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**The following items will be discussed at a virtual and/or in person meeting of the Standing Committee on Teaching, Learning and Student Supports to be held on Wednesday, June 22 at 5:00 p.m. in Room 410 in the Durkin Administration Building:**

gb 1-53- Mr. Monfredo/Miss Biancheria/Mrs. Clancey/Ms. McCullough/Ms. Novick (February 12, 2021)

Request that the Administration collaborate with community agencies, retired teachers and other groups, to study the feasibility of establishing a summer learning program to assist K-8 students.

gb #1-312 - Ms. McCullough/Mrs. Clancey/Mr. Monfredo/Ms. Novick (November 9, 2021)

Request that the Administration explore utilizing virtual tutoring services for the students of the WPS.

gb 2-94 – Kamara/Clancey/Johnson/McCullough/Mailman (March 9, 2022)

Request that the Administration provide an update on the Worcester Public School's opt-in and opt-out options regarding the sex education curriculum and provide the full scope of program per grade level and information regarding the hiring of staff.

gb 2-141 - Administration (April 11, 2022)

To consider approval of the Fundamentals of Cybersecurity course.

gb 2-145 - Mailman (May 6, 2022)

Request that the Administration provide a report, from January to present, regarding teacher shortages to include teacher absences by school and indicate the resources utilized to cover their classroom.

STANDING COMMITTEE: **TEACHING, LEARNING AND STUDENT SUPPORTS**

DATE OF MEETING: Wednesday, June 22, 2022

ITEM: Mr. Monfredo/Miss Biancheria/Mrs. Clancey/Ms. McCullough/Ms. Novick  
(February 12, 2021)

Request that the Administration collaborate with community agencies, retired teachers and other groups, to study the feasibility of establishing a summer learning program to assist K-8 students.

PRIOR ACTION:

- 2-25-21 - Mr. Monfredo requested that the Administration consider formulation of a committee by early April.  
On a roll call of 7-0, the item was referred to the Standing Committee on Teaching, Learning and Student Supports.
- 3-30-21 - STANDING COMMITTEE ON GOVERNANCE AND EMPLOYEE ISSUES  
Dr. O'Neil stated that new grant opportunities were announced by the State this week and plans for the 2022 summer programs have begun.  
Mr. Monfredo made the following motion:  
Request that the Administration provide an update in May regarding summer program possibilities and pandemic planning.  
On a roll call of 3-0, the motion was approved.
- 4-8-21 - SCHOOL COMMITTEE MEETING – The School Committee approved the action of the Standing Committee as stated.
- 1-18-22 STANDING COMMITTEE ON TEACHING, LEARNING AND STUDENT SUPPORTS  
Dr. Morse stated that the Administration is looking for innovative ways to make the elementary school summer learning program more engaging for students.

BACKUP: Annex A (3 pages) contains the Administration's response to the item.  
Annex B (1 page) contains the Administration's response to the following motion:  
*Request that the Administration provide a report on the Jump Start Program by mid July 2022.*

PRIOR ACTION (continued)

- 1-18-22 - Dr. Sippel stated that WPS is partnering with Generation Teach, which engages educators as leadership residents, who train and supervise high school and undergraduates who are interested in teaching to lead a program for middle school students. He feels this is an opportunity to cultivate future educators within the community.  
Ms. Kamara asked about reading programs and Dr. Morse stated that the Administration is exploring tutoring labs for students who need extra help.  
On a roll call of 3-0, the item was held for additional updates in March.
- 2-3-22 - SCHOOL COMMITTEE MEETING – The School Committee approved the action of the Standing Committee as stated.
- 4-12-22 - STANDING COMMITTEE ON TEACHING, LEARNING AND STUDENT SUPPORTS  
Member Kamara made the following motion:  
Request that the Administration provide more information regarding the grants.  
On a roll call of 3-0, the motion was approved.  
Chair McCullough made the following motion:  
Request that the Administration provided a report on the Jump Start Program by mid July 2022.  
On a roll call of 3-0, the motion was approved.  
On a roll call of 3-0, the item was held.
- 5-5-22 - The School Committee approved the action of the Standing Committee as stated.

**2022 SUMMER PROGRAM PARTNERSHIPS FOR MULTILINGUAL STUDENTS**

<b>AGENCY</b>	<b>DESCRIPTION</b>
African Community Education	Summer Reading Program
Cultural Exchange Through Soccer	Summer Leadership Soccer Program
Latino Education Institute	Live multilingual campaign Parent engagement activities
Southeast Asian Coalition of Massachusetts	ESL for students and families
Quinsigamond Community College	Host site for secondary Multilingual Acceleration Summer Academy (MASA) Professors and WPS Staff collaboration in curriculum development and delivery
Holy Cross	Holy Cross student athletes will provide recreational activities to our students participating in MASA programs
New England Botanic Garden	Students will apply observation and botany skills at the New England Botanic Garden and develop their oral English skills through observation. Students will participate in a guided tour of the gardens, a forest walk in which they record nature observation of cause and effect in their nature journals, and will construct a terrarium based on the principals of environmental balance.
Green Hill Park	As a culmination of the four-week program focused on Math and English language development, students will undertake hands-on experiments in which they apply geometrical thinking to problem solving, observe and classify natural objects, and describe the characteristics of living things. Students will participate in a scavenger hunt through the nature trails, create art using geometric thinking, and undertake a scientific inquiry activity in which they apply English oral language skills to describe observations and make comparisons.
Worcester Art Museum	Students will participate in a guided tour in which they use English to describe and make inferences on culturally diverse artworks across time periods and media. They will make comparisons across different cultures' approaches to the same topics. They will participate in a workshop in which they create an artistic representation using clay, paint, collage, printmaking, or other materials based on the content they observed in the tour.

## 2022 Summer Programs for Elementary Students and Community Involvement

Programs	Description
Tutoring Hubs	Every quadrant is hosting a Summer School Program for students rising to grades 1-6. There will be both an academic and enrichment focus. An Acceleration curriculum for the summer school program has been purchased in both literacy and math to collect data to determine effectiveness of the program. The goal of the program is to keep the teacher student ratio low to ensure individualized support for acceleration. Each program will run June 27-July29 on Tuesdays, Wednesdays, and Thursdays for four hours each session. The schedule will include three one hour blocks: ELA, Math and Enrichment with an hour including breakfast, lunch and recess. SACs will be on site to provide SEL support. The schools hosting are Norrback, Roosevelt, Canterbury and Chandler Elementary
WPS Summer Camps	Our fantastic Art, Music, Science Liaisons have each created exciting and enriching summer camps. These camps will run three one week camps for students in grades 4-6. Each student is registered for one week of fun packed, content focused activities. WPS camps will be held the weeks of July 11, 18, and 25. They are being held Monday to Friday from 9-1. The Visual Arts Explorer Camp and Robotics Camp have created daily schedules of immersion into the arts and science. The best part of these two camps is the student interns from WPS high schools have been hired to support the camps and be mentors to the campers. Elm Park is hosting both the Arts camp and Robotics Camp
School Based Camps	Both Clark Street School and Goddard School will hold their own school based program. Dates for these two camps have been shared with families of both schools. These camps will focus on the individual needs of their students and both will support the academic and social needs of their students. OSEL staff will be supporting summer camp programming with School Adjustment Counselor and School Psychologist staff.
Worcester Art Museum	The final day of the WPS Arts camp will include a field trip to the Art Museum to align with students' projects and activities worked on during the week.
Emerson Theater Consultant	A theater consultant will be working with all students during the Arts Camp to create activities and learning opportunities in the theater and performing arts.
Libby/Lilly Library on Wheels	Both Libby and Lilly will be visiting our Tutoring Hubs so all students can visit the books mobiles and take books out to read during the summer.
Ecotarium	The Ecotarium has provided scholarships to WPS students to provide one week camperships. Students will participate in learning opportunities and Science Activities during the week.

