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from the pages
of....



EXTRAORDINARY MINDS,
PURPOSEFUL PLAY... ORDINARY STUFF

THE ASPERKID'S GAME PLAN

JENNIFER COOK O'TOOLE



EXTENSION ACTIVITIES
FOR:
COVIDO #2: NAKED EGGS

#covideobundle

NAKED EGGS:
MORE NON-LAME
— learning —
ON QUARANTINE



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"Look there," I stopped her, mid-muck. "See? Beyond the fragile shell, is an even more fragile, paper-thin membrane." Maura was amazed by the intricate, lace-like patterns webbing the translucent skin and wondered aloud how she'd never noticed it before.

"That's true for a lot of things we see often," I said casually. "The more mundane something seems, the less attention we give it." It was, we agreed, sort of like never seeing the sites in your own city, but all the tourists have been.



"But, back to the egg," I said. "How do you suppose the chick breathed while it was inside?" Sean piped up (as younger brothers will) that there were actually really tiny holes in the surface of the shell which allowed gas, like air, to pass through it. "Yes, that's it. Even though it's solid, an eggshell is gas-permeable" (I repeated the word a few times), "or penetrable, a boundary that gases can easily cross."

"What about other things, like liquids?" I mused. "If you poured water on the shell, would it leak in?" "No, of course not." They said. "If you boil eggs, after all, they don't soak up the cooking water." "Well, what about the membrane? Is it liquid-permeable?" I asked. They weren't sure. After all, there was no way to test *just* membrane with no shell. So, you couldn't really tell if one or both were keeping the water out...or could you?

I called the boys over and asked them to hold a paper towel stretched between them. On cue, Maura poured a cup of water onto the towel, and as they predicted, liquid seeped through the porous fibers.

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(which my mother actually was in real-life), so she had developed a rather personal relationship with government sticking points. I planned on using that.

"Take, for example, politics," I started aloud. "You could have the best lawmakers in the world with the best intentions in the world, but if they show up to work completely unwilling to listen or learn—if they are completely impermeable—there's no peace and prosperity, there's just instant quagmire and bureaucracy." "That makes sense," she agreed. "On the other hand," I continued, "everyone needs boundaries, both for their bodies and minds. We all start out, or should with adults as benevolent 'dictators,' teaching us how far is too far, what's safe and what's not. Eventually, we each have to take on the job for ourselves. That's maturity. Remaining totally 'permeable'—open without discretion—to every influence, idea and fad leaves us very vulnerable to predators of all sorts. There is a saying I remember; 'If you don't know what you stand for, you'll fall for anything.' Somewhere in the middle—semi-permeable—is probably best." She seemed to consider.

"Anyway," I interjected, changing topics before I could get preachy, "let's get the vinegar." And we turned back to the eggs.

The kids had, correctly, figured out that you couldn't test the egg's membrane with the shell in tact. But if you got rid of the shell, they'd agreed, the membrane would tear. Or would it? "Maura," I smiled. "We are now going to make naked eggs."

Each of the two eggs went gently into a glass and were then covered with white vinegar. "An eggshell," I explained, "is made of calcium carbonate—basically, calcium and



carbon. As soon as we add the vinegar, some of the shells' chemical bonds will dissolve immediately, and...ta da!" Right on cue, carbon dioxide bubbles appeared as the shells began to disintegrate. We left them alone and in just a day or so, there was a white powdery residue on the glass. What was it? The calcium from the eggshell! The same stuff that made up our teeth and bones.

Our eggs remained in their baths for a week, carefully maintained with enough vinegar to keep them covered. After seven days, Maura was allowed to carefully lift the first egg, gently rubbing it smooth—and there, in her hand, was a naked egg. A bright yellow egg yolk floating within its liquid whites, held together by a rubbery membrane and completely devoid of that pesky shell. The second egg was identical.

And now what? Now, we weighed each "naked" egg and recorded the information. Two clean glasses were set out: one filled with plain water and the other with dark, viscous corn syrup. One egg went into each and we walked away for one day.

The next afternoon, I called the boys in to join us. All three kids were asked to follow me into our downstairs half-bathroom where, as you might imagine, we were completely squished when packed in together. "Welcome to a concentrated solution," I announced. "You are now a molecule. And it's tight in here. Is anybody happy?" Definitely not. Without a word of direction, I opened the door...and instantly, they walked out. "Very good, young molecules," I called from behind. They looked back. Huh?

Molecules. Kids. It didn't matter. Nature likes balance. If you're cramped and you see a way to get more room—less squished—you just naturally take it. No one had said, "Walk out of the room now." It's natural to want to move from a crowded place to one that's less jammed. Molecules do the same thing. They'd rather have everything all evened out—to be in equilibrium—than be smooshed. And then I brought them to the glasses.

The first egg had been placed in water. Very carefully, Maura lifted it out of the glass—and before she even weighed it, she could see what had happened. Without its shell, the liquid most certainly *did* get inside. Our little egg had ballooned up! The other egg, however, had been placed in corn syrup, and it looked pitiful.

Surrounded by a denser (hypertonic) area, the egg's original water content had passed out, trying to "equal" things out. In fact, Maura noticed, she could even see an inch or so of

water floating on top of the corn syrup! All that was left behind in the membrane were the fats and proteins that were too big to get through the membrane.

It should probably be noted that for the sake of that all-important factor, fun, there were a few other objects left to soak overnight: gummy bears. Some gummy bears took the plunge in water; others bathed in salt water. And, just like the eggs, those in the hypotonic solution got HUGE, while the others shrunk like some poor taxidermy project gone wrong. The rest of the bag? Well, a girl's gotta eat.



