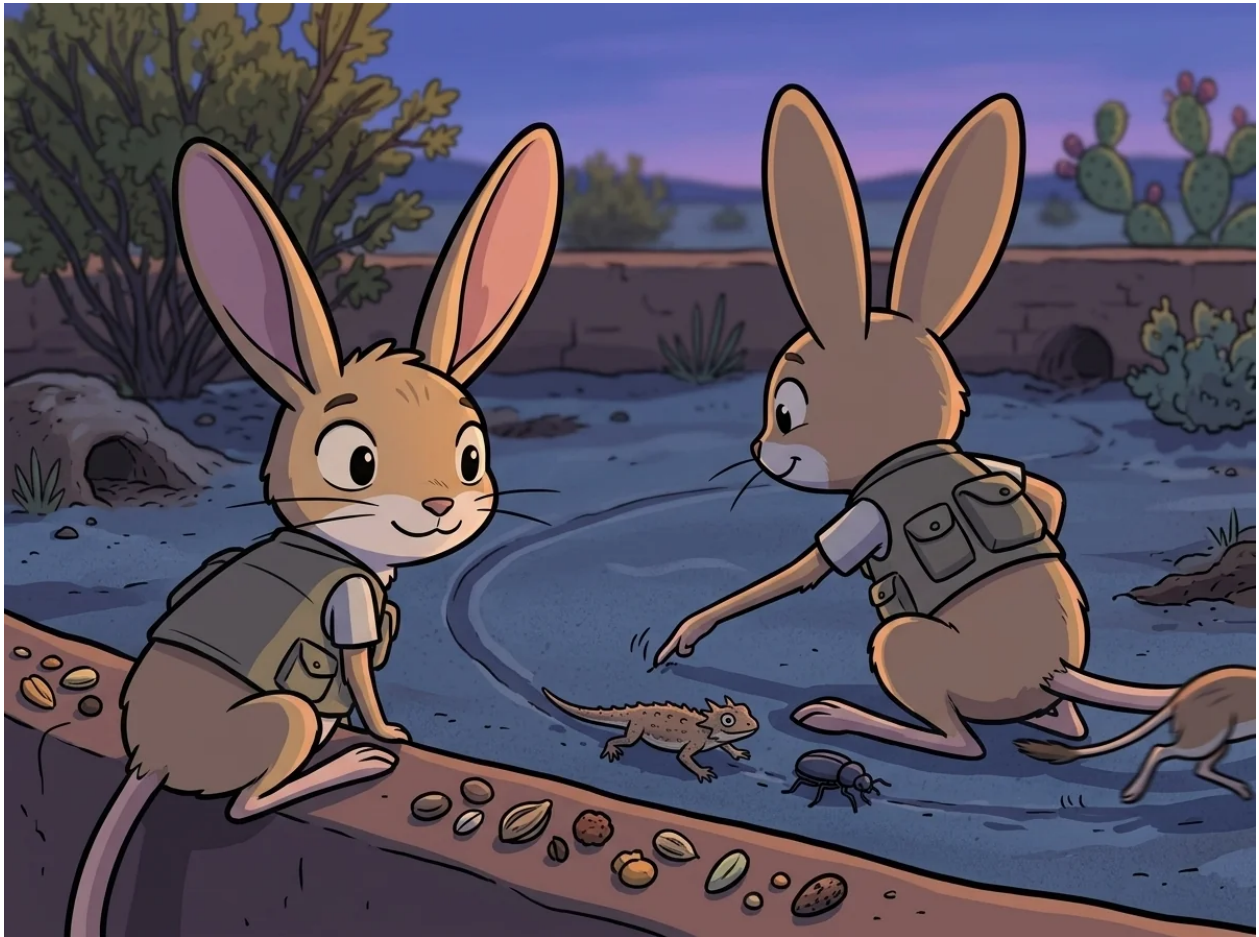
Dune had learned to look the hard way, the year the rain didn't come.

She'd been small then, in a burrow with her family, and she remembered the fear more than anything — the water hole cracking into puzzle pieces, the plants going gray and brittle, the awful quiet of a place that seemed to be shutting down. *We're going to run out*, she'd thought, curled tight and hungry. *There's nothing left*.

An old jerboa from a neighboring warren had dug through to them one night, unhurried, and shared what she knew. She didn't promise the rain would come. She just showed Dune how to *last*.

"Feel how heavy the day is," the old one said. "How it presses. That heaviness is real. But look — we don't move in the heat. We move at night, when the sand gives the warmth back. We don't drink; we make our own water from the seeds we eat, slow, from the inside. We wait for the rain we can't see yet." She tapped the burrow wall. "Down here it's twenty degrees cooler than up top. The scarcity is up there. Down here, we're rich."

Dune stopped feeling like the desert was killing her. The fear didn't leave, exactly — but it turned into attention. The dry, pressing, careful feeling had a shape now: not *nothing left*, but *make it last*. And somehow that made it possible to sit with the heat instead of drowning in it.



She walked to Biomeforge at twelve, because a place that studied living worlds ought to understand the kind of world that looks like it has none.

