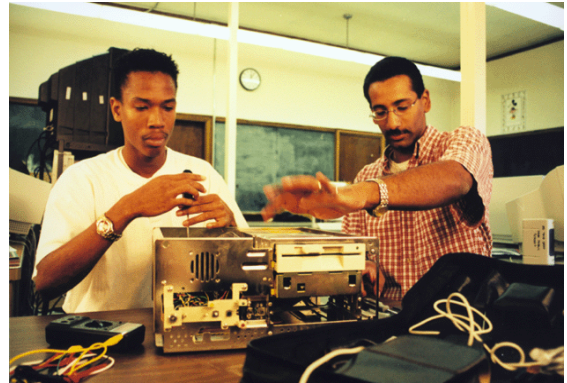


Take It To The Max!



Designing the
Next Generation
Max Hayes High
School for **This**
Generation of
Cleveland's Youth

concordia
community centered planning & design

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PICTURE
LEARNING

Take It To The Max!

Designing the **Next** Generation Max Hayes School for
This Generation of Cleveland's Youth

August 2010



EXECUTIVE SUMMARY

The Cleveland Metropolitan School District (CMSD) has embarked on a major transformation of its high schools. The proposed revitalization of the Max Hayes School is part of that transformation. CMSD has designated Max Hayes as a “refocus” school and requires that it develop a framework for school partnership development and prepare school, program, and curriculum design frameworks to guide the facilities design and frame the development work leading to full-scale implementation of “the new Max Hayes.”

WIRE-Net assembled and organized a Technical Team to provide direction to the design process and to contribute to the development of the design specifications themselves. The Technical Team consisted of representatives from the industry, postsecondary, and community sectors along with CMSD and Max Hayes leaders and Max Hayes students.

The Technical Team met monthly from November 2009 through June 2010 to discuss school, program, and curriculum design topics. WIRE-Net conducted two major forums to share preliminary design work. Over a hundred industry, postsecondary, and community representatives provided their vision for the new Max Hayes and provided feedback on the proposed preliminary design features and components. WIRE-Net leaders, Technical Team members, and the C/BPL team also met with parents and teachers several times to gather data, describe preliminary design features and components, and receive feedback.

Design Requirements

As an outcome of their deliberations, the Technical Team concluded that a next generation Max Hayes School should:

- Address career, postsecondary, work, and job readiness coherently and holistically.
- Provide sufficient time for students to achieve competence with respect to the increasing academic requirements for a high school diploma. Even with careful integration of academic, technical, and work readiness skills, there is likely to be less time in the traditional school day for attention to technical skill development.
- Assign high priority to student proficiency with respect to general work readiness skills, including creativity and innovation.
- Focus on applied learning in real-world contexts and settings in order to motivate students to remain in school and persist in their learning.
- Provide a personalized learning program focused on each student's career interests.
- Provide opportunities for each student to engage with adults working in the student's career interest.
- Provide opportunities for students to obtain, in addition to a high school diploma, multiple forms of certifications and credentials in their career interests through industry-certified training, where available.
- Provide students with a pathway to technical certificates that may require postsecondary learning, particularly an Associate or technical school degree or certificate.
- Encourage and support all graduates in pursuing some form of postsecondary learning upon graduation as well as work that is aligned with that learning.

- Teach academic skills and knowledge within the projects the students work on in their customized programs of study.
- Assess student performance using multiple measures, stressing exhibitions, simulations, and other performances that demonstrate skill and understanding.
- Ensure that each student's personalized learning program is focused on his/her holistic development as a learner, worker, and citizen.
- Provide the faculty with state-of-the-art professional development and time for developing curriculum modules and planning instruction, including organizing external resources.
- Provide substantial autonomy to the school and its leadership and faculty. The school in turn provides substantial autonomy to each career area.
- Ensure that industry and postsecondary sector leaders are involved in all aspects of the career areas and programs of study, advising on the appropriateness of student learning outcomes, learning opportunities, and assessments of skill and understanding.
- Infuse design and the arts into all aspects of the curriculum as a means of nurturing creativity and innovation and creating competent problem-solvers.
- Provide opportunities for out-of-school and disconnected youth to restart and renew their learning, working closely with other organizations and agencies that serve these young people.
- Employ a post-graduation follow-up program to ensure student success at work and in postsecondary learning.
- Develop valid and reliable information regarding the career pathways of all graduates.

The New Max Hayes

Mission

The Max Hayes School prepares young men and women for success in life-long learning and work by providing them with customized learning programs in selected career pathways based on their interests.

Guiding Principles

To accomplish this mission, the Max Hayes school design will be based on these guiding principles:

- Max Hayes will develop the whole young person, not just a competent worker, but also a lifelong learner and engaged citizen, healthy in mind and body.
- Max Hayes will accommodate students of all abilities.
- Max Hayes students will have a voice and a choice regarding their education.
- Max Hayes graduates will be prepared for success in the workplace and in postsecondary learning.
- Max Hayes students will learn through a curriculum that is focused on their career interests.
- Max Hayes students will have multiple opportunities and ways to show what they know and what they can do.
- Max Hayes will engage parents and families in their children's education and in the school community.

- Max Hayes will be open to the community it serves, aggressively seeking opportunities for service and establishing relationships for advancing student learning and development.
- Max Hayes will form strong and lasting partnerships with the industry and postsecondary sectors.
- Max Hayes will be dynamic and open to ongoing change, nimble and quick in responding to what is happening in the workplace and in society, and particularly in the lives of its students.

Vision

The Technical Team identified several “images of the future” that constitute a vision for how Max Hayes will achieve its mission in accordance with the guiding principles.

- Students are working with faculty-led teams that include industry experts, expert practitioners, and other knowledgeable adults from industry, the community colleges, and the community.
- Faculty members know their students well and care about their development as learners and citizens in the school community.
- Students are learning and working in industry and community settings as well as in the school. Student projects often address community needs and challenges.
- The school facility is open to the community.
- Students are customizing their learning plans to include focused attention on technical certificate requirements.
- While in high school, students are enrolled in postsecondary learning opportunities that are consistent with their learning plans.
- Faculty teams are providing integrated learning modules that address academic, technical, and work readiness skills through highly engaging, real-world projects.
- Students are using a wide variety of general and specialized technology tools to support their learning and work.
- Students and adults learning together, where appropriate.
- Max Hayes operates as a professional organization and culture. It is a bustling place, full of purposeful activity, with many groups of students and faculty members working on different projects and tasks.
- Max Hayes is “open for business” beyond the traditional school day, week, and year.
- Professionals from industry and postsecondary institutions are members of teams evaluating students’ work.
- Students address academic skills and knowledge within their career pathways.
- Female students are participating in all Max Hayes career areas and pathways.
- Students use their learning plans and portfolios during job interviews.
- Max Hayes students schedule fitness and nutrition sessions into their busy schedules.
- Students use performance tests to demonstrate competency based on learning that they did online or out of school.
- A few businesses have “set up shop” at Max Hayes to operate training centers for their employees and for selected Max Hayes students.
- Specialists from local businesses are interacting with students and “scouting” talent.

Max Hayes graduates will have a sound academic foundation—proficient in reading, communications, mathematics, and quantitative and empirical reasoning—and will be skilled in using the arts and design in their career areas. They will be fit, eat smart, and pursue healthy lifestyles. All graduates will be ready for success in postsecondary learning—without remediation—and in the workplace.

Goals

The Max Hayes School will accomplish these goals:

- Every Max Hayes student will graduate with a diploma that indicates that he or she is ready for success in postsecondary learning and work.
- Every Max Hayes student will have an opportunity to graduate with a recognized certificate or some form of endorsement that verifies that the he or she is ready for work in a career area or pathway.
- Every Max Hayes student will graduate with a plan for postsecondary learning and a career.

School-Wide Features and Components

The Max Hayes School will provide a four-year program with a non-traditional ninth-grade “transition” program and a three-year grade 10-12 continuum that stretches into a postsecondary learning program and incorporates (through, for example, dual enrollment, Tech Prep, and articulation agreements) selected postsecondary learning opportunities for selected students.

Max Hayes will employ an open enrollment policy with selection by lottery, taking into account subpopulations such as young women and special needs students. Further, Max Hayes will aggressively market its special ninth grade experience and its career areas and pathways to young women as well as young men.

Max Hayes will establish organizational structures and processes for ensuring that students have a voice in their own education and in the life of the school. The Max Hayes Administrative Team will form partnerships with parents and families through programs and activities that engage them while their children are still in the middle grades and work collaboratively with them through to graduation and into postsecondary learning and work.

The Max Hayes Administrative Team and the faculty will give particular attention to establishing the norms and expectations of the school culture and providing a climate in which those norms can be realized. Each of the career areas will establish specific norms regarding work readiness skills, professional dress and demeanor, and schedules. Each of the four industries will adopt the respective career area and help it establish a professional culture and structure that mirrors the finest practices in the industry. The faculty will model these norms in all of their work with students. They will establish a climate of high expectations and professionalism by inviting adults from the industry, community, and postsecondary sectors to work with the students.

CMUSD will create a Max Hayes School Advisory Board to provide specific school-level guidance to the district and to the Max Hayes Administrative Team. The Board will be deeply engaged in all facets of the school's program and curriculum. It will be organized and operate similarly to boards established in other of CMUSD schools. The Board will include representatives from the industry, postsecondary, and community sectors. The Max Hayes principal will attend all meetings of the Board and serve as an *ex officio* member. The Advisory Board will establish a nonprofit foundation to assist the school in procuring resources and otherwise advancing its mission. The industry, postsecondary, and community partners will operate as "co-owners" of Max Hayes.

