BLOOMFIELD TECH PLAN: 2019-2024

Updated for FRS Submission 2018-19
Version 1.0 (April 2019)

Version 1.0 (April 2019) - **BOE APPROVED 8 yea, 0 nea, 1 abstain, May 7, 2019**

BOARD OF EDUCATION
155 Broad Street
Bloomfield, NJ 07003

The following is an extract from the minutes of the Regular Meeting of the Bloomfield Board of Education held on Tuesday, May 7, 2019.

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Board Members Present: Mr. Shane Berger, Ms. Jill Fischman, Mr. Thomas Heaney, Mr. Michael Heller, Ms. Lillian Mancheno, Mr. Benjamin Morse, Ms. Ellen Rogers, Ms. Jessica Salinas, Mr. Ralph Walker

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Upon the motion of Mr. Heller, seconded by Ms. Mancheno, the following resolution was introduced:

RESOLVED that the Bloomfield Board of Education, upon the recommendation of the Superintendent of Schools, approves the Bloomfield Technology Plan for 2019-2024.

Resolution carried (8-0-1) with Mr. Morse abstaining.

I, HWEY-HWEY "VICKY" GUO, Secretary to the Board of Education of the Township of Bloomfield, Essex County, New Jersey, do hereby certify that this is a true copy of a resolution adopted at the Regular Meeting of the Board of Education of the Township of Bloomfield, NJ held on Tuesday, May 7, 2019.

Hwey-Hwey "Vicky" Guo

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Executive Summary

Mission Statement

The mission of Bloomfield School District includes the mandate “to provide an equal opportunity for all learners to achieve individual success and to be prepared to meet the needs of an evolving Society.” The District’s philosophy is equally explicit and specific to the non-discriminatory nature of the mission to provide for the welfare and progress of each individual and “to meet the instructional needs of each student” in “an educational environment that is conducive to the teaching/learning process.” (See District Mission & Philosophy, at https://www.bloomfield.k12.nj.us/apps/pages/index.jsp?uREC_ID=364825&type=d, accessed 12/20/18, 12:23 PM.)

Vision

Like the previous Tech Plans, this Plan “attempts to give every student, teacher, and school in the entire District, a higher starting place for beginning specialized tech initiatives.” In other words-

> Regardless of where a student comes from, every student will have the same basic opportunity to prepare for life and work in the 21st century. If a rising tide lifts all boats, we hope that providing every student with the same, greater opportunity than was previously enjoyed within the District, all students will perform at ever higher and higher levels of accomplishment. (See DISTRICT TECHNOLOGY PLAN 2016-2021, at https://www.bloomfield.k12.nj.us/ourpages/auto/2018/7/19/51651636/Tech%20Plan%20Draft%20171128%20Wo%20Watermark.pdf, on 12/20/18, 12:31 PM.)

Integral to this vision is the implementation of the 1:1 across as many grade levels as deemed effective for instruction. In the words of one teacher:

> Bloomfield is a district of those who have, and those who have not. Distributing chromebooks has alleviated some of the disparities between our students. There are families whose main concern is putting food on the table and paying the rent, these families do not have the resources to purchase computer equipment. If we want our students to be engaged in the information age we need to provide technology to make this happen. (Anonymous Survey, All Faculty, February 2019).

Educational Technology Stakeholders

The Bloomfield School District comprises a very diverse community with a lot of bureaucratic, administrative, political, and institutional levels, each of which demands time and work on the part of leaders and members. The Technology program strives to interact and involve as many

stakeholders as possible in meaningful exchanges. The main meeting place, the group which handles all issues related to technology, especially educational technology that impacts students, the nexus for the entire District with regard to Technology, and the primary tool for implementing and evaluating instructional and community initiatives is the District Faculty Technology Committee and the companion BOE Technology Committee. Both groups convene monthly, either in person, or virtually, via Google Hangouts, progress through planned agendas and discussion items, and always remain open to discussing any topic or issue of concern to members.

The District Faculty Technology Committee consists of teachers recommended each year by the building Principals. Teachers are selected on the basis of the regard in which they are held by peers as educators (not necessarily technology savants). The teachers are expected to attend monthly meetings, contribute as called upon, and report back to their principals and peers on current programs.

The Faculty on the District Tech Committee are the primary conduits for communicating with teachers district-wide, parental and student concerns, as well as serving as channels for the District to report back on budgetary and programmatic initiatives.

The BOE Technology Committee is created annually by BOE appointment and also meets monthly. Below are the members for the 2018-19 School Year.

Members of Technology Committee (2018-19)

HS	*Rich Adams (Business) *George Agens (English) *Peter Bodor (PRIDE) *Keri Giannotti (Social Science) *Matt Giordano (Science) *Sara Rothman (English) *Jason McLaughlin (Math) *Desiree Testa (Social Studies)
MS	*Theresa Hughes (Technology)
Berkeley	*Jennifer Noto
Brookdale	*Lisa Gallagher
Carteret	*Gianna Cafaro
Demarest	*Jessica Barton
Fairview	*Dawn Rabbia and *Ed Reyes
Franklin	*Allison Bendokas (LOA) *Shane Haimbach
Oak View	*Marissa Calderon
Watsessing	*Monika Martin
ECC @ FG	*Michelle Ogden
District	Superintendent

	Assistant Superintendent Directors Supervisors Principals

Members of BOE Technology Committee (2018-19)

BOE Members	*Mr. Michael Heller (Chair) *Ms. Jill Fischman (Pres. - BOE) *Mr. Thomas Heaney
District	*Thomas Atkinson (Dir Sys & Info Tech) *Mrs. Jen Khoury (Supv - Web Master)

*Confirmed for 2018-19

For examples of Tech Committee agendas, please see below:

Agenda/Minutes of BOE Tech Committee Meetings 2019: Feb, March, April
Agenda/Minutes of District Faculty Tech Committee Meetings 2019: Jan, Feb, March

Planning Process

Historical Overview & Perspective

The Bloomfield Public School District serves a township of almost 50,000 citizens (47,315, according to the 2010 Census) and in many ways statistically mirrors the demographics of most urban and suburban communities in the New York metropolitan area. Bloomfield is 60% White, 20% Black or African American, and 25% self-declared Hispanic or Latino. The median household income is comparable to similar communities.

Bloomfield is also changing in ways that mirror trends in the nation. While whites remain the majority in the township, their numbers have declined almost 16%, since 2000. Similarly, the population of Black or African American, Hispanic, and people of multiracial descent have increased. As in the rest of the nation, median income for almost all households has declined over the past decade.

Within the School District student population, as of November 2015, whites are no longer the majority racial group. They comprise 29% of the total student population, while Hispanics constitute 36%. Together, traditionally "minority" populations (Black, Hispanic, Asian) are now in the majority.

As of April 2019, the white population district-wide has declined to 26.8%, while the Hispanic population has increased to 40.4%. Minority, non-white populations constitute 73.1% of the total population and are the majority in all but two schools (Brookdale, 42.7% and Oak View, 43.8%).

Race	April 2019						
	Asian	Black	Hispanic	n/a	Pacific	White	Grand Total
Berkeley	7.16%	29.53%	52.57%	0.00%	1.34%	9.40%	100.00%
Bloomfield High School	7.29%	27.33%	39.61%	0.31%	0.73%	24.71%	100.00%
Bloomfield Middle School	6.51%	24.01%	41.91%	0.20%	2.03%	25.33%	100.00%
Brookdale	12.18%	7.93%	20.11%	0.28%	2.27%	57.22%	100.00%
Carteret	3.96%	26.12%	60.16%	0.00%	2.11%	7.65%	100.00%
Demarest	6.99%	20.97%	35.92%	0.00%	1.55%	34.56%	100.00%
Fairview	7.42%	25.23%	45.64%	0.00%	2.41%	19.29%	100.00%
Franklin	3.62%	17.83%	44.01%	0.00%	1.39%	33.15%	100.00%
Oak View	10.63%	9.54%	20.44%	0.00%	3.27%	56.13%	100.00%
Watsessing	4.19%	37.74%	39.68%	0.65%	1.29%	16.45%	100.00%
Grand Total	**7.05%**	**23.97%**	**40.40%**	**0.18%**	**1.59%**	**26.81%**	**100.00%**

District-wide 45% of the student population is free or reduced rate for lunch services. Three schools (Berkeley, Carteret and Watsessing) are majority reduced or free lunch students. They qualify for "School-Wide" Title I fund. The HS and MS have slightly higher free and reduced lunch averages than the District as a whole (50% and 48%, respectively, versus 45%). The HS and MS are also "School-Wide" eligible for Title I assistance. Fairview and Franklin Elementary, qualify for "Targeted Assistance" (TA) Title I funds.

As of April 2019, district-wide free or reduced lunch status for students has declined to 39.7%, ranging from Carteret's high of 65.6% to Oak View's, 7.0%. The High School and Middle School have seen comparable drops in overall enrollment in free or reduced lunch programs: to 41.2% at the HS, to 42% at the MS.

Lunch Status	April 2019				
	Free	Full Pay	Reduced	n/a	Grand Total
Berkeley	55.70%	35.57%	8.72%	0.00%	100.00%
Bloomfield High School	34.73%	58.66%	6.56%	0.05%	100.00%
Bloomfield Middle School	34.28%	57.99%	7.73%	0.00%	100.00%
Brookdale	3.40%	95.18%	1.42%	0.00%	100.00%
Carteret	56.73%	34.30%	8.97%	0.00%	100.00%
Demarest	21.75%	73.79%	4.47%	0.00%	100.00%
Fairview	34.14%	59.74%	6.12%	0.00%	100.00%
Franklin	32.59%	60.72%	6.69%	0.00%	100.00%
Oak View	5.45%	92.92%	1.63%	0.00%	100.00%
Watsessing	43.55%	42.90%	13.55%	0.00%	100.00%
Grand Total	**33.18%**	**60.20%**	**6.61%**	**0.02%**	**100.00%**

The Bloomfield Public School District comprises 11 schools: one HS (9-12), one MS (7-8), seven elementary schools (K-6), and one pre-kindergarten school. As of 2015-2016, there are

approximately 6,200 active, enrolled students in the 11 schools. As of April 2019, there are 6,355 active enrollments in the 11 schools.

Current Technology Environment

Instructional Technology Programs and Initiatives

Bloomfield School District supports various Technology & STEM programs and initiatives but does not teach technology merely for its own sake, or simply to acquire rote keyboard skills. Rather, technology as the reach of information and communication resources beyond what is achievable within a school or isolate classroom is infused in all instruction and curricula. The objectives related to 21st Century themes and readiness are part of every curriculum, as well as the technology resources available to both teachers and students.

The New York Times recently published (Sunday, April 21, 2019) an article on the reported failure of programs to infuse technology in certain schools and districts with a highly technical, personalized learning system called Summit Learning. The program supposedly allows teachers and students to utilize infused technology in highly tailored learning programs that support the student's personal interests. But the company provides the curriculum, via its own servers. Moreover evaluation and assessment, such as they are practiced, must be carried out on their learning platform. (See *Silicon Valley Came to Kansas Schools. That Started a Rebellion.*. (2019). *Nytimes.com*. Retrieved 22 April 2019, from https://www.nytimes.com/2019/04/21/technology/silicon-valley-kansas-schools.html.)

As an alternative approach, Bloomfield has always pursued technology as the servant of its approved curriculum. Curricula are not overhauled or replaced to accommodate technology. Instead, the Tech Committees and Instructional leaders seek out technology to support the approved learning pathways. Moreover, other than Google Classroom, the District utilizes no third-party learning platform. The teacher remains the caretaker and the guide and focus for student learning.

While acknowledging that the future of education is closer to a tech-infused classroom where students use computers and information/communication resources rather than one in which no such resources are available, Bloomfield supports the cautions of Salman Kahn, creator of the Khan Academy:

> What will make this goal attainable [high-quality, personalized education] is the enlightened use of technology. Let me stress ENLIGHTENED use. Clearly, I believe that technology-enhanced teaching and learning is our best chance for affordable and equitable educational future. But the key question is is how the technology is used. It's not enough to put a bunch of computers and smartboards into classrooms. (See The One World Schoolhouse: Education Reimaged, Salman Khan, Hatchette Book Group, 2012, p. 119.)

In brief, nothing replaces the teacher's leadership in helping students learn and freeing them from the chains of ignorance and error. The teacher-student or teacher-class relationship is the heart of the educational process. The centrality of the District Faculty Technology Committee in Bloomfield's overall program ensures that preeminence of the teacher. Just about every aspect of Bloomfield's Technology program, including the Teacher Academy, support the centrality of the teacher in the learning response. Bloomfield supports the almost 500 year-old plea of late Renaissance educators, "Magistri sint insignes" or "The teachers should be outstanding." (See El Liderazgo Al Estilo de los Jesuitas, Chris Lowney, Loyola Press, 2003.)

District 1:1 Chromebook Initiative

The core of Bloomfield's Technology program is the 1:1 Initiative in place for grades 7-12, as of 2018-19.

The current program evolved from early discussions in the spring and fall of 2015 on how to achieve equity in technology resources and opportunity across the schools. At that time, there was considerable disparity in the disposition of equipment and type of equipment in the different schools. A further complication was the variety of software and online programs present in various schools, which made cross-school, district-wide training difficult or impossible.

The District discussed achieving a parity of technology resources in all classrooms, in light of budgetary constraints and long-term viability of supporting programs. The first steps were to ensure the installation of a classroom projection system in every classroom. Smartboards were replaced with more affordable interactive LCDs.

In 2015-16, The Tech Committee also decided to introduce in parallel with the then dominant Microsoft Office 365 Suite,, the Google Apps for Education programs, since renamed G Suite for Education. The role of the Tech Committee in assisting teachers master new programs, such as PowerSchool as the SIS grew into a teacher-led Teacher Academy, where fellow faculty offer courses in approved topics to teachers who earn the approved rate for extra-school learning.

The Teacher Academy offered courses in Google and related programs, introduced Chrome as the preferred web browser and finally supported the migration from Microsoft Office email to GMail.

At the same time, in 2015-16, the Superintendent encouraged research into the possibility of rolling out a 1:1 for students in one school or grade level. He insisted on the absolute need for no payment or charge to any family or student for participation and the requirement to include all students and families, even those who do not currently have high-speed Internet access. In 2016-17, after spending a the previous term preparing teachers, a pilot of 300 students in both 7th and 8th grades at the Middle School received Chromebooks. From that relatively small beginning, approximately ⅓ of each 7th and 8th grade class, the program has expanded to include all 3,000 students in both the Middle and High Schools. The District stands ready to roll-out the same program to the 6th grades in all eight elementary schools in the 2019-20 school year.

Pointedly and specifically, Bloomfield leadership at every level in the planning stages for the 1:1 rejected the proposal for students to “Bring Your Own Device.” Administrators, principals, and teachers consistently pointed to the wide socio-economic range of their student base, and the certainty that excessive personalization of tech platforms almost guaranteed unfairness and inequality. Moreover, the teachers, especially after the Pilot with 300 middle school students, insisted that only a district-implemented 1:1 would ensure consistency of instruction. If each student could bring to school his or her own device, the teacher would have no realistic way to manage what the students experienced on their screens, or realistically and fairly require similar submissions and performance from all students.

Provision was made from the beginning to discreetly supply Internet access to families and students without home Internet access, but otherwise all students enjoyed the same opportunity to success, irrespective of whether or not or the nature of special classification, or programmatic enrollment. If a student attends a Bloomfield school in a grade that is part of the 1:1, that student has the same opportunity -and responsibilities- as all his peers.

Teaching and Learning with Computers: Classroom Default Setup

Beginning in 2016-17, the District’s goal -since achieved- was to outfit every classroom that had a fully scheduled class of students with an interactive whiteboard for displaying a computer screen to support instruction, a mini-PC or windows computer attached to that LCD, with a wireless mouse and keyboard, as well as whatever supporting peripherals for audio and display were necessary. Elementary school classrooms were supplied with document cameras for displaying books on the computer screen. All classrooms had some enhanced audio system, either built-in speakers on the LCD or legacy SmartBoard, or external speakers.

It turned out that the Libraries in each school were the best places to disburse additional tech equipment, such as student earbuds, wide area microphones, and laser pointers or displays.

The District took advantage of other districts who were replacing all of their SmartBoards with LCDs and obtained at great discount some functional, but used, older model SmartBoards. Those units were utilized in places without any display system or were cannibalized to support broken SmartBoards. Some classrooms had insufficient wall space for interactive boards of any kind, and receive pull-down screens instead. Installations in other, specialized rooms, such as performance halls for the performing arts, but many have since been backfilled.

In every case, the presentation system has displayed Chrome and Google related programs, mimicking Chromebooks used by students.