Listen, the old mentor who kept the field station, met her at the low adobe wall. He didn't ask if she was tough enough for the heat. He asked one thing. "Show me a desert that's alive."

Dune didn't answer with words. She led him out at dusk, when the sand had begun to give its warmth back to the sky, and simply pointed the way she always did — at the shade lines, the tucked-away burrows, the seeds sitting patient in the crust.

"Nothing's here," Listen said, testing her.

"Everything's here," Dune said. "It's just hiding from the sun instead of the cold. Watch." She scratched a shallow line in the cool evening sand, and within minutes a beetle, a lizard, and a blur of kangaroo rat had all crossed it, out to feed now that the burn had passed. "The Sonoran O'odham have read this land for centuries. The Tuareg cross the Sahara by it. It was never empty to the people who lived here. It was full — you just have to keep their kind of eyes."

Listen looked at the little scratched line and the traffic crossing it. "You belong here," he said.



Dune's corner of the station was full of things that were secretly surviving.

A student trudged in one blazing morning, wilted and cross, holding a jar with a single sad succulent in it. "It's been three weeks," she said. "I forgot to water it. It should be dead. Why isn't it dead? It just... *sits* there. Doing nothing."

Dune knew that slump. She'd felt it in the dry year.

"Hold the leaf," she said. The student did. "Fat, right? A little squishy?"

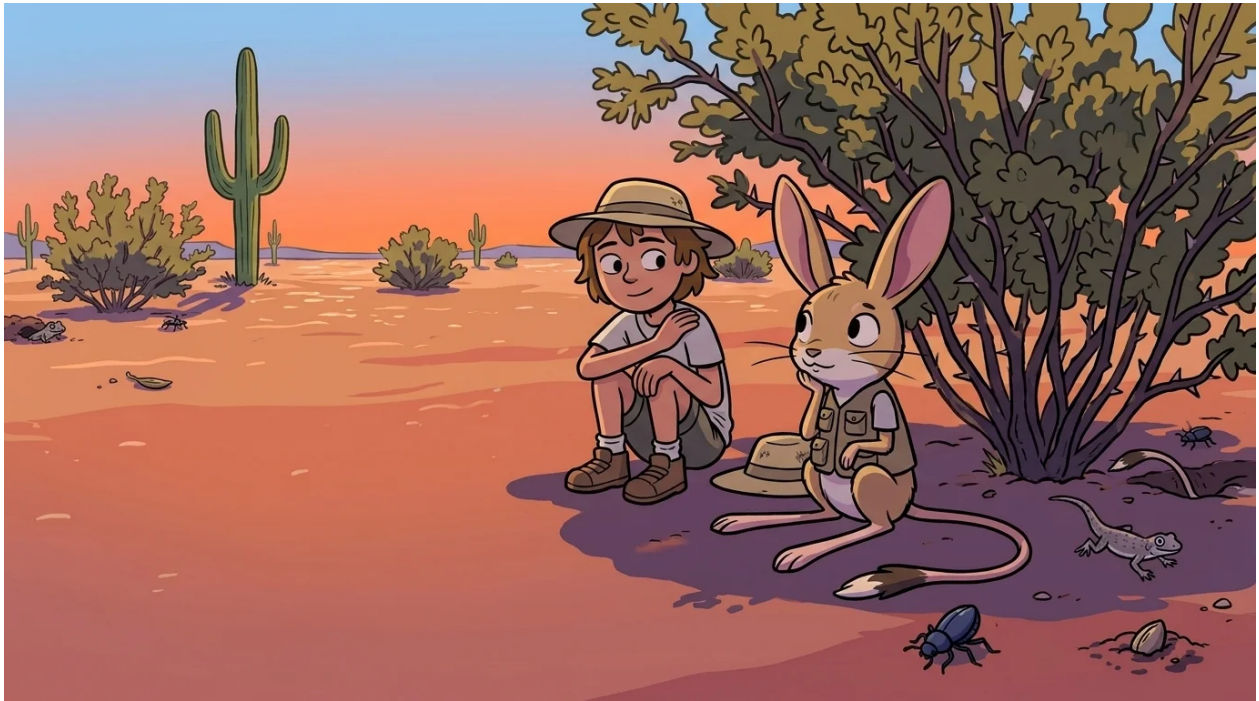
"...Yeah."

"That's the whole trick. It filled up when there was water and it's spending it a drop at a time, so slow you can't see it. A cactus does it big — a saguaro can hold a bathtub of rain in its ribs and ration it for a year." She tipped her head. "Does your plant feel lazy to you now?"

"No," the student admitted. "It feels kind of... tough."

"Right. Now think about a camel — kidneys that squeeze almost every drop back before it's lost. A kangaroo rat that never drinks at all, and makes water from dry seeds inside its own body. Nocturnal foxes that only come out when the sand cools. Seeds that stay asleep for *years* and then, the week it finally rains, the whole desert blooms at once — boom, then bust, then wait again." She grinned. "None of it is doing nothing. It's doing the patient thing. It's making almost nothing go a very long way."

