Waltham Public Schools
1:1 Learning Initiative

1:1 Team

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Vision

All students will be successful learners - intellectually, personally, physically, and creatively - college and career-ready, and contributing community members.

Theory of Action

If we ensure that all students have access to high-quality content and instruction, continuously analyze data, and provide tools, infrastructure and systems that will expand the learning environment then we will improve student learning and narrow the achievement gap for all students.
District Goals

Equity and Excellence
Ensure that all students have **equal access** to high-quality content that meets their academic, social, emotional, and physical needs.

Data-Driven Decisions
Continuously analyze data on student learning and educator, school, and district performance to **improve student learning** and teaching quality

Infrastructure
Provide an infrastructure of tools, systems, and services that supports district initiatives and **expand the learning environment** for students and families.
Technology Priorities

At a FY 14 budget meeting held on January 4, 2013, administrators identified the following technology priorities:

- Establish wireless environment to support 1:1 initiative
- Model Classroom should be furnished with interactive projector, laptop, document camera and tablets for students
- Purchase LCD interactive projectors and laptops for elementary schools to support implementation of Math in Focus
- Purchase tablets in FY14 for teachers
  - Provide PD for teachers during 2013-2014 school year
- Select two-grade levels to launch 1:1 initiative
  - Launch 1:1 initiative in September 2014
Educational Impact of 1:1 Learning

The proliferation of mobile tablets and the "knowledge revolution" that these devices, in the hands of skillful teachers and engaged students, have engendered are already beginning to have a major impact on instructional practices in public education today (Birch, 2011). The irony is that many students are already fluent users of some of these new technologies. As Costa and Kalick (2010) noted “our students are in the 21st century and they are waiting for the teachers and the curriculum to catch up.” Clearly the educational impact of 1:1 learning for today’s students here in Waltham is to put these new technologies into their hands so they can further acquire, refine, and expand their skills as a tool for learning every day.

College and career readiness now means that our students must be proficient in mobile technologies and be adept at using these technologies to do critical thinking, problem-solving, collaboration, and multi-media research and sharing. Studies show that employers now expect students to have digital literacy skills before they enter the workplace (The Conference Board, Partnership for 21st Century Skills). The Partnership for 21st Century Skills, an organization that promotes and encourages 21st Century readiness for all students, identified the following as essential 21st century skills:

- Critical Thinking and Problem-Solving
- Innovation and Creativity
- Inquiry
- Communication
- Collaboration
- Information and Media Literacy
- Technology Skills
- Self-Directed Learning
- Global Awareness

Looking at future trends in society, it is clear that the 21st century world will require different skills and learning environments. For example, the Horizon Report annually ranks trends according to how significant each is likely to be for education over the next five years.

The top trends from 2012-2016 are listed here:

- People expect to be able to work, learn, and study whenever and wherever they want.
- There is a new emphasis in the classroom on more challenge-based, active learning.
- Technology continues to profoundly affect the way we work, collaborate, communicate, and succeed.
• The abundance of resources and relationships made easily accessible via the Internet is increasingly challenging us to revisit our roles as educators.

• The world of work is increasingly collaborative, giving rise to reflection about the way student projects are structured.

Additionally, according to the *Innovate to Educate Symposium* (2010):

“Today’s industrial-age, assembly-line educational model – based on fixed time, place, curriculum and pace – is insufficient in today’s society and knowledge-based economy. Our education system must be redesigned from a mass production to a mass customization model to better meet the diversity of students’ backgrounds and needs and the higher expectations set for all students.”

The new model for schools is collaborative, where the classroom environment is similar to that of the workplace and where “education in the lifelong-learning era will be skills based” (Birch 2011). Students graduating into a 21st century world will encounter a very different place than the 20th century. To prepare students for this world we need to establish equitable access to quality learning tools and technologies that enable students to learn in relevant, real world contexts. To achieve these objectives, many schools are turning to one-to-one computing initiatives as a solution (Penuel, 2006). The use of mobile technologies places the student at the center of the teaching and learning experience. The opportunity for one-to-one access facilitates student problem-solving, project-based learning, critical thinking, and global awareness. Access to information is literally in the palm of their hands, but what students learn to do with this information remains our prime directive and requires us to change the way we think about teaching and learning.
Why 1:1?