Girls and Boys Clubs	WPS has funded full summer scholarships for girls and to attend full summer long camps at the Worcester Girls and Boys Club. OSEL will be supporting Boys and Girls club during summer programming.
Childcare Agencies (Rainbow, Guild of St. Agnes, Girls Inc, YMCA, YMCA, Boys and Girls Clubs)	OSEL will support these agencies through SAC and School Psychologists working on site at various locations all summer. This is continuation of work begun during the 2021-2022 school year.
Jump Start and New Student Orientations/Open Houses	OSEL Staff will participate in Jump Start and Orientation/Open Houses to introduce themselves to students and families.
OSEL Summer Enrichment	<p>From 6/20-6/30, OSEL is offering a variety of community based enrichments that will foster mental and physical wellness and Social Emotional Learning. Activities will include:</p> <ul style="list-style-type: none"> <li>Claytime for pottery making</li> <li>Miniature Golf</li> <li>Breezy Picnic and Waterslides</li> <li>Fitclub</li> <li>Community Cleanup</li> <li>Woo Sox Games</li> <li>Central Rock Gym</li> <li>EL outreach and engagement</li> <li>Zumba classes</li> <li>Ice Cream truck/school based activities</li> <li>Cooking Classes/parent Open House</li> <li>Sports Clinics</li> <li>Basketball Camps</li> <li>Step up days from Elementary to Middle Schools</li> <li>Arts and Crafts activities</li> </ul>
McKinney Vento Outreach	During Summer, McKinney Vento grant will support a variety of activities include financial support for camps, purchases of necessary supplies to participate, transportation, provision of emergency supplies and a Spree Day for local Shelters in August. Including distribution of backpacks for open houses

## **2022 Secondary Jump Start Programs**

*These programs provide students who are making a transition to a new school and grade span with an opportunity to become familiar with staff and students at their new school building. Programs listed in anticipated chronological order and mostly funded through ESSER.*

Forest Grove Middle: June 21 & 22, 8:30am to 12:00pm for 300 rising 7th grade students

Worcester Technical High: June 21 & 22, 8am-3pm

Worcester East Middle: June 27-July 1, 8am-12pm daily

UPCS: July 18-29, 8am-12pm for rising grades 7 and 9

Sullivan Middle: August 11 or 17, 9:30am-12pm for 250 rising students in grades 6, 7 & 8

North High: August 15-18, 8am-2pm (all incoming 9th grade students, 100 per day)

Burncoat Middle: August 22-23, 8am-12pm for 75 rising 7th grade students

South High: August 22, 23, & 24, 9am-1pm for approximately 200 rising grade 9 students

Doherty High: August 23 & August 24, 8am-12pm for rising grade 9 students

Burncoat High: TBD

Claremont Academy: Two days, dates TBD, for rising grades 7 and 9

STANDING COMMITTEE: **TEACHING, LEARNING AND STUDENT SUPPORTS**

DATE OF MEETING: Wednesday, June 22, 2022

ITEM: Ms. McCullough/Mrs. Clancey/Mr. Monfredo/Ms. Novick (November 9, 2021)

ITEM:

Request that the Administration explore utilizing virtual tutoring services for the students of the WPS.

PRIOR ACTION:

11-18-21 - Ms. McCullough requested that the Administration provide a report at a meeting of the Standing Committee on Teaching, Learning and Student Supports.

It was moved and voice voted to refer the item to the Standing Committee of Teaching, Learning and Student Supports.

1-18-22 STANDING COMMITTEE ON TEACHING, LEARNING AND STUDENT SUPPORTS

Ellen Kelley stated that City View, Flagg Street and Norrback Avenue Schools will be utilizing Catapult Learning and the Ignite Program will be used at Quinsigamond Avenue School beginning in February. The programs are being funded by the One 8 Program and through DESE. The programs focus on foundational reading skills, are all virtual and will be held after school. The Catapult Learning Program at Flagg Street School will take place in the evening hours with assistance from families.

Dr. Sippel stated that the district has just begun looking at tutoring services at the secondary level. They did meet with representatives from Paper Education Company, but are also exploring other options.

**(continued on Page 2)**

BACKUP:

Annex A (2 pages) contains a copy of the Administration's response to the item.



PRIOR ACTION (continued)

- 1-18-22 - Bruce Duncan, representing Paper Education Company, presented an overview stating that it is a twenty-four hour platform with unlimited essay review and is currently available in four languages, English, Spanish, French and Mandarin. Students would be able to receive annotated feedback from tutors and is accessible on all platforms. Teachers are trained to apply the Socratic teaching method. He provided a demonstration of the program detailing the different search methods for students including typing in a question or logging in with a tutor. Tutors will not be sharing answers with the students. Files can be uploaded and assessed by the tutor for review and returned back to the student within 24 hours with feedback from the tutor. WPS teachers can access their student's usage and tutor comments. Chair McCullough was impressed with the 24/7 availability and the variety of subject areas. She asked if the Administration could explore piloting the program for one grade or a certain subset. Superintendent Binienda stated that the company does not prefer to do a pilot and that the cost would be over 1.4 million dollars and would have to go out for bid. Lydia Rodriguez, Assistant Superintendent of Springfield Public Schools, stated that Springfield has been using Paper for over four years and teachers are also using it in the classroom allowing them to work with smaller class groups. She stated that it has been very helpful with staffing shortages and provided equity to learning and acceleration. Vice-Chair Mailman asked if the elementary teachers suggest the tutoring or do the students ask for the help. Ms. Kelley stated that all three principals meet with the project managers and receive input from the teachers, but families also can request the extra help. Ms. Kamara asked if there is any video component with Paper and Mr. Duncan stated that most students preferred the anonymity and video could pose a privacy issue.

**(the following motions were considered together)**

Chair McCullough made the following motions:

Request that the Administration provide an update in March on the Catapult and Ignite tutoring programs in the elementary schools.

Request that the Administration continue a conversation with Paper and explore what the opportunities are for utilizing their virtual tutoring services and consider sending out a bid for comparison and provide an update at the February 8, 2022 meeting of Teaching, Learning and Student Supports.

**(continued on Page 3)**

PRIOR ACTION (continued)

- 1-18-22 - Ms. Kamara made the following motion:  
Request that the Administration provide a report on the elementary quadrants' use of Catapult and Ignite.  
On a roll call of 3-0, the motions were approved.  
On a roll call of 3-0, the item was held for the meeting of February 8, 2022.
- 2-3-22 - SCHOOL COMMITTEE MEETING - The School Committee approved the action of the Standing Committee as stated.  
Superintendent Binienda stated that she met with Mr. Duncan regarding a pilot for grades 9-12.  
Vice-Chair Mailman requested that an update be provided with the scope and cost of the program.  
On a roll call of 3-0, the item was held.
- 2-17-22 - SCHOOL COMMITTEE MEETING - The School Committee approved the action of the Standing Committee as stated.
- 2-8-22 - STANDING COMMITTEE ON TEACHING, LEARNING AND STUDENT SUPPORTS  
Superintendent Binienda stated that she met with Mr. Duncan regarding a pilot for grades 9-12.  
Vice-Chair Mailman requested that an update be provided with the scope and cost of the program.  
On a roll call of 3-0, the item was held.
- 2-17-22 - SCHOOL COMMITTEE MEETING - The School Committee approved on a roll call of 7-0, the action of the Standing Committee as stated.
- 3-15-22 STANDING COMMITTEE ON TEACHING, LEARNING AND STUDENT SUPPORTS  
Ellen Kelley, Manager of Instructional and School Leadership, stated that Catapult and Ignite programs have allowed for one to one and four to one instruction on a consistent basis. There is no data available because Catapult just began and a walk through with Ignite and the One8 Foundation is scheduled for March 23, 2022. The Catapult program is done in twelve week blocks which will take students through the end of the school year. Depending on funding, the district is planning on using one or both of the programs for the summer school programs. She also stated that Catapult tutoring is done during after school and Ignite is during the school day.  
Chair McCullough asked if there were any challenges encountered regarding Flagg Street School using the program at night and Ms. Kelley stated that other than a few technical issues in the beginning, the families reported that the program was going well.  
Member Kamara requested that a chart be created containing the information on Catapult and Ignite and Ms. Kelley stated that she has that chart and will provide that information.  
On a roll call of 3-0, the item was held.

PRIOR ACTION (continued)

- 3-15-22 - STANDING COMMITTEE ON TEACHING, LEARNING AND STUDENT SUPPORTS  
Ellen Kelley, Manager of Instructional and School Leadership, stated that Catapult and Ignite programs have allowed for one to one and four to one instruction on a consistent basis. There is no data available because Catapult just began and a walk through with Ignite and the One8 Foundation is scheduled for March 23, 2022. The Catapult program is done in twelve week blocks which will take students through the end of the school year. Depending on funding, the district is planning on using one or both of the programs for the summer school programs. She also stated that Catapult tutoring is done during after school and Ignite is during the school day. Chair McCullough asked if there were any challenges encountered regarding Flagg Street School using the program at night and Ms. Kelley stated that other than a few technical issues in the beginning, the families reported that the program was going well. Member Kamara requested that a chart be created containing the information on Catapult and Ignite and Ms. Kelley stated that she has that chart and will provide that information.  
On a roll call of 3-0, the item was held.
- 4-7-20 - SCHOOL COMMITTEE MEETING – The School Committee approved the action of the Standing Committee as stated.
- 4-12-22 - STANDING COMMITTEE ON TEACHING, LEARNING AND STUDENT SUPPORTS  
On a roll call of 3-0, the item was held.
- 5-5-22 - The School Committee approved the action of the Standing Committee as stated.
- 5-10-22 - STANDING COMMITTEE ON TEACHING, LEARNING AND STUDENT SUPPORTS  
On a roll call of 3-0, the item was held for a meeting in June.
- 5-19-22 - The School Committee approved the action of the Standing Committee as stated.