The principal will lead Max Hayes, with support and assistance from the Administrative Team and the faculty. The Ninth Grade Coordinator and the Career Area Coordinators (CAC) will serve with the principal as members of the Administrative Team.

Program Features and Components

All Max Hayes programs will have these features:

- Assist each student in developing a program of study that becomes increasingly focused during the progression through grades 10-12.
- Include in each student's learning plan and program of study a pathway to postsecondary learning, particularly to community colleges and technical schools.
- Employ the learning plan and the program of study as the central reference for all student learning and focus the faculty and other "adjuncts" on the required competencies and expected performances delineated in the plan.
- Provide choices in career areas and pathways for each learner and opportunities for customization within pathways based on his or her interests.
- Provide pathways to established certificates and endorsements, and create customized certificates and endorsements where appropriate.
- Establish organizational structures to provide the flexible schedules and time necessary to support individual and small group learning in a variety of in-school and out-of-school settings.
- Bring many adults—experts and expert practitioners—into each career area to serve as models, mentors, coaches, and assessors.
- Provide multiple opportunities for students to get out of school into industry and postsecondary settings and contexts in order to work with adults doing work the students wish to do.
- Develop industry, postsecondary, and community partnerships that support each career area and pathway.
- Provide ready access to the support services essential for keeping students focused on productive learning and work and to help faculty respond successfully to students' needs and circumstances.
- Provide customized, just in time tutoring through a variety of in school, out-of-school, and digital learning resources.
- Max Hayes School will address four career areas: 1) Building and Construction, 2) Information Technologies, 3) Manufacturing, and 4) Transportation/Automotive. Additionally, Max Hayes will offer a fifth "Opened Pathways" career area in which students

can design a customized grade 10-14 program of study that spans two or more career areas or pathways within those areas.

Ninth-Grade Program

Learning the Max Hayes way will require that many entering ninth grade students unlearn old ways of learning and working. The ninth grade will provide a significant and substantial transition, helping students to reassess and recommit to a new kind of learning. The faculty will design a totally new experience and help all students to be successful in that new environment.

The goals of the ninth grade program are to help all students:

- Build a profile of themselves as learners and discover and investigate their career interests.
- Develop a learning plan with their parents and their Max Hayes workgroup leader/faculty member.
- Understand and contribute to the Max Hayes School culture.
- Unlearn unproductive behaviors and dispositions and form productive ones.
- Take increased responsibility for their learning and personal development.
- Build a foundation of essential skills, particularly in literacy, quantitative and empirical reasoning, and work readiness skills.
- Develop a preliminary program of study for refinement in the 10th grade.

Career Areas and Pathways

In grades 10-12 Max Hayes will provide students with four career areas in which to do their learning and work. Each of these career areas will provide at least three designated pathways identified by the Technical Team. The designated pathways typically will lead to some form of certificate or endorsement either at graduation or at the postsecondary level.

Open Pathways

Some Max Hayes students will have difficulty in selecting a career area or career pathway by grade 10 or 11. Therefore, consideration will be given to creating a fifth career area which is open to students who wish to custom design their own learning program and portfolio by working across two or more of the existing career areas offered at Max Hayes. In this way, a student who is interested in a particular pathway or skill set within a pathway, can create a customized program of study that assembles in a coherent fashion a scope and sequence of modules that address academic, technical, and work readiness skills.

Cross-Career Area Drivers

Each of the career areas will be significantly impacted by what might be called key cross-area drivers or forces at work, each of such significance that they might constitute a career area or pathway but selected because they are central to the way in which each of the four career areas and selected pathways will develop in the future. These drivers are: 1) new and emerging technologies, 2) sustainability, 3) design and the arts, and 4) entrepreneurial ventures

Career Areas and Pathways

Career Areas and Pathways				
Building, and Construction	Information Technology	Manufacturing	Transportation / Automotive	Open Pathways
Construction Management	Networks	Metalworking / Machining	Automobile Repair / Electronics	Customized
Woodworking	Technical Support	Welding / Fabrication	Transportation Systems	
Building Trades	Media / Gaming / Social Networking	Robotics / Electronics	Automobile Design	
Customized	Customized	Customized	Customized	

Curriculum Features

These curriculum design features respond to the school design requirements:

- Employ a modular curriculum that integrates attention to academic, technical, and work readiness skills within projects related to specific career pathways.
- Use project-based learning as a core curriculum and instructional strategy in all modules, projects, and workshops, as appropriate.
- Assist students in customizing programs of study.
- Provide flexible time structures and allocations so that students have sufficient time for deep practice that enables proficiency on essential learning standards.
- Employ a performance-based assessment system.
- Address the four cross-career drivers in all career areas and pathways, as appropriate.
- Provide students with in-school and at-home access to an array of online learning resources and instructional programs and materials that are embedded and integrated with the specific pathway focus of modules and projects.
- Provide students with choice and flexibility in selecting learning modules and projects within modules.
- Provide focused skills development to individual students that is connected to their pathways work.
- Provide multiple ways for students to demonstrate competence, including particularly performances that demonstrate both skill and understanding.
- Employ the Ohio Competency Assessment System as a means of helping students demonstrate proficiency on important learning standards based on learning and work accomplished both in school and in out-of-school settings.

Staging the Development Work

Although the new Max Hayes facility will not be ready until fall 2013, the Administrative Team can begin, in the fall 2010, a staged implementation of selected features and components of the

proposed school, program and curriculum designs. This next phase of the work includes five stages: develop, prototype, revise, scale, and maintain (including ongoing improvement).

To begin the development phase, several tasks and activities will be completed in 2010-11.

1. Recruit and select a principal.
2. Recruit and select career area leaders and establish the school administrative team.
3. Develop a faculty “recruitment” process.
4. Develop a memorandum of understanding with the faculty union.
5. Develop faculty program and curriculum development teams.
6. Develop and implement a comprehensive education, training, and support system for faculty.
7. Develop a marketing program for middle grades faculty, students, and families.
8. Establish the Max Hayes School Advisory Board
9. Design and organize the industry, community and postsecondary partnerships.
10. Develop a student orientation program for incoming 9th graders (summer program).
11. Establish a program implementation monitoring system.

Most assuredly, there will be an opportunity to create a new state-of-the-art facility that serves students and the community and engages industry, postsecondary, and community partners. A new facility, however necessary, is not sufficient. CMSD needs as well to create an integrated school, program, and curriculum design that is itself state-of-the-art. Doing so will **“Take it to the Max”** and create a truly next generation design for the Max Hayes School to serve this generation of Cleveland’s youth.

ACKNOWLEDGEMENTS

School design is a messy process, one part predictable, two parts unpredictable, and a good measure of promise and promises; simultaneously too many and not enough cooks, consequently always challenging, and often surprisingly rewarding. Designing the new Max Hayes School followed that recipe faithfully and, hopefully, with the promised rewards.

We extend special thanks to the Technical Team that WIRE-Net assembled for this project. The Team gave and then gave some more of their time and their energy, not just for the monthly design sessions but also for site visits and numerous *ad hoc* meetings along the way. Singling out individual Team members would result in too long a list for this space, but four Max Hayes students—Destiny Jones, Kern Peale, Brittany Roldan, and Kenneth Thomas—attended nearly every Team meeting and grounded many of our design discussions with their perspectives. We extend our gratitude to them. Hopefully, they and all members of the Technical Team will see in this report a reflection of their many insights and suggestions.

We are especially appreciative for the guidance provided by WIRE-Net's Director John Colm and WIRE-Net consultant Leslie Yerkes, who were ably supported by Anne Schaum. They provided good advice, made us welcome, and facilitated our meetings, gently but firmly pressing the Technical Team for yet another meeting, yet another document to review, and yet another site to visit.

Eric Gordon, Chief Academic Officer for the Cleveland Metropolitan School District, communicated the district's vision effectively and pressed the Technical Team and us to challenge the district to create a school that would serve students well. Eric's leadership team—Karen Thompson, Annette Darby, and Ahmed Abonamah—was most helpful, always available, generous with their time and insights, forthright in their assessments of current practice, and ever open to our suggestions for improvement and redesign. Christine Fowler-Mack, formerly Director of the Office of Innovative Schools and currently the District's Chief of Staff, provided guidance early in the design process and encouraged boldness in our proposed design.

Our colleague, Bobbie Hill of Concordia, LLC, helped us understand and frame the several partnership components of the proposed school design. We used the Concordia partnership framework as a guide for several of our design recommendations.

Finally, we would be remiss if we did not extend our gratitude to Ellen Tetreault for her just-in-time research support and to Corinne Mojkowski for her editorial support. No report is ever complete in our eyes until it survives the research, rigor, and readability gauntlet they employ. Our acknowledgement of these many contributors and contributions in no way diminishes our responsibility for all aspects of this report. We are happy for the opportunity to stretch and apply our "big picture" thinking to so important an undertaking. We hope our contributions spark a truly different and better Max Hayes.