When we consider why the world of education is moving in the direction of 1:1 learning, it has its origins in the advent of these wireless, mobile tablets. In the hands of students and teachers, these tablets have set in motion new modes of understanding the world around us, of accessing information instantaneously, and of connecting with others. What we know already from the research is that 1:1 learning engages struggling or inactive students, including students in their own learning. Districts all around us are moving in this new direction and are actively putting plans into place to rollout 1:1 learning. The days of the hardcopy textbook or paperback novel are being replaced by digital textbooks with search capabilities that far surpass what hardcopy can offer. And finally, colleges and universities are ahead of us in this 1:1 conversion. One to one programs currently exist across the United States in a wide variety of settings including large-scale 1:1 initiatives in South Dakota, Pennsylvania, New Hampshire, Texas, Georgia, Louisiana, California, Virginia, Florida, Kansas, Maine, Massachusetts, and Michigan. Waltham must prepare our students for 1:1 learning so that our students possess a facility with these learning tools before they move on to their college or careers. Additionally, the forthcoming PARCC assessments will eventually be administered online and, therefore, will require a solution by school districts to assess all students using some technological tool.
"Do we want kids walking around with 50-pound backpacks and every book in those backpacks costing 50, 60, 70 dollars and many of them being out of date? Or, do we want students walking around with a mobile device that has much more content than was even imaginable a couple years ago and can be constantly updated?

I think it's a very simple choice."

Secretary of Education, Arne Duncan from an interview about Redefining Instruction: Five Essential Steps

1:1 Learning Goals

Aligned with the studies from The Partnership for 21st Century Skills and the Horizon Report, the district's 1:1 learning goals are:

- To increase student engagement and productivity through personalized learning and equal access to technology
- To extend and expand learning beyond the school day—anytime, anywhere learning
- To provide authentic and relevant learning experiences
- To increase student achievement and academic rigor
- To promote inclusion by providing opportunities that level the playing field for children with disabilities in general education classrooms
- To increase 21st century skill development in collaboration, communication, creativity, critical thinking and problem solving, digital literacy, and global awareness
The 1:1 learning goals align and support our district goals:

- To ensure that all students have **equal access** to high-quality content that meets their academic, social, emotional, and physical needs (Equity and Excellence)
- To continuously analyze data on student learning and educator, school, and district performance to **improve student learning** and teaching quality (Data Driven Decisions)
- To provide an infrastructure of tools, systems, and services that supports district initiatives and **expand the learning environment** for students and families (Infrastructure)

"I think every student needs access to technology, and I think technology can be a hugely important vehicle to help level the playing field."

*Secretary of Education, Arne Duncan*

**What the Research Says . . .**

- **Benefits for Students**
  - Increased Interest in Learning (Bebell & Kay, 2010; Lowther, Ross, Strahl, Inan, & Pollard, 2005)
  - Increased Engagement and Reduced Behavior Referral (Bebell & Kay, 2010; Bebell & O’Dwyer, 2010; Suhr, 2010; Muir, Knezek, & Christensen, 2004)
  - Better Organized, More Efficient (Weber, 2009; Silvernail & Lane, 2004)
  - Decrease in Absentee Rate (Holcomb, 2009; Lemke & Martine, 2003)
  - Higher Test Scores for Writing and Higher Quality of Writing (Suhr, 2010; Metri Group, 2006; Lowther, Ross & Morrison, 2003; Warschuer & Kahi, 2002)

- **Benefits for Teachers**
  - More Student-Centered Strategies (Bebell & Kay, 2010; Lowther, Strahl, Inan, & Bates, 2007)
    - Element II-A-2: Student Engagement
  - Individualized Curriculum to meet Diverse Student Needs (Weber, 2009; Silvernail & Lane, 2004)
    - Element I-B-2: Adjustment to Practice
Element II-D-3: Access to Knowledge
  o Movement toward Constructivist Teaching, Student-led Inquiry, and Collaborative Work (Rockman, 2000; Muir et al., 2004; Ross & Strahl, 2005)
  o More Creative, Customized, and Collaborative Lessons (Holcomb, 2009)
    • Element I-A-4: Well-Structured Lessons
    • Element IV-C-1: Professional Collaboration
  o More Collaborative and Project-Based Instruction (Bebell & Kay, 2010; Gulek & Demirtas, 2005; Jeroski, 2003; Warschuer & Kahi, 2002)
    • Element I-A-4: Well-Structured Lessons
    • Element IV-C-1: Professional Collaboration

