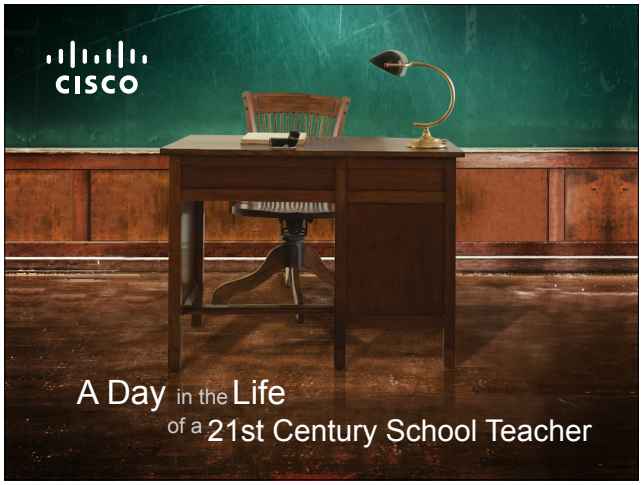


- **Opening**
- This slide show is about H.S. 21+, an imaginary school that follows the principles of 21st- century learning outlined in *Equipping Every Learner for the 21st Century.* It follows a science teacher through a day of work, to illustrate the educational ideas suggested by that document.
- H.S. 21+ is not a real school -- it's a hypothetical school, invented for the purposes of this presentation, but nonetheless within the realm of technical possibility. This day in the life of a teacher parallels that of a student in the same school, which for best results should be experienced before this one.

7:00 AM

- The alarm on Mr. Bacon's iPod chimes to wake him, and remind him of his tasks for the day: to check in with the students in his project group, to install a real-time water-quality monitoring station, and to participate in the district-wide science curriculum meeting. In addition to his teaching duties. Another busy day.

- *Mr. Bacon's day is varied, with several hours scheduled to lead lectures and labs, but time set aside for guiding a project group and setting up research experiments. At H.S. 21+, students spend a third of their day on independent work, not under the direct supervision of a teacher -- which frees Mr. Bacon and his colleagues for other tasks.*

7:10 AM

- Mr. Bacon sits down at his laptop for his morning routine. His project group's wiki shows some early morning activity: Sally, one of his students, has posted a graph showing alarming levels of PCB contamination in the city's drinking water. Noticing that Sally's conclusions were based on very few data points, Mr. Bacon posts a suggestion that she re-sample the data later in the day.

7:12 AM

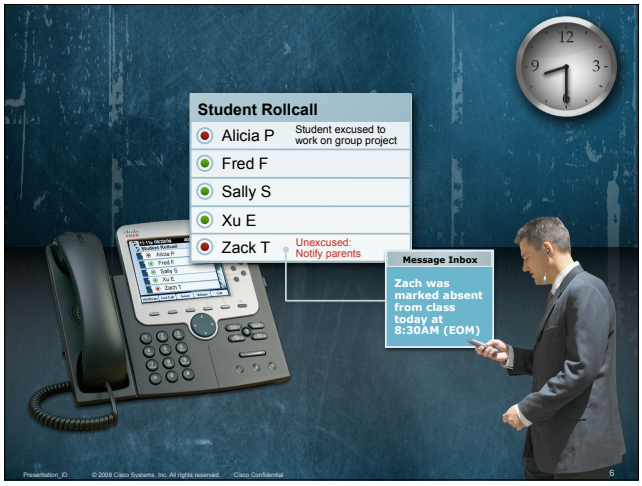
- Continuing his morning checks, he calls up the activity logs from his online environmental chemistry course. Next to the names of the 17 students -- from all over the district -- he sees what they have been working on over the last 24 hours. He notices that despite completing the quiz on pH levels at 2:00 AM, Fred in Flushing earned a perfect score, and sends him a quick congratulatory note. He denies (politely and patiently) Alicia's request for another extension on her research proposal.

- *Frequent contact with students is even more important in the digital age. Whether they're enrolled in his online course, or working in his project group, Mr. Bacon knows that daily monitoring and feedback -- with a human touch -- is they key to learning. And an interesting way to practice his professional craft.*

8:00 AM

- *Mr. Bacon meets his project group and a city highway supervisor at the Darwin Street bridge. Together they install and test a solar-powered, real-time data probe with wireless network connection that measures water temperature, pH, and other variables. The students have been planning this installation for the past two months, and it goes smoothly. They met especially early in order to do the work at low tide.*

- *Teachers at H.S. 21+ are encouraged to design and conduct field-based research projects with their students, to focus them on issues of community concern, and to take advantage of the latest digital technologies. From these projects students learn not only their science and math, but also the politics of working with public agencies and the practicalities of real-world installations.*



8:30 AM

- *Tick* goes Mr. Bacon's IP telephone set as he marks Alicia absent from his chemistry class. Almost immediately a message pops back that Alicia is excused today to work with her project group at the art museum. Zach's absent mark, however, goes into the system and is automatically communicated to his parent's mobile phone through a text message.