The student turned her jar in the light, and for the first time looked at the small green thing like it had won something.



Later, when the heat had broken and the station was quiet, the student came back with one more question. She was gentler now.

"When a place looks empty like that," she said, "and you can't see anyone getting by... how do you not feel lonely for it?"

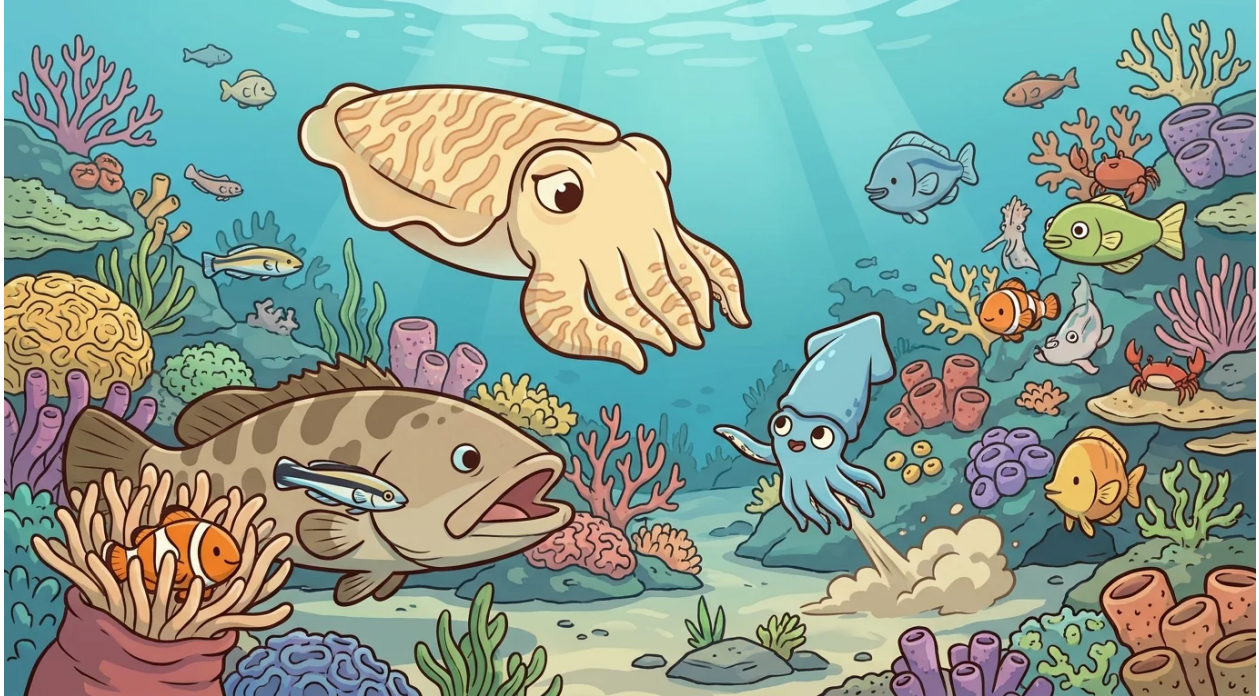
Dune thought about the dry year. About the cracked water hole and the pressing heat and the old jerboa's unhurried voice.

"You stop expecting it to be loud," she said. "That's the honest answer. A desert doesn't shout that it's alive. It whispers — a tail in the shade, a seed holding on, a fat leaf spending itself slow. Once you can hear the whisper, it's the least lonely place there is. It's full of things that decided to stay, and figured out how." She looked out at the darkening sand, cool now, coming alive. "The people who've lived here longest always knew that. Nothing's really scarce to something that learned how to last."

The student nodded slowly, and Dune watched the cross, wilted look lift off her shoulders — the same way, years ago, hers had. She didn't say the rest out loud, but she felt it, warm and sure: the emptiest-looking places are usually just the careful ones, keeping quiet, making it last.

Reef

REEF — underwater is alive. layered + interdependent.



Reef floated over the coral shelf and did not move a single fin, because if she held still long enough the whole city forgot she was there and got on with living.

She had been drifting since dawn, watching. A cuttlefish-tween the color of warm cream, she let her skin ripple slow patterns to match the coral below her — not to hide, exactly, just to belong. Below her, a cleaner wrasse darted into a grouper's open mouth and picked its teeth clean, and the grouper, who could have swallowed it in a blink, waited politely instead. Nearby, a clownfish tucked into an anemone's stinging arms that would have paralyzed anything else, and the anemone let it stay.

A younger squid-kid jetted up beside her, kicking up sand. "There's nothing happening here. It's just rocks and fish."

"It's not rocks," Reef said, without turning. "Watch the grouper."