Implementation
  o Concentrated Model is Most Effective (Shapley, Sheehan, Maloney & Caranikas-Walker, 2010; Rockman, 2004)
    • More Time Doing HW and Engaged in Learning Activities outside of school day (Bebell & Kay, 2010; Weber, 2009; Muir, 2004)
    • Increased Community Support (Muir, Knezek, & Christensen, 2004)
      • Element III-A-1: Parent/Family Engagement
  o Teacher Professional Development is Critical Component (Bebell & O'Dwyer, 2010; Muir, 2005)
  o Have Realistic Expectations (Holcomb, 2009)
    • 5 to 8 Years to have Discernable Impact (Silverman & Gritter, 2007)

Mobile versus Traditional Learning

Several benefits for our 21st century students will be realized by moving to a 21st century mobile learning model from a fixed traditional model. Teaching and learning will shift to more student centered activities with students accessing electronic resources that provide an environment for collaboration, creativity, analysis and critical thinking. Below is a comparison chart of the two learning models.
<table>
<thead>
<tr>
<th>Mobile Learning</th>
<th>Traditional Learning</th>
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<tbody>
<tr>
<td>• Student centered</td>
<td>• Teacher Directed</td>
</tr>
<tr>
<td>• Mobility</td>
<td>• Scheduled in computer lab</td>
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<tr>
<td>• Anywhere, Anytime</td>
<td>• Takes place in school</td>
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<tr>
<td>• Access for All Students</td>
<td>• Access for some students</td>
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<tr>
<td>• Online information is up-to-date and easily accessible</td>
<td>• Information comes from a textbook and is dated</td>
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<tr>
<td>• Assessed for 21st century outcomes</td>
<td>• Assessed on knowledge learned</td>
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**Technology Equipment Considerations**

Several 1-to-1 computing devices were reviewed for the Waltham Public Schools. Careful consideration was given to each in the areas including, but not limited to, classroom integration, student performance, student support, teacher support, security, ease of use, annual budget requirements, capital requirements and sustainability.

Types of computing devices reviewed included laptops, netbooks, tablets, "BYOD" (Bring Your Own Device), and miniature mobile devices. The "pro's" and "con's" determined in the table below.
The District’s goal is to increase student achievement and engagement in a 21st century teaching and learning environment where each student has a mobile computing device to use at school and home.

Keeping this goal in mind along with the operational challenges of security, support, training and professional development, initiative costs, and classroom integration, the "tablet" computing device was deemed the best choice for Waltham Public Schools.
Why iPads?

- Ease of use
- Multi-touch screen
- Accessibility features—screen reader, zoom feature to magnify any application, and playback of closed-captioned content.

While several tablet computing devices exist on the market today, the iPad is the choice of the Waltham Public Schools.
- Selection of educational apps
- Personal organizer and productivity device

- Can be used as a student personal response device, graphing calculator, eBook reader

- Personalized
- Engaging
- Durable and lightweight for students to carry around.
- Fast because of solid-state hard drive

- Notetaking
- Lower cost.
- Long battery life

- Low maintenance/tech support costs
- Green technology—limits paper/printing costs
- Video Mirroring

Feedback from Stakeholders

2nd grade students from Whittemore

The iPad helped us to . . .

"Read books at higher levels."

"Learn more math facts with addition, subtraction and multiplication."
"Identify and count money and coins."

"Record our voices when we read a story that we have written."

"Research places and countries on Google Earth."

"Tell time."

**Jill Gold, 2nd grade ESL teacher at the Whittemore Elementary School**

"My teaching has greatly been enhanced by using the iPad in my instruction with the students. It has been an incredible opportunity to be able to help the students use technology. Reading skills have greatly improved and I can attribute some of that success to the apps that students are exposed to on the iPad. I use the DRA2 as the measuring tool to determine a student’s reading level. In September, I had students who started at a level 3 on the DRA2--that is at a Kindergarten level. Many of these students have progressed 9 reading levels from September to June 2013 using the iPad as a learning tool."

**A Parent of a student in Jill Gold’s class at Whittemore**

"After seeing what my daughter was doing in Ms. Gold’s class, we purchased an iPad for my children to use at home. When my youngest daughter is not using the iPad to practice her letters and ABC’s, my older daughter (2nd grader @ Whittemore), is using the iPad to read books on RAZkids, to play games, and for a little bit of math. The iPad is a very wonderful way to help children learn a lot because they can look at so many things."