8:32 AM

- He also sees on his internet phone eleven warnings that students under his care have wandered off-campus. These were sent by the GPS-equipped iPods that all students carry. Mr. Bacon is concerned, until he reads the list, sees the names of his project group students, the pins on the map concentrated on the Darwin Street bridge, and the time stamp at 8:35 AM.
- *H.S. 21+ takes full advantage of digital communication tools to manage information about the students they are responsible for. This not only reduces paperwork and clerical expense, it also provides a measure of security that enables students to be given more freedom in their work places.*

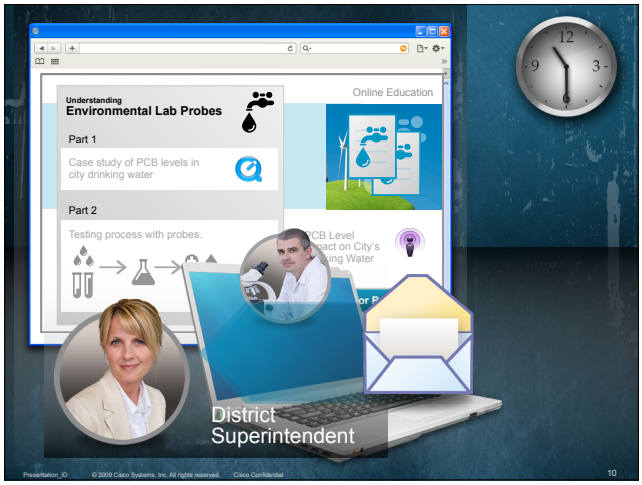
9:30 AM

- Mr. Bacon participates in the district-wide chemistry curriculum development meeting, from his classroom at H.S. 21+. The meeting is conducted through WebEx; Mr. Bacon has focused his Flip video camera on the new lab sensor he has been testing, so the other teachers at the meeting can see the probe as the data displays in a real-time graph in the WebEx window, and hear Bacon's commentary.

- *Teachers from all over the district collaborate regularly on curriculum and professional development, without leaving their classrooms. Thy use the same desktop videoconferencing tools that are employed in business, that enable the full range of human communication methods: voice, video, whiteboard, image, and text.*

10:30 AM

- In an instant message conversation with student Fred from Flushing, Mr. Bacon discusses the quality of the online tutorials that both of them have been reviewing. He needs an efficient way for all students to learn how to use the new data probes that he's just installed in the lab. They agree that students will learn the most from the podcast tutorials developed by the science education faculty at Hunter College and published online by McGraw-Hill. He checks that the district has licensed these tutorials -- which make extensive use of digital video -- and then links them to his class page on the school's learning management system.
- *Teachers at H.S. 21+ don't waste class time teaching skills that are best learned independently online by students. Nor do they need to develop all of their own curriculum materials. Instead, they take advantage of the academic and publishing community that more and more shares its new developments online, creating tutorials that can be played on mobile devices as well as computers. And the teachers at H.S 21+ often involve their students in selecting the best of them.*



11:30 AM

- With a half hour to spare before his next class, Mr. Bacon works on an assignment in the online course that he is taking to help him integrate the new environmental lab probes into the Regent's chemistry course. After working his way through the video-on-demand segments of the course, he completes this last assignment. Once his work is checked by the online instructor, he'll send his record to the district superintendent to get professional development credit for this work.

12:03 PM

- With the experiment set to run on the demo table, Mr. Bacon polls the large lecture class. "How many of you predict that the data will appear as in the first result table?" No hands go up; instead a graph grows in real time on the big screen as the students' responses are tallied and displayed -- they entered their predictions on their iPods, which linked to Bacon's computer through the school's wireless network, where interactive software compiles the results into a real-time graph. "Looks like 43 of you predict the first result, 54 the second, and the rest of you number three. The class is about equally divided on what's going to happen, so we'll need to discuss this some more before I run the experiment."

- *Teachers at H.S. 21+ sometimes work with very large classes, especially when demonstrating dramatic sequences or delivering special performances suitable to large groups. While Mr. Bacon is teaching 150 in the auditorium, his colleagues are free to engage in research and in small-group work with other students. The plenary sessions often take advantage of digital technologies to make these sessions interactive and thought-provoking.*

1:30 PM

- Mr. Bacon listens to his project group as they prepare for their upcoming presentation. He suggests they gather one more round of data, with a larger sample, before publishing their conclusions about PCB levels in the river. He also shows them how to use a spreadsheet to fit a mathematical curve to the data points they have collected from their water samples.