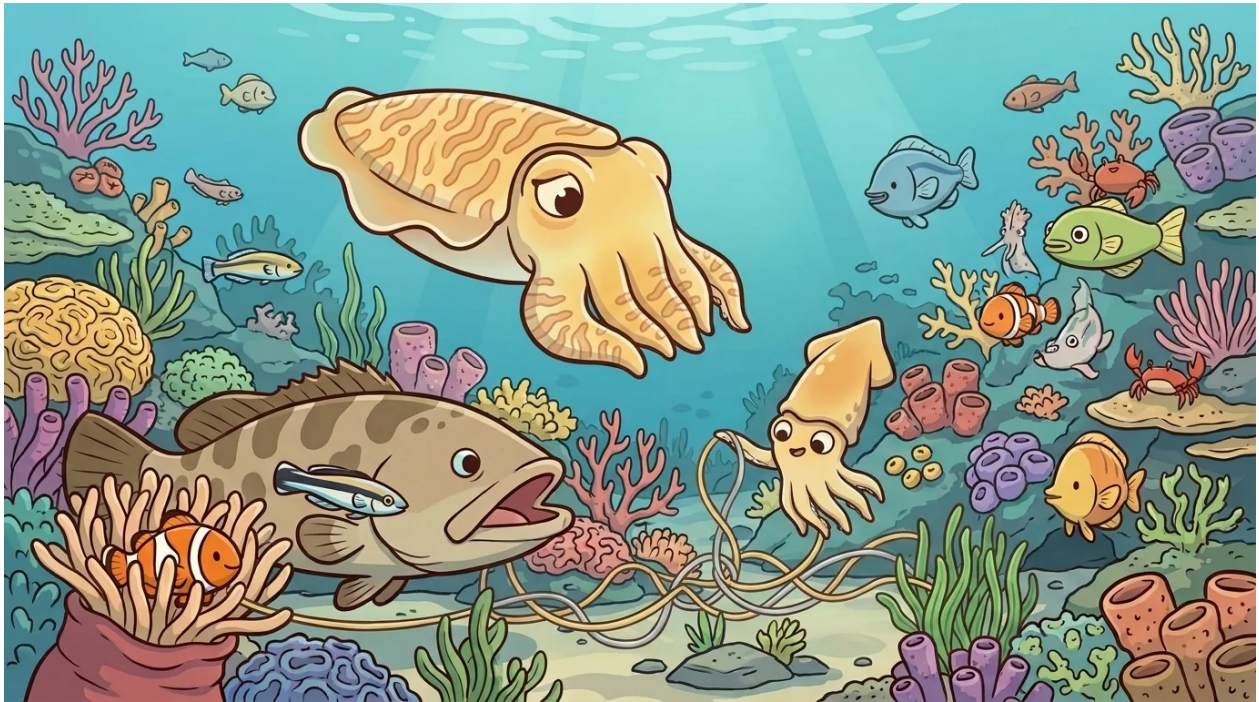
The squid-kid watched. The wrasse finished, swam out, and the grouper closed its mouth and drifted off, teeth gleaming.

"He could've eaten the little one," the squid-kid said slowly.

"He needs the little one more than he needs a snack. Clean teeth, no rot. And the little one gets fed." Reef flushed a soft gold across her skin, pleased. "Nobody down here is alone. The grouper needs the wrasse. The wrasse needs the grouper's mouth. The coral needs the tiny algae living inside it, and the algae need the coral's walls. Pull

one thread —" she flicked a fin at the shelf "— and the whole city leans."

The squid-kid stared at the reef like it had just turned into a face.



Reef had not always been able to see it.

When she was small, she'd lived at the edge of a bay where a river met the sea, and she'd thought the underwater world was just *scenery* — a backdrop you swam across to get somewhere better. Then one summer the river ran muddy and warm, and the little bay changed. The seagrass thinned. The crabs she used to chase vanished. The water felt wrong on her skin, thick and tired.

She'd found an old octopus wedged in the rocks — eight arms, calm eyes, a slow way of speaking — and asked her what was happening.

"You feel it, don't you?" the octopus said. "Like the place is holding its breath."

Reef had nodded, her skin going pale and grey without her meaning it to.

"That's because nothing here stands alone, little one. The seagrass fed the crabs. The crabs fed the fish. The fish kept the seagrass from being smothered. When the muddy water hurt the grass, it didn't hurt *one* thing. It hurt the whole braid at once." The octopus uncurled an arm toward the empty seabed. "That's the hard part and the good part. Everything's tied together. So when it breaks, it breaks everywhere. But when you help one strand —" her eyes crinkled "— you help more than you can see."

Reef had felt the tightness in her mantle ease, just a little. The empty bay still frightened her. But now the fear had a shape. It wasn't *everything's ruined*. It was *everything's connected* — which meant everything was also worth mending.