Elliot Washor, Co-Director and Co-Founder
Associate Big Picture Learning

Charles Mojkowski, Senior
Big Picture Learning

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I. INTRODUCTION AND OVERVIEW

Context and Needs

Throughout this design project, the phrase the “new Max Hayes” has been used to signal to all involved that the new school will be much more than a state-of-the-art facility, as sorely as that is needed. The Technical Team and others have stressed that the new Max Hayes must be innovative and exemplary—“world-class”—in its school, program, and curriculum designs. The Team’s intent is to create a very different school and then to continually improve its design and its implementation. Therefore, the proposed design framework presented in this report is not merely a better version of the existing Max Hayes School. This design framework constitutes a considerable rethinking and redesign of nearly every aspect of the school.

The evidence regarding the challenges we face is substantial. The school dropout rate has barely changed over the last decade and is seemingly intractable (Bainbridge, 2006; Belfanz, 2006; Bloomberg, 2006; Dounay, 2006; Edwards & Chronister, 2007; J. D. Jordan, 2006; Orfield, 2004). An estimated 3.8 million 18-24 year olds (15% of all young adults) are neither in school nor employed (Annie E. Casey Foundation, 2007). The cost of dropouts to our economy exceeds \$50 billion in federal and state income taxes each year, and the costs to society attributable to health, welfare, and incarceration are much higher (Pinkus, 2006).

There is widespread consensus that high schools are failing to serve many students well, including many of those who go on to college (Carter, 2006; Gates, 2005; Gray, 2004; Janofsky, 2005). This is particularly the case in urban areas serving large populations of poor and minority students.

High schools need to graduate and prepare many more students to achieve success in postsecondary learning and in the workplace. Experts call for a much more cosmopolitan view of the graduates we need: not just workers for the 21st Century but citizens and family leaders as well (Commission on the Whole Child, 2007; Finn & Ravitch, 2007).

A wise pundit once said that it is very likely that the last surviving manufacturer of buggy whips in this country probably made the best buggy whips on the planet. Nevertheless, even the highest quality buggy whip was unable to survive the onslaught of new designs for new products to meet new needs. In much the same way, it is likely that creating merely better versions of the schools we have will not do. Still, we educators persist in doing just that.

Current reform efforts, however exemplary, may not address fundamental needs of students. There is a mismatch between the skills schools emphasize and those valued in the workplace (Barone, 2004; Brown Lerner & Brand, 2006; Conference Board, Corporate Voices for Working Families, Partnership for 21st Century Skills, & Society for Human Resources Management, 2006; Gewertz, 2007; Partnership for 21st Century Skills, 2004, 2006). CTE programs, in particular, typically achieve their highest success by preparing students for specific jobs or for work in a specific career area (Brown, Ruzzi & Kraemer, 2006). Few programs, however, graduate a majority of students who are highly proficient in core 21st

Century learning skills and who are versatile, flexible, balanced, broadly educated, and committed to lifelong learning (Friedman, 2006).

Because neither traditional high school programs nor existing career and technical education (CTE) programs are adequately preparing many students for college, life-long learning, citizenship, and work, both designs need to be changed fundamentally in order to address the needs of all students (Borg, 2004). Some critics, for example, have even questioned such stalwarts as advanced placement courses as a means of increasing rigor (J. Berger, 2006). Educators and the public alike appear to underestimate the tectonic shift in access to just-in-time learning resources that the Internet provides.

Many of the core components of high quality CTE programs are exactly those design features that are being advocated by proponents of high school redesign: increased relevance, authentic rigor, performance assessments, and connections to the real world (Hoachlander, 2006; McNeil, 2007). Many reformers view all secondary education as needing to be involved in and contextualized by careers and career pathways (Bottoms, 2006; Bottoms & McNally, 2005; Castellano, Stringfield, & Stone, 2003; Hughes & Mechur Karp, 2006; Jenkins, 2006; Steinberg, Johnson, & Almeida, 2006). There is a growing trend toward incorporating some form of career education into the high school experience for every student (T. Lewis & Cheng, 2006).

With these understandings as a context, the Cleveland Metropolitan School District (CMSD) has embarked on a major transformation of its high schools. The proposed revitalization of the Max Hayes School is part of that transformation. CMSD has designated Max Hayes as a “refocus” school, requiring that it rethink its school, program, and curriculum designs to significantly increase the number of students who graduate ready for success in postsecondary learning, work, and careers.

WIRE-Net has had a substantial role in Max Hayes since 1992. Based on that relationship, the WIRE-Net Board requested that CMSD support its role in bringing the industry sectors into a planning process to design a new approach to career and technical education at Max Hayes High School. CMSD agreed to work with and through WIRE-Net, and several Cleveland-area foundations and corporations supported that work (See Appendix A for a list of these benefactors). Concordia, LLC of New Orleans and Big Picture Learning, a non-profit school developer based in Providence, RI, were selected by WIRE-Net and CMSD to develop a framework for school partnership development and to prepare school, program, and curriculum design frameworks to guide the facilities design and frame the detailed development work leading to prototyping and full-scale implementation of “the new Max Hayes.”

Scope of Work

WIRE-Net requested that Concordia/Big Picture Learning (C/BPL) provide these deliverables:

Mission and Vision. Facilitate the development of a new mission and vision statement for Max Hayes. This statement will be aligned with the CMSD's mission and vision, particularly with respect to the District's mission and vision for career and technical education as a component of its portfolio of high schools.

Engagement Plan. Delineate the specific tasks and activities for engaging the several stakeholder groups to include the Technical Team, Advisory Teams, and Core Planning Team in deliberating on, and providing feedback for, components of the design, including the overall mission and vision and the school, program, and curriculum design frameworks.

Research Support. Provide a synthesis and analysis of knowledge obtained from a review of research and literature, CMSD materials, interview notes, and on-site observations. Use the analysis to inform the Technical Team and to support decisions regarding the framework for the school, program, and curriculum designs. Use conference calls and reviews of appropriate materials in order to provide the Technical Team with a review of relevant conceptual support and understanding of best practices with respect to career and technical education in general and with respect to school, program, and curriculum designs appropriate for the Max Hayes School.

School Design. Provide a comprehensive framework for the school, program, and curriculum designs for each of the proposed career areas—Design, Building, and Construction; Information Technology, Manufacturing Technologies, and Transportation/Automotive Technologies.

Framework for Development. Provide a framework for the development phase work, identifying the essential tasks and staging their development and implementation between the 2010-11 and 2013-14 school years.

Partnership and Funding Models. Provide a design for ongoing collaboration with interested business and community organizations and groups in guiding the development and implementation of the school and program designs. Outline strategies for obtaining resources to support the ongoing program revitalization. Provide the Technical Team with specific recommendations for forming and sustaining partnerships with the business/industry, postsecondary learning, and community/social service sectors.

Design Process

WIRE-Net assembled and organized a Technical Team to provide direction to the design process and to contribute to the development of the design specifications themselves (see Appendix A for a list of members and their organizational affiliations). The Technical Team consisted of representatives from the industry, postsecondary, and community sectors along with CMSD and Max Hayes leaders and Max Hayes students.

The Technical Team met monthly from December 2009 through June 2010 to discuss school, program, and curriculum design topics. The first few design sessions were devoted to provoking and stimulating the Technical Team in order to obtain their ideas and to debate and discuss school, program, and curriculum issues and topics. During this first half of the design process, C/BPL listened and reflected. This stage of the design culminated in a March 31 open design session during which more than 100 industry, postsecondary, and community representatives provided their insights on the new Max Hayes.

During the second stage of the design, C/BPL present preliminary ideas to the Technical Team and engaged them in critiquing those ideas and suggesting new ones. This phase of the design process culminated in the June 15 session in which about 70 industry, postsecondary, and community representatives provided feedback on the proposed preliminary design features and components (see Appendix A for a list of participants in the March 31 and June 15 sessions).

Also during the second half of the process, WIRE-Net leaders, Technical Team members, and the C/BPL team met with parents and teachers several times to gather data, describe preliminary design features and components, and receive feedback. WIRE-Net leaders, Technical Team members, and the C/BPL team also met with industry and postsecondary representatives in telephone work sessions. WIRE-Net leaders, Technical Team members, and the C/BPL team met with the leadership of the apprenticeship training councils for the building and construction trades to understand the dynamics of how those apprenticeships work and to explore the possibilities for Max Hayes students and graduates.

The Technical Team made several site visits to a diverse number of schools and programs outside of the District. The visiting teams discussed their observations and findings with other members of the Technical Team. C/BPL found several examples of exemplary school, program, and curriculum components operating within CMSD schools. Where appropriate, we have incorporated those design features and components in our recommendations to WIRE-Net and CMSD.

All of this work has culminated in this report, which constitutes the documentation of that work and proposes school, program, and curriculum designs for Max Hayes. Chapter 2 provides a compilation of the Technical Team's field notes from its site visits as well as a synthesis of understandings from the research and best practice literature. The chapter concludes with a delineation of the design requirements identified as a result of that work.

Chapter 3 describes the recommended features and components for the school design. It also provides a statement of the mission, guiding principles, and goals for Max Hayes. The framework addresses such components as organizational structure governance and management, culture and climate, student voice, and so forth. Chapter 4 describes the recommended features and components for the program design, outlining the framework for the five proposed career areas and the pathways within them.

Chapter 5 provides a detailed framework for the essential curriculum development work that needs to transform this design framework into learning opportunities for students. Chapter 6 provides a framework for the development phase work, identifying the essential tasks and then staging their development and implementation between the 2010-11 and 2013-14 school years. This chapter also provides details on several essential tasks that are critical to success during this second phase.