Amazingly, many of the features of systems that were very expensive in recent years past are affordable and able to be implemented by teachers in individual classrooms. Broadcast TV studios that used to require very costly equipment and network broadcasting systems can be emulated in Google Hangouts, Skype, and other free services. Sharing screens is almost achieved with Google document sharing, where teachers and students can collaborate on single documents, while others observe the interactions. Video conferencing systems that used to cost thousands of dollars and demand extensive maintenance are now emulated by single computers and on-board webcams. Teachers lead and interact with classes all around the

district, as well as the area, nation and, we hope, eventually, the world -under the direction of their teachers. All video conferencing remains exclusive to the teacher accounts in Bloomfield's Google domain.

Assistive Technology

The District's Special Services Department manages all assistive technology, either as part of IEPs, or accomodations for 504 compliance. The Department is also responsible for special equipment necessary for educators to fulfill INRS requirements.

The 1:1 program has benefited Special Services directly in one, indirect way. Over the past two years, the Department has worked with the Technology Committee and schools to get rid of iPads and iOS devices that are so out of date that they could not be upgraded to the most current version. The result was the retirement and ecologically sound disposal of over 500 iPads and the consolidation of about 300 that were able to be upgraded for use in Special Services:

Device	Model	Nov Meraki Count	iOS Upgradeable to	Fully Upgradeable	Inv Total
iPad		10	5.x Full		6
iPad	3rd Gen	42	6.x Full - 9.x Partial		0
iPad	4th Gen	158	7.x - 10.x Partial		39
iPad	2	304	5.x Full - 9.x Partial		106
iPad	2 AT&T	1	5.x Full - 9.x Partial		0
iPad	Air	307	11.x Full	x	216
iPad	Air (Cellular)	26	11.x Full	x	0
iPad	Air 2 (WiFi)	2	5.x Full - 9.x Partial		2
iPad	mini	2	6.x Full - 9.x Partial		0
iPad	mini (Verizon/Sprint)	1	6.x Full - 9.x Partial		0
iPad	mini Retina	2	11.x Full	x	0
iPad	mini Retina (Cellular)	1	11.x Full	x	0
Total		**856**		**336**	369
Upgradeable					216
K-3 Sections Total By School			94		
Allocated Chrome Tablets Per 7 Section			658		
Note					
	Total Inventory		856		
	Fully Upgradeable		336		
	Need Replacement		520		

The Special Services Department obtained those approximately 300 devices for use with students who would benefit from iOS specific applications.

The Tech Committee recommended that the schools use a Chromebook or touch sensitive Chrome tablet as replacement devices for the inventoried iPads to be disposed of. The specific device, and the grades that will use those devices remains a matter of discussion and evaluation for the Tech Committee. In some case, touch sensitive Chrome tablets have been found to be lacking for the purposes to which the K-3 teachers would want to use them. Teachers in grades 2-3 appear to prefer Chromebooks with full keyboards, to support keyboarding and general creation of content. Teachers in K-2 appear to have mixed opinions on the utility of the devices. In all cases, teachers appear to have utilized the tablets more for their own personal use, as teachers, rather than with students. (See Appendix G: Survey on Chrome Tablets.)

Informational Technology Literacy

Bloomfield District's Technology instruction occurs within approved curricula at every level and in every subject area of instruction. Every curriculum includes sections on 'Technological Literacy' and enumerates the specific, grade appropriate indicators of NJCCCS 8.1 and 8.2 that are covered within the Curriculum.

For example, current Grade 6 Math Curriculum specifies, "All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge" and enumerates the ...specific NJCCS indicators." (See Appendix J - GRADE 6 MATH CURRICULUM - TECHNOLOGY *ONLY* INDICATORS.)

All current approved curricula follow the same Understanding By Design framework pioneered by Jay McTighe and Grant Wiggins. The goal is to give students profound understanding through structured learning into what are called "Essential Questions" germane to the topic. Rather than mere recitation of facts, or rote repetition of learned skills, students advance to synthesis and reflection on their learning. The process of curriculum design in UBD is to begin with the product or goal of instruction, and work backwards from there to construct relevant activities in the lesson, from testing of pre-knowledge, via pre-assessment, to learning activities that culminate in Performance Tasks and successful assessments.[1]

This UBD format with template includes for each subject relevant professional standards (Library, or Math, e.g.) or NJCCCS within Unit Plans to enhance instruction. End of unit and lesson assessments guide structured on essential questions for in-depth, comprehensive learning inform the resources and pedagogy, including technology usage, taught daily. (See *Grade Levels - Bloomfield School District*. (2019). *Bloomfield.k12.nj.us*. Retrieved 22 April 2019, from https://www.bloomfield.k12.nj.us/apps/departments/?show=TDE .)

[1] Jay McTighe and Grant Wiggins, Understanding By Design, Prentice Hall, 2006. See also Jay McTighe and Grant Wiggins, Understanding By Design: Professional Development Workbook, ASCD, 2004.

Because the nature of both potential technology resources and particular classroom needs are constantly evolving, teachers are encouraged to work with content level supervisors and tech coaches, as well as school Media Specialists, on specific aids to instruction. PLC meeting times, prep periods, and school and department meetings are opportunities to implement lessons tailored to student needs.

While the District curricula specifically includes NJCCCS Educational Technology Standards 8.1, 8.2, and 9, Supervisors and teachers are also trained in the use and application of the SAMR Model for Technology integration.

The SAMR model -acronym for Substitution, Augmentation, Modification, and Redefinition- is a way for teachers to chart or map their progress in the integration of technology within their teaching. It was adopted at the MS early in the stages of the planning for the Pilot, specifically because it allows teachers to take the first, early, tentative steps into Technology integration with their existing lessons, without major alteration. It is worth remembering that prior to the 2016-17 school year, there were no Chromebooks in the District, the secure Google domain for Bloomfield did not exist, and teachers were encouraged to use Microsoft Office 365 in their instruction. Within four years, Bloomfield has essentially transformed its educational model, in terms of technology. The SAMR model allowed teachers to begin their path to technology integration by first “substituting” what they currently do with a tool of technology. Most blandly, teachers could create an online Google docs file, rather than a printed worksheet. Substituting the electronic file for the paper version is the lowest, or first, step in moving along the SAMR model to an eventual Redefinition of the lesson itself in a way that would not be possible without technology. In the most basic use of Redefinition, students might collaborate on a Web Site to share and display their learning and solution to a real-world problem initially articulated in the paper worksheet. They could interact with experts or resources within the community, under teacher guidance, as additional citations. In essence, teachers discuss within their peer learning groups how their lessons might evolve. (See *Sign in - Google Accounts*. (2019). *Sites.google.com*. Retrieved 22 April 2019, from https://sites.google.com/bloomfield.k12.nj.us/1to1bloomfield/samr.)

Teachers are encouraged to engage in discussions about the nature of appropriate technology integration, given the nature of the subject area content and the level of tech comfort for the teacher. At School and Department meetings, it is reviewed and explained that what is excellent use of technology in one lesson or field might not be optimal in another. Moreover, teachers should feel relaxed as they advance in comfort with building toward student-centric and project oriented lessons. (See *Sign in - Google Accounts*. (2019). *Sites.google.com*. Retrieved 22 April 2019, from https://sites.google.com/bloomfield.k12.nj.us/1to1bloomfield/samr.)

Collaborative, cloud-based tools, such as Google Docs and Classroom, allow teachers easily to exchange lessons and plans to improve technology integration. Moreover, the Bloomfield Teacher Academy invites teachers to share particular expertise or talent, on the theory that even small, incremental advances in technology usage in effective instruction can have significant impact on overall achievement.

At the core of Bloomfield’s 1:1 Initiative, currently -as of 2018-19- in grades 7-12 and planned next year for grade 6-, is the confidence that anytime, anywhere learning allows students to

learn at their own best opportunities. Classroom and curriculum materials are all web-based, and accessible to students 24/7/52/365.

Administrative and Productivity Initiatives

Increasingly, Administrative and Business software projects and databases are sought in online versions, that allow remote hosting, management and support, under clear Data Privacy Guidelines. Even legacy systems that run in client-server mode are accessed via remote services that effectively render them cloud-based.

In Bloomfield, budget and personnel services are run on a legacy platform as part of the Systems3000 software, but accessed via secure RDP on the desktop. Automated services utilize virtual desktops that run scripts for remote connection and download.

Related systems, such as Employment Applications, Teacher Evaluation system, and secure record management (e.g., tax forms, personal demographic data, etc.) are managed in more purely cloud-based solutions, specifically Applitrak, T-Eval, and Secure Doc. Each of these systems are managed by business departments, in conjunction with oversight by Technology, who manages primary accounts and email -which are increasingly the required logins/passwords.

All systems, software and subscriptions, are evaluated for support in terms of overall stakeholder impact. Key users are identified, responsible partners are tasked with specific routines, and serve as contacts with vendors. While priority in support and maintenance is always given to instructional issues that impact students, particularly during the school year, when classes are in session, every issue of maintenance and upgrade is evaluated in terms of the affected stakeholders. (See Appendix H: Software Stakeholder Impacts and *System Diagram*. (2019). *Google Docs*. Retrieved 22 April 2019, from https://docs.google.com/spreadsheets/d/1HAUE7vCdfivRjHjw4KHTmD3tKgvJot_TGgKLyay7hNA/edit#gid=0 .)

Among the practices developed in response to administrative support needs are monthly workshops for secretaries. For one morning or afternoon per month, absent critical building needs, such as PARCC or State testing, school secretaries convene in the Training Center of the Board Office to review best practices, resolve issues with software and systems, and share new needs or problems. Department and other clerical staff also convene in monthly or bi-monthly meetings to review their needs. New procedures for PowerSchool, state reporting requirements, special registration information, etc., are all covered at these mandatory meetings.

Data Management and Interoperability

New student enrollments are registered first in PowerSchool by the District Registrar or school registration specialists. On the day, or the day after, the student becomes “Active” and begins enrollment in specific classes, he is enrolled in related systems, and appropriate level accounts are created in those software systems and subscriptions. (See Appendix I - Network Account/Synch Procedures.)

As of April 2019, the network/email account creation automatically creates and synchs student access in all of the following related systems:

Active Directory
Follett Destiny for School Library access;
GAFE for Google Suite access;
Hibster for extracurricular support for HIB and related counseling;
Malware Bytes for antivirus and related software protection;
Nutrikids for cafeteria account management with students and families;
Office365 for online Microsoft access to all programs;
PaperCut for managed printing (includes all students in grades 5-12, as well as all staff);
PowerSchool as SIS;
Renaissance for student assessment benchmarking;
School Messenger for home/school and family communication;
Securly Web Filter for web filtering;
Tienet or PowerSchool Special Ed;
VersaTrans for bussing management;
WiFi (Meraki) for WiFi access throughout Distiict;
(All the following software packages are district-sponsored and academically related to instruction:)
_Instructional-Chromium Management/Neverware
_Instructional-_Brain Pop
_Instructional-_Discovery
_Instructional-_EBSCO
_Instructional-_Edmentum
_Instructional-_Explore Learning (Gizmos)
_Instructional-_Facts4Me
_Instructional-_Learning A-Z
_Instructional-_Middlebury
_Instructional-_Nearpod
_Instructional-_Newsela
_Instructional-_NY Times Digital Subscription
_Instructional-_Overdrive
_Instructional-_Screencastify
_Instructional-_Typing Club
_Instructional-_World Book

The District is compliant with current regulatory requirements to retain all District-owned emails, utilizing the Google Vault service. The District has been responsive in all data requests related to Freedom of Information Laws and issues of student safety. The Securly Web Filter is also

web-based and used for reporting on students and staff access within the District or on district owned Chromebooks.

Privacy and data security policies for staff and students are governed by recommended practices of the American Library Association, as reflected in stated District procedures. Overall data management and security remains an absolute priority for District and school personnel. See District Security & Privacy Procedures.

District Website

Beginning in 2018-2019, Bloomfield subscribed to Educational Networks services for web hosting. The District web manager is Mrs. Jen Khoury, Supervisor of Fine Arts. She conducted training for staff in each school, and manages secure web sites with only authorized staff having accounts for edit or access. On each school website, there are Staff Directory, with links to teacher web pages, phone extension, and email contact information.

Parents and the public also have access to post information to school Principals. Users can post comments and questions, anonymously, or by requesting feedback, to schools and the District.

The Ed Networks package includes related social media posting, and a District Facebook page is also managed by Mrs. Khoury.

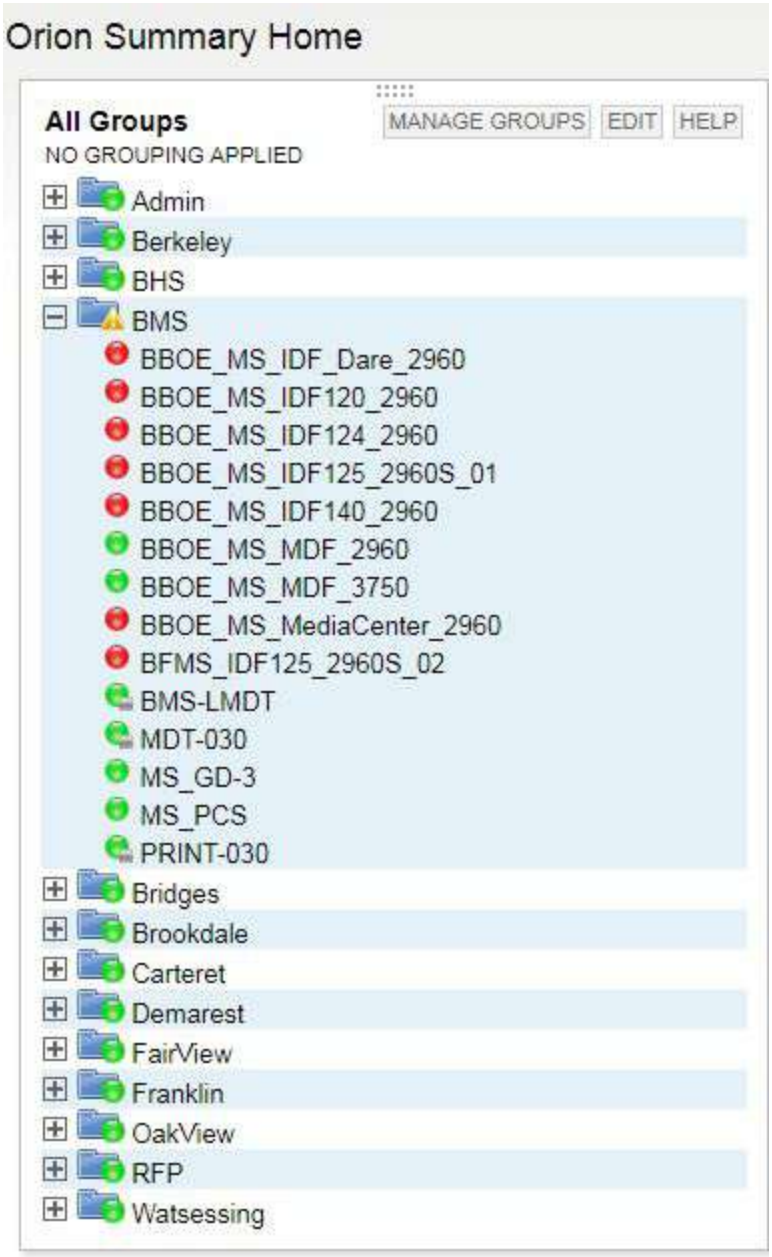
The websites are fully ADA compliant and include links to audio and text replacements of images, when possible. All postings include only web accessible data, specifically PDFs when possible, or files in PowerPoint or Word format, as needed. Only in extremis are scanned documents posted for the public.

In 2018-19, Bloomfield School District was the first place recipient of the NJSPRA award for best district/school website. This award is based on overall design, ease of use and up-to-date content. NJSPRA's School Communication Awards recognize outstanding print and electronic collateral material in New Jersey educational communications programs. The primary role of the professional school communicator is to disseminate important information about schools and school districts to all constituencies. NJSPRA developed the School Communication Awards competition to recognize professional school communicators in New Jersey – and the products they develop – that go above and beyond to disseminate important messages to their publics. (See *NJSPRA*. (2019). *Njspra.com*. Retrieved 25 April 2019, from http://www.njspra.com/menus/school-communication-award-winners.html.)

Video Surveillance, Digital Retrieval & Security

Access to all schools and buildings is only via physical key, authorized key fob for access doors, or access granted by office staff via buzzing-in, or emergency entrance by police, fire, or school administrative staff.

The HS & MS include digital cameras with local building servers as NDVR'. Cameras are posted in key areas, public hallways, and areas, but not in classrooms, or private rooms. The servers and cameras are supported by local vendors, who assist the Technology Department.



All buildings, including elementary schools, have video cameras at the main doors, and only allow entrance to authorized visitors.

Discussions continue within the Board and Administration to extend digital camera recording and remote access within the elementary schools. A multi-year plan to involve all buildings remains to be presented to the Board for final approval, as of April 2019.