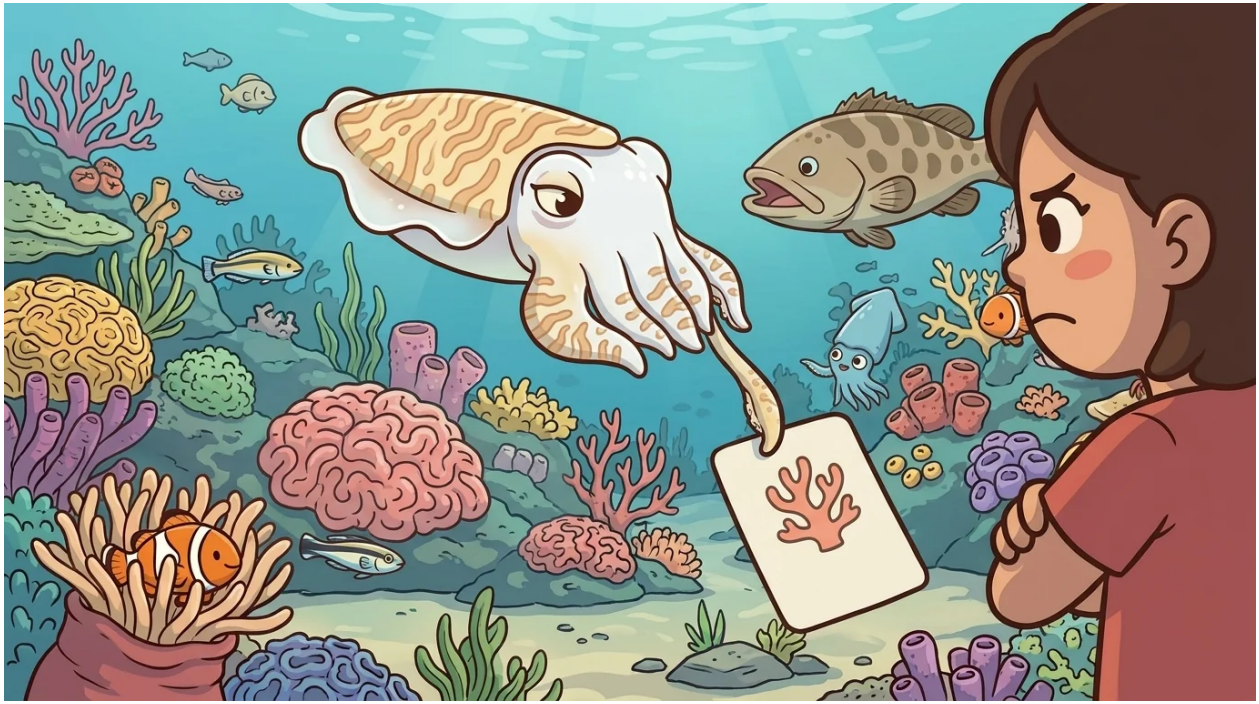
She swam to the field-station at Biomeforge at twelve, because a place that studied living systems ought to understand the ones that lived underwater — the cities that nobody walked past and so nobody noticed.

The old naturalist who ran the water-tanks met her at the dock. He didn't ask her to name a hundred species. He pointed at a tank of clear, empty-looking water and asked, "What's in there?"

Reef looked. To anyone else it was just water and a single knob of pale coral. She pressed close to the glass.

"It's not empty," she said. "That coral's got algae living inside it — you can't see them, but they're feeding it, and it's sheltering them. There's plankton drifting. There's things too small to see eating things too small to see." She turned. "It only *looks* like nothing. It's a whole city holding still."

The naturalist watched her skin shift color as she spoke, matching the coral without her noticing. "Most people see the water," he said quietly. "You see the living. You belong here."



Reef's tank room filled up with kids who thought water was boring.

A girl came in one afternoon, arms crossed, upset. She'd read something about coral reefs dying — bleaching white, whole cities going quiet — and now she couldn't stop thinking about it. "It's too big," she said. "The ocean's warming everywhere. What's the point of learning about reefs if they're all just going to disappear? I can't fix the ocean."