- *Each teacher at H.S. 21+ is assigned a project group: six to a dozen students who design and carry out an action research project in the community. Both teacher and students get as much credit for this course as they do for any other. It has become the opportunity for many interesting educational practices...*

1:40 PM

- He relates the resulting sine function to sound waves; this spurs a discussion of music, into which the students inject (from their humanities class of the previous period) ideas of the romantic era, reflected in lush pastoral themes in both music and art. As they discuss, Mr. Bacon finds in the school's digital media library online a painting from the Hudson River School that depicts the (old) Darwin Street bridge. Meanwhile a student locates and plays a Brahms composition retrieved form the same library. The multimedia juxtaposition provides an interesting moment of reflection for all.

- *...including applications of technology to interdisciplinary linkages. The school's extensive array of fully-indexed online resources makes this kind of connection possible. Mr. Bacon enjoys this kind of teaching.*

1:55 PM

- His project group is interrupted by an instant message from the district superintendent that arrives on Mr. Bacon's iPod. "Just got a call from the chairman of the school board. He says someone from the school is monitoring the pollution from the General Selectric factory just up the river, and he wants to know why. You have anything to do with this? (Our current chair is the COO of that plant.)"

1:56 PM

- Mr. Bacon puts the IM up on the big screen for the class to see. "What should we do about this?" he asks them. They suggest offering to deliver their presentation at the factory to its management group. Bacon responds accordingly to the superintendent, who likes the idea. The students assign one of their group to compose a letter for the superintendent to send to the factory operator.
- *Teachers at H.S. 21+ are expected to interact with the community, and to involve students in careful and critical study thereof. The faculty has learned to do this in a way that melds the newest technologies with old-fashioned political sensitivity. And even the superintendent uses IM.*

2:30 PM

- As he leaves the project group meeting room, Mr. Bacon notices a graph on one of the school's digital signage boards. It shows the results of the just-released online survey of H.S. 21+ students and parents. Four-to-one they prefer digital curriculum materials to paper textbooks; six-to-one they favor the addition of community service to the school's graduation requirements. And at the bottom of the board he sees a reminder of tomorrow's faculty-student charity basketball match.
- *You don't hear bells or loudspeaker announcements at H.S. 21+; instead, public communication takes place through the digital network, directed to relevant individuals, groups, or the school community at large as appropriate, and taking advantage of a variety of reception devices, from iPhones to IP telephones to digital signage in the hallways.*

3:30 PM

- Mr. Bacon practices his two-hand set shot in the gymnasium, in preparation for tomorrow's charity match. On a break, he uses his iPod to check the readings from the probe that his students put onto the Darwin Street bridge in the morning. No data -- the graph is flat-lined. He sends an IM to Alicia, his student whose internship is located just across the street from the bridge, and who arranged to use her company's wireless connection to link the data probe to the network. She asks her supervisor to reset the router, and the data flows freely once more.
- *The network is always with Mr. Bacon, and like the other teachers at H.S. 21+ he uses it all day, from wherever he works or plays, to check on the progress of his projects and his students. Many educational devices connect to the network for the people of H.S. 21+, from iPods to mobile phones, from laptops to data probes, from IP telephones to digital signage. This robust and open network is the key to their educational creativity and flexibility -- and keeps students connected with the school even while they are working their internships.*

8:00 PM

- The calendar alarms Mr. Bacon's mobile phone and laptop go off simultaneously in his home office. Time for the WebEx call with his science-teacher colleague in Japan, where it's early morning.

8:00 PM

(Cont.)

- As they discuss how they are using the new probes in their teaching, Mr. Bacon sees that his project group has posted the first draft of their podcast presentation to their wiki. He links the podcast to his Japanese colleague, who plans to show it to his students as soon as they arrive.
- *The digital network knows few national boundaries. And 21st-century teaching crosses many cultures. Teachers at H.S. 21+ are encouraged to involve their students in studies that circle the globe.*

10:00 PM

- Snoozing in his study, Mr. Bacon is awakened by Mrs. Bacon, who suggests he tune his laptop to the 10-o'clock news. he follows her advice just in time to see his project group's podcast playing in the background in a meeting room at the state senate. "The anti-pollution bill passed the committee an on a 6-4 vote this evening," reports the commentator. "The crucial compromise on the allowable levels of PCB's in water supplies was catalyzed by a podcast prepared by students at H.S. 21+ in Carson City..." With a smile, Mr. Bacon puts all of his digital devices, as well as himself, to sleep.

Closing

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