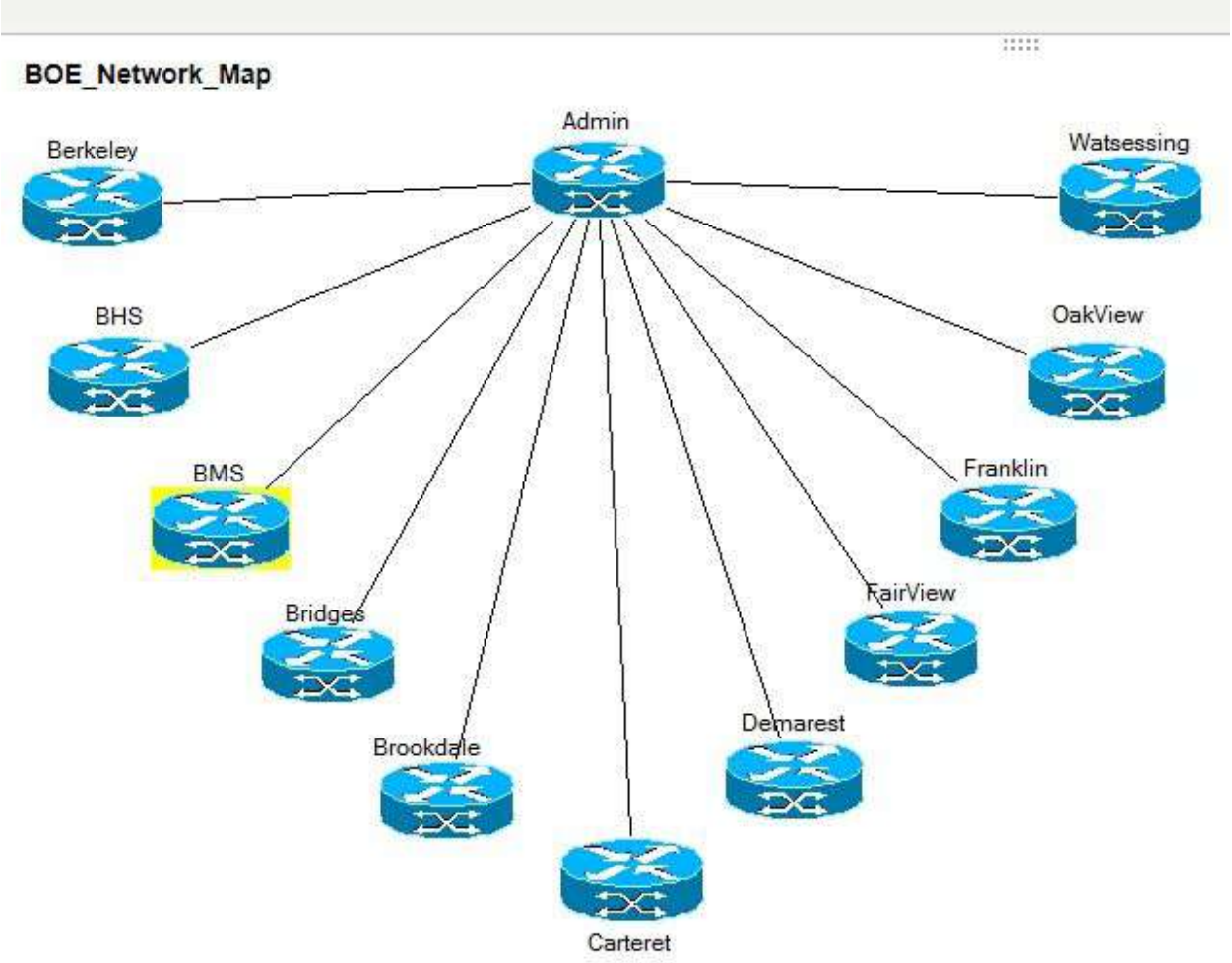
Facilities, Hardware Resources and Infrastructure

Internet Connectivity

At present (April 2019), the Bloomfield Township School District has an external connection to the Internet of 2 GB/sec (or 2,000 MB/sec). With

approximately 3,500 devices active at any given time, that total bandwidth computes to an average KB/device of 570.1. Even allowing for all 6,400 students accessing the Internet simultaneously, the KB/student is 312.5. The NJ DOE recommends the following bandwidth minimums for educational purposes: ". . .at least 100 KB per student external connection for each 1,000 students and 1000 KB per student internal connection scalable up to 1 GB Ethernet or 1,000 MBPS."

Several of the systems that previously consumed district bandwidth have been replaced. The internal Internet filter has been replaced with Securly, a cloud-based solution. An internally managed antivirus package that had high overhead both for traffic within the network and on individual workstations has been replaced with a cloud-based solution (Malware Antibytes) that covers both Chrome-based and Windows computers.



WAN

The internal connections among the schools are identical. The Sunesys WAN connects the schools with fiber Ethernet pipe of 1 GB/sec. The configuration is theoretically star-based, with the Board Office at the center or hub, but some of the schools are connected one to another, in

a serial configuration. While this topology portends potential interruption to multiple sites with one break in the cable, Sunesys service contracts stipulate three hour response time and eight hour solutions for any break in service, and the company has responded within those parameters in the one serious incident, connecting the Board Office to the MS, in the past three years.

With the addition of building-based servers in school year 2015-16, for network authentication, printing, test caching, etc., that bandwidth has been acceptable. No negative impact on performance has been detected, due to restricted intra-WAN bandwidth, and all planned activities and programs have been carried out.

District DNS servers reside in the Board Office and the HS.

If SolarWinds or other internal monitoring of backbone bandwidth indicates a need for further upgrade, we can increase the WAN to a speed of 10 GB/sec, with the substitution of switches at each building and an upgraded contract with Sunesys.

The District monitors all building connections and closets, as well as all key systems and servers, through SolarWinds, an industry standard monitoring and notification system. Alerts are emailed when closets or buildings are down, or experience an intermittent usage.

Technician schedules begin coverage at 7 AM, and often, when responding to a SolarWinds alert, resolve outages well before school begins in any building. As of December 26, 2018, there were no district-wide or school-wide outages reported by SolarWinds that were not wholly resolved prior to the start of school in that building.

Servers

The District maintains two types of servers: virtual servers in VMWare environment; standalone servers, running MS Windows, in either standalone mode, as District domain controller, or with multiple hosts in Hyper-V.

There are currently 16 VMware servers, running in the District data center in the BOE Office. The indicated applications or services below:

Server Function/Name	**Application**
PS-VMS1	Primary Powerschool Web Server
PS-DBS1	Primary Powerschool Oracle Database Server
PS-VMT1	Backup PowerSchool Server (Training/Reporting) 1
PS-VMT2	Backup PowerSchool Server (Training/Reporting) 2
PS-VMT3	Backup PowerSchool Server (Training/Reporting) 3
SQL	SQL database for Data Processing
Nutrikids	Student Lunch Program/Parent Account
VersaTrans	Bussing
Spiceworks	Help Desk
Data Store 1 - 3	Home Directory/Shared Network Drive Storage
DNS 1 - 3	Primary DNS Servers for External/Internal Mapping

SolarWinds	Network Monitoring

In addition to the VMware environment, the District manages standalone servers. There are 11 servers, one in each school, running Microsoft Hyper-V for four distinct purposes: Domain Controller access to facilitate security and logins; Print Server access to run PaperCut for secure printing and document retrieval; Test Administration Management, primarily PARCC or NSSLA; and image management for laptops and PCs.

Additionally, the District maintains four other standalone servers:

Server	**Purpose**
DNS 4-5	Additional Domain Controller and DNS Reduncancy
Imaging	For District Use
Alcatel-Lucent	VoiceMail and Phone Management

The District's Main Data Center is in the first floor of the Board Office. It is secured by a unique key (different from door access,even within Technology) and regulated by two separate environmental control systems.

SolarWinds provides real-time notification of outages or performance degradations in any of the district data facilities, closets, servers, or switches.

WLAN

As of school year 2015-16, the wireless infrastructure for all buildings, except one, is CISCO's Meraki, with cloud-based management. After some fine tuning of radius and other settings, teh Meraki infrastructure met testing needs during PARCC. More importantly, the Meraki system is comparatively easy to scale to need, adding additional access points on overloaded stations. It is not as robust when users wander from one access point to another, or at least it is not as reliable as other, older, more traditional CISCO solutions with their older suite of access points. But the cost, training and expense of managing the older CISCO access points is beyond the District's support structure. Meraki is manageable, albeit with an annual cost for cloud management, but sufficient for foreseeable needs.

Some years prior to 2015, the District opted for a wholly wireless solution, including mobile laptops, and moved away from cabled or wired labs. Many schools have only a handful of functioning cable connections to computers. The switches will be utilized in connecting telephones and other devices, including those desktop computers that are in use. But the trend to increased reliance on wireless appears unstoppable, though it would be the preference of the Tech Office to reinstate some cabled classroom, particularly if there is a need for high-end computing at the secondary level. With this goal in mind, the Tech Office will have to stay apprised of construction and upgrade plans in the buildings, especially any new construction.

SCHOOL INFRASTRUCTURE

Each school has a similar network infrastructure.

The buildings are connected to the District Office via the 1 GB Sunesys WAN. Each building has a cat5e wiring to each classroom, from Main and Intermediate Data Closets or Facilities. The switches are CISCO Intelligent switches or newer Meraki managed switches, with 100 MB or 1 GB backbones.

Moreover, since 2016-17, each school has a standalone Microsoft server running Windows 2012 that functions as AD controller for regulating logins, print server for managing printing devices, and test caching or proctoring servers for managing PARCC and other tests in a HyperV environment/platform. These servers have performed excellently over the previously, wholly district-based model,where the only centralized servers were in the Board Office and HS. Since the introduction of the building-based servers, network response time, printing, and testing have all improved dramatically.

With the Meraki wireless implementation, almost every classroom in the District has a dedicated AP, or shares one with an adjoining classroom. All corners, floors, and shared space in all buildings are covered, allowing three successive years of effective PARCC testing. Moreover, the HS and MS have been made ready for student 1-to-1 issuance and continuous usage throughout the day.

Through the donation of the Bloomfield Education Foundation and access to the educational program by Sprint for extending home access to student, there is equitable access to technology and connectivity in all instructional settings for all students, including home access. The 100% equitable access specifically precludes consideration of cultural gaps, opportunity gaps, barriers obtaining teaching and learning resources, or digital device gaps. All students have the same opportunity to succeed.

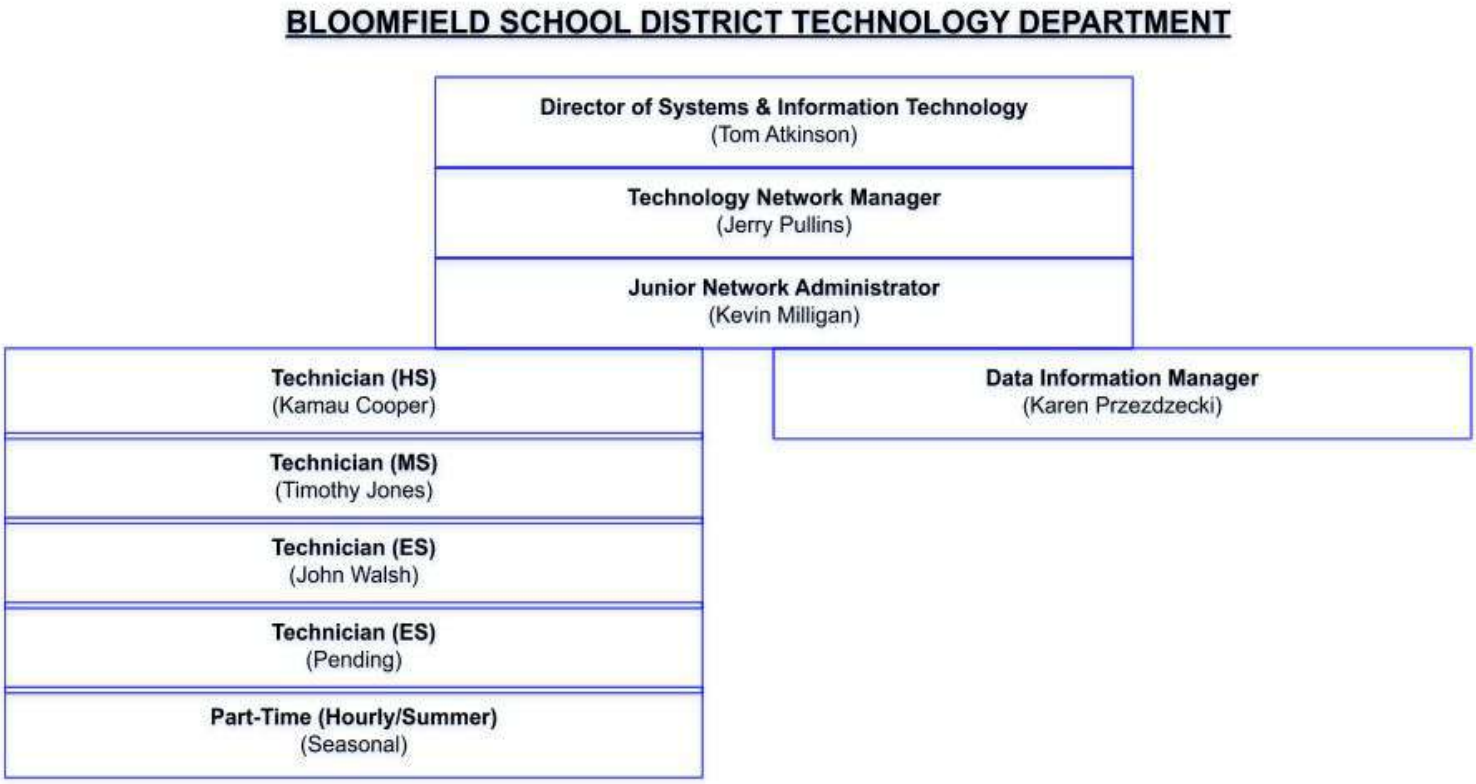
Based on the planned, gradual roll-out of the 1-to-1 to at least grades 5 and 6, there remains a determination to evaluate continuously the needs of the school and each department, and upgrade with additional AP's or increased Internet usage. The District Tech Committee will continue to meet and evaluate.

There is on-site maintenance and tech support–current and proposed– to meet the district's educational goals, and to manage and maintain the district computing environment. The key location in each building is the school Library/Media Center. The school Information/Library Specialist has an especial role in managing the devices and supporting the instruction of all the students and staff.

Infrastructure Support & Diagram(s)

In the nature of technology's omnipresence in the modern workplace and classroom, everyone involved in technology shares some responsibility for support, helping colleagues, and reporting problems, as well as recommending improvements. Teachers on the District Tech Committee receive 'extra' instruction on new programs, and are often expected by their Principals to provide some turnkey training to their peers. Technicians, who in previous years may have been limited to repairing hardware, are called upon to support the great variety of software present in offices and classrooms. No one does just one thing.

As of April 2019, the Technology Department is structured as follows:

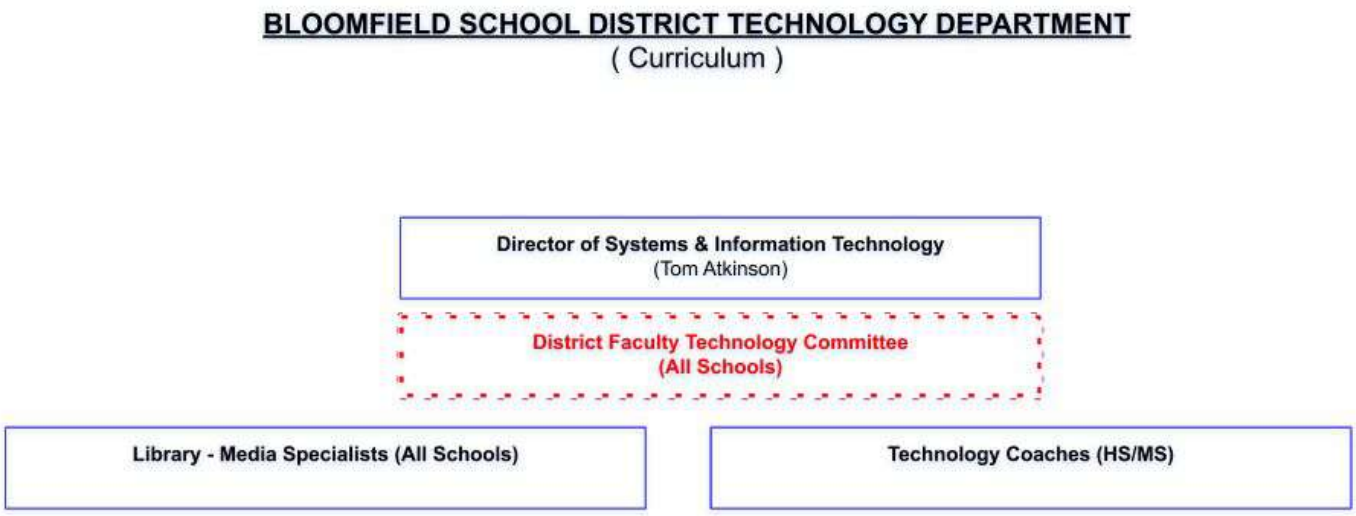


Technicians are assigned 'priority' buildings or schools, but are asked to work in any school or building. In November 2018, the Data Information Manager resigned for a position in another district. The role has been filled by the former 'Data Technician' since February. A decision has been made since March not to fill the vacated role of 'Data Technician' but reside primary responsibility for data between the Director and the Data Information Manager. The vacated

position would be filled by a Technician to assist with new responsibilities in building security, door accesses, cameras, and related systems.