This report provides a framework. It is not a detailed blueprint, but it does provide the scaffold upon which such a blueprint can be constructed. Throughout the process, the C/BPL team listened carefully, initially in gathering data, hard and soft, and later in gathering feedback to our preliminary designs. We believe we have heard and contemplated all of those recommendations and observations. As might be expected, however, it was not possible to accommodate every opinion and every recommendation. Ultimately, we needed to decide what was the most coherent framework to present for consideration. Therefore, this report constitutes C/BPL's recommendation to the WIRE-Net Technical Team and to CMSD.

Most assuredly, there will be an opportunity to create a new state-of-the-art facility that serves students and the community and engages industry, postsecondary, and community partners. While necessary, however, a new facility is not sufficient. CMSD needs as well to create an integrated school, program, and curriculum design that is itself state-of-the-art. That is what C/BPL has attempted to do. To the many features and components we found in practice and research, in selected CMSD schools, and in the insights of the Technical Team, we have added a few of our own in an attempt to “**Take it to the Max**” and create a truly next generation design for the Max Hayes School to serve this generation of Cleveland's youth.

2. CONCEPTUAL AND RESEARCH SUPPORT FOR THE PROPOSED DESIGN

This chapter provides a synthesis and analysis of knowledge obtained from a review of materials, interview notes, and on-site observations. It also provides the Technical Team with conceptual and research support and understanding of best practices with respect to career and technical education in general and with respect to school, program, and curriculum designs appropriate for the Max Hayes School.

The Technical Team sought insights by making site visits to a diverse number of schools and programs outside of the District. The visiting teams discussed their observations and findings with other members of the Technical Team. The following section regarding site visits provides a summary of the data obtained from the on-site visit reports.

C/BPL and the Technical Team found insights from within the district as well. The Technical Team visited the Mc²STEM School to learn about its several innovations, including scheduling, curriculum integration, and partnerships with the industry¹ and postsecondary sectors. C/BPL consultants visited selected CMSD schools, consulted with CMSD leaders, and reviewed documents that described the innovations being implemented within the district. These included CMSD's professional development program and its innovative approach to negotiating agreements with the CMSD teachers union.

Following the site visit summary, we provide a review of research literature, organized into two major categories. The first deals with the broad context that includes economic and workforce development and work and the workplace. The second deals with high school redesign and reform, particularly as it relates to the redesign of career and technical education.

The understandings drawn from the site visits, interviews with CMSD leaders and staff, Max Hayes faculty and parents, and from the research and literature review provide support for the core requirements for the Max Hayes design presented at the end of this chapter. In Chapters 3 through 5, we describe the essential features and components of the school, program, and curriculum designs that respond to these requirements.

Summary of Site Visit Field Notes

Technical Team members who conducted site visits used a standard protocol and process to identify the major features and components of each school's program and curriculum designs and their implications for the Max Hayes design (see Appendix B for a list of the sites visited and the visit forms).

¹ The term "industry" is used as a general descriptor for the career areas.

These findings and observations are based on the field notes provided to C/BPL by Technical Team members as a result of their observations and interviews concerning major features and components of other CTE centers that have the potential to impact the Max Hayes design.

Governance and Leadership

Toledo Academy of Technology's school board consists of business representatives, school administrators, and a school union. One member of the Technical Team recommended that Max Hayes have the same, with a nonprofit company attached and supportive of the school. At Ponitz, the principal appeared to be hands on with regard to the partnerships between business, the community and the school. Some of Tuttle's school board members have been active for 30 years. In response, a Team member suggested that Max Hayes' board concentrate on their school only. Austin Polytechnical is comprised of a management team of partner representatives, the principal, and the assistant principal. One member of the site visit team recommended that staff hired for Max Hayes must want to be there, be supportive of its philosophy, and reflect the career focus. Also, Austin did not engage academic and technical teachers in the planning process, but, a reviewer stated, Max Hayes should.

School and Business Partners

Based on the Ponitz school model, visitors recommended that Max Hayes have defined postsecondary, business, and community/family partnerships. Several career communities at Ponitz replicate industry, both in design of classroom space as well as their mode of operation. Ponitz has strong partnerships in place: The principal indicated to site visitors that partners are often in the building, participating in meaningful ways, as well as active on advisory boards. This school was designed with a postsecondary partner (Sinclair Community College), which also has a strong presence in the school. A college representative staffs a College Career Resource Center. Also, college coursework is available on site for students. There is ongoing dialogue with Sinclair Community College faculty in academic content areas specific to each pathway.

At Austin, all employers sign a letter of commitment, which helps cement employer involvement. Employers are also involved in curriculum mapping and partners also have access to the curriculum development process. Visitors to Tuttle noted the need for Max Hayes to expand the connection to post-secondary training and partner with those institutions to provide opportunities for students. For Max Hayes, it was suggested that career teachers from businesses lead each career area. Also important is working for business as a learning experience or having business work on site with students to design and implement unique projects.

Student Recruitment, Selection and Orientation

Team members observed that Tuttle's admission requirement is 3.0., and questioned whether the GPA for admission to Max Hayes should be even higher. Parents and students of the Tuttle School must participate in a mandatory pre-enrollment visit. It was suggested that Max Hayes parents must be fully engaged in the school selection process. A tour before acceptance should be minimum requirement.

Polaris enrolls only grades 11 and 12; sophomores apply and are admitted junior-senior year. Site visitors observed that there is less attrition, better attendance, and fewer behavior issues. Visitors to Polaris suggested that Max Hayes should be designed for grades 10-12, allowing grade 9 students to apply for admission in grade 10.

Ponitz admits 9th graders with good attendance, a 2.0 or better GPA, acceptable discipline record, teacher and/or counselor recommendation, and a career interest essay. Students entering Ponitz after the 9th grade must have a minimum 2.0 GPA, have the necessary credits to be on track for graduation, and have passed Algebra I or a higher level math course with a C or better. All students must complete an interview, with their parent/guardian present. Ponitz students must maintain GPA at mid-point evaluation or be returned to their home school. Based on the visit to Ponitz, it was suggested that under the CMSD Transformation Plan, all schools become schools of choice, with a district-wide open enrollment policy in place, and necessary interventions at school site to keep the student in their school of choice. Also, a career interest survey and essay were recommended as application components to help the career area placement of the student.

Learning and the Curriculum

The Tuttle School uses Project HOPE for youth at risk of dropping out of school. This project provides supportive services, including professional counseling. Success rates of 82–90% are reported. A site visitor suggested adopting this arrangement for Max Hayes, adding that this is a best practice that greatly reduces the dropout rate. Tuttle also employs individualized programs, which allow students to learn at their own pace, and they place a strong emphasis on professional skill training. Team members suggested that Max Hayes create a broadly supported and reinforced approach to soft skill training that crosses all sectors.

Tuttle's state-of-the-art technology, tools, and labs are critical. Facilities should mirror the workplace environment. Every classroom and shop should feel and operate like a professional environment. Austin has a hands-on machine shop. Max Hayes needs serious commitment to ensuring that students have the proper technology on which to train. Tuttle has a well-designed and modern facility with state-of-the-art technology.

At Tuttle, the entire school, not just specific areas of study, is open to all students. This allows students to use other resources outside of a cluster and also to gain knowledge about other clusters. Max Hayes needs a flexible curriculum, one that allows each student to gravitate toward a career suitable to his or her talents and/or interests.

The first priority of Max Hayes should be to make students job ready; advanced training is secondary. Trade and academics should be integrated. Each career area should have attached academic teachers. Each career pathway at Ponitz has a dedicated math and language arts teacher. The duties, as well as the financial feasibility of employing "career cluster directors" exclusively for Max Hayes, need further examination. Strong partnerships

must be formed between principal and instructional leaders in each cluster. Team members recommended separating Max Hayes into academies with academic staff attached to the academy only.

School Culture and Climate

The Ponitz School has a dress code, which is also recommended for Max Hayes. It was observed that Ponitz has successfully achieved a culture that inspires pride and a sense of belonging among students. Max Hayes must have the same, where students “own” their school. If Max Hayes starts with one or two grades (not all four), this will help ensure the desired culture takes root.

At Tuttle, with its strong collaborative culture, teachers are mentors and engaged with students, volunteering their own time. The Max Hayes culture needs career teachers as a focal point, teachers who are engaged with rigor, relevance and relationships. The teachers are empowered to make changes to improve the school. The culture at Tuttle drives the excellence in programming and student skill attainment. The culture at Max Hayes needs to be developed with the three R’s: rigor, relevance and relationships. This can drive the institution to excel.

Calendar Year and School Day

The Toledo and Tuttle schools employ a half-day technical/half-day academic program. Toledo includes an extra hour in their school day (8:00 a.m. – 4:00 p.m.). It was recommended that Max Hayes consider extended days, periods, and year, as well as a block of alternative days for career classes so that there is more time on task at a time. Ponitz uses 90-minute periods (till 4:30 p.m.) three days a week.

Summary

In looking across all of the site visits, the Technical Team identified several features and components that they recommended for inclusion in the Max Hayes design:

- Academic and technical teachers working closely to design and implement an integrated curriculum
- Strong principal leadership
- Strong partnerships with industry, postsecondary, and the community
- Deep engagement with parents and families
- Opportunity to take college coursework while in high school
- Strongly connected to postsecondary learning
- Businesses working at the school site with students
- Admission requirements
- Career interest surveys
- Culture and climate, including dress code, uniforms, and student ownership of the school
- Flexible and extended time structures to provide more time for student learning
- Professional environment focused on rigor, relevance, and relationships

- Technology infrastructure and tools

Review of Research and Best Practice Literature

The relevant research and literature for the Max Hayes design is organized into three sections, the first dealing with the broad context that includes economic and workforce development, the second dealing with work and the workplace, and the third reviewing high school redesign and reform and, in particular, the redesign of career and technical education for preparing young people for success beyond high school in work, careers, and postsecondary learning.