### **Ignite Tutoring**

Our in school Virtual Tutoring was a success. Dr Donohue, Dr. Keu, Dr. Fan Fan (Elm Park, Quinsigamond, Burncoat Prep) report Ignite Tutoring was very successful at their respective schools. Creating the learning environment and student transition to the tutoring sessions was organized and seamless. Students built relationships with their tutors and looked forward to going to tutoring. Every participating student received a 15 minute virtual tutoring session every day. The focus of the literacy tutoring is word work and phonics. At this point, leadership teams are analyzing STAR and common assessments to determine the academic growth students' achieved. Teachers of the students report anecdotal data of student achievement, and also report teacher data collection shows a strong correlation between participation in virtual tutoring and students' achievement in foundational reading skills. Quinsigamond hosted two visits with Ignite founders and One8 Foundation representatives. All stakeholders are invested in this program and increasing the amount of student participation the next school year. They are working on funding. Next year the district focus will be on grade one students which is in alignment with the vision of Ignite Tutoring to have every grade one student in the nation reading on grade level.

### **Catapult Tutoring**

This virtual tutoring program was done outside of WPS school hours. Some schools held the sessions at schools during after school hours and some students received their tutoring support at home during the evening. Catapult Tutoring provided a project manager who was the communicator between schools and families. She also scheduled all the sessions and connected tutors with students. Students in this program built relationships with their tutors, as well as students in their groups. This was a 4 to 1 tutoring session being held three days a week for 45 minutes. Mrs. Labuski, Mr. Tremba, Ms. Troiano, and Mr. Dukaj (Flagg St, City View, Norrback, Clark Street) also reported great success. Their reports were based on the similar data as mentioned above. A data analyst from Catapult is working with a DESE representative and Marco Andrade to analyze the achievement data of students participating in this virtual session. Next year, Catapult is waiting for confirmation of continuation of GEER funding. Their hope is to be able to provide this virtual tutoring experience to 300-400 primary aged WPS students.

Catapult is also providing virtual tutoring during the summer. It is the same format as mentioned above. Approximately 185 students in grades 1-3 are signed up to participate in this summer program. The project manager has communicated with parents, assigned tutors, and dropped supply bags to schools to go home with students. Schools are sending all students home with Chromebooks or IPADs.

### **Challenges**

The only challenges reported were technology issues; there were glitches in the ZOOMS at times. Below is an updated table of Virtual Tutoring offerings.

Virtual Tutoring		
Ignite Tutoring		
Schools	Model	Number of Students
Quinsigamond, Elm Park, Burncoat Prep	One to One Tutoring Remote During the school day Students meet with their tutor in classroom or other designated space	90 Students
Plan for School Year 22-23: Ignite Tutoring plans to focus primarily on grade 1 students. We hope to continue the program at Quinsigamond, Elm Park and Burncoat and hopefully with funding from the One8 Foundation we can add more schools. All schools will focus on grade 1.		
Catapult Tutoring Spring		
Flagg Street, City View, Norrback, Clark Street School,	Four to One Tutoring Remote After school hours Three sessions a week for 40 minutes	108 Students
Plan for School Year 22-23: We hope to continue working in all four schools. As of June 14 Catapult was anticipating continuation of GEER funding. Catapult hopes to continue their work with Worcester and add 300-400 tutoring spots to WPS students. This program would continue after school and evening hours.		
Catapult Virtual Tutoring: Summer		
Belmont, Canterbury, Elm Park, Flagg, Gates Lane, Heard, Jacob Hiatt, La Familia, McGrath, Midland, Quinsigamond, Rice Square, Roosevelt, Union, WAMs Wawecus, Union Hill West Tatnuck, Woodland	Virtual Tutoring Four to One Tutoring Remote After school hours Three sessions a week for 40 minutes	155 Students

STANDING COMMITTEE: **TEACHING, LEARNING AND STUDENT SUPPORTS**

DATE OF MEETING: Wednesday, June 22, 2022

ITEM: Kamara/Clancey/Johnson/McCullough/Mailman (March 9, 2022)

Request that the Administration provide an update on the Worcester Public School's opt-in and opt-out options regarding the sex education curriculum and provide the full scope of program per grade level and information regarding the hiring of staff.

PRIOR ACTION:

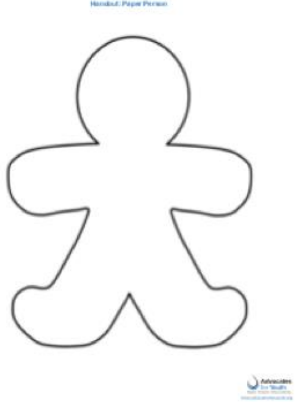
3-17 22 - Superintendent Binienda stated that the sex education curriculum and opt out information is contained on the WPS website. Member McCullough requested that the Administration provide an update at the end of the school year to include feedback from staff. It was moved and voice voted to refer the item to the Standing Committee on Teaching, Learning and Student Supports.

BACKUP: Annex A ( 3 pages) contains the Administration's response to the item.

**Opt out Options:**

Caregivers can opt their students out of the 3R lessons at any time. District wide 15.4% of students were opted out by caregivers.

**Full scope of the program: See Below**

	<u>Kindergarten Lessons</u>	Learning Objectives and National Sex Education Standards
1. Paper People	<p>This lesson focuses on what makes each student unique and special.</p> 	<p><u>LEARNING OBJECTIVES:</u> By the end of this lesson, students will be able to:</p> <ol style="list-style-type: none"> <li>1. Describe at least three things that are unique about themselves.</li> <li>2. List at least three things they did not know about classmates before the lesson.</li> </ol>
2. My Space, Your Space	<p>This lesson educates students on what 'personal space' means and how to identify actions that are right from wrong.</p>	<p><u>National Sex Education Standards</u> PS.2.CC.1 - Students will be able to explain that all people, including children, have the right to tell others not to touch their body when they do not want to be touched.</p> <p>PS.2.IC.1 - Students will be able to demonstrate how to respond if someone is touching them in a way that makes them feel uncomfortable.</p>

You can learn more about *Rights, Respect, Responsibility*. and download the specific lessons at [3rs.org](http://3rs.org)

	<u>First Grade Lessons</u>	<u>National Sex Education Standards</u> By the end of 2nd grade, students will be able to:
1. Gender Roles	<p>The overall purpose of this lesson is to show students that they are not limited to what they can and cannot do based on their gender.</p> <p>Book:</p>	<p>ID.2.CC.1 – Describe differences and similarities in how boys and girls may be expected to act.</p>

	<i>My Princess Boy</i> by Cheryl Kilodavis	ID.2.INF.1 – Provide examples of how friends, family, media, society and culture influence ways in which boys and girls think they should act.
2. My Body is My Body	This lesson helps students understand and prevent sexual abuse and unsafe or uncomfortable situations by teaching bodily autonomy.  Video: <a href="https://safeshare.tv/x/dkraVxm8If4">Shout Run Tell</a> <a href="https://safeshare.tv/x/dkraVxm8If4">https://safeshare.tv/x/dkraVxm8If4</a>	IV.2.CC.1 – Define child sexual abuse and identify behaviors that would be considered child sexual abuse  IV.2.AI.1 – Identify situations that may be uncomfortable or dangerous (e.g., bullying, teasing, child sexual abuse)*

You can learn more about *Rights, Respect, Responsibility*. and download the specific lessons at [3rs.org](http://3rs.org)

### **Information regarding the hiring of staff:**

Last summer 5 additional health teachers were hired; one teacher for each of the WPS High Schools. 2 staff were hired to teach health to students in k-3

### **Staff Feedback:**

### **Summary of Feedback:**

### **Successes:**

- Students have been understanding and receptive to the information.
- My successes with this curriculum were working together with my colleagues to put together slides, getting the opt-out lists every week at each school and understanding what was to be taught in the 4th grade.
- The lessons were easy to follow but have only taught them to 4th grade at this time. Students were very receptive and engaged in the topics. They maintained their attention, participation and enthusiasm throughout the program.
- The activities were successful and the videos were entertaining and informative.
- The gender neutral language was well received and respected.
- As the instructor/educator I was excited to teach each lesson.
- I felt strongly the information was critical to the health and wellbeing of the students.
- I took pride, was interested and had heightened enthusiasm teaching each lesson.
- The students were extremely interested and respectful throughout the lessons.
- They maintained a much appreciated maturity.
- Overall the program is a huge success!
- The K-3 lessons prove valuable and needed.
- I've heard from many teachers that they wish we would have taught this sooner.
- Students seemed to enjoy all the lessons as well. All grade levels seem excited for health.
- Adding a PA component for the younger grades seems to help keep their attention.
- Kids seem to be excited to have discussions more relatable to them.
- Great response to the curriculum and educators are very happy to find out the reality of what is being taught. Interaction with the students!
- The lesson plans were easy to teach. The students are very enthusiastic, the first three lessons have gone very well.