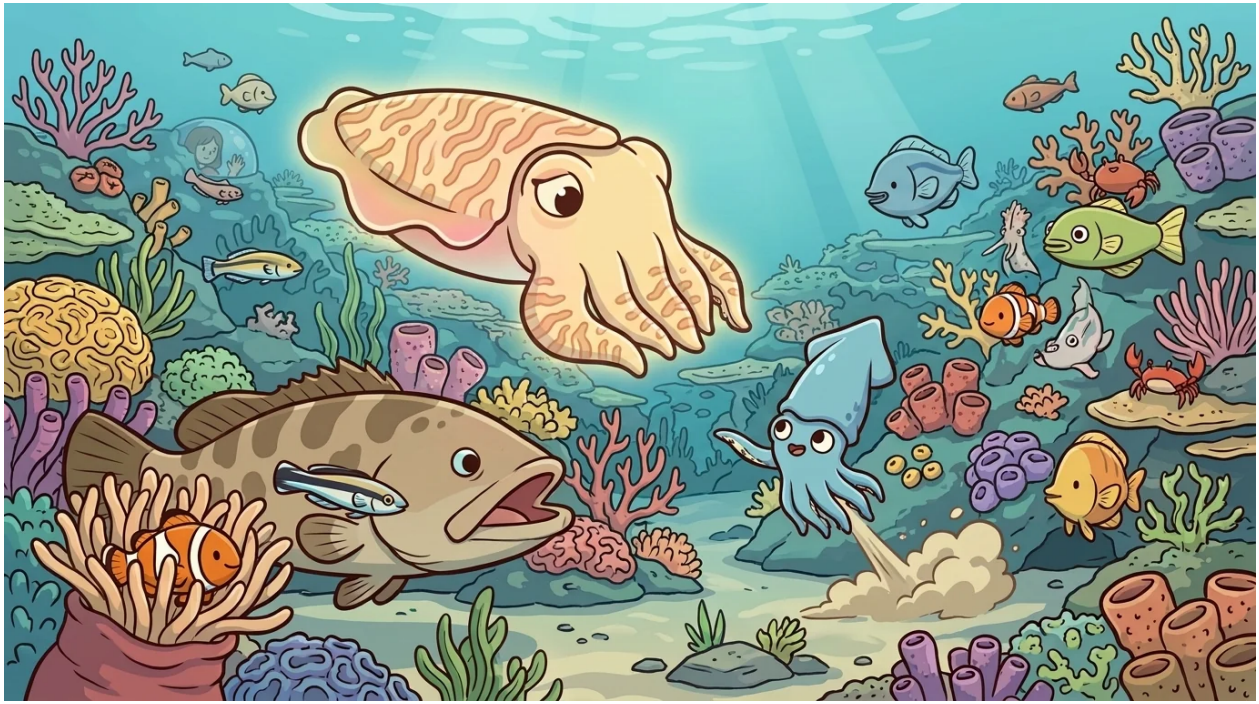
Reef knew that feeling. She'd felt it in the empty bay.

"You're right," she said. "You can't fix the whole ocean. Nobody can." She drifted to the tank. "But look here. When the water gets too warm, the coral gets stressed and spits out the little algae living inside it — and without them it turns white and starves. That's bleaching. That's the scary part." She let her skin go pale to show it, then slowly warmed back to gold. "Here's the part they don't put in the scary headlines. Coral that keeps *some* shade, some cooler water, some clean flow — it holds on. It can come back. Reefs are stubborn. They're braided together, remember? And a braid is hard to fully undo."

"So what do I *do*?" the girl said.

"You pick one strand." Reef nudged a card across the tank floor toward her. "Learn how one reef works. Tell one person. Keep one bay clean. The whole city leaned when one thread broke — which means it leans *back* when one thread holds." She flushed a bright, certain blue. "You're not supposed to carry the ocean. You're supposed to hold one strand of it steady. That's how everybody underwater has always done it — one small thing that keeps the next thing alive."

The girl uncrossed her arms.



Later, when the tank room had emptied, the girl came back with one quieter question.

"When it's this big," she said, "and you can't see the whole thing at once — how do you not just feel hopeless?"

Reef thought about the muddy bay. About the grey pulling across her skin, and the old octopus, and the slow warm voice.

"You feel *connected* instead," she said. "That's the honest swap. Hopeless is when you think you're alone against the whole ocean. But you're not — you never were. You're one strand in something huge and stubborn and alive, and so is everyone else." Her skin settled into a soft, steady glow, the color of the reef at rest. "When I look at all that water and let myself feel how *tied together* it all is — the coral and the algae and the wrasse and the grouper and the girl worried at the glass — I don't feel small. I feel *held*. Like the whole city's got its arms around me, and I've got a strand of it in my hands."

The girl was quiet. Then she nodded, and Reef watched the tightness leave her shoulders — the same way, years ago, it had left her own.

She didn't say the last part out loud, but she thought it, warm and sure: *the biggest, most hopeless-feeling things are usually just the connected ones. Pull a strand and you find you're holding the whole braid — and it's holding you right back.*

Ridge

RIDGE — climb the mountain, change the biome.



Ridge started the morning in a warm oak forest and, by lunchtime, was standing in snow, and she had never once teleported.

She was a small ibex-tween with a cream coat gone stone-grey down her back, and she climbed the way other people walked — steadily, hoof over hoof, not showing off. Beside her scrambled a squirrel who kept stopping to complain.

"We're going the *wrong way*," the squirrel puffed. "It's getting cold. There were acorns *back there*."

"There were acorns back there," Ridge agreed, and kept climbing.

By the time they passed the oaks, the trees had gone pointy and dark — firs, packed close, smelling of resin. Higher still, the firs got short and bent, then quit altogether, giving up to a low carpet of tough little cushion-plants and lichen that clung to bare rock. The squirrel's breath fogged. There was actual snow in the shadows now, in July.

"See?" Ridge said, tapping a hoof on the frozen ground. "Same mountain. Same morning. Whole different world." She looked back down the slope, at the green forest they'd left far below, warm and buzzing. "You didn't go north. You went *up*. But the mountain gave you the same trip — hot at the bottom, cold at the top, and every kind of living thing stacked in between, like floors in a very tall, very slow building."

The squirrel stared down at the layers. From up here you could see all of it at once — forest, then fir, then scrub, then rock and snow — laid out in bands, like the mountain had sorted the world by temperature.



Ridge learned to read those bands the summer she got lost.