Technicians start at different times during the day, beginning at 7 AM, and check SolarWinds for system readiness and outages. Buildings and key personnel are notified of outages prior to the start of school

The interrelation of software packages to stakeholder groups is detailed in the linked system diagram. When an update is planned, or outage is reported, stakeholder contacts are notified of any interruption in service.



While Technicians have responsibility for technology's implementation within the classroom and have to be ready to assist teachers whenever needed, the teachers who are most directly involved in Technology have to cope with issues that would formally fall under a technician's purview. In effect, everyone has to be modestly "omnicompetent" in matters of software and hardware. Nevertheless, the primary responsibility for technology's implementation in curriculum falls to the Director, working with the Faculty Tech Committee, under the guidance of Curriculum committees, in conjunction with the Librarians and Technology Coaches in the school

CURRENT TECHNOLOGY INVENTORY

As of December 2018, all students in the two largest schools, BHS and BMS, covering all students in grades 7-1, participate in the 1:1 program. All students in those schools, in all sections, regardless of classification, or other status, have and take back and forth from home a Chromebook. Those schools have over 3,000 Chromebooks directly loaned to their students,

via the Follett Destiny Library system. Each student is loaned a Chromebook for the duration of the school year.

At present, the plan is to allow the students to retain their computers over the summer for academic work.

(See Appendices B & C for specific quantities by school as of December 2018 in HS & MS Computer Inventory, and related documentation.)

Each of the elementary schools has at least four, usually six or seven, carts of either Chromebooks, or laptops, which have been imaged with Chromium, open source software to mimic a Chromebook, or Windows 7.

(See Appendix A.)

Additionally, following on the previous Tech Plan for 2016-2022, each classroom with a fully scheduled class in every building has been outfitted with an interactive whiteboard, either a SmartBoard, or Epson Interactive. Classrooms are also outfitted with a desktop computer, usually a Lenovo “mini-PC” or desktop, that is connected to the LCD display. Most elementary classrooms also have Document Cameras attached for display to the Interactive Whiteboard. (See Appendix D.)

Each teacher is issued a Chromebook or laptop for professional use.

Each building also has approximately one Meraki AP for each classroom and a local, standalone server running Microsoft software that serves four purposes: Domain Controller to regulate access and login to the network and its resources; Print Server passthrough to the centralized PaperCut server; IP management via DHCP; and hosting testing, such as PARCC.

Each building also has at least one Meraki Smart Switch for network management and CISCO managed switches.

At present, many classrooms have local printers. Some are legacy inkjet and deskjet printers that are not being replaced, as they malfunction. Similarly, even more classrooms have networked HP Laser Jets that are only being replaced when the Principal or Supervisor represents a strong justification for not using the leased Savin-Ricoh printers, to which all printing is encouraged to be routed. PaperCut software management allows regular review of printing, by user and by printers. Discussions in the Tech Committee beginning in January 2019 have shared a plan for “expedited retirement” of all legacy printers (inkjet, deskjet, non-networked laserjet, and all laserjet printers beyond certain specific models) before September 2019. Discussion and planning continue.

TECHNOLOGY PLANNING FOR DIGITAL LEARNING PROCESS (2019-2024)

INTENDED OUTCOMES

The aspirational objectives of the District's Technology program is universal equity to high-quality technology in an inspired and inspiring educational environment that leads children to excellence in the realization of their potential in the 21st century.

Districts and schools effectively pursue two related, overlapping, but distinct, paths to success in 2019. The first is the standard performance on grades and standardized testing. In New Jersey, this criterion formerly includes PARCC, now NJSLA, as well as measurable outcomes on PSAT, SAT, ACT and other tests. The other path is the integration of technology in broader curriculum outcomes than subject-area testing. Future Ready goals and indicators are among the benchmarks that hundreds of schools and districts in New Jersey and around the country have adopted to guide their planning.

Bloomfield has long espoused the belief that effective, engaging curriculum solves most related problems in education today, including chronic absenteeism and related attendance issues, classroom management and school disciplinary problems, as well as student performance on standardized testing. Consequently, we have two, related academic outcomes in which we expect to see improved performance: standard measures of success in testing; and greater integration in wider paths to project-based, real-world learning, aligned with Future Ready indicators.

As of 2018-2019, the MS implemented a schoolwide 1:1 program since 2017-18.[2] According to the NJ School Performance Report for Bloomfield Middle School, every state-set growth and performance objective was met:

2017-18 PARCC PERFORMANCE REPORTS	
COUNTY_NAME	ESSEX
DISTRICT_NAME	BLOOMFIELD TWP
SCHOOL_NAME	BLOOMFIELD MIDDLE SCHOOL
ELAProf_MetTarget	Met Target
MathProf_MetTarget	Met Target‚Ä†
ELAGrowth_MetStandard	Met Standard

[2] 300 students in both 7th and 8th grades were involved in a test or pilot of the 1:1 in 2016-17, and every student who participated in that pilot has remained in the district-wide 1:1 since then. The 1:1 rolled out in 2017-18 to all students in grades 7-9, and in 2018-19 to all students in grades 7-12.

MathGrowth_MetStandard	Met Standard
ELP_MetTarget	Met Target‚Ä†
CA_MetAverage	Met
Targeted_ConsUnderPerf	No
Summative Rating	34
Summative Score	40.96

In fact, based on the Summative Score for 2017-18 PARCC, Bloomfield Middle School was the 28th best Grade 7-8 MS in the entire State, just behind West Essex Regional (24th) and West Orange (20th). BMS finished ahead of Rutherford (32nd) in Bergen and Hoboken (51st) in Hudson County. (See Appendix K-2017-18 PARCC Performance 7-8 Middle Schools Statewide.)

PLANNING & NEEDS ASSESSMENT

Building on what was proposed in the last Technology Plan, the predominant need and most often expressed request from each school within the District is to continue the roll-out of the 1:1. At present, grades 7-12 in the MS and HS have their own District-issued Chromebooks. The next challenge is to expand the 1:1 Initiative into the elementary schools. Plans have been in place and developed all year to roll-out the 1:1 to each 6th grade in 2019-20.

The Technology Program at Bloomfield is probably the most scrutinized element of the District's many initiatives. Since everyone has a stake, from each student, to every staff member, to the entire community, who contribute taxes, few hesitate to express themselves in the various forums provided for collecting input.

The District's weekly cabinet meetings under the Superintendent's leadership often discuss a tech issue, which can be forwarded by any Director. The monthly Administrative Council meetings also share ongoing tech concerns.

Monthly tech training meetings with school secretaries convene at the Board Office and are conducted by the Tech Department. In addition to providing training in SIS and routine, related duties and programs, the secretaries offer input and information and feedback on the state of technology in the buildings.

The faculty's District Technology Committee convenes monthly. All schools send a representative who reports back to the Principal and teacher colleagues. Agendas include any topic of interest to the members. There are three key general purposes or roles for the Tech Committee each year, spanning various months and meetings. In the fall, the Committee provides input on needs for the upcoming school year, and prepares schools for new initiatives such as revamped practices for printing, for example. In the late fall and early spring, the Committee reviews and contributes input on the budget needs and recommendations for

technology. In the May and June, the teachers offer suggestions for summer work and evaluations on the success of programs during the year.

The faculty Tech Committee is the most important component of the District's tech planning. Since teachers themselves are the best indicators of what goes on in the classroom and gauges at how effectively technology is being implemented, soliciting their input and advice is absolutely critical.

Many of the needs expressed in the last Tech Plan have been met:

1. Internet bandwidth has been expanded from 1 GB/sec to 2 GB/sec.
2. The locally managed Internet filter has been replaced by a web-based product (Securly) that filters student content whether in-district or at home.
3. Newly enrolled students 'almost' automatically receive login credentials for network/email and related systems. Students can register or enroll one day and be fully configured for login to all student systems by the next morning. Once registered in PowerSchool, student accounts are created on the network, in Google, Destiny, and related systems and software 'almost' automatically, requiring only querying of the database and extraction of basic information (student number, grade level, etc.).

Several of the needs remain unresolved, or are ongoing, in whole or in part:

1. Digitizing the "on-boarding" process for new staff hires, and automatically adding them to a Personnel section for BOE approval, and notifying Technology and other departments for account creation in related systems. That remains largely a manual process, with paper or single forms pushed or circulated from one office to the next.
2. Having installed local Domain Controller computers as servers in each school, we need to begin replacing the most extensively used and be prepared to replace any that irreparably malfunction during the year.
3. Continue regular threat assessment and detection analyses via Kali Linux tools, from internal and external vantage points, and continue contract for bi-annual audits by already contracted security services.

GOALS

Specific goals related to hardware and infrastructure that must be folded into overall planning for learning and educational outcomes include the following. In each case, the Department or Committee spearheading the request is noted.

1. Beginning replacement and upgrading of building level servers with newer equipment; possibly changing the platform from Microsoft's Hyper-V to VMWare or equivalent for improved performance. (Technology Department)

2. Continuous monitoring of bandwidth usag at both the WAN and Internet, being prepared to increase the WAN backbone from 1 GB to 2 GB or up to 10 GB, and from 2 GB to more for the Internet. (Technology Department)
3. Integrating security cameras at the schools into a single platform for easier viewing and recovery. (Technology & Facility Departments)
4. Integrating a number of efficiencies on the business side into routine procedures, including -
    a. Onboarding new staff into Board Notes and automatic creation of related systems and network accounts (as is currently done with students) (Technology & Personnel Departments)
    b. Creating automated sign-in of staff and students with IDs on barcode or other recognition system (Business Office)

PLANNING DIGITAL LEARNING

All technology at Bloomfield falls under Curriculum management.

In the inevitable contention for a district's scarce resources, including technician and data manager time, as well as money and infrastructure bandwidth and storage space, even the needs of the Business Office yield to the District's primary goal of educating children.

All Technology goals are set by the Superintendent, as governed by BOE and District-wide goals, in annual retreats and weekly Cabinet meetings, including the Assistant Superintendent, all Directors, including the Director of Systems & Information Technology. Specific Curriculum objectives are set and reviewed in the District Curriculum Committee.

Technology-specific goals and issues, including implementations of new programs, review of existing programs, are discussed in the District Faculty Tech Committee, which meets monthly.

GOALS

Having completed general curriculum reviews and update in almost all subject areas, the District hopes in the upcoming years to move teaching and learning to additional metrics, specifically the following-

1. Increasing inter-disciplinary content with explicit inclusion in Curriculum documents of projects that span content areas and include Unit plans that involve different subjects;
2. Including a gauge of the use of effective and appropriate technology in the teacher observation instrument, to credit teachers of special talent and enable easier identification for sharing their classroom successes in the Bloomfield Teacher Academy;

3. Addition of a third PD day, dedicated primarily to effective Technology integration in instruction; hopefully, the Teacher Academy model could allow substitution of approved courses for seven hours of instruction in place of or in lieu of attendance at that day for teachers who qualify; without punishment or consequence, teachers unable to meet the PD requirement in approved BTA courses would attend the third PD day for attendance at comparable opportunities, ensuring district-wide level of competence in technology; (It is worth noting that as of April 2019, the District has confirmed in contract negotiations for the next teacher agreement that nothing in any the stipulations of any involved group [teacher, paraprofessional, substitute] precludes substitution of BTA hours for a third PD day, if ever introduced into the calendar];
4. District-Wide Shared Lesson Plan system that specifically exemplify use of effective technology, across grades, subjects, and district-wide, so that the best teaching practices and technology usages are shared and available to all.

All of these goals require coordination with Curriculum for discussion, implementation, and planning.

TEACHING & LEARNING WITHIN THE DISTRICT

These initiatives, including problem-based learning, performance assessments, and technology infusion, were leading drivers of learning that integrated content area knowledge with the skills necessary for college and careers.

Backed by research, our new and redesigned curricular programs are now supported by an increased emphasis on critical thinking, problem-based instruction, effective use of data, strong research skills, effective use of technology, and all forms of written and spoken communication.

Content supported by effective technology gives students opportunities to take advantage of learning opportunities that will expand their horizons as they more easily research the past, the present, and anticipate the future.

Content supported by effective technology gives students opportunities to take advantage of learning opportunities that will expand their horizons as they more easily research the past, the present, and anticipate the future.

BLOOMFIELD TEACHER ACADEMY (BTA)

Professional Development for teachers is a unique challenge for Districts today. Just when teachers are expected to be present in the classroom, we are compelled to remove teachers from their classrooms to conduct training. Sometimes this is unavoidable, as with some new

academic programs and District initiative that require lots of concentrated time and multiple, consecutive days of pull-out training.

But Technology in K-12 education is somewhat unique. Advances in K-12 are sometimes marked by the need for massive pull-out training, but most advances in educational technology are incremental, small, quick to learn, or easy to experience. The nature of technology in schools is more like consumer technology, which is relatively easy to master, as compared to years past. To become familiar with these incremental changes and advances, teachers do not need days of pull-out training. They can learn small tricks and tips that can have an enormous impact on their instruction. Moreover, they can learn massive new systems, such as Google Apps For Education, in small bites, learning a little bit at a time, incorporating what they learn in their teaching, as they progress.

It is also an arguable point --perhaps ultimately unprovable, but nevertheless consistent with the experience of many educators-- that some teachers learn quickly, and adopt effective new strategies to support their existing curricula, particularly with regard to new Technology, very quickly. Their adoption and enthusiasm is infectious, or can possibly be infectious, if they are allowed to share their experience and excitement with their colleagues.

It is precisely to afford these 'early adopters' a forum for sharing what works best in implementing their assigned curriculum --and integrate educational technology-- that the Bloomfield Teacher's Academy invites teachers to submit for approval courses that they will teach to their colleagues. The courses can be multi-hour, or single hour, meet over the course of many days, or just one, and cover instructional techniques that are most relevant to their colleagues.

Below are guidelines governing the Academy. These guidelines are subject to revision, but basically invite and welcome participation in an on-going model for PD, particularly in, but not restricted to, Technology:

1. The Academy is only for faculty and staff of Bloomfield School District.
2. The Academy is not for CEU credit, unless specifically noted in the Course Title or Description.
3. Unless otherwise noted in the course title or description, teachers who attend all the scheduled hours of an approved class receive compensation at the contractual rate. Instructors are compensated at the same rate, including one hour of preparation for every three hours of instruction.
4. Each term there will be a date by which courses have to be offered or proposed.
5. Competent teachers may propose courses, but all classes must be approved by the Superintendent, Assistant Superintendent, or authorized administrator, by the stipulated deadline for submission of courses for the term.

6. Teachers may propose courses to teach at the page for Courses Offered. (This renders the list of courses with a Preview Pane.) It is the teacher's responsibility to make sure that the rooms or location where the course is to be offered are available on the dates and times indicated for the course.
7. To register to take approved courses, teachers must log into the SharePoint and register on the for Registration page as themselves for the specific classes.
8. While every effort is made to ensure that a course offered by a teacher, approved by administration, and posted for registration will be conducted, there is no guarantee that any particular course will be offered. Registrants will be notified of any change in the status of the course.
9. If a particular class fails to meet necessary minimum enrollment, or has to be canceled for other reasons, the teacher responsible for the course will be notified and the 'Posting' for that class will be noted with the change (i.e., either "Course Cancelled" or "Maximum Enrollment Met").
10. Instructors of approved classes will receive class lists via email. It is the instructor's responsibility to contact their teacher-students, confirm the course session, and notify them of any preparations that they need to make in order to complete the requirements of the course.
11. It is the instructor's responsibility to ensure that all teachers sign the Attendance sheet, stay for the full course, and complete all assignments.
12. All teachers who complete approved courses must complete a course evaluation. This is an alternative link for completing a course evaluation on Google forms.
13. Based on needs of availability, specific content, or logistics, including available funds (as determined by the District), both course offerings and teacher registrations can be restricted, up and until BOE approval of rosters for courses each semester.