**Challenges**

- Another challenge was the many sources of misinformation being spread throughout the community - preconceived notions and opt-outs that, if informed, would not be an issue.

ITEM: gb 2-141

STANDING COMMITTEE: **TEACHING, LEARNING AND STUDENT SUPPORTS**

DATE OF MEETING: Wednesday, June 22, 2022

ITEM: Administration (April 11, 2022)

To consider approval of the Fundamentals of Cybersecurity course.

PRIOR ACTION:

5-5-22 - On a roll call of 7-0, the item was referred to the Standing Committee on Teaching, Learning and Student Supports.

BACKUP:

Annex A (14 pages) contains a copy of the new course request form.

# WORCESTER PUBLIC SCHOOLS – NEW COURSE REQUEST FORM

Date of Request: 2/18/22 Requesting School/ Office: Innovation Pathways

Proposed Course Name: Fundamentals of Cybersecurity Required Prerequisite Course/s: \_\_\_\_\_

Proposed Course Level				
(check all that apply)				
A.P.		Honors	College	X

Proposed Course Credit				
(check all that apply)				
1.0	X	.5	.25	

G.P.A.		Honor Roll	
Yes	No	Yes	No
X		X	

Proposed Course Department	Select one	
	CoreCourse	CoreElective
Career Technical Education		X

Is proposed course a Career/Vocational Technical Course			
(if yes check one)			
Yes	No	Chapter 74	Non-Chapter 74
X			X

**Proposed Course Description:** In the course, students will...

In this course students will be introduced to the fundamentals of cybersecurity. This introduction to cybersecurity is in response to the growing need of cyber professionals in the workforce as identified by both our local partners, workforce blueprint, and the National Institute of Standards and Technology (supplement attached). While this course will not prepare students to enter the workforce in cybersecurity, it will open student minds to the opportunities that exist in the industry if they continue their education and work experience. This course will target knowledge of the internet and security features as well as encryption, protection of data, and safe practices. Students will review hardware, programming and networking concepts as they relate to data protection. Additionally, students will learn what happens when running a web application and how to look inside web apps using developer tools, source code, and more.

(Please note the following phrase will be used to distinguish honors level courses: As an honors level course, content will be covered at an accelerated pace. Students will study topics at a deeper level and will be expected to complete more independent coursework and assignments.)

**Essential question/s for the course:**

- Why is cybersecurity important?
- What are recent threats to cybersecurity?
- What are different careers in the field of cybersecurity?
- What is your digital footprint and reputation?
- What are the impacts of cyberbullying?
- What are data privacy and security?
- What are the different types of copyright licenses
- Are there different kinds of hackers? (white, black, grey)
- How do you differentiate between the different data types?
- Why do we Need to Encrypt Data?
- What Processor are you Running? How do they differ?
- How do we structure and query data using SQL?
- What is the Internet? How does it work?
- What has the impact been on society?
- How do we send data over the Internet?
- Why are protocols so important?
- What are the steps to improving faulty network systems?

**Standards addressed in the course:**

CAS.a. Safety & Security

CAS.b. Ethics & Laws

CAS.c. Interpersonal & Societal Impact

- Explain the impact of the digital divide on access to critical information.
- Discuss the impact of computing technology on business and commerce
- Discuss the social and economic implications associated with malicious hacking, software piracy, and cyber terrorism

DTC.a. Digital Tools

Programming and Development [9-12.CT.d]

- Use a programming language or tool feature correctly to enforce operator precedence.
- Use a development process in creating a computational artifact that leads to a minimum viable product and includes reflection, analysis, and iteration
- Decompose a problem by defining functions, which accept parameters and produce return values.
- Identify different problems (e.g., large or multipart problems, problems that need specific expertise, problems that affect many constituents) that can benefit from collaboration when processing and analyzing data to develop new insights and knowledge.
- Computing Devices [9-12.CS.a]
- Explain and demonstrate how specialized computing devices can be used for problem solving, decision-making and creativity in all subject areas.

MassCore is a rigorous and comprehensive course study recommended by the Commonwealth as preparation for college and career. MassCore is also the vehicle through which high school students can gain competence in computational, scientific, visual, creative, and critical thinking and can engage opportunities for “hands-on” application and exploration of new areas of knowledge and experiences.

**How does this course support the readiness of students for college and career?**

This course is part of Innovation Pathways and provides students from WPS comprehensive high schools an opportunity to explore a career field and develop technical skills in the Information Technology field. At the conclusion of this course, students will have marketable job specific skills and a perspective on different career paths they can explore within this field and may pursue them with at the post-secondary level.

**Please Note:  
All New Course Requests  
must come through the school  
principal.**

**For Office Use Only**

**Approved Date:** \_\_\_\_\_

**S.C. Item Number:** \_\_\_\_\_

**Assigned Course Number:** \_\_\_\_\_

**Dept. Code:** \_\_\_\_\_

**Subject Area Code Number:** \_\_\_\_\_

**Subject Area Course:** \_\_\_\_\_

**Zip Code Number:** \_\_\_\_\_

**Worcester Public Schools  
WPS Course Template  
Spring 2022**

Please reference the extended list of Worcester Public Schools Foundation Documents here as you are building a course: [WPS Foundation Documents](#)

<b>Course Title: The Fundamentals of Cybersecurity</b>	<b>Select length of course:</b> __Quarter __Semester __Year
<b>Department: ISSN/Web Development</b>	<b>Discipline: Computer Science</b>
<b>School: Innovation Pathways - WTHS</b>	<b>Contact: Jen Hardy</b>

<b>Scope &amp; Sequence</b>			
<b>Unit Title: Add units as needed.</b>	<b>Weeks of the course</b>	<b>Approximate Number of Lessons</b>	<b>Person Responsible</b>
UNIT 1 What is Cybersecurity?	1-2	5 lessons	
UNIT 2 & 3 Digital Citizenship and Cyber Hygiene Project - Public Service Announcement	2-3	8 lessons	
UNIT 4 Programming Fundamentals	2-3	6 lessons	
UNIT 5 & 6 ABCs of Cryptography Project - Classic Cipher Newscast	2-3	6 lessons	
UNIT 7 System Administration	3-4	9 lessons	
UNIT 8 & 9 Software Security Project - Security Assessment Report	4-5	11 lessons	
UNIT 10 Networking Fundamentals	3-4	10 lessons	

UNIT 11 & 12 IT Infrastructure Project - Troubleshooting	3-4	8 lessons	
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**Course Units: Complete a unit template for each of the units listed above.**

**UNIT 1** What is Cybersecurity?

**Notes to Educator**

This unit provides an introduction to cybersecurity. It focuses on why cybersecurity is important, recent threats to cybersecurity, and different careers in the field.

**Transfer Goals**

Students will be able to independently use their learning to:

- Protect their personal information.
- Understand the foundation elements of Computer Science.

**Framework Standards**

CAS.a. Safety & Security

<b>Enduring Understandings</b>	<b>Essential Questions</b>
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Students will understand:

- Since the Internet is used to send, receive, and store valuable personal information, users are put at risk of having this information stolen through cyber attacks.
- Cybersecurity is a field that involves several disciplines of computer science. It is valuable to build basic computer science literacy no matter what field you eventually enter.

- Why is cybersecurity important?
- What are recent threats to cybersecurity?
- What are different careers in the field of cybersecurity?

<b>Knowledge</b>	<b>Skills</b>
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Students will know:

- What Cybersecurity is
- Impact of Cybersecurity
- What the CIA Triad is.