Economic and Workforce Development

Current economic conditions have made it difficult to think about long-term strategies for economic development. Mark Whitehouse (2010) in the *Wall Street Journal*:

Overall, U.S. industrial capacity declined by an estimated 1% in 2009, the largest year-to-year decrease on record, while goods-producing businesses shed more than 2.3 million jobs. As a result, economists expect unemployment to remain high for many years as millions of American workers in the hardest-hit sectors struggle to find new jobs (para. 6 & 7).

Richard McCormack (2009), in his article, "The Plight of American Manufacturing": "Since 2001, the country has lost 42,400 factories, including 36% of factories that employ more than 1,000 workers (which declined from 1479 to 947), and 38% of factories that employ between 500 and 999 employees (from 3,198 to 1,972)" (para. 4). The recession is exacerbating this problem, and we are likely to feel the lingering effects of the global economic slowdown for several more years. From "The Manufacturing Shibboleth" (Economist, 2009): While some US industries, such as textiles, luggage, furniture, and apparel are in decline, others—computing and electrical products, chemical and medical goods, and energy and transportation—are continuing to flourish, contributing to an overall rise in US manufacturing output.

In a very real sense, *education* is workforce and economic development (Cox, Alm, & Holmes, 2004; Jobs for the Future, 2005; *Rising above the gathering storm: Energizing and employing America for a brighter economic future*, 2005). Learning and work will increasingly be integrated throughout a career for businesses to respond rapidly and successfully to marketplace demands. Product lifecycles are shrinking; products disappear completely within months (Blustein, 2004; National Governors Association Center for Best Practices, 2007). Jobs also disappear and are re-created with increasing frequency. Within such contexts, preparing high school students for specific jobs is unproductive (Levy & Murnane, 2004; Malone, 2004; O'Toole & Lawler, 2006; Olson, 2007).

Forecasts of future demand for workers in specific occupations are notoriously unreliable, and many of the jobs high school freshmen will have when they turn 25 are not yet invented

(Blustein, 2004; O'Toole & Lawler, 2006). Current trends indicate that more than 75 percent of companies in the Standard & Poor's 500 in 2020 are virtually unknown today or have not yet been created (Foster & Kaplan, 2001).

Over half of all jobs in Ohio to be created between 2011 and 2018 will require some postsecondary training beyond high school (Carnevale, Smith, & Strohl, 2010). Between 2008 and 2018, Ohio will create 1.7 million job vacancies. Half of these job vacancies will be for those with postsecondary credentials; about one-third will be for high school graduates; only about 150,000 of those jobs will be for high school dropouts.

Care must be taken to prepare young people for tomorrow's jobs as well as today's and to prepare them to contribute to the business strategy that exists and the business strategy that must emerge if the organizations they work for are to survive and thrive. Business organizations have an uneven track record in crafting strategy. Their missteps—in this age of rapidly declining commitments to lifetime employment—have meant significant reductions in force and a limited commitment to employee retraining and development (Gross, 2006; Kolb, 2006; Tight, 2002).

Economic conditions have made it difficult to provide students with apprenticeships. Moreover, the dropout rate from some apprenticeship programs exceeds 50% for men and 70% for women (Greater Cincinnati Workforce Network, 2010). The Wisconsin Department of Workforce Development (2010) uses a request for proposals process to stimulate and support innovative approaches to youth apprenticeships.

The work is changing--rapidly and significantly. Levy and Murnane's (2004) economy-wide measures of routine and non-routine task input (see Figure 1) show how the work is changing, but they do not indicate whether businesses are using retraining or new hiring to respond to the shift. It would appear that the temptation is to hire new employees for those new tasks, but there is no guarantee that the new hires will have the needed skills, so both strategies are used, and both entail costs. And, while businesses are trying to figure out which one is better, the global competition is rendering the answer superfluous.

Figure 1: Economy-Wide Measures all of Routine and Non-Routine Task Input: 1969 - 1998 (1969 = 0).

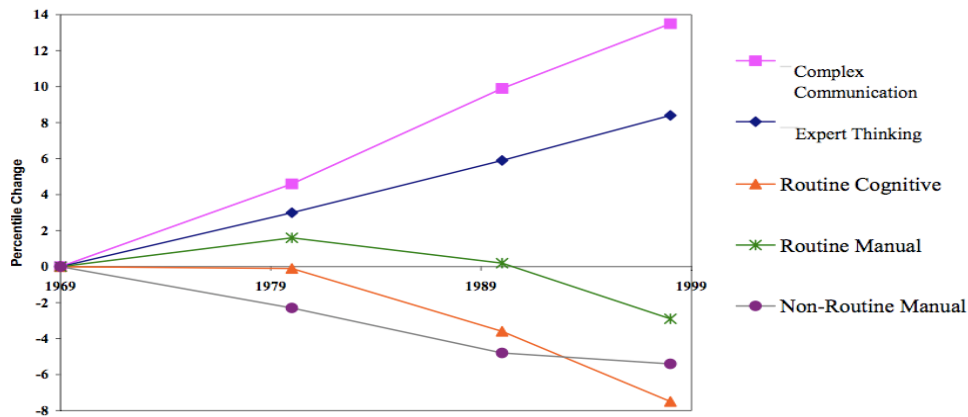


Figure 1. From Levy, F., & Murnane, R. J. (2004). *The new division of labor: How computers are creating the next job market*. Princeton, NJ: Princeton University Press.

Rosin (2010) identifies yet another facet of the changing nature of work, suggesting that the traditional allocation of work types to genders is breaking down and is likely to become untenable going forward. The current recession is likely to further challenge male dominance in the workplace and in particular career areas and pathways. Rosin points out that three-quarters of the 8 million jobs lost were lost by men, continuing a trend that has been developing for at least 30 years. The male-dominated workplace is shrinking. More than ever, therefore, career and technical education needs to reach out to and capitalize on the strengths that young women bring to an ever-expanding array of work in rapidly changing workplaces, not just in the United States but globally.

Postsecondary learning is essential. Most high-wage jobs now require at least a technical certificate or Associate degree. Far fewer need a traditional four-year degree. This does not mean that there is less intellectual challenge in these certificates and degrees. On the contrary, as Mike Rose (2004) in *The Mind at Work* reminds us: What appears to be menial work can be accomplished at high quality and productivity only with generous applications of intelligence. Therefore, we must find the intellectual in every skill set and develop it maximally.

Training needs to be linked to the work and the workplace. Students need to develop their competencies in the workplace or in training centers that resemble the places they will work in, using as trainers the people who actually do the work. This might be accomplished by establishing businesses at or near the school that serve as training centers and are run collaboratively by the business and education (secondary and postsecondary) sectors.

Traditional pathways from high school immediately into the workplace without additional formal education are no longer the norm (Olson, 2006). Lee (2006) describes several programs that provide internships for college students that provide essential contexts for learning 21st Century skills.

Work and the Workplace

Work and the way it gets accomplished are changing rapidly and substantially (Douthwaite, 2006). New work and jobs are being created daily, requiring that both new and existing workers keep their options open, ready to apply their 21st Century skills to rapidly changing work and work contexts (Holzer & Smith Nightingale, 2007).

Technology will continue to widen the gap in performance between those who are highly skilled in its use and those who are not. This is primarily because technology empowers and multiplies exponentially individual talent and skill.

Businesses typically see work and job preparation as the schools' responsibility (see Figure 2). As The Partnership for 21st Century Skills reports:

Three-quarters (75.6 percent) of employer respondents say that K-12 schools should be responsible for providing the necessary basic knowledge and applied skills for their new entrants. Over two-thirds (68.4 percent) say four-year colleges and universities, and 45.2 percent select two-year colleges among their top three choices. Half of the employer respondents (49.7 percent) say workforce readiness is the responsibility of the new entrants themselves.... Only 19.0 percent of the employer respondents report that workforce readiness is primarily the responsibility of the hiring employer, and even fewer—11.4 percent—say it is primarily the responsibility of the business community (Conference Board, et al., 2006, p. 54).

Given that work and the workplace are changing so rapidly and significantly, industry will need to take on a greater role in providing training to its new hires as well as to its existing staff. Additionally, the industry and postsecondary sectors will need to be much more engaged in curriculum design, instructional design, and performance assessments.

Most young people need to work during and after high school in order to support themselves (and sometimes their families) and to pay for additional schooling. Ideally, the work they do should be linked to their career interests. In the later years of high school, young people already are working in entry-level jobs, so they would be willing to accept entry-level pay for apprentice jobs if there were ready access to on-the-job training, career pathways, and opportunities for advancement upon receiving a diploma and/or a credential.