It is always the presumption of the School District that all participants in the Bloomfield Teacher Academy will behave professionally, make every effort to learn thoroughly, and abide by all relevant Board doctrines and regulations.

(See Appendix Q: Analysis of Bloomfield Teacher Academy Course Offerings & Enrollments: 2016-2019.)

TRANSFORMATIONAL BUDGETING

In Bloomfield, the annual budgeting process for the next school year begins in the early fall. Administrators submit budget needs to Central Office in each of the following categories or budgetary accounts:

- New Positions
- Extra-Comp Programs
- Maintenance Projects
- Equipment & Furniture Request

- Capital Projects
- Supplies & Textbooks
- PD-Out of District

Additionally, the Tech Department is responsible for two other categories or 'buckets' of anticipated expenditures:

- Tech Projects (New)
  This category contains projected expenditures for new programs or purchases, not previously included in budgets, or wholly new purchases for existing programs, such as brand new Chromebooks for students entering 9th grade. (See Appendix N , New Tech Projects, Fall 2018 Superintendent Budget Meetings.)
- Tech Budget Ongoing
  This list includes all current software and subscriptions, tagged as either Instructional, or Business/Infrastructure related. The former list includes annual, or multi-year, subscriptions for Newsela, Discovery Streaming, and other programs utilized by students and teachers. The latter includes necessary expenditures for managing the District as an enterprise, such as SIS, Business/Accounting/Personnel (Systems3000), security camera and building access and HVAC facilities software, etc. (See Appendix O, Ongoing Tech Projects, Fall 2018 Superintendent Budget Meetings.)

The requests by each Administrator are submitted electronically and reviewed by a Superintendent's Committee. Each Supervisor, Principal, or Director presents his or her requests. The Superintendent decides on the merits of each proposal, in consultation with the Assistant Superintendent for Curriculum & Instruction and the Business Administrator.

Final recommendations are collected in a budget proposal that goes before Committees of the BOE in the early spring: Facilities & Maintenance, Budget, Curriculum & Instruction, Personnel, and Technology. The whole Board puts together a full, preliminary budget in time for submission to the County Executive Superintendent's Office, prior to scheduled public hearings and formal Board adoption in the late spring, usually mid-May.

As a result of the above process, needs for academic technology have to be prepared for the following year in the early fall. Each request for new expenditures is reviewed by the Superintendent, delegates, and various Committees of the Board.

It is critical that as many Technology needs as possible fall within existing programs, so that their specific costs and impacts can more easily be proffered for review. New programs and expenditures have to generate justifications on the basis of recommendations from approved vendors or programs initiated in other districts, such as PLTW or Project Lead The Way. This national agency offers comprehensive curricula in engineering and computer-related fields, with anticipated resources and purchases. Districts make cost projections for new PLTW courses on

the basis of their expertise. Other new expenditures, such as device purchases for existing 1:1 programs, rely upon prior year experiences and recommendations.

Technology programs are specifically reviewed monthly in discussions of the District Technology Committee Meetings by both Faculty and the BOE. These discussions lead to project-related cost projections, like the one below for the District

1:1

The single largest cost for educational technology is the 1:1 program. Originally, in 2015-16, the plan was to expand the program two years at a time, beginning in 7th and 8th grades. Over six years, all K-12 would have been included in the program, at an approximate annual cost of $420K, as reported in the District's Draft Tech Plan for 2016-2021. (See *Meet Google Drive – One place for all your files*. (2019). *Drive.google.com*. Retrieved 23 April 2019, from https://drive.google.com/drive/u/0/folders/1j0fAZCvDM0cRAECSstfGhQsn6nqrWpfY .)

After the success of the 1:1 Pilot with 300 7th and 8th graders in 2016-17, the BOE Tech Committee recommended, and Administration and Faculty Tech Committee concurred, that the following year roll-out had to include 9th grade, as well as both Middle School grades, in order not to exclude any student who had benefited from participation in the Pilot. Consequently, with that decision, the annual costs for roll-out -always predetermined to cost more than the mere maintenance of existing programs, due to the need to outfit schools, grades, teachers, and libraries with suitable resources for the new program, escalated approximately 50% to about $630K. (See Appendix F Multi-Year Budgeting for 2015-2019.)

In fact, expenditures specifically for roll-out of the 1:1 to three grades in two successive years have been on-target for that approximate amount (ca. $630K). Additional, related expenditures have been included in a general "Chromebook" cost projection, such as replacement of 856 iPads with Chrome devices, and maintenance of Chromebooks for faculty retention of Chromebooks, in place of more expensive laptops.

It is anticipated that once the 1:1 program is finished rolling-out to new years, either after 2020-21 when 5th grade receives devices in a manner similar to what is planned next year for 6th grade, or another year, the anticipated annual expense, specifically for Chromebooks in the 1:1, including replacement/recycle maintenance for grades K-4 (or other) and faculty devices will be approximately the original $420K to $450K. (See Appendix F Multi-Year Budgeting for 2015-2019.)

It may be worth noting that the 1,125 Chromebooks that would be purchased annually to sustain the 1:1 compares very favorably with the fewer than 500 laptops selected in 2015 and prior years as the device of use and choice for both faculty and student that could be purchased annually in their stead. In other words, the alternative to 1,125 Chromebooks, at current marked

prices, is fewer than 500 Windows-based laptops, or even fewer alternative devices, such as iPads, when all related fees, such as 4-year warranty, needed peripheral devices, including keyboard, and associated apps, are included. In fact, that represents fewer devices that would be necessary to sustain even one grade of approximately 500 students at Bloomfield, at present.

Related Ed Tech Expenditures

(For the below, please see Appendix L-Ed Tech Expenditures Beyond 1:1.)

In addition to the 1:1 Initiative as currently proposed, or whatever program the District pursues as part of its Technology program, there are related expenditures that would have to be met and planned for annually:

1. While we have basically completed the outfitting of every classroom with a default setup of computer projection system connected to a mini-PC or Windows computer, wireless mouse and keyboard, and appropriate peripherals, such as document camera, web cam and microphone, etc., the ongoing requirement will be to follow a cycle of replacement and upgrade. Without a reliable, robust computer projection system, there is no technology instruction. The Smartboard and interactive LCD have replaced the chalkboard and whiteboard of earlier years.

   The need to follow through on a replacement cycle for the classroom projection systems is especially acute at the HS, which has some of the oldest systems in the District. While we have upgraded or replaced many Smartboards with older or retired systems from other districts, the regular, routine, annual replacement of the oldest units has to be sustained, or the District will face an enormous cost for a mass replacement of many devices in one year, through irreparable damage, or incompatibility with new softwares.

   Another strong reason for beginning a cycle of replacement is the need to be able to both experiment and migrate to a newer system, in a gradual way, when they become available. There are literally dozens of potential upgrades to the current systems, from the highly expensive Jamboards from Google, to wide-screen high-definition interactives, but to take advantage at the right time of the one that emerges as market dominant will require an existing system or cycle of replacement.

   The proposal for the past few years has been to allot six replacement or upgrades to classroom systems at each the MS and HS, and three per elementary school. At $5K per installation, this represents an annual budgeted amount of about $200K.

2. While the adoption of the Chromebook as the primary student device appears set, there will always been a need for higher end computers, especially at the HS and MS levels,

where courses will involve more and more engineering, draftsmanship, video editing, and more complex data processing requirements.

Each of the past years has involved the purchase of Macs, power-PC's, and -recently, perhaps- Android devices for specific STEM, engineering, or Fine Arts courses. The anticipated cost to sustain the current inventory of "specialized computers" is $40K annually.

3. The WLAN infrastructure as previously mentioned is Meraki, a cloud-based solution for wireless AP and traffic management. Additionally, the District has begun to implement Meraki switches in place of CISCO intelligent switches to support the environment and traffic. The cloud-based Meraki solution requires ongoing, current licenses for each device, including AP and switch, and amounts to an annual renewal of approximately $100K.

   It is possible that multi-year contracts would reduce this annual cost.

4. Finally, there are ongoing issues with electrical management, sufficient power for switches, closets, printers, and servers in each building. Moreover, installation of new LCDs or Chromebook or laptop carts entails availability of electrical outlets. The precise cost of this work, depends on the work level of the District's electrician and the nature of the repair, upgrade itself. Nevertheless, in buildings of 100 years age, such power and electrical maintenance will be ongoing.

ONGOING SOFTWARE

The District has in place the various reviews of educational need for software and subscriptions, including regular Cabinet meetings with the Superintendent, Curriculum Council Meetings with Supervisors and Principals, as well as the District Technology Committees for Faculty and BOE. As the educational environment grows, these needs for programs and softwares will grow. And there will be an ongoing need to evaluate annually, the relative success and relevance of different softwares.

As you can see from the list of approved educational softwares for the 2019-20 budget, two packages have been eliminated, as either ineffective, or no longer relevant. All other softwares are similarly reviewed each year. The expected, annual cost of software, based on the 2019-20 proposed school budget is approximately $558K. (See Appendix M SOFTWARE.)

PD for TECH: GOAL ONE

One possible growth within PD for Tech might be the substitution, previously mentioned, of BTA hours in lieu of attendance at a third, full PD day. The implementation of the proposal below would save the District the majority of the current budgeted cost of $100K for the BTA, since most teachers (based on precedent elsewhere) would opt for the substitution of the hours. The only cost to the District would be for the instructors, who would work with Supervisors, and any special presenters needed for the third PD day or special courses.

The essence of the proposal is that teachers are responsible for seven hours of Professional Development that could be met either by taking Supervisor-approved after-school PD courses as part of the BTA in the fall or early spring, or by attending the full day of PD in the spring. If they complete six approved hours of PD through the BTA, then they would be excused from the spring PD day. If they fail to complete a full seven-hours, then they must attend the spring PD in full.

When teachers sign-up for a BTA class, they would be required to indicate whether the hours would be compensated at the contractual rate of $31/hour (at present), or be used to time-substitute toward taking off the spring PD day. There could be no backtracking on the nature of the compensation, since we process the compensations right away. If a teacher opted for payment, then he could not later change it to time; similarly, if he opted to use the hours to take off the spring day, he could not later be asked to be compensated in dollars.

The sign-up lists and Verified Class Lists would be amended to indicate whether a teacher opted for payment, or time-substitute.

Final class lists would go before the Board of Education with the teacher selection.

Summer BTA classes would not be eligible for time-substitute, only the courses offered in the fall and spring.

Teachers who serve as Instructors of courses on the spring PD Day would have to have completed the six hours of PD and been eligible to take-off that day. They would be compensated at the current, contractual rate of $31/hr plus 1/3 (one-third) additional hour for each hour of instruction, for preparation time.

Again, presumably, the cost of the BTA would decrease, since teachers would probably sign-up to take-off in the spring, rather than be compensated.

These are the changes that we would have to make in our current processes-

1. Curriculum would have to decide at the beginning of the year, prior to the fall BTA what topics, courses, and emphases that they want the teachers to learn.
2. We would have to be sure to offer sufficient courses in the requisite areas in both the fall and spring, prior to the PD Day.
3. And Supervisors / Principals would have to direct teachers to take specific classes and review and approve their registrations.
4. I think this will reverse the current practice of having everyone wait until the last days to sign-up for courses. They would sign-up in the first days of registration, to ensure that they have a seat.
5. Some courses might fill-up before everyone who wants a course can sign-up.
6. The same courses would possibly have to be offered in both the fall and spring.
7. There would have to be a deadline in the spring by which six hours of approved courses would have to be completed.
8. We might move from courses that are just one day, one hour, to perhaps courses that are two day and two hour, or three hours, to increase the focus and attention to the work.
9. For the spring PD day, we would have to bring in professional trainers, if we do not have enough instructors for courses, though with proper planning, we should be able to provide enough training with in-house workers.

With this expansion of the BTA, the District could make explicit, specific technology courses required. Moreover, we can convene in one place, at one time, in the spring PD day, all the teachers who have failed to take any after school PD, whether by reason of childcare, or other, and target best practice for their benefit. We would be able to offer this group very targeted, basic, or specific instruction.

CONCLUSION

The sole and specific goal of the Technology Program in Bloomfield School District is to improve the instruction and learning afforded the students. It is our conviction that this improvement can be met with efficient, effective use of technology in learning, and in a fiscally sound, responsible manner.

APPENDICES

APPENDIX-A - Chromebook Inventory - Elementary Schools

(As of 12/22/18, per Follett Destiny Library System)

Count - Circ Type			Data			
Site Name	Sublocation	Circ Type	Available	Checked Out	Lost	**Total Result**
Berkeley	Berkeley School	Chromebook	127	136		**263**
		Equipment	95	33		**128**
		Laptop		1		**1**
		Regular	3	2		**5**
		student laptop	5	5		**10**
	(empty)	Equipment	23	7		**30**
		Laptop	26	5		**31**
		Regular	38	27	20	**85**
		RETIRED IPAD	18			**18**
		student laptop	73	146		**219**
Brookdale	Brookdale	Chromebook	173	47	8	**228**
		Equipment	10	16	41	**67**
		Regular		4		**4**
	Tech	Regular		2		**2**
	(empty)	Chromebook		2		**2**
		Regular	276	9	27	**312**
Carteret	Carteret	Chromebook	200	56		**256**
		Equipment	214	37		**251**
		Regular	9	1		**10**
	Tech	Regular	29	2		**31**
	(empty)	Equipment	4	43		**47**
		Regular	46	1		**47**
Demarest	Chromebook	Chromebook	1	3		**4**
	Classroom	Chromebook	1			**1**
		Lenovo	72			**72**
		Regular	2			**2**
	Demarest	Chromebook	240	139		**379**
		Equipment	110	91		**201**
		Lenovo	1	10		**11**
		Regular	7	26		**33**
	Faculty Laptop	Lenovo	21	3		**24**
		Regular	1	1		**2**
	LENOVO CART FL.1	Lenovo	32			**32**
		Regular	1			**1**
	(empty)	Regular	133	47		**180**
Fairview	Fairview	Chromebook	196	48		**244**
		Equipment	150	77		**227**
		IPAD		3		**3**
		Regular	202	23		**225**
		RETIRED IPAD	2	25		**27**

	Tech	Regular	25	31	2	**58**
	(empty)	Chromebook		6		**6**
		Regular	211	37	1	**249**
Franklin	Franklin	Chromebook	229	37		**266**
		Equipment	68	29		**97**
		Laptops	7	6		**13**
		Regular	2			**2**
	(empty)	Equipment		1		**1**
		Laptops	14	28	1	**43**
		Regular	123	29	5	**157**
		Retired Tech	50			**50**
Oak View	OakView	Chromebook	160	33		**193**
		Equipment	89	6		**95**
		Regular	2	1		**3**
		RETIRED IPAD	29			**29**
	Tech	Chromebook	13	14		**27**
		Equipment		2		**2**
	(empty)	Chromebook	32			**32**
Watsessing	CLASSROOM CENTER	Regular	7	2		**9**
	teacher laptop	Regular	5	11		**16**
	Watsessing	Chromebook	67	140		**207**
		Cloudready	4			**4**
		Cloudready Charger	5			**5**
		Equipment	78	30		**108**
		Regular	1			**1**
	(empty)	Regular	122	184		**306**
Total Result			**3884**	**1705**	**105**	**5694**

APPENDIX-B - Chromebook Inventory - Middle School

(As of 12/22/18, per Follett Destiny Library System)

Count - Circ Type			Data			
Site Name	Sublocation	Circ Type	Available	Checked Out	Lost	**Total Result**
Middle School	BMS	Chromebook	346	1099	3	**1448**
		Ebook	1			**1**
		Equipment	335	1214	33	**1582**
		Staff Laptop	48	68		**116**
	(empty)	Chromebook	2			**2**
		Equipment		2		**2**
		Regular	28	18	3	**49**
Total Result			**760**	**2401**	**39**	**3200**

APPENDIX-C - Chromebook Inventory - High School

(As of 12/22/18, per Follett Destiny Library System)

Count - Circ Type			Data			
Site Name	Sublocation	Circ Type	Available	Checked Out	Lost	**Total Result**
High School	Admin Bldg	Chromebook	1	1		**2**
		Chromebook Charger	1	1		**2**
	BHS	Chromebook	431	2195		**2626**
		Chromebook Charger	191	2137	2	**2330**
		Chromebook Tablet		1		**1**
		Chromebook Tablet Charger		1		**1**
		Cloudready	178	44		**222**
		Cloudready Charger	162	45		**207**
		Computer/Accessories	181	48		**229**
		Equipment	269	76	22	**367**
		Fiction		1		**1**
	Liberty	Chromebook	4	6		**10**
		Chromebook Charger	2	8		**10**
		Equipment	3			**3**
	(empty)	Chromebook	1			**1**
		Chromebook Charger		1		**1**
		Cloudready Charger	1	6		**7**
		Computer/Accessories	4	23		**27**
		Equipment		1		**1**
		Fiction	9	9		**18**
Total Result			**1438**	**4604**	**24**	**6066**