Students will be able to:

- Set individual learning goals for themselves in the cybersecurity course
- Explain why it is important to learn computer science, regardless of their goals in college and career
- Define cybersecurity
- Describe how the Internet of Things makes people more vulnerable to cyber attacks
- Reflect on recent cyber attacks and identify the financial and societal impact of the attack
- Evaluate recent cyber attacks and understand the negative consequences of these attacks
- Understand career opportunities in the

	field of cybersecurity <ul style="list-style-type: none"> <li>● Identify what the CIA triad is and how it relates to cybersecurity</li> <li>● Identify which part of the CIA triad has been broken in a given scenario</li> <li>● Prove their knowledge of basic cybersecurity concepts and its impacts through a multiple choice quiz</li> </ul>
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**Assessment -- Evidence that students have achieved the desired learning outcomes described**

<ul style="list-style-type: none"> <li>● Lists steps to take to protect yourself on the Internet</li> <li>● What is something you want to know or make by the end of the course?</li> <li>● Summarize and discuss recent cyber attacks</li> <li>● Explore a threat map to see where cyber attacks are coming from and which countries are being targeted</li> <li>● Review resources and reflect on or discuss</li> <li>● What information do cyber criminals steal?             <ul style="list-style-type: none"> <li>○ What do cyber criminals do with stolen information?</li> </ul> </li> <li>● Determine where scenarios break part of the CIA Triad</li> </ul>	<b>Other Evidence</b>
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**Learning Activities**

Code HS Fundamentals of Cybersecurity  
 Lesson 1.1 Module - <https://codehs.com/course/6560/explore/module/11942/lesson/794006>

**Resources**

[Code HS Course Overview - https://codehs.com/course/fundamentals\\_cyber/overview](https://codehs.com/course/fundamentals_cyber/overview)  
 Code HS Syllabus - <https://codehs.com/uploads/9599b3449716ad3925be97671d909032>

**UNIT 2 &3 Digital Citizenship and Cyber Hygiene/ Project - Public Service Announcement**

**Notes to Educator**

This unit includes topics on Internet etiquette and how to stay safe on the world wide web. Students will also look at the potential effects of our digital footprints, how to protect information from online risks, and the implications of cyberbullying. Finally, the module includes how to find and cite quality resources online.

**Transfer Goals**

Students will be able to independently use their learning to:

- Understand and control their cross-curricula (and social) digital footprint.
- Participate as a responsible digital citizen throughout their education and beyond.

**Framework Standards**

CAS.b. Ethics & Laws CAS.c. Interpersonal & Societal Impact	
Enduring Understandings	Essential Questions
<p>Students will understand:</p> <ul style="list-style-type: none"> <li>• Understand how they can control and protect their footprint. As students use the Internet, they are building their digital footprint. This includes social media posts, emails, picture and video uploads amongst other online activities.</li> <li>• Now that students have learned about digital citizenship and cyber hygiene, they will take what they have learned and create a PSA to inform members in the community about a topic!</li> </ul>	<ul style="list-style-type: none"> <li>• What is your digital footprint and reputation?</li> <li>• What does it mean that the internet is public and permanent?</li> <li>• Who looks at your digital footprint and reputation?</li> <li>• What are some recommended social media guidelines?</li> <li>• How can you maintain your digital footprint?</li> <li>• What does your digital footprint say about you?</li> <li>• What are the impacts of cyberbullying?</li> <li>• Are there cyberbullying roles?</li> <li>• What do you do if you are being bullied?</li> <li>• What do you do if you see bullying?</li> <li>• How can you be an upstander?</li> <li>• What are some ways to stay safe online?</li> <li>• What are some online safety guidelines?</li> <li>• What are data privacy and security?</li> <li>• How can you keep personal data secure and private?</li> <li>• What can happen if your data is stolen and what can you do about it?</li> <li>• How can you do effective internet searches?</li> <li>• What are some techniques for judging source legitimacy and identifying misinformation?</li> <li>• What are the different types of copyright licenses</li> <li>• Are there different kinds of hackers? (white, black, grey)</li> <li>• What are bug bounty programs?</li> <li>• Is hacking always illegal?</li> <li>• What are the consequences of illegal hacking?</li> </ul>
Knowledge	Skills
<p>Students will know:</p> <ul style="list-style-type: none"> <li>• What their digital footprint and reputation is.</li> <li>• What cyberbullying is along with its impacts.</li> <li>• Important details about internet safety, privacy and security.</li> <li>• Improve internet literacy and understand</li> </ul>	<p>Students will be able to:</p> <ul style="list-style-type: none"> <li>• Understand how their online activity contributes to a permanent and public digital footprint</li> <li>• Articulate their own social media</li> </ul>



<ul style="list-style-type: none"> <li>creative credit and copyright</li> <li>• Understand hacking ethics.</li> </ul>	<p>guidelines to protect their digital footprint</p> <ul style="list-style-type: none"> <li>• Create a public service announcement for members of their community about a topic in digital citizenship or cyber hygiene</li> <li>• Use google sheets to store and analyze data, and create a data visualization.</li> </ul>
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**Assessment -- Evidence that students have achieved the desired learning outcomes described above.** (Note: Assessments are not visible to teachers on the public side of Atlas)

<p><b>Performance Task(s): What authentic task(s) will students do to demonstrate they know and can do what is expected at the conclusion of the unit?</b></p> <ul style="list-style-type: none"> <li>• Are you going to make any changes in what you post on social media?</li> <li>• Explore cyberbullying scenarios: What would you do?</li> <li>• Explore Internet safety scenarios: What would you do?</li> <li>• Test out various passwords on a site</li> <li>• Explore Google’s privacy policy: What do they know about you?</li> <li>• Explore what penetration testing is</li> </ul>	<p><b>Other Evidence</b></p>
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**Learning Activities**

**Project:**  
**Create a Public Service Announcement**  
 Create a Public Service Announcement (PSA) to teach your peers about your selected topic in digital citizenship and cyber hygiene. You can select any of the topics covered in this module. Be creative and make it fun! You could make a video, song, poster, or slideshow.

Code HS Fundamentals of Cybersecurity  
 Lesson 2.1 Module - <https://codehs.com/course/6560/explore/module/11943/lesson/794036>

**Resources**

This course description uses Code HS Fundamentals to Cybersecurity as a template;  
[Code HS Course Overview - https://codehs.com/course/fundamentals\\_cyber/overview](https://codehs.com/course/fundamentals_cyber/overview)  
[Code HS Syllabus - https://codehs.com/uploads/9599b3449716ad3925be97671d909032](https://codehs.com/uploads/9599b3449716ad3925be97671d909032)

**UNIT 4** Programming Fundamentals

**Notes to Educator**

Students will learn the fundamentals of programming including variables, arrays, and objects as well as the difference in interpreted and compiled languages. They will explore programming through block coding which includes conditional statements and control structures.

**Transfer Goals**

Students will be able to independently use their learning to:

<ul style="list-style-type: none"> <li>Understand the motivation behind using encryption systems, and basic cryptography systems</li> </ul>	
<b>Framework Standards</b>	
DTC.a. Digital Tools	
<b>Enduring Understandings</b>	<b>Essential Questions</b>
<p>Students will understand:</p> <ul style="list-style-type: none"> <li>The basics of what a programming language does and the differences between compilers and interpreters.</li> <li>Data types and how to initialize and assign values to variables.</li> </ul>	<ul style="list-style-type: none"> <li>How do you differentiate between the different data types?</li> </ul>
<b>Knowledge</b>	<b>Skills</b>
<p>Students will know:</p> <ul style="list-style-type: none"> <li>Programming Concepts</li> <li>Looping and Branching</li> <li>Code Organization</li> </ul>	<p>Students will be able to:</p> <ul style="list-style-type: none"> <li>Explain the difference between the different types of programming languages</li> <li>Initialize and assign values to variables</li> <li>Differentiate between the different data types</li> </ul>
<b>Assessment -- Evidence that students have achieved the desired learning outcomes described above.</b> (Note: Assessments are not visible to teachers on the public side of Atlas)	
<ul style="list-style-type: none"> <li>Interpreted vs. Compiled</li> <li>Variables and Objects</li> <li>Lists and Arrays</li> <li>Programming with Karel</li> <li>Looping <ul style="list-style-type: none"> <li>For Loops</li> <li>While Loops</li> </ul> </li> <li>Branching <ul style="list-style-type: none"> <li>If statements</li> <li>If/else statements</li> </ul> </li> <li>Top Down Design</li> <li>Comments and Pseudocode</li> </ul>	<b>Other Evidence</b>
<b>Learning Activities</b>	
<p>Module 5: The ABCs of Cryptography (1-2 weeks/5-10 hours) In this module, students will dive into the history of cryptography systems, the motivation behind using encryption systems, and basic cryptography systems. Additionally, they will explore topics on how to use cryptography, cryptology, and cryptanalysis to decode a message without the use of a key.</p>	
<b>Resources</b>	
<p>This course description uses Code HS Fundamentals to Cybersecurity as a template;  <a href="https://codehs.com/course/fundamentals_cyber/overview">Code HS Course Overview - https://codehs.com/course/fundamentals_cyber/overview</a>  <a href="https://codehs.com/uploads/9599b3449716ad3925be97671d909032">Code HS Syllabus - https://codehs.com/uploads/9599b3449716ad3925be97671d909032</a>  <a href="https://codehs.com/course/6560/explore/module/11945">https://codehs.com/course/6560/explore/module/11945</a></p>	