Figure 2 Responsibility for Workforce Readiness

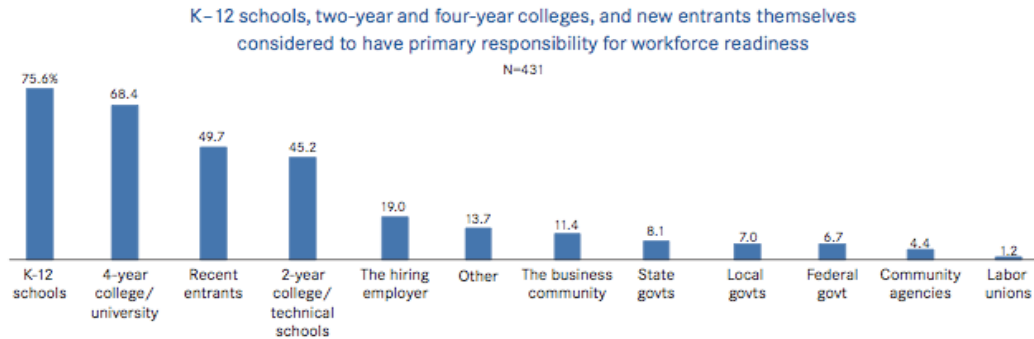


Figure 2. From Conference Board, The Corporate Voices for Working Families, Partnership for 21st Century Skills, & Society for Human Resources Management. (2006). *Are they really ready to work? Employers' perspectives on the basic knowledge and applied skills of new entrants to the 21st century U.S. workforce.* Washington, DC: Author. Retrieved from http://www.p21.org/documents/FINAL_REPORT_PDF09-29-06.pdf

High School and Career and Technical Education Redesign

High schools need to graduate and prepare many more students to achieve success in postsecondary learning and in the workplace. To accomplish this, however, will require a fundamental redesign of high schools (Bottoms, Presson, & Han, 2006; Hoachlander, 2005; Wallis & Steptoe, 2006; Wolk, 2005). Many reform advocates argue that a very different set of skills will be required for high school graduates to succeed in work and workplaces that do not yet exist (Cavanagh, 2007; Colvin, 2006; Conley, 2005, 2007; Lloyd, 2007; Partnership for 21st Century Skills, 2006; Southern Regional Education Board [SREB], 2007). Because neither traditional high school programs nor existing CTE programs are adequately preparing many students for college, life-long learning, citizenship, and work, both designs need to be changed fundamentally in order to address the needs of all students (Borg, 2004).

The prevailing age-grade and seat time structures employed in most high schools are contradictions to a proficiency- and performance-based assessment system. As the reliability and validity of such assessment systems increase, such traditional structures should be retired. Proficiency indicators and performance-based systems should be developed for two-year postsecondary programs as well, complementing the assessment systems that lead to certifications (Mojkowski & Washor, 2007).

A consensus is emerging on the essential elements for next generation high schools. These elements are those most frequently cited as part of that consensus:

- High schools must customize a learning program and pathway for each student that is addressed to essential learning standards, developing what amounts to a career academy for each student. Schools need to be small enough to provide a personalized experience for each student (Dweck, 2006; Erikson, 1968; Gustavson, 2007; Levine, 2002; Pink, 2009; Sarason, 2006).

- Applied learning challenges students to apply their academic skills and understandings to real-world problems through individual and small group projects (Berryman, 1993; Brown & Vaughan, 2009; Coyle, 2009; Gustavson, 2007; Sennett, 2008).
- Project-based learning focused on each student's interests provides a context and structure for integrating academic, technical, and career skills and dispositions into holistic learning opportunities (R. Berger, 2003; Boss & Krauss, 2007; Levine, 2002; Trilling & Fadel, 2009).
- High schools need to provide opportunities for students to learn outside of school in authentic contexts and settings where they can observe and work with adults addressing real-world problems and challenges (Bailey, Hughes, & Moore, 2004; Blustein, 2006; Christensen, Horn, & Johnson, 2008; Halpern, 2009; Pink, 2009; Resnick & Wirt, 1996).
- Academic knowledge and skills must be embedded/integrated into learning modules, with a deep emphasis on literacy and numeracy skills. Students work in classes, small groups, and one-on-one tutoring for direct instruction, including online learning, based on their assessed needs (Jacobs, 2010; Lesgold, 2009).
- High schools employ comprehensive, performance-based assessments in addition to traditional assessments. Such assessments include exhibitions of work and learning on individual and group projects, service learning, college classes, and community-based internships (American Educational Research Association [AERA], 2000; Baker, 2007; R. Berger, 2003; Lesgold, 2009; Linn, 1994; Silva, 2008).
- Parents' involvement in their children's education is required through regular meetings regarding their children's learning plan and participation in reviewing their children's exhibitions of learning and work (R. Berger, 2003; Epstein, 2009; Gustavson, 2007).
- College and career readiness and transition support and longitudinal tracking are an integral part of the entire K-12 experience (Arnold, Fleming, DeAnda, Castleman, & Wartman, 2009; Bloom, 2007; Kahlenberg, 2004; Sedlacek, 2004; Washor & Mojkowski, 2007).
- Business engagement is an essential ingredient for success. The nature of the partnerships needs to change from simply providing funding to forming substantial alliances that include collaborative program and curriculum design, mentoring and instructional support, and program assessment (Reese, 2006a, 2006b; Viadero, 2006).

High quality CTE programs include all or most of these essential elements. Such CTE programs actually produce higher graduation rates than traditional general track high school programs while preparing CTE program graduates for success in postsecondary learning as well as in the workplace (Castellano, et al., 2003; Mojkowski & Washor, 2007).

CTE faces several obstacles, however. For example, a significant challenge in scaling successful CTE programs is the substantial training and support required to prepare teachers to implement the new teaching and learning designs, particularly employing problem- and

project-based learning environments that integrate attention to academic, technical, and work readiness skills (Washor & Mojkowski, 2007).

Another significant issue is the debate regarding how job-specific CTE programs should be. The current understanding of what constitutes preparation for a career is being challenged (Blustein, Juntunen, & Worthington, 2000). The trend appears to be on teaching generic academic and work readiness skills and social competencies to all students and requiring employers to train their workers in the specific job skills. Students come to employer work ready but not necessarily job ready (Colvin, 2006; Gewertz, 2007; Lloyd, 2007; Sipchen, 2007).

High school CTE programs must address academic, technical, and work readiness skills together in a problem- and project-based learning environment (Hyslop, 2007) and assess proficiency through demonstrations of performance in real-world settings, including learning on the job (Association for Career and Technical Education [ACTE], 2006).

CTE program designs include several innovations. For example, Borja (2006) describes the potential role of online learning that is being explored in California and Michigan CTE programs. Furger (2005) argues that online courses provide ways to customize learning that supplement the classroom. Mojkowski and Washor (2007) describe examples of innovative online internships and mentoring as part of CTE programs. Strong partnerships with business are essential (Trotter, 2007). For example, Fahey (2004) describes how technical schools and programs can custom design courses and modules for automobile dealers who hire their graduates. Florida's CHOICE legislation requires that career academies establish close working relationships with business that go far beyond providing material resources (Florida Legislature, 2009).

Opportunities for moving across career areas and specific pathways within those areas must be readily available. Students must be able to customize their learning plans within a particular career pathway or academy. Academy designs, however, need to think outside the typical box of courses, subjects, periods, and grade levels in order to design highly effective and rigorous learning for each and every student within their areas of interest (Quartz & Washor, 2008).

Many of the core components of high quality CTE programs are exactly those design features that are being advocated by proponents of high school redesign: increased relevance, authentic rigor, performance assessments, and connections to the real world (Hoachlander, 2006; McNeil, 2007). Many reformers view all secondary education as needing to be involved in and contextualized by careers and career pathways (Bottoms, 2006; Bottoms & McNally, 2005; Castellano, et al., 2003; Hughes & Mechur Karp, 2006; Jenkins, 2006; Steinberg, et al., 2006). There is a growing trend toward incorporating some form of career education into the high school experience for every student (T. Lewis & Cheng, 2006).

Most high school graduates will not leave prepared to enter the workforce in their field of study. More training will be required, most of it conducted as part of work. Postsecondary

learning, particularly provided by community colleges, technical schools, and specialized certificate programs, is essential to both formal and informal learning (Bedsworth, et al., 2006; Dobelle, 2006). A traditional four-year college program may be unnecessary and inappropriate for many, if not most. Graduates of CTE programs enter postsecondary education at about the same rate as all high school graduates, and a higher percentage of them graduate (Castellano, et al., 2003).

The Bureau of Labor Statistics estimates that occupations requiring an associate degree are projected to grow the fastest—at about 19 percent—of occupations in a category with some postsecondary education (Bureau of Labor Statistics Division of Occupational Outlook, 2009). These jobs often pay as much as or more than jobs requiring a four-year degree (Carnevale, 2007; A. C. Lewis, 2006; L. Olson, 2006; Washor & Mojkowski, 2007).

Postsecondary learning, particularly provided by community colleges, technical schools, and specialized certificate programs, is essential to both formal and informal learning (Bedsworth, Colby, & Doctor, 2006; Dobelle, 2006). In order for these institutions to make a significant contribution, however, substantial and significant changes are required in what is offered and how it is offered. A major redesign is necessary in order to increase relevance, provide more engaging learning, and enhance real-world rigor. Indeed, the very designs advocated for high schools can be applied successfully in postsecondary learning programs.

States and districts are employing a variety of blended CTE program and school designs that provide multiple pathways for all students (Blustein, 2004; Commission on the Whole Child, 2007; Grubb, 2007; Hyslop-Margison, 2005; D. Jordan, 2006; National Governors Association, 2003; Oakes & Saunders, 2008; SREB, 2006; SREB, n.d.; Stasz & Bodilly, 2004). These pathways significantly increase options for students and reduce dropout rates (Callan & Finney, 2003; Jenkins & Spence, 2006).