APPENDIX -D- INVENTORY SMARTBOARDS + INTERACTIVE PROJECTORS + LCDs

Count - School		Data								
School	Projector	DLP	Eno	Epson	Hitachi	Manufacturer	Mitsubishi	Smart	(empty)	**Total Result**
	SmartBoard					1				**1**
Berkeley	Projector	6		11	10			1		**28**
	SmartBoard			1				25		**26**
BHS	Projector	18		51	21		2	1		**93**
	SmartBoard		1	34				52		**87**
BMS	Projector	13		50	7		1	10	2	**83**
	SmartBoard		9	23				51		**83**
Brookdale	Projector			11	4		3	4		**22**
	SmartBoard							19		**19**
Carteret	Projector	5		9	4		5			**23**
	SmartBoard			3				20		**23**
Demarest	Projector			13	8		2	2		**25**
	SmartBoard			1				21		**22**
ECC	Projector			2	1					**3**
Fairview	Projector	1		13	9		7	1		**31**
	SmartBoard							28		**28**
Franklin	Projector				4		2	1		**7**
	SmartBoard							19		**19**
Oak View	Projector			14	4		4	1		**23**
	SmartBoard			1				19		**20**
School	Projector					2				**2**
Watsessing	Projector	4		14	3					**21**
	SmartBoard			4				15		**19**
Total Result		**47**	**10**	**255**	**75**	**3**	**26**	**290**	**2**	**708**

APPENDIX-E - Printers

(As of Summer 2018)

Count - School		Data								
School	Projector	Epson	(n/a)	Manufacturer	HP	Sharp	Brother	Konica	Savn	**Total Result**
Berkeley	printer	1			11	6	2			**20**
Berkeley Result		**1**			**11**	**6**	**2**			**20**
BHS	print				1					**1**
	printer	1			37	6		2	8	**54**
	Printer/Fax					1				**1**
BHS Result		**1**			**38**	**7**		**2**	**8**	**56**
BMS	printer				61	3				**64**
BMS Result					**61**	**3**				**64**
Brookdale	printer	1			10	5				**16**
Brookdale Result		**1**			**10**	**5**				**16**
Carteret	printer	1	1		19	5				**26**
Carteret Result		**1**	**1**		**19**	**5**				**26**
Demarest	printer	1			10	5				**16**
Demarest Result		**1**			**10**	**5**				**16**
ECC	printer				4	1				**5**
ECC Result					**4**	**1**				**5**
Fairview	printer	1	2		13	6				**22**
Fairview Result		**1**	**2**		**13**	**6**				**22**
Franklin	printer				10	4				**14**
Franklin Result					**10**	**4**				**14**
Oak View	printer	1			10	4				**15**
Oak View Result		**1**			**10**	**4**				**15**
School	printer			1						**1**
School Result				**1**						**1**
Watsessing	printer	1			13	5				**19**
Watsessing Result		**1**			**13**	**5**				**19**
(empty)	printer									
(empty) Result										
Total Result		**8**	**3**	**1**	**199**	**51**	**2**	**2**	**8**	**274**

APPENDIX-F - Multi-Year Budget for 1:1

History of 1:1 Budgeting: 2015-2019

Purchases of New Chromebooks-		For 1:1 Usage	For Shared Use	For Modified 1:1
	2015-16	**2016-17**	**2017-18**	**2018-19**
ES		300	300	300
Gr PK				
Gr K				
Gr 1				
Gr 2				
Gr 3				350
Gr 4				
Gr 5				
Gr 6				
MS				
Gr 7			350	
Pilot Gr 7		200		
Gr 8			350	
Pilot Gr 8		200		
HS		300		
Gr 9			500	500
Gr 10				
Gr 11				500
Gr 12				200
Faculty	100	300	200	
Annual Unit Total:	100	1300	1700	1850
Unit Cost:	$400	$400	$400	$400
Projected Unit Cost Increase:				
Grand Total:	$40,000	$520,000	$680,000	$740,000

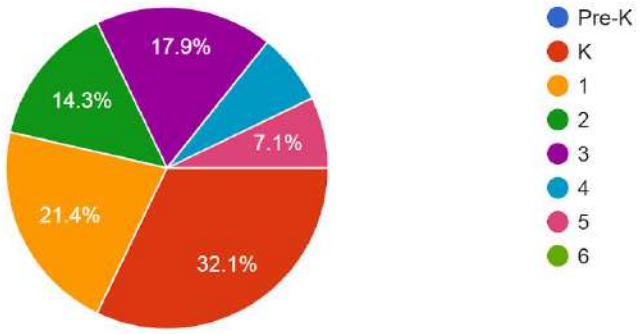
Projection of 1:1 Budgeting: 2019-2024

Purchases of New Chromebooks-			For 1:1 Usage	For Shared Use	For Modified 1:1
	2019-20	**2020-21**	**2021-22**	**2022-23**	**2023-24**
ES					
Gr PK					
Gr K					
Gr 1					
Gr 2					
Gr 3	450				
Gr 4			125	125	125
Gr 5		600	500	500	500
Gr 6	600	500			
MS					
Gr 7					
Pilot Gr 7					
Gr 8					
Pilot Gr 8					
HS					
Gr 9	500	500	500	500	500
Gr 10					
Gr 11					
Gr 12					
Faculty					
Annual Unit Total:	1550	1600	1125	1125	1125
Unit Cost:	$400	$400	$400	$400	$400
Projected Unit Cost Increase:		0.00%	0.00%	0.00%	0.00%
Grand Total:	$620,000	$640,000	$450,000	$450,000	$450,000

APPENDIX G - Survey on Chrome Tablets

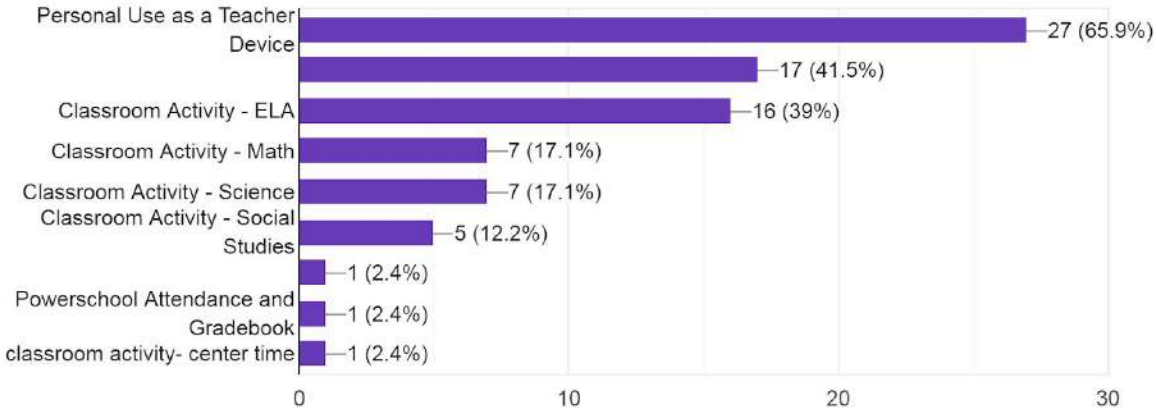
Please indicate the grade of the students with whom you most used the tablets

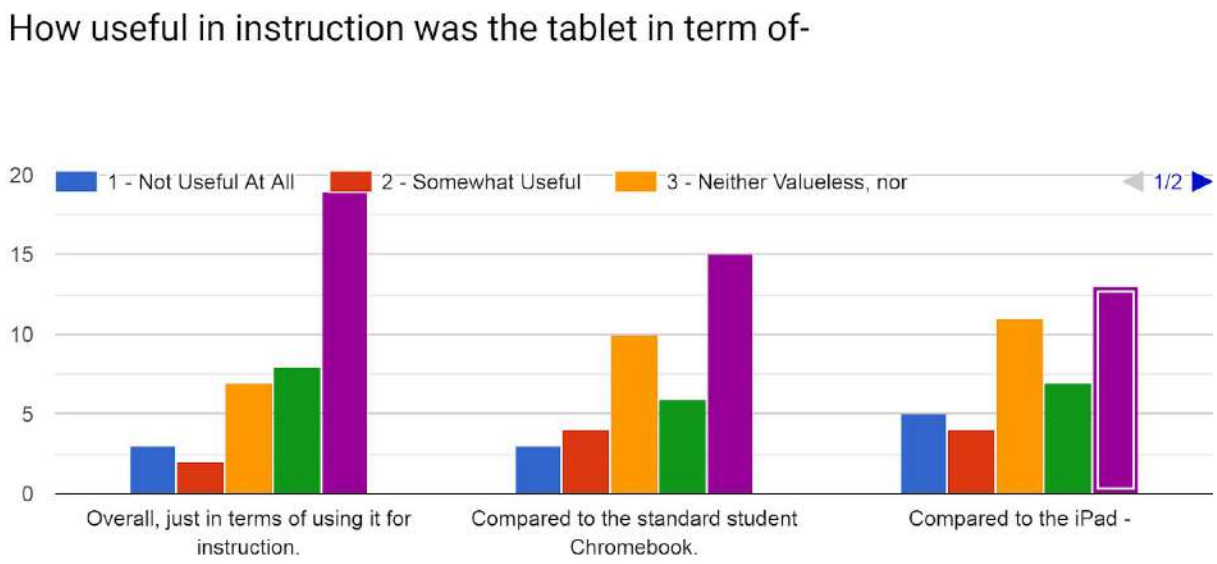
28 responses



Please indicate the purpose(s) for which you used the tablets

41 responses





Was the tablet uniquely valuable in any particular way or for any specific task?

- folds open so it is easy to carry around classroom
- none
- Easy to carry to and from school.
- I like scrolling with the touch screen much more than the touchpad
- Not specifically
- All school-related tasks and responsibilities.
- No, just helpful for everyday tasks.
- The tablet offers more control for students to complete various activities that require the use of a mouse. It is also helpful when students are completing artistic activities.
- easier to use and faster
- It allows the student to work anywhere in the room
- games
- Yes, in the sense that my classroom computers are the slower laptops and the tablet actually loads quickly.
- very portable and easy for the students to use
- Yes
- No
- Easier to handle for Kindergarten
- I didn't think there were be a difference between the tablet and the chromebooks. I was surprised by how much easier and quicker lessons went with my K, 1 students on the tablets compared to the chromebook. I have used them with K and 1 students and the kids innately know how to use them. For tasks that require scrolling, it is developmentally easier for these young students to use the touch rather than the mouse pad. This allowed us to work faster lessons using chrome. They are also lighter and easier for the younger students to transport. This may seem silly, but getting them from storage and being able to use them quickly takes away one of the barriers to using them.
- No much software is still written for regular chrome books and the touch surface was only really useful for basic navigation.
- The younger students like it because they are familiar with using iPads and tablets at home
- Only used for teacher purposes but can see the benefit of using it in a small group for centers in the future.

- The touchscreen us easier to navigate than the mouse at times. It's nice to have an option for the student.
- It's much easier for first grades students to navigate compared to a chrome book. As easy as an ipad.
- The touch capability was nice to have. Being able to scroll via the screen vs. using the touch pad.
- Raz -Kids and Discovery, Brain Pop
- Yes, The ability to write IEP's using the stylus was extremely helpful.
- no
- Use mostly for students to access Reading A-Z kids
- studend find it easier to use than the chrome books
- Students seem to adapt to locating apps better than the Chromebook.

Did you have any complaints about the tablet?

- no
- No
- It doesn’t hold a charge for even 1 day. Unable to download any apps for students to use.
- not really
- Battery life too short. Don't see a point for it. Just go to all chromebooks.
- Very slow
- It's hard to find documents and downloads not located in the google drive
- No, no issues.
- Not at the moment.
- The screen is smaller than other tables so the pop up keyboard is challenging for students to log in.
- It was very difficult to manipulate and to work within apps. Not very user friendly
- Yes! The tablets cannot be used for any website or resource that requires the students to click and drag. It's entirely useless if I want the kids to use study island. They also do not have nearly as many apps to use for the class compared to ipads.
- I don't really know how to use it very well and neither do the kids, they are much more accustomed to iPads. Also, if they are left unplugged for any period of time, they die.
- none
- Need more apps for the younger grades
- They don't have a screen protector. So far this hasn't been an issue, but it may become one.
- Needs getting used to.
- None with the usability of the device itself. Would like if it had some sort of screen protector.
- touch pad is a bit too sensitive, even after turning down the sensitivity
- mine is not turning on, I have put in a Spiceworks
- The charge didn't hold as long as the Chromebook.

APPENDIX H- Itemized Software List & Total Stakeholder Significance

(See *System Diagram*. (2019). *Google Docs*. Retrieved 22 April 2019, from https://docs.google.com/spreadsheets/d/1HAUE7vCdfivRjHjw4KHTmD3tKgvJot_TGgKLyay7hNA/edit#gid=0 .)

System Name	Impacted Stakeholders: System Description	Ttl Impact
Access Doors	Building Key Fobs	**100**
Active Directory	Windows Network	**50**
AD Manager	Account Management	**63**
AESOP	Sub, Employee Attendance	**50**
BTA	Teacher Academy	**46**
Ed Networks	World Wide Web Site	**100**
Facebook	District Facebook	17
Follett Destiny	Library / Tech Inventory	**50**
GAFE	Google Apps for Education	**83**
Hibster	Social Emotional	**38**
Malware Bytes	Anti-Virus	**63**
Naviance	HS Counselling	**38**
Nutrikids	Cafeteria, Free & Reduced	**38**
Office365	Microsoft Office Cloud	**38**
PaperCut	Print Management	**63**
Phone System	Honeywell	**96**
PowerSchool	SIS	**75**
Renaissance	Learning / Testing	**50**
School Messenger	Emergency Notification	**75**
Security Cameras	In-building, door cams	**100**
District	Web Filter	**75**
Servers	Local Building DCs	**63**
SolarWinds	Network Bandwidth Monitor	**29**
Systems3000	Business, Budget, Personnel	**50**
T-Eval	Teacher Evaluation Observation	**38**
Tienet	Sp Ed (PS Spec Ed)	**46**
VersaTrans	Bussing	**46**
VMWare	Virtual Server Env	**33**
WiFi	Meraki Network	**63**
_Instructional-Chromium Management/Neverware		**38**
_Instructional-Lesson Planning (EduSoft or OnCourse)		13
_Instructional-NJECC		17
_Instructional-_Brain Pop		**25**
_Instructional-_Culturegrams		**25**
_Instructional-_Discovery or Equivalent Video Repository		**25**
_Instructional-_EBSCO		**25**
_Instructional-_Edmentum		**25**
_Instructional-_Explore Learning (Gizmos)		**25**
_Instructional-_Facts4Me		**25**

_Instructional-_Learning A-Z		**25**
_Instructional-_Middlebury		**25**
_Instructional-_Nearpod		**25**
_Instructional-_Newsela		**25**
_Instructional-_NY Times Digital Subscription		**63**
_Instructional-_Overdrive		**25**
_Instructional-_Reach TV		**25**
_Instructional-_Screencastify		**29**
_Instructional-_Typing Club		**25**
_Instructional-_WeVideo (k-12)		**25**
_Instructional-_World Book		**25**

APPENDIX I - New Student Enrollment Procedures

Identify & export information for all new students in PowerSchool-

1. Export all students with District Entry Date > than previous check
   OR
   Search for Web_ID#@;schoolid<1000
2. Check Registration screen for errors, omissions.
3. Export new/unprocessed registrations with following fields -

   Student_Number
   [39]Name
   [39]Principal
   Home_Room
   Last_Name
   First_Name
   Street
   City
   State
   Mailing_Street
   Mailing_State
   Mailing_Zip
   AllowWebAccess
   Web_ID
   Web_Password
   U_Students_Extension.NETWORK_PASSWORD
   Home_Room
   graduation_year
   Grade_Level
   Student_AllowWebAccess
   U_StudentsUserFields.studentemail
   Student_Web_Password
   Student_Web_ID
   Student_AllowWebAccess
   DOB

4. See monthly process below for checking network accounts.

Check new students against all existing and active network accounts -

5. Copy download student.export file into columns B-Y of worksheet **dyn** in last Excel file named newusersYYMMDD.xlsx
6. Delete or clear all text in all other worksheets, except **allusersYYMMDD**
7. Copy values of **dyn** to **stat**.
8. Copy text from **stat** between first two delimiters | to **csv** and between second two to **tab** and final columns to **txt**.
9. Save worksheet with new name/date.
10. Export **csv** as csv, **txt** as delimited tab, and copy **txt** to file setpasswordYYMMDD.bat and rename for new date.