## UNIT 5 & 6 ABCs of Cryptography/**Project - Classic Cipher Newscast**

Notes to Educator	
<p>Students will dive into the history of cryptography systems, the motivation behind using encryption systems, and basic cryptography systems. Additionally, they will explore topics on how to use cryptography, cryptology, and cryptanalysis to decode a message without the use of a key.</p>	
Transfer Goals	
<p>Students will be able to independently use their learning to:</p> <ul style="list-style-type: none"> <li>• Understand the history/importance of encryption systems and how codes work.</li> </ul>	
Framework Standards	
<p>Programming and Development [9-12.CT.d]</p> <ul style="list-style-type: none"> <li>• Use a programming language or tool feature correctly to enforce operator precedence.</li> </ul>	
Enduring Understandings	Essential Questions
<p>Students will understand:</p> <ul style="list-style-type: none"> <li>• Cryptography, Cryptology, Cryptanalysis</li> <li>• History of Cryptography</li> <li>• Basic Cryptography Systems: Caesar Cipher</li> <li>• Basic Cryptography Systems: Cracking the Caesar Cipher</li> <li>• Basic Cryptography Systems: Vigenère Cipher</li> </ul>	<ul style="list-style-type: none"> <li>• Why do we Need to Encrypt Data?</li> <li>• What is the motivation behind using encryption systems, and basic cryptography systems?</li> </ul>
Knowledge	Skills
<ul style="list-style-type: none"> <li>• Cryptography, Cryptology, Cryptanalysis               <ul style="list-style-type: none"> <li>◦ Why do we need some secrecy in our transparent information age?</li> <li>◦ Explain general encryption with data, keys</li> </ul> </li> <li>• History of Cryptography               <ul style="list-style-type: none"> <li>◦ Why do we encrypt?</li> <li>◦ What are some classic encryption techniques?</li> <li>◦ What is the flaw in substitution ciphers?</li> <li>◦ What was The Enigma during WW2?</li> <li>◦ What is modern cryptography and how has cryptography changed over time?</li> <li>◦ What is 256-bit key encryption and how does this help cryptography overall?</li> </ul> </li> <li>• Why do we Need to Encrypt Data?               <ul style="list-style-type: none"> <li>◦ Explore the CIA Triad and encryption</li> <li>◦ Example activities:                   <ul style="list-style-type: none"> <li>■ Telephone game with math (offline)</li> </ul> </li> </ul> </li> </ul>	<p>Basic Cryptography Systems:</p> <ul style="list-style-type: none"> <li>• Caesar Cipher</li> <li>• JavaScript program               <ul style="list-style-type: none"> <li>■ Modify the program to create the decrypting Caesar program</li> </ul> </li> <li>• Basic Cryptography Systems: Cracking the Caesar Cipher</li> </ul>

<ul style="list-style-type: none"> <li>Modulo math activity sheet</li> </ul>	
<b>Assessment -- Evidence that students have achieved the desired learning outcomes described above.</b> (Note: Assessments are not visible to teachers on the public side of Atlas)	
<b>Project: Create a Newscast</b> Students work collaboratively to research a <b>**classic cipher**</b> (beyond Caesar and Vigenere) to address in their newscast. They will investigate their cipher and write a script that includes how the cipher works, when it was used, and when the cipher stopped being useful.	<b>Other Evidence</b>
<b>Learning Activities</b>	
Browse the full content of this module at <a href="https://codehs.com/library/course/6560/module/11946">https://codehs.com/library/course/6560/module/11946</a>	
<b>Resources</b>	

### UNIT 7 System Administration

<b>Notes to Educator</b>	
Students will compare and contrast common operating systems (Windows, Linux, OS) and explain the importance of application security.	
<b>Transfer Goals</b>	
Students will be able to independently use their learning to: <ul style="list-style-type: none"> <li>Understand cross-application security</li> </ul>	
<b>Framework Standards</b>	
Programming and Development [9-12.CT.d] <ul style="list-style-type: none"> <li>Use a development process in creating a computational artifact that leads to a minimum viable product and includes reflection, analysis, and iteration</li> <li>Decompose a problem by defining functions, which accept parameters and produce return values.</li> </ul>	
<b>Enduring Understandings</b> <ul style="list-style-type: none"> <li>Operating Systems</li> <li>Software and Applications</li> <li>Application Security</li> <li>Browser Configuration</li> <li>System Administration</li> <li>Command Line Interface</li> </ul>	<b>Essential Questions</b> <ul style="list-style-type: none"> <li>What Processor are you Running?</li> </ul>
<b>Knowledge</b> <p>Understanding Operating Systems</p> <ul style="list-style-type: none"> <li>Comparing Operating Systems</li> <li>Installing an OS</li> <li>File Management</li> </ul> <p>What Processor are you Running?</p> <ul style="list-style-type: none"> <li>Software Licenses</li> <li>Antivirus Software</li> </ul>	<b>Skills</b> <p>Admin vs. Standard</p> <ul style="list-style-type: none"> <li>Host Security <ul style="list-style-type: none"> <li>Using a Log</li> </ul> </li> <li>System Commands <ul style="list-style-type: none"> <li>cd, ls, mk etc</li> </ul> </li> <li>Network Commands <ul style="list-style-type: none"> <li>ipconfig, netstat etc</li> </ul> </li> </ul>

<ul style="list-style-type: none"> <li>○ Data Backups</li> <li>○ Using Cache</li> <li>○ Popup Blockers</li> <li>○ User Accounts</li> </ul>	
<b>Assessment -- Evidence that students have achieved the desired learning outcomes described above.</b> (Note: Assessments are not visible to teachers on the public side of Atlas)	
Students will investigate security options and implement user accounts to enforce authentication and authorization. Students will also demonstrate how to work with basic and advanced command prompts.	<b>Other Evidence</b>
<b>Learning Activities</b>	
<b>Resources</b>	

## UNIT 8 & 9 UNIT 8 & 9 Software Security/**Project - Security Assessment Report**

<b>Notes to Educator</b>	
In this module, students will learn what happens when running a web application and how to look inside web apps using developer tools, source code, and more. They will learn basic SQL and common attacks like SQLi. Students will also be able to recommend solutions for flawed security systems.	
<b>Transfer Goals</b>	
Students will be able to independently use their learning to: <ul style="list-style-type: none"> <li>● Analyze complex data set to answer a question or test a hypothesis</li> </ul>	
<b>Framework Standards</b>	
Data [9-12.CT.c] <ul style="list-style-type: none"> <li>● Identify different problems (e.g., large or multipart problems, problems that need specific expertise, problems that affect many constituents) that can benefit from collaboration when processing and analyzing data to develop new insights and knowledge.</li> </ul>	
<b>Enduring Understandings</b>	<b>Essential Questions</b>
<ul style="list-style-type: none"> <li>● Inside Web Applications</li> <li>● Developer Tools</li> <li>● The Value of Data</li> <li>● SQL Overview             <ul style="list-style-type: none"> <li>○ What is SQL?</li> <li>○ Structuring Data in SQL</li> <li>○ Basic Querying in SQL</li> <li>○ Filtering Queries in SQL</li> </ul> </li> <li>● Clients, Servers, Databases</li> <li>● Common Security Problems</li> <li>● SQL Injection</li> </ul>	<ul style="list-style-type: none"> <li>● How do we structure data using SQL?</li> <li>● How do we query databases using SQL?</li> </ul>