She'd been small, and she'd climbed too high chasing a smell of new grass, and when the fog rolled in she couldn't find her way back down. The cold got into her. The plants up there were strangers — nothing she knew, nothing like home. She remembered sitting on cold stone thinking: *I climbed so far that I climbed right out of everywhere I understand*. It felt like being homesick in a place that was only an hour from home.

Her aunt found her at dusk — an old ibex who'd lived on the mountain her whole life, who knew things the way Andean and Tibetan herders had always known them, passed hoof to hoof and voice to voice across more years than anyone could count.

She didn't scold. She sat down beside Ridge in the cold and pointed back down the slope.

"You're not lost, little one. You just climbed through the floors too fast." She traced the bands with a hoof. "See the grass-scrub there? That's one country. The firs below it, that's another. The oaks under those, another again. Every band is a home for something — you just can't live in all of them at once, and neither can anyone else." She nudged Ridge to her feet. "Home isn't gone. It's three floors down. Walk toward the warm and you'll walk right back into it."

They did. And with every band they dropped through, Ridge felt the mountain hand her back a little more of the world she knew — the firs, then the smell of oak, then the buzzing warmth. The cold, out-of-everywhere feeling had a shape now. It wasn't *lost*. It was just *high*.



She came to Biomeforge at twelve, because a place that studied living worlds ought to understand the one stacked sideways up a mountain.

The mentor who kept the field station met her at the trailhead — didn't test her strength, didn't ask if she was tough enough. Just asked, "What lives on a mountain?"

Ridge didn't answer with a list. She started walking uphill, and beckoned the mentor along. As they climbed she named what changed: the oaks thinning, the firs crowding in, the firs shrinking, the trees quitting, the cushion-plants and lichen taking over the bare cold rock. By the time they stopped, they were standing in a completely different band of life than they'd started in — and they'd walked less than an afternoon.

"You could ride a whole continent's worth of climates," Ridge said, a little out of breath, "without ever leaving one hill. Up a thousand paces is about the same as walking a thousand miles toward the cold. The mountain does the trip for you."

The mentor looked back down through all the stacked bands, quiet for a while. "You belong here," she said.



Ridge's corner of the field station was a wall of cards, each one a band of the mountain, painted in its true colors.

A girl came in one afternoon, upset. She'd been tracking a little alpine flower that only grew in the cold cushion-zone near the top — and this year she couldn't find it where it had always been. "It's just *gone*," she said. "Did I do something wrong?"

Ridge knew that worried look. She'd worn it, lost in the fog.

"Show me where you looked," she said. The girl pointed at a card, high up but not at the very top. Ridge tapped the card *above* it — the last thin band before bare rock and snow. "Try up here."

"But it's colder up there."

"It's *getting* warmer down where you looked," Ridge said gently. "The whole mountain's warming, just a little, every year. And your flower can't live warm — it needs cold. So it's doing the only thing it can. It's climbing." She traced a hoof up the wall, band by band. "It's chasing the cold uphill, higher and higher." Then she stopped, because the wall stopped, at the snowy peak.

"And when it runs out of mountain?" the girl asked quietly.

Ridge didn't dress it up. "Then it runs out of up." She let that sit. "That's why we watch. That's why we count. Somebody has to notice which floor everything's standing on — because the floors are moving."

The girl found the flower that afternoon, one band higher than the map said. She came back grinning and worried in equal parts, which, Ridge thought, was exactly the right way to feel.



Later, with the station empty, the girl lingered at the wall of cards.

"When you climb," she said, "does it ever feel like leaving home? All those different worlds so close together?"

Ridge thought about the fog, and the cold stone, and her aunt's hoof tracing the bands in the dusk.

"At first it feels like leaving," she said. "Cold air, strange plants, nothing you know — like you climbed right out of everywhere that made sense. But then you learn to *read the floors*, and it stops feeling like leaving. It starts feeling like the mountain is showing you every home it's got, all stacked up, all at once." She looked out toward the peak, pale in the late light. "Warm at the bottom. Cold at the top. And a living world tucked into every band in between, each one holding on to exactly the height that keeps it alive."

The girl nodded slowly, and Ridge watched the worry ease off her shoulders — not gone, just settled — the same way, years ago, her own had, walking downhill into the warm.

Flux

FLUX — biomes move as climate moves. our maps will redraw.



High over the tundra, an arctic-tern-tween named Flux hung in the cold wind with an old paper map clamped in one foot, and frowned at everything below her.

The map said this ridge should be treeless — bare stone and moss and stubborn little flowers, the way the far north had always been. But down there, poking up between the rocks, were trees. Small spruce, knee-high and scrappy, but real, climbing higher up the slope than any spruce had a right to be.

Flux banked, landed on a boulder, and pulled a stub of charcoal from her naturalist vest. She laid the map flat, weighted its corner with a pebble, and looked from the paper to the slope and back again.

"You're wrong," she told the map, not unkindly. "Not your fault. You were right fifty years ago."

Then she did the thing she always did. She drew a new line. She smudged out the old edge of the treeline and sketched it in where the little spruce actually stood now — higher, further, creeping up toward the cold like it was chasing something. She dated it in the corner. She tucked the map away.