Mandate network/account creation in Microsoft AD-

11. Send csv file to Tech Manager for network account creation.
12. Use tab delimited txt file in Quick Import.

13. Process all new students with assignment of access codes.

Effect password change in AD for Google Account Activation-

14. Run bat file for setpassword, after notification that accounts are created.

APPENDIX J - GRADE 6 MATH CURRICULUM - **TECHNOLOGY STANDARDS ONLY**

Below are the NJCCS indicators specified in Bloomfield's Curriculum for 6th Grade Math. All curricula include specific sections for identification of Technology Standards and enumeration of related indicators for NJCCCS 8.1, 8.2 and 9:

8.1 Educational Technology
All students will use digital tools to access, manage, evaluate, and synthesize information in order to solve problems individually and collaborate and to create and communicate knowledge.

A. Technology Operations and Concepts: Students demonstrate a sound understanding of technology concepts, systems and operations.
● Understand and use technology systems. ● Select and use applications effectively and productively.
8.1.8.A.1 Demonstrate knowledge of a real world problem using digital tools. 8.1.8.A.3 Use and/or develop a simulation that provides an environment to solve a real world problem or theory. 8.1.8.A.4 Graph and calculate data within a spreadsheet and present a summary of the results

B. Creativity and Innovation: Students demonstrate creative thinking, construct knowledge and develop innovative products and process using technology.
● Apply existing knowledge to generate new ideas, products, or processes. ● Create original works as a means of personal or group expression.
8.1.8.B.1 Synthesize and publish information about a local or global issue or event (ex. telecollaborative project, blog, school web).

D. Digital Citizenship: Students understand human, cultural, and societal issues related to technology and practice legal and ethical behavior.
● Advocate and practice safe, legal, and responsible use of information and technology. ● Demonstrate personal responsibility for lifelong learning. ● Exhibit leadership for digital citizenship.
8.1.8.D.1 Understand and model appropriate online behaviors related to cyber safety, cyber bullying, cyber security, and cyber ethics including appropriate use of social media. 8.1.8.D.2 Demonstrate the application of appropriate citations to digital content. 8.1.8.D.3 Demonstrate an understanding of fair use and Creative Commons to intellectual property.

8.1.8.D.4
Assess the credibility and accuracy of digital content.

8.1.8.D.5
Understand appropriate uses for social media and the negative consequences of misuse.

E: Research and Information Fluency: Students apply digital tools to gather, evaluate, and use information.

- Plan strategies to guide inquiry
- Locate, organize, analyze, evaluate, synthesize, and ethically use information from a variety of sources and media.
- Evaluate and select information sources and digital tools based on the appropriateness for specific tasks.

8.1.8.E.1
Effectively use a variety of search tools and filters in professional public databases to find information to solve a real world problem.

F: Critical thinking, problem solving, and decision making: Students use critical thinking skills to plan and conduct research, manage projects, solve problems, and make informed decisions using appropriate digital tools and resources.

- Identify and define authentic problems and significant questions for investigation.
- Plan and manage activities to develop a solution or complete a project.
- Collect and analyze data to identify solutions and/or make informed decisions.
- Use multiple processes and diverse perspectives to explore alternative solutions

8.1.5.F.1 Apply digital tools to collect, organize, and analyze data that support a scientific finding.

8.1.8.F.1 Explore a local issue, by using digital tools to collect and analyze data to identify a solution and make an informed decision.

8.2 Technology Education, Engineering, Design, and Computational Thinking-Programming
All students will develop an understanding of the nature and impact of technology, engineering, technological design, computational thinking and the designed world as they relate to the individual, global society, and the environment.

A. The Nature of Technology: Creativity and Innovation Technology systems impact every aspect of the world in which
we live.

- The characteristics and scope of technology.
- The core concepts of technology.
- The relationships among technologies and the connections between
- technology and other fields of study.

8.2.8.A.1 Research a product that was designed for a specific demand and identify how the product has changed to meet new demands (i.e. telephone for communication - smart phone for mobility needs).

8.2.8.A.2 Examine a system, consider how each part relates to other parts, and discuss a part to redesign to improve the system.

8.2.8.A.3 Investigate a malfunction in any part of a system and identify its impacts.

8.2.8.A.4 Redesign an existing product that impacts the environment to lessen its impact(s) on the environment.

8.2.8.A.5 Describe how resources such as material, energy, information, time, tools, people, and capital contribute to a technological product or system.

B. Technology and Society: Knowledge and understanding of human, cultural and societal values are fundamental when designing technological systems and products in the global society.

- The cultural, social, economic and political effects of technology.
- The effects of technology on the environment.
- The role of society in the development and use of technology.
- The influence of technology on history.

8.2.8.B.1 Evaluate the history and impact of sustainability on the development of a designed product or system over time and present results to peers.

8.2.8.B.2 Identify the desired and undesired consequences from the use of a product or system.

8.2.8.B.3 Research and analyze the ethical issues of a product or system on the environment and report findings for review by peers and /or experts.

8.2.8.B.4 Research examples of how humans can devise technologies to reduce the negative consequences of other technologies and present your findings.

8.2.8.B.5 Identify new technologies resulting from the demands, values, and interests of individuals, businesses, industries and societies.

8.2.8.B.6 Compare and contrast the different types of intellectual property including copyrights, patents and trademarks.

8.2.8.B.7 Analyze the historical impact of waste and demonstrate how a product is upcycled, reused or remanufactured into a new product.

C. Design: The design process is a systematic approach to solving problems.

- The attributes of design.
- The application of engineering design.
- The role of troubleshooting, research and development, invention and innovation and experimentation in problem solving.

8.2.8.C.1 Explain how different teams/groups can contribute to the overall design of a product.

8.2.8.C.2 Explain the need for optimization in a design process.

8.2.8.C.3 Evaluate the function, value, and aesthetics of a technological product or system, from the perspective of the user and the producer.
8.2.8.C.4 Identify the steps in the design process that would be used to solve a designated problem.

8.2.8.C.5 Explain the interdependence of a subsystem that operates as part of a system.

8.2.8.C.5.a Create a technical sketch of a product with materials and measurements labeled.

8.2.8.C.6 Collaborate to examine a malfunctioning system and identify the step-by-step process used to troubleshoot, evaluate and test options to repair the product, presenting the better solution.

8.2.8.C.7 Collaborate with peers and experts in the field to research and develop a product using the design

process, data analysis and trends, and maintain a design log with annotated sketches to record the developmental cycle.

8.2.8.C.8 Develop a proposal for a chosen solution that include models (physical, graphical or mathematical) to communicate the solution to peers.

D. Abilities for a Technological World: The designed world is the product of a design process that provides the means to convert resources into products and systems.

- Apply the design process.
- Use and maintain technological products and systems.
- Assess the impact of products and systems.

8.2.8.D.1 Design and create a product that addresses a real world problem using a design process under specific constraints.

8.2.8.D.2 Identify the design constraints and trade-offs involved in designing a prototype (e.g., how the prototype might fail and how it might be improved) by completing a design problem and reporting results in a multimedia presentation, design portfolio or engineering notebook.

8.2.8.D.3 Build a prototype that meets a STEM-based design challenge using science, engineering, and math principles that validate a solution.

APPENDIX K - PARCC PERFORMANCE 2017-18 ALL 7-8 MIDDLE SCHOOLS STATEWIDE

COUNTY_NAME	DISTRICT_NAME	SCHOOL_NAME	ELAProf_MetTarget	MathProf_MetTarget	ELAGrowth_MetStandard	MathGrowth_MetStandard	ELP_MetTarget	CA_MetAverage	Targeted_ConsUnderPerf	SummativeRating	SummativeScore	Rank
ESSEX	LIVINGSTON TWP	HERITAGE MIDDLE SCHOOL	Met Goal	Met Target	Exceeds Standard	Met Standard	**	Met	No	95.26	84.99	1 / 53
BURLINGTON	MOORESTOWN TWP	WILLIAM ALLEN MIDDLE SCHOOL	Met Target	Met Target	Met Standard	Exceeds Standard	**	Met	No	93.6	83.29	2 / 53
SOMERSET	BRIDGEWATER-RARITAN REG	BRIDGEWATER-RARITAN MIDDLE SCHOOL	Met Goal	Not Met	Exceeds Standard	Met Standard	**	Met	No	86.61	75.72	3 / 53
UNION	NEW PROVIDENCE BORO	NEW PROVIDENCE MIDDLE SCHOOL	Met Goal	Met Goal	Met Standard	Exceeds Standard	**	Met	No	80.92	71.1	4 / 53
GLOUCESTER	DEPTFORD TWP	MONONGAHELA MIDDLE SCHOOL	Met Target	Met Target	Exceeds Standard	Met Standard	**	Not Met	No	77.43	67.88	5 / 53
SOMERSET	HILLSBOROUGH TWP	HILLSBOROUGH TOWNSHIP MIDDLE SCHOOL	Met Target	Met Target	Met Standard	Met Standard	**	Met	No	75.12	66.23	6 / 53
HUNTERDON	CLINTON TWP	CLINTON TOWNSHIP MIDDLE SCHOOL	Met Target	Not Met	Met Standard	Exceeds Standard	**	Met	No	74.76	65.95	7 / 53
BURLINGTON	NORTHERN BURLINGTON REG	NORTHERN BURLINGTON COUNTY REGIONAL MIDDLE SCHOOL	Met Target	Met Target	Met Standard	Met Standard	N	Met	No	67.12	60.57	8 / 53
SOMERSET	MONTGOMERY TWP	MONTGOMERY UPPER MIDDLE SCHOOL	Met Goal	Met Target	Met Standard	Met Standard	**	Met	No	66.94	60.47	9 / 53
ESSEX	NUTLEY TOWN	JOHN H. WALKER MIDDLE SCHOOL	Met Target	Met Target	Met Standard	Exceeds Standard	**	Not Met	No	66.23	60.11	10 / 53
GLOUCESTER	KINGSWAY REGIONAL	KINGSWAY REGIONAL MIDDLE SCHOOL	Met Target	Met Target	Met Standard	Met Standard	**	Met	No	66.11	60.05	11 / 53
BERGEN	RIVER DELL REGIONAL	RIVER DELL MIDDLE SCHOOL	Met Target	Not Met	Met Standard	Met Standard	**	Met	No	63.15	58.34	12 / 53

MORRIS	DOVER TOWN	DOVER MIDDLE SCHOOL	Met Target	Met Target,Ä†	Exceeds Standard	Met Standard	Met Target,Ä†	Met	No	60.6	56.9	13 / 53
MONMOUTH	HOLMDEL TWP	WILLIAM R. SATZ SCHOOL	Met Goal	Met Target	Met Standard	Met Standard	**	Met	No	57.41	55.03	14 / 53
MONMOUTH	MANALAPAN-ENGLISHTOWN REG	MANALAPAN-ENGLISHTOWN MIDDLE SCHOOL	Met Target	Met Target	Met Standard	Met Standard	**	Not Met	No	56.81	54.63	15 / 53
GLOUCESTER	CLEARVIEW REGIONAL	CLEARVIEW REGIONAL MIDDLE SCHOOL	Met Target	Met Target	Not Met	Exceeds Standard	N	Met	No	53.61	52.73	16 / 53
BURLINGTON	MEDFORD TWP	MEDFORD MEMORIAL MIDDLE SCHOOL	Met Goal	Met Target	Met Standard	Met Standard	**	Met	No	52.73	52.14	17 / 53
GLOUCESTER	DELSEA REGIONAL H.S DIST.	DELSEA REGIONAL MIDDLE SCHOOL	Met Target	Not Met	Met Standard	Met Standard	**	Met	No	52.67	52.1	18 / 53
MERCER	LAWRENCE TWP	LAWRENCE MIDDLE SCHOOL	Met Target,Ä†	Met Target,Ä†	Met Standard	Met Standard	**	Met	No	49.11	49.78	19 / 53
ESSEX	WEST ORANGE TOWN	LIBERTY MIDDLE SCHOOL	Met Target,Ä†	Not Met	Met Standard	Met Standard	**	Met	No	46.21	48.35	20 / 53
OCEAN	LACEY TWP	LACEY TOWNSHIP MIDDLE SCHOOL	Met Target	Met Target	Met Standard	Met Standard	N	Not Met	No	42.65	46.13	21 / 53
MORRIS	ROXBURY TWP	EISENHOWER MIDDLE SCHOOL	Met Target	Met Target	Met Standard	Met Standard	**	Met	No	42.06	45.83	22 / 53
HUNTERDON	FLEMINGTON-RARITAN REG	J.P. CASE MIDDLE SCHOOL	Met Target	Met Target	Met Standard	Met Standard	**	Met	No	41.59	45.41	23 / 53
ESSEX	WEST ESSEX REGIONAL	WEST ESSEX MIDDLE SCHOOL	Met Goal	Met Target	Met Standard	Not Met	**	Met	No	41.35	45.29	24 / 53
UNION	ROSELLE BORO	GRACE WILDAY JUNIOR HIGH SCHOOL	Not Met	Not Met	Met Standard	Exceeds Standard	Met Target,Ä†	Not Met	No	38.74	43.85	25 / 53
OCEAN	SOUTHERN REGIONAL	SOUTHERN REGIONAL MIDDLE SCHOOL	Met Target	Met Target	Met Standard	Met Standard	**	Met	No	37.38	43.23	26 / 53
GLOUCESTER	GLASSBORO	GLASSBORO INTERMEDIATE SCHOOL	Met Target	Met Target	Met Standard	Met Standard	**	Not Met	No	35.9	42.45	27 / 53
ESSEX	BLOOMFIELD TWP	BLOOMFIELD MIDDLE SCHOOL	Met Target	Met Target,Ä†	Met Standard	Met Standard	Met Target,Ä†	Met	No	34	40.96	28 / 53

MIDDLESEX	SOUTH PLAINFIELD BORO	SOUTH PLAINFIELD MIDDLE SCHOOL	Met Target,Ä†	Not Met	Met Standard	Met Standard	**	Met	No	33	40.13	29 / 53
BERGEN	FORT LEE BORO	LEWIS F. COLE MIDDLE SCHOOL	Met Target,Ä†	Met Target,Ä†	Not Met	Met Standard	Met Target	Met	No	30.51	38.06	30 / 53
HUDSON	UNION CITY	UNION HILL MIDDLE SCHOOL	Met Target	Met Target	Met Standard	Met Standard	Not Met	Met	No	29.21	37.26	31 / 53
BERGEN	RUTHERFORD BORO	UNION SCHOOL	Met Target,Ä†	Not Met	Met Standard	Not Met	**	Met	No	27.78	36.21	32 / 53
CAMDEN	WINSLOW TWP	WINSLOW TOWNSHIP MIDDLE SCHOOL	Met Target,Ä†	Met Target,Ä†	Met Standard	Met Standard	**	Met	No	25.89	35.2	33 / 53
BURLINGTON	MOUNT LAUREL TWP	T. E. HARRINGTON MIDDLE SCHOOL	Met Target	Met Target	Not Met	Met Standard	**	Met	No	22.81	32.94	34 / 53
CAMDEN	PENNSAUKEN TWP	HOWARD M. PHIFER MIDDLE SCHOOL	Not Met	Met Target	Met Standard	Met Standard	**	Not Met	No	22.75	32.85	35 / 53
SOMERSET	FRANKLIN TWP	FRANKLIN MIDDLE SCHOOL	Met Target	Met Target,Ä†	Met Standard	Met Standard	Met Target,Ä†	Met	No	21.98	32.4	36 / 53
CAPE MAY	LOWER CAPE MAY REGIONAL	RICHARD M. TEITELMAN MIDDLE SCHOOL	Met Target	Met Target	Met Standard	Met Standard	**	Met	No	20.97	31.51	37 / 53
MONMOUTH	EATONTOWN BORO	MEMORIAL MIDDLE SCHOOL	Met Target	Met Target	Met Standard	Not Met	**	Not Met	No	20.38	31.14	38 / 53
SOMERSET	NORTH PLAINFIELD BORO	NORTH PLAINFIELD MIDDLE SCHOOL	Met Target	Met Target	Met Standard	Not Met	Met Target,Ä†	Met	No	19.67	30.58	39 / 53
OCEAN	CENTRAL REGIONAL	CENTRAL REGIONAL MIDDLE SCHOOL	Not Met	Not Met	Not Met	Exceeds Standard	**	Not Met	No	17.18	28.93	40 / 53
HUDSON	WEST NEW YORK TOWN	WEST NEW YORK MIDDLE SCHOOL	Not Met	Not Met	Met Standard	Met Standard	Met Target,Ä†	Met	No	16.47	28.1	41 / 53
ESSEX	WEST ORANGE TOWN	ROOSEVELT MIDDLE SCHOOL	Not Met	Not Met	Not Met	Not Met	**	Met	No	16.23	28.02	42 / 53
HUDSON	KEARNY TOWN	LINCOLN MIDDLE SCHOOL	Not Met	Not Met	Not Met	Not Met	Exceeds Target	Met	No	15.17	27.32	43 / 53
BERGEN	ENGLEWOOD CITY	JANIS E. DISMUS MIDDLE SCHOOL	Met Target	Met Target	Not Met	Met Standard	**	Not Met	No	11.91	23.66	44 / 53
WARREN	WARREN HILLS	WARREN HILLS	Met Target,Ä†	Met Target,Ä†	Met Standard	Not Met	**	Met	No	10.9	22.68	45 / 53