<ul style="list-style-type: none"> <li>○ SQLi Overview</li> <li>○ Types of SQLi</li> <li>○ Preventing SQLi</li> </ul>	
<p><b>Knowledge</b></p> <ul style="list-style-type: none"> <li>● Use the WHERE clause to query a database <ul style="list-style-type: none"> <li>● Clients, Servers, Databases</li> <li>● Common Security Problems <ul style="list-style-type: none"> <li>○ What is the "Fortification Principle"?</li> <li>○ What are some tips about HTTP vs. HTTPS, password fields and CAPTCHA that can help us to navigate more securely on the Web?</li> </ul> </li> <li>● SQL Injection <ul style="list-style-type: none"> <li>○ SQLi Overview</li> </ul> </li> </ul> </li> <li>■ What is SQLi?</li> <li>■ Why is SQLi a problem?</li> <li>■ What happens during a SQLi attack?</li> <li>■ What is the the fallout of a SQLi attack?</li> <li>■ How does SQLi work?</li> <li>■ How do hackers use SQL in a SQLi? <ul style="list-style-type: none"> <li>○ What are the types of SQLi (error-based, union-based, blind)</li> </ul> </li> <li>■ What is the underlying SQL behind the scenes that hackers may be trying to hack? <ul style="list-style-type: none"> <li>○ How to we mitigate or prevent SQLi?</li> </ul> </li> <li>■ What are the OWASP recommendations? <ul style="list-style-type: none"> <li>■ How can we tell if our code is vulnerable? <ul style="list-style-type: none"> <li>○ Example activities:</li> </ul> </li> </ul> </li> </ul>	<p><b>Skills</b></p> <p>Students will be able to:</p> <ul style="list-style-type: none"> <li>■ Discuss the Equifax SQL injection attack</li> <li>■ Practice basic SQLi on a safe site</li> <li>■ Research SQLi prevention</li> </ul>
<p><b>Assessment -- Evidence that students have achieved the desired learning outcomes described above.</b> (Note: Assessments are not visible to teachers on the public side of Atlas)</p>	
<p><b>Project: Security Assessment Report</b></p> <ul style="list-style-type: none"> <li>○ SQLi Testing</li> <li>○ Create a Security Assessment Report</li> <li>○ Project Reflection</li> </ul>	<p><b>Other Evidence</b></p>
<p><b>Learning Activities</b></p>	
<p>Browse the full content of this module at <a href="https://codehs.com/library/course/6560/module/9718">https://codehs.com/library/course/6560/module/9718</a></p>	
<p><b>Resources</b></p>	

**Unit 10** Networking Fundamentals

<p><b>Notes to Educator</b></p>	
<p>This module explores the structure and design of the internet and networks, and how this design affects the reliability of network communication, the security of data, and personal privacy. Students will learn how the Internet connects computers all over the world by use of networking protocols.</p>	
<p><b>Transfer Goals</b></p>	

<p>Students will be able to independently use their learning to:</p> <ul style="list-style-type: none"> <li>• Improve their communication skills.</li> <li>• Understand the impact of the internet on society.</li> </ul>	
<p><b>Framework Standards</b></p>	
<p>Interpersonal and Societal Impact [9-12.CAS.c]</p> <ul style="list-style-type: none"> <li>• Explain the impact of the digital divide on access to critical information.</li> <li>• Discuss the impact of computing technology on business and commerce</li> <li>• Discuss the social and economic implications associated with malicious hacking, software piracy, and cyber terrorism</li> </ul>	
<p><b>Enduring Understandings</b></p> <p>Students will understand:</p> <ul style="list-style-type: none"> <li>• The structure and design of the internet and networks</li> <li>• How design affects the reliability of network communication, the security of data, and personal privacy</li> <li>• Networking protocols</li> </ul>	<p><b>Essential Questions</b></p> <ul style="list-style-type: none"> <li>• What is the Internet? How does it work?</li> <li>• What has the impact been on society?</li> <li>• How do we send data over the Internet?</li> <li>• Why are protocols so important?</li> </ul>
<p><b>Knowledge</b></p> <ul style="list-style-type: none"> <li>• Introduction to the Internet</li> <li>• Notational Systems</li> <li>• Data Representation</li> <li>• Internet Hardware</li> <li>• Internet Addresses</li> <li>Domain Name System (DNS) <ul style="list-style-type: none"> <li>• Routing</li> <li>• Packets and Protocols</li> <li>• The Internet and Cybersecurity</li> </ul> </li> <li>• Impact of the Internet</li> </ul>	<p><b>Skills</b></p> <ul style="list-style-type: none"> <li>■ Explore the different levels of the internet. <ul style="list-style-type: none"> <li>• Decimal to Binary</li> <li>• Hexadecimal</li> <li>• Bits to ASCII <ul style="list-style-type: none"> <li>○ Hello World in Bits</li> </ul> </li> <li>• Internet hardware <ul style="list-style-type: none"> <li>○ Vocabulary: bandwidth, bitrate, latency</li> <li>○ ?</li> <li>○ ○ Example Activities</li> </ul> </li> </ul> </li> <li>■ Explore how data is able to be transmitted across the ocean by using underwater cables</li> <li>■ Explore the role of simple and complex networks and routers • Internet Addresses <ul style="list-style-type: none"> <li>○ Vocabulary: Internet Protocol (IP)</li> <li>○ How do IP addresses compare to postal addresses?</li> <li>○ How IP addresses work?</li> <li>○ Example Activities</li> </ul> </li> <li>■ Explore the differences between IPv4 and IPv6. Why are we running out of addresses?</li> <li>■ Trace a website request from the server, through the network, and to your computer</li> <li>• Domain Name System (DNS)</li> </ul>

	<ul style="list-style-type: none"> <li>○ How does DNS help with sending digital information and IP addresses?</li> <li>● The Internet and Cybersecurity <ul style="list-style-type: none"> <li>○ What are cybercrime and cyberwarfare?</li> <li>○ How do we network attacks? (certificate authorities, public key encryption)</li> </ul> </li> </ul>
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**Assessment -- Evidence that students have achieved the desired learning outcomes described above.** (Note: Assessments are not visible to teachers on the public side of Atlas)

<ul style="list-style-type: none"> <li>● As a class, create a protocol that will allow one classmate to send another classmate a note, without the need for talking to each other.</li> <li>● What are the standard protocols for the Internet and how do they work? (TCP/IP, HTTP)</li> </ul>	<p><b>Other Evidence</b></p>
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**Learning Activities**

<p>Example Activities</p> <ul style="list-style-type: none"> <li>■ Explore the process of how requesting a web resource works <ul style="list-style-type: none"> <li>● Routing <ul style="list-style-type: none"> <li>○ How is routing used to send messages / data?</li> <li>○ Why is redundancy a good thing for the Internet? (fault tolerant)</li> </ul> </li> <li>● Packets and Protocols <ul style="list-style-type: none"> <li>○ How data is transmitted?</li> <li>○ How are internet packets able to find their way to your computer?</li> </ul> </li> </ul> </li> <li>○ Example Activities:</li> <li>■ Explain in your own words how a request from your computer travels through the various levels of servers to reach and return the correct webpage and resources?</li> </ul>
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**Resources**

**UNIT 11 & 12 IT Infrastructure/ Project - Troubleshooting**

**Notes to Educator**

Students will learn about the physical elements of computers and networking such as motherboards, RAM, routers, and the use of port numbers, ethernet and wireless devices. Students will explore the troubleshooting methodology and utilize it to solve sample IT support issues.

**Transfer Goals**

Students will be able to independently use their learning to:

- Identify and troubleshoot problems
- Establish and test theories

**Framework Standards**

Computing Devices [9-12.CS.a]

Explain and demonstrate how specialized computing devices can be used for problem solving, decision-making and creativity in all subject areas.

<b>Enduring Understandings</b>	<b>Essential Questions</b>
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<p>Students will understand:</p> <ul style="list-style-type: none"> <li>• The physical elements of computers and networking</li> </ul>	<ul style="list-style-type: none"> <li>• What are the steps to improving faulty network systems?</li> </ul>
<p><b>Knowledge</b></p>	<p><b>Skills</b></p>
<ul style="list-style-type: none"> <li>• Internal Components of a Computer</li> <li>• Peripheral Devices</li> <li>• Network Devices</li> <li>• Storage and Network Options</li> <li>• Network Communication</li> <li>• Network Management</li> </ul>	<p>Students will be able to:</p> <ul style="list-style-type: none"> <li>• Identify different Types of CPU</li> <li>• Determine RAM vs. Hard Drive</li> <li>• Wireless Internet Connections <ul style="list-style-type: none"> <li>◦ Speed Test</li> <li>◦ Security of Cloud Storage</li> </ul> </li> </ul> <p>Ethernet Standards</p> <ul style="list-style-type: none"> <li>• Setting Up a Firewall</li> </ul> <ul style="list-style-type: none"> <li>◦ Establish Firewall Rules <ul style="list-style-type: none"> <li>• SSH Logs</li> <li>• Reading Logs</li> </ul> </li> </ul> <ul style="list-style-type: none"> <li>• Troubleshooting Methodology <ul style="list-style-type: none"> <li>• Identify the problem</li> <li>• Research past solutions</li> <li>• Establish a theory</li> <li>• Test the theory</li> <li>• Establish a plan of action</li> <li>• Implement the solution</li> <li>• Verify functionality</li> <li>• Document findings</li> </ul> </li> </ul>
<p><b>Assessment -- Evidence that students have achieved the desired learning outcomes described above.</b> (Note: Assessments are not visible to teachers on the public side of Atlas)</p>	
<p>Performance Task(s):  Troubleshooting: In this project, students will learn more about each step of the troubleshooting methodology and use these steps to repair and improve faulty network systems.</p> <ul style="list-style-type: none"> <li>◦ Poor Signal Strength</li> <li>◦ Interference</li> </ul>	<p><b>Other Evidence</b></p>
<p><b>Learning Activities</b></p>	
<p>Browse the full content of this module at <a href="https://codehs.com/library/course/6560/module/12961">https://codehs.com/library/course/6560/module/12961</a></p>	
<p><b>Resources</b></p>	

ITEM: gb 2-145

STANDING COMMITTEE: **TEACHING, LEARNING AND STUDENT SUPPORTS**

DATE OF MEETING: Wednesday, June 22, 2022

ITEM: Mailman (May 6, 2022)

Request that the Administration provide a report, from January to present, regarding teacher shortages to include teacher absences by school and indicate the resources utilized to cover their classroom.