**A Millis 8th grade student**

"The iPad is helping me to learn better and more independently, in all subjects. The teachers are letting the students work by themselves, and spend less time speaking in front of the class, which saves a lot of class time. Since the arrival of the iPads into the eighth grade, learning has become easier for me."

**A Burlington High School student**

"My favorite educational use for the iPad is the way everyone can do everything at the same time in the classroom. For instance, in biology, we all watch relevant YouTube videos on our iPads at the same time. Also, I enjoy taking notes on it. Evernote is a very handy and useful tool. I think that BHS has given us a wonderful tool, the iPad, to expand our knowledge in the modern day world and the 21st century. Students are going to use technology regardless, in the outside world. Why not incorporate that and use it in school as well. This teaches students to be responsible, and use some of the advantages that technology has."

**Burlington High School teacher**

"This was an unparalleled success. Student enjoyed the work, were engaged at a higher level that I might normally expect, and produced work at a very high level. It’s worth noting that this was a positive example for me as well- I was able to be mobile, and interact with students seamlessly and effortlessly. It was nice to see technology work without any noticeable effort."

**Financing the 1:1 Initiative**

**Phase I: Wireless Network**
Phase II: LCD Projectors/Laptops

Phase III: 1:1 Initiative

- iPad carts (25/cart) for pilot at MacArthur (1) and WHS (3) $72,000
- iPads for pilot at middle schools (approximately 90 students/school) $108,000
- iPads for middle school teachers (113) $67,800
- Laptops for middle school teachers (113) $135,600

Total $383,400

How will we assess the initiative?

We will use technology integration surveys to assess entry points for teacher skills and to evaluate ongoing technology integration into instruction. Classroom observations and focus groups will concentrate on the levels of use and integration of the iPads in our pilot programs at MacArthur, McDevitt, Kennedy and Waltham High School. School and student data will be reviewed to target any trends in assessment scores, attendance, and discipline data.
**Timeline**

**June 2013**
Presentation to Waltham School Committee
Identify students and teachers who will be involved in iPad Pilot Program at Kennedy, McDevitt and WHS

**July 2013**
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<td><strong>Purchase iPads and laptops for middle school teachers</strong></td>
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<td><strong>Purchase iPads for middle school students involved in iPad Pilot Program</strong></td>
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<tr>
<td><strong>Purchase iPad Carts for high school teachers</strong></td>
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<td><strong>Purchase iPad Cart for MacArthur Elementary School</strong></td>
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**August 2013**

- Distribute iPad Carts to MacArthur and high school teachers

**September 2013**

- Distribute iPads and laptops to middle school teachers and provide introductory training

**Fall 2013**

- Distribute iPads to middle school students involved in iPad Pilot Program

**September 2013 - June 2014**

- Provide professional development for elementary ITS, middle and high school teachers
- Share best practices at staff and curriculum meetings
- Tech Thursdays
- Collect data from staff and students through focus groups and surveys

**April 2014**

- Presentation to faculty, students, Waltham School Committee and parents
- Launch 1:1 website
- Acceptable Use Policy draft and insurance protocol draft to school committee

**June 2014**

- Create master list of required Apps for each department
- Student-Parent iPad information packet created

**August 2014**

- Student iPads loaded with required Apps
- Student/Parent/Guardian Deployment and Training

**2014-2015**

- Ongoing professional development
- Share best practices at staff and curriculum meetings
- Parent Workshops
Next Steps

The 1:1 Team has identified the following areas that need further review or revision:

- Acceptable Use Policy
- Insurance Coverage
- Lease to Own Options
- Annual Operating Budget versus CIP
- Roll Out of 1:1 Initiative at Waltham High School
- Security

Student security is a district priority, as well as, regulated by the Department of Elementary and Secondary Education. The district shall deploy stringent security measures through the use of content filtering software, monitoring application, and security locked equipment distributed to students.

The content filtering shall be achieved through "CIPA" (Children’s Internet Protection Act) compliant browser installed on ALL iPads. Students may only use this browser for internet activity and no other browser can be accessed. The application is specific for education, cross-platform filtering for mobile devices and works on or off site. The application provides reporting on sites visited, blocked sites attempted, and blocked sites by category, while safely allowing access to educational videos, blogs, and wiki pages.