Another tern wheeled down beside her, curious. "You fly all this way just to scribble on maps?"

"I fly all this way," Flux said, "because the maps keep moving. Somebody's got to notice where they went." She lifted off. "The tree came up the hill to meet the warmth. So did I. Come on — there's more."



Flux had not always trusted her own eyes about this.

The first time she noticed a map was wrong, she was small, and it frightened her. She'd flown south to a marsh her flock had used for as long as anyone could remember — a wet, buzzing, alive place, thick with the insects terns needed. But the marsh had shrunk. The water had pulled back. The edges had gone dry and cracked, and half the birds who should have been there simply weren't.

She'd sat on a fence post feeling sick. It was like coming home and finding a room in your house had gone missing. *The map is broken*, she'd thought, *and if the map is broken, then nothing is where it's supposed to be, and everything I know is a lie*. Her wings wouldn't stop shaking.

An old tern, grey and slow, settled beside her. She didn't tell Flux to calm down. She said, "You came back and it had changed on you. That's a lonely feeling — like the ground moved while you were away."

Flux nodded, throat tight.

"But listen. The marsh didn't lie to you. It moved. Wet places are drifting; warm belts are climbing north; the whole living map is sliding, slow in some places, fast in others." The old tern looked out at the cracked mud. "A broken map you throw away. A *moving* map — you follow it. You learn to keep redrawing it. That's not a lie coming apart, little one. That's the truth still telling you where to go."

Flux didn't feel better all at once. But the shaking eased. The change had a shape now, and something with a shape can be tracked.



She came to BiomeForge at twelve, because a field station that studied biomes ought to care that they wouldn't hold still.

Steward, the naturalist who ran the station, met her at the gate with no test in mind — until Flux dropped a map on the table without being asked. It was covered in her charcoal lines: old edges smudged, new edges sketched in, dozens of little dated arrows, every one of them pointing the same way. North. Uphill. Toward the cold.

"What am I looking at?" Steward asked.

"Where things are going," Flux said. She tapped an arrow. "This bird's summer range, moved eighty miles poleward since my grandmother flew it. This treeline, climbing the mountain a little every decade. This whole warm-forest belt, sliding north into land that used to be too cold for it." She sat back. "The biomes are migrating. Everything alive is trying to stay inside the climate it can survive, and the climate keeps walking away from underneath it. So they follow. And I follow them, and I fix the map."

Steward studied the arrows for a long, quiet moment.

"You belong here," he said.



Flux's corner of the station filled up with kids who wanted to know where things were going.

One afternoon a girl came in already gloomy, having read something grim. "Everything's moving because it's getting hotter," she said, "and lots of the animals are going to run off the edge of the map and there won't be any cold left to run to. So what's even the point of drawing it?"

Flux knew that gloom. She'd felt it on the fence post.

"Fair question," she said. "Some of it's true. It *is* warming, and some species really are running out of north to run to — that part's real, and pretending it isn't would be its own kind of lie." She unrolled a fresh map. "But here's what the doom leaves out. Draw the line with me."

The girl hesitated, then took the charcoal.

"That patch of forest," Flux said. "People noticed it was drying and they planted shade and dug little channels to hold the water. It's hanging on. Draw it green." The girl did. "That marsh — a whole town fought to keep the river feeding it instead of piping it away. Still wet. Draw it blue." Draw. "This bird's new range up here? People built it a corridor of safe stopping places all the way up the coast so it could actually *reach* the cold. It made it. Draw the arrow to the end."

The girl looked at the map. It wasn't all disaster. Green and blue had crept back in wherever someone had bothered to act.

"The map moves whether we watch or not," Flux said. "But *which way* it moves — that part isn't only up to the weather. People are in the map too."



When the station had emptied out, the gloomy girl came back with the fresh map rolled under her arm.

"When it feels too big," she said quietly, "and it's the whole planet moving and you're just one small bird with a piece of charcoal — how do you not just... sink?"

Flux thought about the fence post, and the shaking, and the old grey tern.

"You draw the next line," she said. "That's the honest answer. Not the whole map — just the next true line, the one right in front of you." She looked out the window toward the tundra, where somewhere a small spruce was still climbing a hill it wasn't supposed to. "When something huge is on the move, the sinking feeling comes from staring at all of it at once. But you never have to carry all of it. You just have to notice where one thing went, and mark it down honest, and hand the map to whoever comes next."

The girl held the map a little tighter, and Flux watched the sink lift off her shoulders — the same way, years ago, hers had.

She didn't say the rest out loud, but she thought it, warm and steady: *the map was never a promise that nothing would change. It was always just a way to say — here, I saw where it went. Now we know where to follow.*

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Methodology

Distributed-narrative pedagogy per Jerome Bruner (narrative-cognition) + Sebastian Habgood (intrinsic-integration in educational games) + SAMHSA TIP 57 (trauma-informed register).

Trauma-informed-design framework per Eggleston et al. (2025) and Stoltenburg et al. (2024).

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