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GADGETS GO TO CLASS

Instead of banning kids' phones, some schools are starting to embrace them By John Cloud

EVEN THOUGH THE VAST majority of students own cell phones—something like 80% by eighth grade—more than half of schools prohibit the use of any mobile device. And yet a few pioneering administrators are considering a new approach called BYOT—bring your own technology. BYOT offers an elegant solution to an old problem. Instead of outlawing kids' devices, BYOT policies allow kids to take their phones or tablets to class and use them not just to Instagram stupid photos from Friday night but also to engage with one another in classroom lessons.

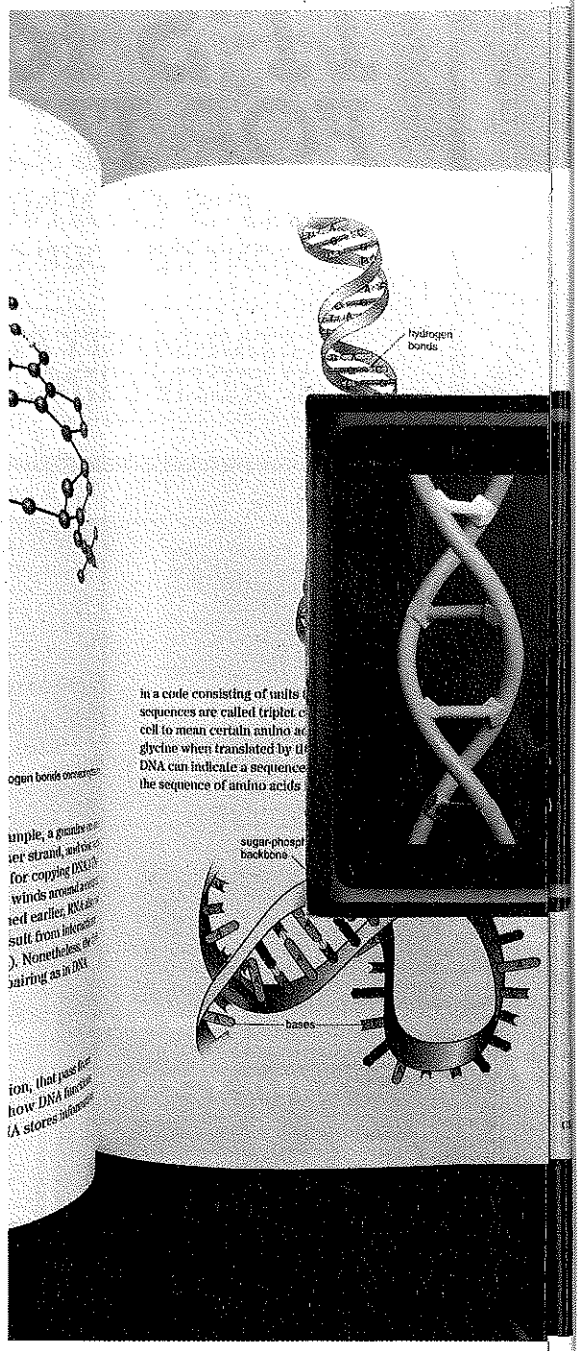
To many parents who use a cell phone to juggle the obligations of work and family and Words with Friends, school bans on phones can seem ridiculous. Even a first-generation iPhone is more powerful than some computer labs' ancient desktops. Putting a new laptop at every desk can cost hundreds of dollars per student, so tapping into the tech that kids already have seems like a no-brainer. Why can't schools turn those devices into learning tools?

A small but growing number of schools are giving it a try. Some districts—such as those in Meriden, Conn.; Allen, Texas; and Hanover, Pa.—have developed BYOT policies that allow kids not only to take their mobile devices to school but also to access school networks. The districts—all in relatively wealthy enclaves where a new iPad causes no stir—enforce strict rules. Kids can use devices only with a teacher's permission; activating a screen during tests can be grounds for expulsion.

Companies like Avaya and HP, as well as many smaller players, are racing to develop in-classroom apps for mobile devices. One idea is that a teacher presenting a math problem can ensure that every student has responded and then compare the answers. It's not as convoluted as it sounds. At many colleges, professors are using clickers—remote-control-like devices that let students answer questions from their seats—to gather real-time information about whether students are comprehending lessons.

Cell phones are the easiest fit for BYOT. Even for kids from poor neighborhoods, cell phones have become nearly biological appendages. Ask 10th-graders about, say, mitochondria, and they can deploy a phone to give an answer in seconds. Do you really expect them to walk over to that dusty shelf with the *Britannicas*?

Many parents want their kids constantly connected for safety



Too Young to Text? Deciding the right age

How young is too young for a cell phone? A YouthBeat survey from the first six months of 2012 found that 13% of children ages 6 to 10 already own one. But 12 is the most common age for first-phonedom; that's when 18% of kids get theirs. "Middle school is the clear-cut time in my mind," says Gwenn O'Keeffe, a pediatrician who last