High school CTE programs must develop skills and dispositions for lifelong learning and provide deep and sustained integrated academic and experiential learning and sophisticated education and workplace tools in real-world settings (Blustein, 2006; Tight, 2002). These programs must address academic, technical, and work readiness skills together in a problem- and project-based learning environment (Hyslop, 2007) and assess proficiency through demonstrations of performance in real-world settings, including learning on the job (ACTE, 2006). The work readiness skills often characterized as “soft” are not only those most valued in the workplace and in postsecondary learning, but are those least well addressed in traditional high school and college courses.

Increasingly, high school programs must be redesigned to fit the student rather than having the student fit the school. Some high schools embed internships in every student’s CTE experience (Singh, 2006a, 2006b), and others extol the benefits of integrated learning and work (Zimmer-Gembeck & Mortimer, 2006). Many educators argue that there is considerably

more relevance in learning and considerably more rigor (in a real-world sense) in CTE programs than exist in traditional high school programs.

Students must be able to customize their learning plans within a particular career pathway or academy. Academy designs, however, need to think outside the typical box of courses, subjects, periods, and grade levels in order to design highly effective and rigorous learning for each and every student within their areas of interest (Quartz & Washor, 2008).

One of the most significant challenges in creating innovative CTE programs is preparing teachers to design and implement the proposed learning opportunities and learning environments. As these innovative CTE programs proliferate in comprehensive high schools, it will be equally important to provide orientation, training, and support to principals. Creating a portfolio of diverse programs that engage each and every student is a new and extremely challenging task, requiring new understandings and an expanded skill set for principals.

Schools must move away from seat time and courses and toward specific learning modules that integrate practical academic, technical, and employability skills that are assessed with simulations, exhibitions, and real performances that demonstrate skill and understanding of the work required: know-how and know-what. Schools need to focus on fewer, clearer, and higher academic standards that align with the technical standards needed for certificates and credentials that lead to employment or learn-while-you-earn programs. This requires knowing how to do the work with an integrated skill set developed in the ways that adults develop those skills (Mojkowski & Washor, 2007). Further, young people are learning much outside of school. Schools need to influence and give credit for that learning, where appropriate.

Design Requirements

Based on these insights and understandings gleaned from site visit field notes and from a review of relevant research and best practice literature, C/BPL identified several design requirements for the Max Hayes school design.

A next generation Max Hayes School should:

- Address career, postsecondary, work, and job readiness coherently and holistically.
- Provide sufficient time for students to achieve competence with respect to the increasing academic requirements for a high school diploma. Even with careful integration of academic, technical, and work readiness skills, there is likely to be less time in the traditional school day for attention to technical skill development.
- Assign high priority to student proficiency with respect to general work readiness skills, including creativity and innovation.
- Focus on applied learning in real-world contexts and settings in order to motivate students to remain in school and persist in their learning.
- Provide a personalized learning program focused on each student's career interests.

- Provide opportunities for each student to engage with adults working in the student's career interest.
- Provide opportunities for students to obtain, in addition to a high school diploma, multiple forms of certifications and credentials in their career interests through industry-certified programs, where available.
- Provide students with a pathway to technical certificates that may require postsecondary learning, particularly an Associate or technical school degree or certificate.
- Encourage and support all graduates in pursuing some form of postsecondary learning during high school and upon graduation as well as work that is aligned with that learning.
- Teach academic skills and knowledge within the projects the students work on in their customized programs of study.
- Assess student performance using multiple measures, stressing exhibitions, simulations, and other performances that demonstrate skill and understanding.
- Ensure that each student's personalized learning program is focused on his/her holistic development as a learner, worker, and citizen.
- Provide the faculty with state-of-the-art professional development and time for developing curriculum modules and planning instruction, including organizing external resources.
- Provide substantial autonomy to the school and its leadership and faculty. The school in turn provides substantial autonomy to each career area in preparing students for work in an industry.
- Ensure that industry and postsecondary sector leaders are involved in all aspects of the career areas and programs of study, advising on the appropriateness of student learning outcomes, learning opportunities, and assessments of skill and understanding.
- Infuse design and the arts into all aspects of the curriculum as a means of nurturing creativity and innovation and creating competent problem-solvers.
- Provide opportunities for out-of-school and disconnected youth to restart and renew their learning, working closely with other organizations and agencies that serve these young people.
- Employ a post-graduation follow-up program to ensure student success at work and in postsecondary learning.
- Develop valid and reliable information regarding the career pathways of all graduates.
- Create an organizational structure and culture that is flexible and nimble in order to respond to changing needs and circumstances in the economy, the workplace, and in the students' lives.
- Create a school leadership structure with a principal who holds staff, partners, and the District accountable for achieving Max Hayes's vision, mission, and goals.

3. SCHOOL DESIGN FRAMEWORK

This chapter presents the overall framework for the school design and serves as the foundation for the program and curriculum designs presented in Chapters 4 and 5. All three frameworks address the design requirements identified in Chapter 2. In addition to presenting the mission, principles, vision, and goals, this chapter provides details on the recommended school features and components.

The thrust of the proposed school design is to create a bold new stance for Max Hayes in the district and the community. The word will go out that the new Max Hayes is worth a second and a third look. This new stance will be expressed most powerfully through Max Hayes graduates, who will demonstrate their readiness to advance their own careers and contribute to the community.

Mission

The Max Hayes School prepares young men and women for success in life-long learning and work by providing them with customized learning programs in selected career pathways based on their interests.

Guiding Principles

To accomplish this mission, the Max Hayes school design will be based on these guiding principles:

- Max Hayes will develop the whole young person, not just a competent worker, but also a lifelong learner and engaged citizen, healthy in mind and body.
- Max Hayes will accommodate students of all abilities.
- Max Hayes students will have a voice and a choice regarding their education.
- Max Hayes graduates will be prepared for success in the workplace and in postsecondary learning.
- Max Hayes students will learn through a curriculum that is focused on their career interests.
- Max Hayes students will have multiple opportunities and ways to show what they know and what they can do.
- Max Hayes will engage parents and families in their children's education and in the school community.
- Max Hayes will be open to the community it serves, aggressively seeking opportunities for service and establishing relationships for advancing student learning and development.
- Max Hayes will form strong and lasting partnerships with the industry and postsecondary sectors.
- Max Hayes will be dynamic and open to ongoing change, nimble and quick in responding to what is happening in the workplace and in society, and particularly in the lives of its students.

Vision

The Technical Team identified several “images of the future” that constitute a vision for how Max Hayes will achieve its mission in accordance with the guiding principles.

- Students are working with faculty-led teams that include industry experts, expert practitioners, and other knowledgeable adults from industry, the community colleges, and the community.
- Faculty members know their students well and care about their development as learners and citizens in the school community.
- Students are learning and working in industry and community settings as well as in the school. Student projects often address community needs and challenges.
- The school facility is open to the community.
- Students are customizing their learning plans to include focused attention on technical certificate requirements.
- While in high school, students are enrolled in postsecondary learning opportunities that are consistent with their learning plans.
- Faculty teams are providing integrated learning modules that address academic, technical, and work readiness skills through highly engaging, real-world projects.
- Students are using a wide variety of general and specialized technology tools to support their learning and work.
- Students and adults learning together, where appropriate.
- Max Hayes operates as a professional organization and culture. It is a bustling place, full of purposeful activity, with many groups of students and faculty members working on different projects and tasks.
- Max Hayes is “open for business” beyond the traditional school day, week, and year.
- Professionals from industry and postsecondary institutions are members of teams evaluating students’ work.
- Students address academic skills and knowledge within their career pathways.
- Female students are participating in all Max Hayes career areas and pathways.
- Students use their learning plans and portfolios during job interviews.
- Max Hayes students schedule fitness and nutrition sessions into their busy schedules.
- Students use performance tests to demonstrate competency based on learning that they did online or out of school.
- A few businesses have “set up shop” at Max Hayes to operate training centers for their employees and for selected Max Hayes students.
- Specialists from local businesses are interacting with students and “scouting” talent.

Max Hayes graduates will have a sound academic foundation—proficient in reading, communications, mathematics, and quantitative and empirical reasoning—and will be skilled in using the arts and design in their career areas. They will be fit, eat smart, and pursue healthy lifestyles. All graduates will be ready for success in postsecondary learning—without remediation—and in the workplace.

Goals

The Max Hayes School will accomplish these goals:

- Every Max Hayes student will graduate with a diploma that indicates that he or she is ready for success in postsecondary learning and work.
- Every Max Hayes student will have an opportunity to graduate with a recognized certificate or some form of endorsement that verifies that the he or she is ready for work in a career area or pathway.
- Every Max Hayes student will graduate with a plan for postsecondary learning and a career.

SCHOOL-WIDE FEATURES AND COMPONENTS

The Max Hayes School will provide a four-year program with a non-traditional ninth-grade “transition” program and a three-year grade 10-12 continuum that stretches into a postsecondary learning program and incorporates (through, for example, dual enrollment, Tech Prep, and articulation agreements) selected postsecondary learning opportunities for selected students.