PRIOR ACTION:

5-19-22 - On a voice vote, the item was referred to the Standing Committee on Teaching, Learning and Student Supports.

BACKUP: Annex A ( 3 pages) contains the Administration's response to the item.

## **ELEMENTARY RESOURCES**

Staff Attendance was a major challenge this school year. Covid continued to be a major reason for staff absences. Schools utilized all means available to cover classrooms. Below is a list of ways elementary principals worked to ensure students were supported when their teachers were absent. Please note each school has different resources, staffing, and means in which to create solutions for coverages.

- Each Elementary was provided one full time building substitute. This has been reported by principals as a critical and key support this school year. Our larger schools (Gates Lane, Norrback etc.) were given two building substitutes. The building substitutes were assigned a classroom each day to cover due to an absence. There were very few days when a building substitute did not have to cover a classroom. The building substitutes were widely appreciated by principals, and every principal advocated for a building substitute on their Table of Organization for school year 2022-2023
- On days when more than one classroom teacher was absent, some schools used Instructional Assistants to cover classrooms
- Creative schedules where coaches, TMSNs, ESL teachers, SACS and other Instructional Support Teachers would combine efforts to provide coverage for classrooms were developed. Many small schools do not have additional staff and utilized these multi-member approaches to cover classrooms
- Splitting of classes, though not ideal, was utilized when numerous teachers were out. Students usually were split amongst similar grade levels
- When itinerant (gym, music, art) teachers are absent, the special class was scheduled to be made up at a different time, other staff covered the class or other itinerant teachers combined classrooms to ensure the students get their special for the day.
- In the larger schools with many special education programs they too would sometimes combine classrooms to ensure coverage.
- There were also numerous times when principals, assistant principals and coaches covered classrooms.
- When schools experienced high levels of staff shortage district leaders went to schools to cover classrooms and/or cover all duties (lunch, recess, arrival, dismissal) Many times district offices had to release their liaisons/coaches to go to schools to cover staff shortages. District office also covered schools when principals were absent and coverage was needed.

## **SECONDARY RESOURCES**

Staff Attendance was also a major challenge in our secondary schools this year. Secondary school principals and coordinators likewise utilized all means available to cover classrooms.

- Each secondary school had access to at least one building substitute teacher, with our larger schools having two building substitutes assigned each. These positions provided essential and reliable coverage support when teachers were absent.
- Administrators also reassigned teachers' regular daily duty period assignments when they were needed to cover classes for teachers who were absent.
- When teachers were absent on a longer-term basis due to approved medical or other extended leave, school administrators submitted requests for teachers to teach a sixth class (compensated as an "extra one-fifth") to ensure the students in the teachers' classes had the greatest continuity of instruction possible.
- In rare circumstances, students' classes were combined in larger areas (e.g., an auditorium or cafeteria) and were supervised by teachers on duty supported by non-teaching staff members and school administrators.

Teacher Absences January 2022 - June 13th, 2022				January	February	March	April	May	June** through 6/13/2022
Title	Location	Sick	Personal	1	2	3	4	5	6
Teacher	Academic Center for Transition	58	10.5	37	13	14	9	25	9
Teacher	ASP - Harlow Street	3	3	5	2	2	2	2	1
Teacher	Belmont Community	318	42.5	216	159	102	109	120	30
Teacher	Burncoat Elementary	114	22	93	52	28	34	78	25
Teacher	Burncoat High School	605.5	101.5	490	367	286	257	348	118
Teacher	Burncoat Middle School	273	57.5	269	156	94	117	172	62
Teacher	Canterbury Street	89.5	45.5	126	60	38	45	56	20
Teacher	Challenge Academy	61	6	57	42	52	54	73	40
Teacher	Chandler Elementary	145.5	20	168	106	60	57	61	19
Teacher	Chandler Magnet	229	62.5	222	111	87	100	111	46
Teacher	City View	390	39	200	118	104	123	160	57
Teacher	Claremont Academy	199.5	53.5	194	102	87	92	104	49
Teacher	Clark Street	177	28.5	119	94	65	88	81	22
Teacher	Columbus Park	129	33.5	133	73	49	52	80	21
Teacher	Doherty High School	824.5	115.5	542	346	239	279	349	123
Teacher	Elm Park Community	154	37	133	82	45	67	104	38
Teacher	Fanning Building	65	3	27	7	15	3	25	17
Teacher	Fanning Building - Transition Program	34.5	14.5	46	21	17	17	24	6
Teacher	Flagg Street	126.5	24.5	92	60	36	45	77	21
Teacher	Forest Grove Middle School	647	70	386	255	225	236	328	119
Teacher	Francis J. Mcgrath Elementary	149.5	27.5	86	62	50	50	59	19
Teacher	Gates Lane	275	56	231	110	68	104	140	55
Teacher	Gerald Creamer Center	91	25.5	57	25	18	16	53	24
Teacher	Gerald Creamer Center - Evening High School	28.5	3	15	7	6	10	14	16
Teacher	Goddard	285.5	47	185	87	106	104	103	34
Teacher	Grafton Street	203.5	35.5	91	75	63	67	103	39
Teacher	Heard Street	117.5	27	97	44	11	37	70	28
Teacher	Jacob Hiatt Magnet	92.5	25	128	89	57	63	76	17
Teacher	La Familia Dual Language School	72.5	18.5	64	36	26	22	47	15
Teacher	Lake View	185	15.5	126	82	58	39	53	9
Teacher	Lincoln Street	50.5	26	67	46	23	30	41	11
Teacher	May Street	85	19.5	107	42	23	35	38	15
Teacher	Midland Street	88.5	16	61	44	26	36	53	19
Teacher	Nelson Place	445	62	254	170	163	110	192	55
Teacher	New Citizens - Secondary	28	7	18	13	8	8	9	6
Teacher	New Citizens - Young Adult	25.5	7	22	9	10	8	12	5
Teacher	Norrback Avenue	378	74	304	201	164	168	208	102
Teacher	North High School	585.5	80	423	278	161	188	289	92
Teacher	Quinsigamond	376.5	69	303	202	137	148	214	71
Teacher	Reach Academy	34	12.5	39	18	13	11	17	5
Teacher	Rice Square	305.5	44.5	235	163	108	97	133	56
Teacher	Roosevelt	177	65	184	128	71	86	122	42
Teacher	South High School	529.5	158	497	287	167	218	321	95
Teacher	St Casimir	74.5	9	46	30	57	28	42	19
Teacher	Sullivan Middle School	683	73	385	270	215	114	293	101
Teacher	Systemwide	939.5	153.5	595	333	312	240	391	179
Teacher	Tatnuck Magnet	138.5	42.5	134	73	45	47	101	35
Teacher	Thorndyke Road	63.5	28	84	49	15	35	40	19
Teacher	Union Hill	81.5	53	103	69	25	36	85	22
Teacher	University Park	122	18.5	106	31	43	15	58	13
Teacher	Vernon Hill	329.5	43	191	106	81	89	119	51
Teacher	Wawecus Road	45.5	18.5	76	60	30	42	63	19
Teacher	West Tatnuck	103	27	109	52	18	42	58	26
Teacher	Woodland Academy	231.5	56	194	138	102	92	147	67
Teacher	Worcester Arts Magnet	252	30	155	93	84	57	93	32
Teacher	Worcester East Middle School	297	63.5	281	170	68	114	160	60
Teacher	Worcester Technical High	856.5	129.5	560	352	233	302	385	156