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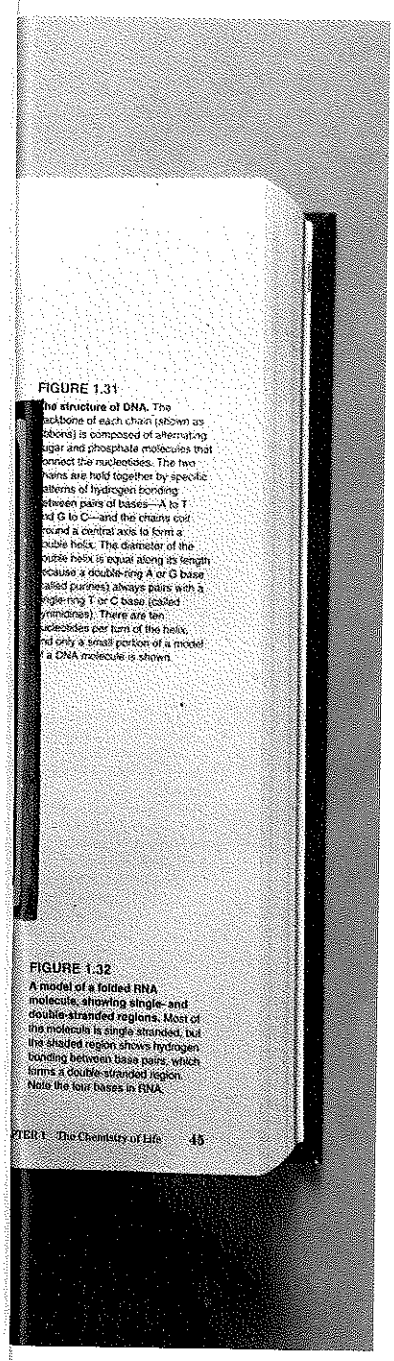

FIGURE 1.31
The structure of DNA. The backbone of each chain (shown as ribbons) is composed of alternating sugar and phosphate molecules that connect the nucleotides. The two chains are held together by specific patterns of hydrogen bonding between pairs of bases—A to T and G to C—and the chains coil around a central axis to form a double helix. The diameter of the double helix is equal along its length because a double-ring A or G base (called purines) always pairs with a single-ring T or C base (called pyrimidines). There are ten nucleotides per turn of the helix, and only a small portion of a model of a DNA molecule is shown.

FIGURE 1.32
A model of a folded RNA molecule, showing single- and double-stranded regions. Most of the molecule is single stranded, but the shaded region shows hydrogen bonding between base pairs, which forms a double-stranded region. Note the four bases in RNA.

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reasons, and, of course, teachers and administrators have their own devices. Teachers look away when kids pull phones from backpacks during lunch, but the classroom remains a contested arena. That's partly because school officials fear getting caught up in lawsuits. "The technology has great promise, but it has created huge legal issues for school districts," says Daniel Domenech, executive director of the American Association of School Administrators. "Some kids use their phones to bully students or to sext or make inappropriate phone calls."

One concern is that schools could run afoul of the Children's Internet Protection Act (CIPA), which President Bill Clinton signed in 2000. The law says schools can lose federal funding if they don't adequately monitor the online activities of minors. CIPA predated smart phones and social networking, but administrators must hold to its letter. If, say, a student tweets something from a locker room that is gross and compromising, cops could arrive.

BYOT also raises equality issues. It's true that most kids have cell phones, but they aren't necessarily carrying smart phones that are capable of running elaborate apps. Some families can't afford a cell phone of any type. School districts can lend devices to students who have less money. But the choice may create a high-tech version of who's on the free-lunch list in the cafeteria.

Tech advocates are convinced that it's worth the trouble. "Parents are desperate for kids to be prepared for the jobs of the future," says Julie Evans, executive director of Project Tomorrow, a nonprofit that studies how to use mobile tech in schools and is partly funded by HP. "We have to create a classroom experience with the tools they already own. If we do that, they won't wander off into Facebook or play a game." When Project Tomorrow studied a classroom pilot project in North Carolina, it found that students who had used the mobile devices to collaborate on school projects scored better on standardized tests than kids who hadn't.

Those test scores are at once encouraging and dispiriting. Any parent knows that mobile devices erase the idea of separation between work and home. Kids may be right that using their mobiles at school will be fun—but they might feel a little less fun when deployed to do homework. ■

EDUCATION APPS

MOTION MATH
Learn addition with hungry guppies and multiplication with (nonangry) birds

TOONTASTIC
Kids choose their characters, story arcs and even emotionally themed background music and can share the cartoons online

BRAINPOP
Animated videos illuminate such wide-ranging topics as sharks, game theory and acne

year co-wrote an American Academy of Pediatrics (AAP) report on children and social media. "There's a huge developmental leap between fourth and eighth grades." When will your child be ready? Here are some factors for parents to consider:

PEOPLE SKILLS. Too much texting can dull kids' social sense, says Gary Small, a professor of psychiatry at the UCLA School of Medicine and a co-author of *iBrain*. "Our brains evolved to communicate face to face," he says. "A lot of this is lost with texting."

RADIATION. Studies on the effects of the nonionizing radiation emitted by cell phones have been inconclusive. Still, the AAP asked the Federal Communications Commission in July to reassess the standards for children out of concern about the impact of radiation on their developing brains. In the meantime, many pediatricians advise limiting talk time. Kids "are not little adults and are disproportionately impacted by all environmental exposures, including cell-phone radiation," AAP president Robert Block wrote.

THE VISION THING. Pediatric ophthalmologist James Ruben says he's seen no uptick in vision problems related to cell-phone use. Gazing at a screen for hours on end may be correlated with nearsightedness, but that's true for reading books as well.
—BONNIE ROCHMAN

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