While that particular girl (Maura, not me), enjoyed her gummies, I brought out the key to her more sophisticated sensory tub. Unlike her brothers, who were looking for items within the filler, the discovery for Maura was the very filler material itself—floral “water beads.”

Starting out as teeny, glasslike balls, the beads would, like the egg, undergo a dramatic physical change when put into water. Osmosis would expand their size hundreds of times over right in front of her eyes.

Yes, of course, she loved the cool, slippery feel, but just as much, she loved understanding what happened and why...knowing that the hypotonic solution flooded into the tiny spheres, then measuring the difference and finally, determining the percentage of change in mass...yet there was more to talk about, later on. The tangible visual of the expanded egg yolk and membrane was really a metaphor for what I most wanted for this girl on the brink of adolescence: we come into this world with gifts and buoyant spirits—like the “naked”

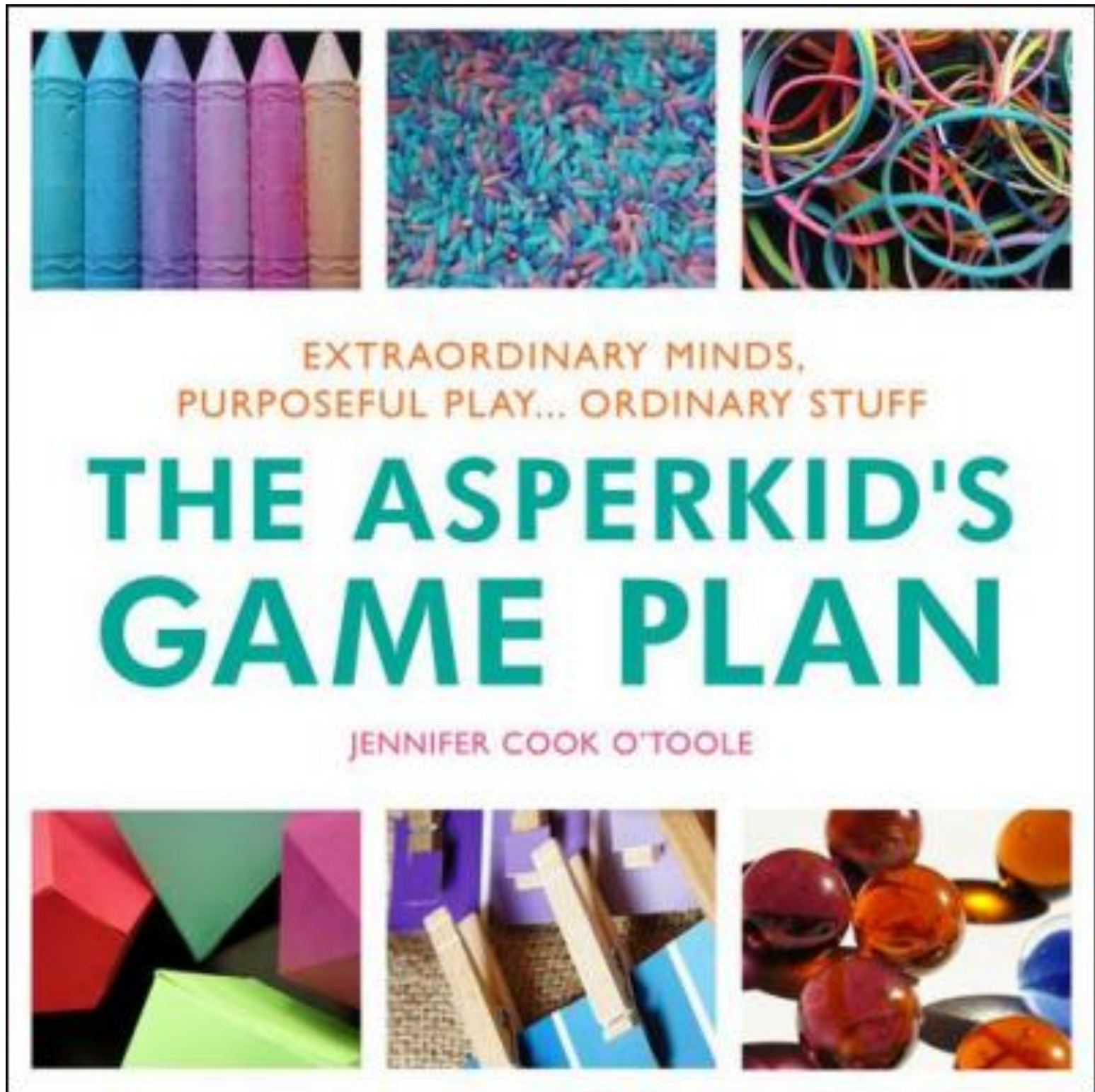
eggs, we are resilient, yet terribly fragile. If we submerge ourselves in an environment that is dark and clingy, like the thick, sticky syrup, we wither. We deflate. We become much, much less.

On the other hand, like the influx of the surrounding water into the egg, the right teachers, friends and loved ones cause us to grow and stretch...if we, like the permeable membrane, allow outside perspectives to enter. Our greatest ideas and talents also expand when enveloped in kind, gentle and intelligent relationships. It's the diffusion of imagination and creativity. We open ourselves by being "permeable," not rigid or unyielding, for a hard "shell" prevents others' gifts from reaching us...and our gifts from flowing out into the larger world.

So, was this a bonanza of eggy, wet and vinegar-scented sensory exploration? You bet. And along the way, more than a little bit of "awesome," too.



ALL ACTIVITIES
(AND SO MANY MORE)
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