	REGIONAL	REGIONAL MIDDLE SCHOOL										
PASSAIC	WEST MILFORD TWP	MACOPIN MIDDLE SCHOOL	Met Target	Met Target	Met Standard	Not Met	N	Met	No	10.84	22.55	46 / 53
ATLANTIC	GALLOWAY TWP	GALLOWAY TOWNSHIP MIDDLE SCHOOL	Not Met	Met Target,Ä†	Not Met	Met Standard	**	Met	No	9.89	21.81	47 / 53
MONMOUTH	HAZLET TWP	HAZLET MIDDLE SCHOOL	Met Target	Met Target	Not Met	Not Met	N	Not Met	No	7.88	19.39	48 / 53
SOMERSET	BOUND BROOK BORO	COMMUNITY MIDDLE SCHOOL	Not Met	Not Met	Met Standard	Met Standard	Not Met	Not Met	No	6.81	18.29	49 / 53
UNION	HILLSIDE TWP	WALTER O. KRUMBIEGEL MIDDLE SCHOOL	Met Target	Not Met	Met Standard	Not Met	**	Not Met	No	5.63	16.54	50 / 53
HUDSON	HOBOKEN CITY	HOBOKEN MIDDLE SCHOOL	Met Target,Ä†	Not Met	Not Met	Not Met	**	Met	No	5.27	15.89	51 / 53
BURLINGTON	PEMBERTON TWP	HELEN A. FORT MIDDLE SCHOOL	Met Target	Not Met	Met Standard	Not Met	**	Not Met	No	4.8	15.13	52 / 53
GLOUCESTER	PAULSBORO BORO	PAULSBORO JUNIOR HIGH SCHOOL	Met Target,Ä†	Not Met	Not Met	Not Met	**	Not Met	No	0.12	1.18	53 / 53

APPENDIX L -ANNUAL TECH EXPENDITURES OTHER THAN 1:1

ITEM DESCRIPTION	**QUANTITY**	**UNIT PRICE**	**TOTAL**	**LOCATION**
LCD for BOE	1	$10,000	$10,000	BOE
LCDs for Elementary Schools	27	$5,000	$135,000	Elementary Schools
LCDs for HS	6	$5,000	$30,000	HS
LCDs for MS	6	$5,000	$30,000	MS
Specialized, High-End PCs for Engineering, STEM, Video Editing, Fine Arts, Tech Director, Data Manager	20	$2,000	$40,000	
Meraki AP/Switch Licenses	1	$100,000	$100,000	
Replacement Meraki Switch	11	$5,000	$55,000	Replace/upgrade 1 switch per building
Server Replacement	3	$10,000	$30,000	2/3 Schools (1 in Abeyance)
Smartnet CISCO (non Meraki)	1	$15,000	$15,000	
Ad Hoc Electrical Work - cabling, upgrade power, install outlets, LCDs, etc.	***?***	***?***	***?***	***ALL SCHOOLS***

APPENDIX M - SOFTWARE COSTS - ANNUAL AS OF 2019

_Software = Curriculum/Academic Explicit	
LINE ITEM	**AMOUNT**
AD Manager	$1,500
BTA	$100,000
Chromium Management/Neverware	$20,000
Destiny Follett Library Systems	$21,000
Educational Networks (Web Host)	$16,000
Lesson Planning (EduSoft or OnCourse)	$30,000
Malware Bytes	$31,000
NJECC	$2,000
PowerSchool Enterprise Support	$6,200
Rennaissance Learning	$65,000
Securly	$16,000
SolarWinds	$6,000
T-Eval (EduSoft=Educator Software Solutions)	$12,000
_Brain Pop	$8,000
~~_Defined STEM (Learning)~~	$0
_Discovery or Equivalent Video Repository	$30,000
_EBSCO	$6,250
_Edmentum	$16,000
_Explore Learning (Gizmos)	$12,500
_Facts4Me	$1,200
_Learning A-Z	$30,000
_Middlebury	$16,000
_Nearpod	$22,000
_Newsela	$34,000
_Overdrive	$6,000
_Reach TV	$3,500
~~_Science A-Z~~	$0
_Screencastify	$2,000
_Typing Club	$6,000
_WeVideo (k-12)	$32,500
_World Book	$5,500

APPENDIX N: TECHNOLOGY PROJECTS -NEW- BUDGET REQUESTS FALL 2018

BLOOMFIELD SCHOOL DISTRICT 2019-2020 BUDGET REQUEST					
TECHNOLOGY PROJECT REQUEST (NEW)					
DEPARTMENT:		**DATE:**			
ITEM DESCRIPTION	**QUANTITY**	**UNIT PRICE**	**TOTAL**	**LOCATION**	**JUSTIFICATION**
Carts for 6th Grade Chromebooks	25	$1,200	$30,000	Elementary Schools	24 Sections current 5th grades; different cart from prior years
Chromebook Tablets for K-3	400	$450	$180,000	K-3	Complete Substitution Ipads (Presume Purchase 300 2018-19)
Chromebooks for 6th Grade	600	$400	$240,000	Elementary Schools	24 Sections 5th grades x 25 CBs = 600 CBs
Chromebooks for 9th Grade	500	$400	$200,000	HS	477 Current 8th Graders; move 12th graders to MS and HS Library
Chromebooks for MS (Replacement)	0	$400	$0	MS	Zero, if use returned 12th graders; replace most damaged
Document Cameras	52	$110	$5,720		8/HS&MS + 4/ES
LCD for BOE	1	$10,000	$10,000	BOE	Board Conference
LCDs for Elementary Schools	27	$5,000	$135,000	Elementary Schools	Continue Replacement Oldest, including Forest Glen
LCDs for HS	6	$5,000	$30,000	HS	Continue Replacement Oldest
LCDs for MS	6	$5,000	$30,000	MS	Continue Replacement Oldest
Mac Lab for "Computer Art Classes" (Jen Khoury: Thu, Oct 18, 3:48 PM Email)	22	$2,000	$44,000		Matt Unger Apple Contact 917-244-8081
Meraki AP/Switch Licenses	1	$100,000	$100,000		Inclusive all switches & AP's, smoothed for term of all licenses
Morris	1	$6,000	$6,000		

Replacement Meraki Switch	11	$5,000	$55,000	Replace/upgrade 1 switch per building	Increased management & functionality
SchoolMessenger	1	$18,000	$18,000		Inclusive SmartDoc Delivery & Email
Server Replacement	3	$10,000	$30,000	2/3 Schools (1 in Abeyance)	Replacement of multi-function servers/DCs in Schools
Smartnet CISCO (non Meraki)	1	$15,000	$15,000		
Trenching or Aerial Hang Cables Foley Field	1	$15,000	$15,000		
Electrical Work ES (include in 11-000-261-420 if need to outsource)	***?***	***?***	***?***	***ES***	***To be collected by Jan 1***

APPENDIX O - TECH PROJECTS -ONGOING- BUDGET REQUESTS FALL 2018

BLOOMFIELD SCHOOL DISTRICT 2019-2020 BUDGET REQUEST			
TECHNOLOGY BUDGET ONGOING			
DEPARTMENT:	$558,150	DATE:	
_Software = Curriculum/Academic Explicit			
LINE ITEM	**AMOUNT**		**ACCOUNT**
AD Manager	$1,500		
BTA	$100,000		
Chromium Management/Neverware	$20,000		
Destiny Follett Library Systems	$21,000		
Educational Networks (Web Host)	$16,000		
Lesson Planning (EduSoft or OnCourse)	$30,000		
Malware Bytes	$31,000		
NJECC	$2,000		
PowerSchool Enterprise Support	$6,200		
Rennaissance Learning	$65,000		
Securly	$16,000		
SolarWinds	$6,000		
T-Eval (EduSoft=Educator Software Solutions)	$12,000		
_Brain Pop	$8,000		
~~_Defined STEM (Learning)~~	$0		
_Discovery or Equivalent Video Repository	$30,000		
_EBSCO	$6,250		
_Edmentum	$16,000		
_Explore Learning (Gizmos)	$12,500		
_Facts4Me	$1,200		
_Learning A-Z	$30,000		
_Middlebury	$16,000		
_Nearpod	$22,000		
_Newsela	$34,000		
_Overdrive	$6,000		
_Reach TV	$3,500		
~~_Science A-Z~~	$0		
_Screencastify	$2,000		
_Typing Club	$6,000		
_WeVideo (k-12)	$32,500		will be evaluated
_World Book	$5,500		

APPENDIX P: COST COMPARISON CLOUD-BASED SERVERS FOR CURRENT LOCAL STORAGE NEEDS

https://www.cloudorado.com/cloud_server_comparison.jsp				
RAM:	16G			
Storage:	1TB			
CPU cores:	8x			
OS:	Windows			
17 cloud server providers found				
Cloud Provider	**Cloud Server Summary**	**Price per month**	**x 24**	**Annual Cost**
Kamatera	16 GB RAM / 8x CPUs Instance	$285	$6,840	$82,080
M5 Cloud Hosting	M5 2XLarge (32 GB RAM, 8 CPUs)	$356	$8,544	$102,528
VPS.NET	16 GB RAM / 8x CPUs Instance	$338	$8,112	$97,344
Cloudware	M5 2XLarge (32 GB RAM, 8 CPUs)	$356	$8,544	$102,528
e24cloud	A8 v2	$401	$9,624	$115,488
CloudSigma	Storm Server 32GB (30.3GB RAM)	$450	$10,800	$129,600
Kamatera	n1-standard-8	$462	$11,088	$133,056
eApps	Compute 1-15 (15 GB RAM) + 1000 GB storage	$491	$11,784	$141,408
Amazon	EC2 c5.2xlarge + 1000 GB SSD EBS	$610	$14,640	$175,680
Google Cloud Platform	n1-standard-8	$610	$14,640	$175,680
M5 Cloud Hosting	Titan - 128 GB RAM / 16 CPUs + 1000 GB SSD	$618	$14,832	$177,984
ZettaGrid	16 GB RAM / 8 CPUs Instance	$657	$15,768	$189,216
Rackspace	32 Nodes + 28 Storage Nodes	$768	$18,432	$221,184
ElasticHosts	16 GB RAM / 8 CPUs Instance	$1,040	$24,960	$299,520
Microsoft Azure	16 GB RAM / 8x 3.0 GHz CPUs Instance	$1,171	$28,104	$337,248
Bit Refinery	Hardware VM High Memory 68.38 GB RAM	$1,217	$29,208	$350,496
Hyve	16 GB RAM / 8 CPUs Instance	$1,318	$31,632	$379,584
JoyentCloud	SSD 16 GB RAM / 8x 2 GHz CPUs	$48,032	$1,152,768	$13,833,216

Cloud Server Comparison - Price & Features. (2019). *Cloudorado - Cloud Computing Comparison Engine*. Retrieved 29 April 2019, from https://www.cloudorado.com/cloud_server_comparison.jsp

APPENDIX Q: ANALYSIS BLOOMFIELD TEACHER ACADEMY COURSE OFFERINGS AND ENROLLMENTS: 2016-2019

BTA Courses
Proposed & Offered

Count BTA Courses Proposed & Actually Offered: By Term		
Row Labels	**Total Proposed**	**Offered**
2015-16-3-Spring	37	35
2016-17-1-Summer	58	47
2016-17-2-Fall	68	51
2016-17-3-Spring	90	83
2017-18-1-Summer	86	76
2017-18-2-Fall	84	71
2017-18-3-Spring	76	49
2018-19-1-Summer	66	54
2018-19-2-Fall	52	46
2018-19-3-Spring	57	30
(blank)	2	
Grand Total	**676**	**542**

Total Actually Offered Within Each School

Offered	Teacher													
Count of Courses Actually Offered By Term Within Each School														
Row Labels	**BE**	**BK**	**CA**	**DE**	**Dist**	**FG**	**FK**	**FV**	**HS**	**MS**	**OV**	**WA**	**na**	**Ttl**
2015-16-3-Spring	2	3	1	2	1		3	2	11	5	1	4		35
2016-17-1-Summer			3		30				5	7		2		47
2016-17-2-Fall		3	3	4	3		4	2	10	17		5		51
2016-17-3-Spring	1	4	2	2	11	6	3		22	23	2	4	3	83
2017-18-1-Summer	1		5		24	1	2		18	19	4		2	76
2017-18-2-Fall	2	3	6	2	8	2	3		16	22	2	3	2	71
2017-18-3-Spring		1	2	5	8		1		16	11	2		3	49
2018-19-1-Summer	1		3		20	2			20	1	1	4	2	54
2018-19-2-Fall	1			1	7		2		21	12	1	1		46
2018-19-3-Spring	1	8	1	5	1		1		8	2	2	1		30
Grand Total	**9**	**22**	**26**	**21**	**113**	**11**	**19**	**4**	**147**	**119**	**15**	**24**	**12**	**542**

BTA Courses Both Proposed & Offered By Administrators, Teachers

Offered	(All)													
Count of Title of Course														
Row Labels	**BE**	**BK**	**CA**	**DE**	**Dist**	**FG**	**FK**	**FV**	**HS**	**MS**	**OV**	**WA**	**na**	**Ttl**
2015-16-3-Spring	**2**	**3**	**1**	**2**	**2**		**3**	**2**	**11**	**5**	**2**	**4**		**37**
Administrator					1									1
Teacher	2	3	1	2	1		3	2	11	5	2	4		36
2016-17-1-Summer			**3**		**36**				**6**	**8**		**2**	**3**	**58**
Administrator					31					1			3	35
Teacher			3		5				6	7		2		23
2016-17-2-Fall		**3**	**3**	**6**	**4**	**2**	**4**	**2**	**18**	**20**	**1**	**5**		**68**
Administrator				2	2	2			7	3	1			17
Teacher		3	3	4	2		4	2	11	17		5		51
2016-17-3-Spring	**1**	**4**	**2**	**2**	**12**	**6**	**3**		**24**	**25**	**2**	**4**	**5**	**90**
Administrator					6				1	2			2	11
Teacher	1	4	2	2	6	6	3		23	23	2	4	3	79
2017-18-1-Summer	**1**	**1**	**7**	**1**	**26**	**2**	**2**		**20**	**19**	**5**		**2**	**86**
Administrator					10				1	1	5			17
Teacher	1	1	7	1	16	2	2		19	18			2	69
2017-18-2-Fall	**2**	**3**	**6**	**3**	**8**	**2**	**3**		**26**	**24**	**2**	**3**	**2**	**84**
Administrator			1	2	1				4	1				9
Teacher	2	3	5	1	7	2	3		22	23	2	3	2	75
2017-18-3-Spring	**2**	**2**	**2**	**5**	**14**		**1**		**30**	**14**	**2**		**4**	**76**
Administrator	2				8						2		4	16
Teacher		2	2	5	6		1		30	14				60
2018-19-1-Summer	**1**		**3**		**20**	**2**			**27**	**2**	**2**	**5**	**4**	**66**
Administrator					11				5	1	2		2	21
Teacher	1		3		9	2			22	1		5	2	45
2018-19-2-Fall	**2**			**1**	**7**		**4**		**21**	**15**	**1**	**1**		**52**
Administrator					6				4					10
Teacher	2			1	1		4		17	15	1	1		42
2018-19-3-Spring	**1**	**9**	**1**	**8**	**7**		**1**		**24**	**2**	**2**	**1**	**1**	**57**
Administrator				1	4				1		2		1	9
Teacher	1	9	1	7	3		1		23	2		1		48
(blank)													**2**	**2**
(blank)													2	2
Grand Total	**12**	**25**	**28**	**28**	**136**	**14**	**21**	**4**	**207**	**134**	**19**	**25**	**23**	**676**

Altogether out of 676 total courses proposed by staff, 146 (22%) have been offered by Principals, Supervisors, or Directors; 528 (78%) by teachers themselves.

Attendances

Attendances By Term - Actual, Present for Course

Attended	Yes
Row Labels	**Count of Last Name of Registrant**
2015-16-3-Spring	326
2016-17-1-Summer	405
2016-17-2-Fall	342
2016-17-3-Spring	713
2017-18-1-Summer	660
2017-18-2-Fall	512
2017-18-3-Spring	347
2018-19-1-Summer	375
2018-19-2-Fall	388
2018-19-3-Spring (***Term in Progress***)	245
Grand Total	**4313**

Altogether 573 distinct teachers have taken one or more courses in the BTA since Spring 2016.