

## The "New PE" Aims to Build Bodies and Brains

Educators see multiple benefits from increasing opportunities to move

by LAURA PAPPANO

In the game Builders and Bulldozers students are assigned to either knock over or set upright colored plastic cones scattered like confetti across the hardwood floor. When PE teacher Jerry Curtiss says "Go!" and flips on music by country singer Kenny Chesney, the Fisher Elementary School gymnasium in Plymouth, Conn., becomes a whirl of racing fifth-graders.

After several minutes, Curtiss calls "Freeze!" and, without any counting of cones, students measure their heart rates for the third of four times during the 40-minute class. "Where are we?" he asks. He hears "170," then "180." "That's a little high," he offers. He then asks how they can tell they are working aerobically. "Because I am breathing and I can hardly stop," Kaitlyn decides. Says Dylan, "You are breathing heavier and getting hotter and hotter."

This, of course, is exactly the point of the "new PE," which trades traditional sport-focused activities like dodgeball and basketball for activities that provide a heart-pumping workout. Instead of featuring games with winners and losers, and substantial downtime as students wait to participate, the new PE is focused on getting all students active (see sidebar, "Characteristics of the New PE" ).

Where studies show most students in a typical PE class are active just 35 percent of the time, according to James Sallis, chief of behavioral medicine at the University of California, San Diego, who helped create the SPARK curriculum Curtiss uses, the new PE aims to engage students in moderate to vigorous exercise for at least half of the class.

The new PE also builds fitness knowledge (for example, how to check your heart rate) and instills lifelong habits, says Lisa Daly, who coordinates the federal physical education grant fueling Plymouth's three-year-old effort. "We are teaching kids to take care of themselves beyond school."

### Can PE Make Kids Smarter?

The move toward more active PE thrills those fighting childhood obesity, but they aren't alone in seeing exercise as a good thing. Education leaders are excited about a growing body of research linking physical activity with academic and cognitive performance. The new PE may not just be more appealing to nonathletes; it could also make kids smarter.

"We are not talking just about the obvious health benefits. We are talking about raising test scores, and that is what everyone is focused on," says Dr. John J. Ratey, Harvard Medical School professor and author of several books, including *Spark*, about exercise and the brain (not related to the SPARK curriculum).

The field of research is less than a decade old, but a 2010 Centers for Disease Control and Prevention (CDC) report synthesizing 50 studies looking at research linking increased or more vigorous school-based physical activity—including PE, recess, classroom, and extracurricular—found that 50.5 percent of 251 associations with academic performance were positive, 48 percent were insignificant, and just 1.5 percent showed a negative relationship.

"The evidence just becomes more compelling all the time," says Sallis. "Kids who are active and fit do better in school, better on achievement tests, better on measures of their brain health."

### The Link Between Fitness and Academics

In 2003, Joseph Donnelly, director of the University of Kansas Center for Physical Activity and Weight Management, came up with a novel intervention to cut obesity and increase physical activity in schools: Have classroom teachers weave movement into the day. Math, for example, could be taught with jumping jacks. Donnelly knew, however, that he first had to show that doing this wouldn't hurt students' academics. After all, he says, "a school's primary function is not health; it's learning."

His randomized control study tracked second- and third-graders in 24 schools for three years with the treatment group given two 10-minute periods of physical activity during daily lessons (teachers were trained for this). But when students were given standardized Wechsler Individual Achievement Tests by a third party blind to the study design, Donnelly found a curious result, which he published in *Preventive Medicine* in 2011: Those who exercised in class saw test scores rise, on average, by 6 percent, while control group members saw scores drop by 1 percent. The finding, says Donnelly, spurred a follow-up study now under way.

At about the same time, Charles Hillman, a neuroscientist specializing in kinesiology at the University of Illinois at Urbana-Champaign,

was comparing brain functions of “high fit” and “low fit” children as defined by aerobic fitness tests. He discovered that high fit children had better “attention and working memory and response speed.” The study, published in 2005 in *Medicine and Science in Sports and Exercise*, was among the first to make this link. More recently, Hillman has found that *adding exercise*—rather than just being fit—can increase brain function. His researchers assigned 221 children to either a nine-month afterschool physical activity program or a waitlist, and he reported in the October 2014 issue of *Pediatrics* that the exercisers made greater gains in fitness and on cognitive tests.

In particular, the exercisers outperformed the control group in areas of executive function, which includes self-regulation, working memory, cognitive flexibility, and multitasking. “In a classroom, that’s reading a passage and answering a question and going back to the passage,” says Hillman, who believes “speed and effective ability” to switch between tasks is key to cognition. When the brain switches between different rule sets, it must inhibit one to activate the other while holding the original information. “It is a complex cognitive process,” he says.

## Getting to 150

Recognition of the value of exercise in school is growing, but many districts, particularly those in urban areas, fail to provide students with adequate physical education, which varies by state but is often targeted at 150 minutes a week. While 38 states require PE for students in elementary, middle, and high schools (six demand it K–12), most states (33) allow substitution of other activities. Just six set minimum mandated minutes of PE, and only nine require recess, according to the *2012 Shape of the Nation Report*.

Research shows that having a state law makes it more likely that schools will have PE and/or recess. Yet, a survey of 1,761 schools in 47 states published in the April 2012 *Archives of Pediatric and Adolescent Medicine* also shows that many use recess as a trade-off for PE, and vice versa. “Schools are substituting one form of physical activity for another rather than providing the recommended amount of both recess and PE,” according to the report.

And, of course, even if states set requirements, many schools don’t meet them. Massachusetts demands PE in every grade, but Jill Carter, executive director of the Boston Public Schools Health and Wellness Department, says the district has struggled to offer it. In 2008, she says, only 60–65 percent of city schools provided PE at all, and while that figure is now at about 87 percent, she says, “we are still out of compliance.”

It is getting better. In 2010 Carter’s office drafted a strategic plan for health and wellness. They also landed federal grants from the CDC and the Department of Education to hire specialists to work with schools—many of which did not even have gymnasiums—to find space and time for PE and to build a “lending library” of equipment, including bicycles and rollerblades. It’s caught on. At first the PE specialists had to prod schools to let them help. “Now we can’t keep up with the business,” says Carter. The percentage of students getting the appropriate 150 minutes a week of moderate to vigorous exercise has risen from 14 percent to 42 percent in the 37 elementary schools in the district.

Word about the academic value of physical activity is getting some districts moving. In Oregon, a state law slated to take effect in 2017 has set time requirements for PE instruction (150 minutes in grades K–5, 225 minutes in grades 6–8) and stipulates that students be active 50 percent of the time. But it’s the links to academic performance that Barbara Kienle, director of student services, mentions when she describes the new PE program put in place this academic year across the David Douglas School District, a high-poverty system in Portland, Ore.

“Ultimately, what we hope is that our students have better outcomes and better academic achievement,” she says, adding that they are training 21 PE teachers in the new approach. “It is not just go in and play for 30 or 45 minutes, but it is, ‘How do we target the activities to increase their physical fitness?’”

## Increasing Opportunities to Move

At Staples High School in Westport, Conn., exercise has become a go-to tool for sharpening concentration and easing stress. “You always hear about test scores and academic performance; you always hear about how well these kids have to do,” says David Gusitsch, the K–12 physical education and health coordinator for Westport, a well-heeled, high-performing district. His message: They will learn better if they have the opportunity to move.

Gusitsch has adorned high school hallways with posters bearing messages like “exercise improves cognition,” offered “brain break” ideas to classroom teachers, and crafted a PE curriculum that hits the high notes of the new PE. Students in grades 9–11, for whom PE is required, meet four times a week for an average of 50 minutes and get to pick their *type* of PE in the hope that they will continue the activity outside of class. In some classes students wear heart-rate monitors, set training goals, and track their progress online.

Options vary by grade but fall into three areas: recreational, lifetime, and team. Students have 33 activities to select from, including meditation/relaxation, rollerblading, team handball, tai chi, yoga, and self-defense. They can even kayak in the school pool or—as was the case on a late Monday morning—maneuver paddleboards in the school pool. “It’s really fun and better than swimming laps,” says sophomore Lindsey Felner. Next door, her classmate Kaila Finn joins a volleyball game with the high-voltage beat of Katy Perry playing

on a boom box courtside. “I like a more holistic approach to keeping fit,” says Finn, who finds that PE midday “makes you more alert and livens your senses.”

Gusitsch’s message about the value of fitness to academics has attracted faculty notice, says principal John Dodig, who adds that “two or three of the teachers have asked for treadmills.” Language teacher Chris Fray put a stationary bicycle in his classroom (a lanky junior pedals during one class). He also plans “brain breaks.”

A recent brain break had students move in pairs while doing math problems in Mandarin Chinese. Fray, who added the breaks last year after a Spanish class he taught struggled to focus during last period, does not need research to justify what he sees as beneficial. “It takes three minutes,” he says. “It doesn’t mean they are perfectly calm and Zen, but I think it recalibrates them.”

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## For Further Information

Carol M. White Physical Education Program: [www2.ed.gov/programs/whitephysed/index.html](http://www2.ed.gov/programs/whitephysed/index.html)

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