Max Hayes Students

Max Hayes will employ an open enrollment policy with selection by lottery, taking into account special needs students. Further, Max Hayes will aggressively market its special ninth grade experience and its career areas and pathways to young women as well as young men. Over time, it is likely that the Max Hayes school, program, and curriculum designs will be viewed as particularly appropriate for serving adult learners, particularly young people who have left high school without obtaining a diploma and who wish to resume their learning. Several features and components of the proposed design—a modular curriculum, flexible time, personalized learning plans, and competency-based assessments—will render it suitable for accommodating the special needs of out-of-school youth. CMSD may wish to exploit this design for that purpose, perhaps through a small pilot program conducted in partnership with workforce, postsecondary, and appropriate social service agencies.

Open enrollment will likely result in Max Hayes accepting some students whose basic skills may not be adequate to allow them to participate fully and successfully in the career areas and pathways in grades 10-12. Several aspects of the school design, however, will accommodate students with poorly developed skills while allowing more advanced students to proceed at their own pace. The transitional ninth grade program, the modular structure of the curriculum; the use of extended day, week, and year schedules; competency-based performance assessments; and the relaxation of seat time/Carnegie unit requirements will allow the faculty to address the needs of all students while ensuring that every student is learning at the “edge of his or her competence” with an appropriate balance of challenge and support. The Max Hayes culture will support student engagement and persistence in learning.

The proposed school, program, and curriculum designs can accommodate students who are struggling with traditional academics without necessarily holding back those students who are ready to move ahead more quickly and easily. The program and curriculum structures will

allow the faculty to customize the pace of learning and accommodate different learning styles, providing extra support where needed. Moreover, many students struggling with traditional academics often have extraordinary talent and skill with respect to the technical skills of a particular career area or pathway. The faculty will build on those talents and strengths to achieve academic success for these students as well.

Special needs students will be welcomed and served well within the program and curriculum. Equitable access requires that the Max Hayes student body reflects the CMSD student demographic profile. An inordinate number of special needs students will strain the ability of the Max Hayes faculty to serve all students well.

Student Voice

Max Hayes will establish organizational structures and processes for ensuring that students have a voice in their own education and in the life of the school. Just as the Max Hayes faculty will have expectations of their students, so also will the students have expectations of Max Hayes and the faculty. These student expectations are often expressed in questions such as these:

- Do my teachers care about me and my interests? Can I work with and learn from adults who share my interests?
- Do I find what the school is teaching to be relevant to my career interests?
- Will I have real choices about what, when, and how I will learn?
- Do I feel sufficiently challenged in doing this learning and work?
- Will I have an opportunity to engage in deep and sustained practice of those skills I need to learn?
- Will I have opportunities to explore and to make mistakes without being chastised for failing?
- Will the learning and work I do be regarded as significant outside of school?
- Will I have opportunities to apply what I am learning in real-world contexts?
- Will there be sufficient time for me to learn at my own pace?
- Can I pursue my learning out of the standard sequence?

Max Hayes will establish a student advisory board that includes among its responsibilities advising on the implementation of the school, program, and curriculum components. Each career area will establish mechanisms for ensuring that students' voices are heard and reflected in the operation of career area programs and pathways.

Student Recruitment, Selection, and Support

Max Hayes needs to signal to middle grades faculty, students, and parents that the new school design will create very different learning opportunities and learning environments. Therefore, the School Leadership Team (Administrative Team) will establish a communications channel with the CMSD middle grades (i.e., 6-8) and begin conversations with the middle grades principals to create the appropriate structures and protocols for ongoing communication and collaboration. Next, the Max Hayes faculty will meet with the middle grades faculty and guidance professionals and then with students to discuss the Max

Hayes School, program, and curriculum. Max Hayes will be marketed as one appealing to those students who want to learn in one or more of the career areas and pathways that the school will offer, including any of the four cross-career area themes. This marketing program will give special attention to attracting young women and students with particular talents in the career areas and cross-career area themes.

These marketing messages will stress the important differences in the Max Hayes design and the expectations that the Max Hayes administration and faculty have for those students who wish to apply. These communications will stress the signature of the new school and describe the new culture and climate as well as the special features and components of the programs and the curriculum. Faculty will stress the expectations they have for students and the special culture of caring and support they have established to help students meet those expectations.

Parent/Family Engagement

Although partnerships with industry, the community, and postsecondary institutions will be important for success, the most essential partnership that the Max Hayes faculty can develop is with parents, who need to engage in planning and monitoring their children's learning and participate in the life of the school as a learning community.

Max Hayes will form partnerships with parents and families through programs and activities that engage them while their children are still in the middle grades and work collaboratively with them through to graduation and into postsecondary learning and work. Parents will be deeply engaged in the development of the learning plan and in discussing their children's progress in moving through their program of studies and providing appropriate evidence of their competence and readiness to move on. Parents will be invited to Max Hayes at least twice each year to review their children's learning plans and programs of study and to observe exhibitions of their learning and work.

School Culture and Climate

The Max Hayes Administrative Team and the faculty will give particular attention to establishing the norms and expectations of the school culture and providing a climate in which those norms can be realized. Some of these norms and expectations will be schoolwide, while others will be customized at the career area and pathway levels. For example, each of the career areas will establish specific norms regarding work readiness skills, professional dress and demeanor, and schedules. Each of the four industries will adopt the respective career areas and help them to establish a professional culture and structure that mirrors the finest practices in that industry. Young people will want to stay at Max Hayes because the school will help them to become powerful learners, shape their futures, and do "cool stuff."

The faculty will model these norms in all of their work with students. They will establish a climate of high expectations and professionalism by inviting and coordinating adults from the industry, community, and postsecondary sectors to work with the students. The faculty will

model norms of openness and innovation. The successful implementation of these norms will reflect and emphasize the features and components of the new Max Hayes that distinguish it from its former self and from other schools in the district.

The faculty is responsible for establishing the appropriate climate for learning. The new organizational structure will support the faculty by allowing them to customize time allocations. The new facility will also contribute to the positive climate in that students will feel that the community is making a considerable investment in their learning. The climate will support knowing well and caring for each student. This requires that the faculty actively engage students and build rapport and relationships with them and their parents.

Governance

CMSD will create a Max Hayes School Advisory Board to provide specific school-level guidance to the district and to the Max Hayes Administrative Team. The Board will be deeply engaged in all facets of the school's program and curriculum. It will be organized and operate similarly to boards established in other of CMSD schools. The Board will include representatives from the industry, postsecondary, and community sectors. The Max Hayes principal will attend all meetings of the Board and serve as an *ex officio* member. The Advisory Board will establish a nonprofit foundation to assist the school in procuring resources and otherwise advancing its mission.

The Advisory Board will have such responsibilities as:

- Advising the faculty regarding program and curriculum development and prototyping.
- Identifying resources (i.e., experts, funds, equipment, and space)
- Connecting Max Hayes to the industry, community, and postsecondary sectors.
- Convening industry sector groups to develop partnership agreements and to maintain their vitality and quality.
- Validating technical and work readiness standards.
- Advising Max Hayes faculty regarding internships and apprenticeships, certifications and endorsements, and postsecondary articulation agreements.
- Assisting CMSD in marketing the new Max Hayes School throughout the community.

Organizational Structure

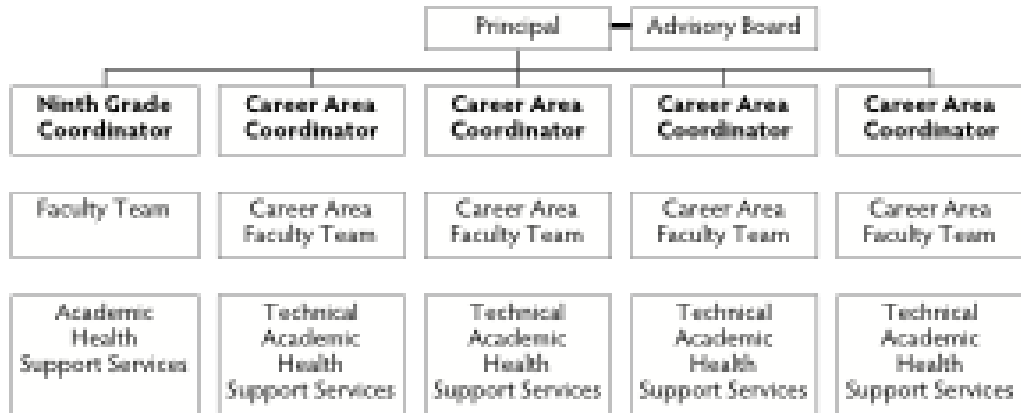
Max Hayes will employ an organizational structure that supports the goals and principles of the school and facilitates the full realization of the school, program, and curriculum features and components.

Management Structure

The principal will lead Max Hayes, with support and assistance from the Administrative Team and the faculty. The Ninth Grade Coordinator and the Career Area Coordinators (CAC) will serve with the principal as members of the Administrative Team. The Administrative Team will

create an organizational structure that provides for shared authority and accountability in each of the career areas (see Figure 3).

Figure 3
Max Hayes Organization Chart



The Administrative Team will have these responsibilities:

- Provide overall direction for the administration and management of the school.
- Ensure that all staff are qualified and have appropriate certifications.
- Foster a culture and climate that stimulate and support faculty innovation and entrepreneurship.
- Develop and maintain strong and enduring partnerships with industry and postsecondary organizations and groups for enhancing learning opportunities and environments for students.
- Engage parents and families in their children’s education and in the school community.
- Ensure that all learning environments, in school and out of school, are appropriate and safe.
- Provide an account to the entire community on the progress Max Hayes is making in accomplishing its goals and achieving its mission.

In addition to the structures and processes employed to link Max Hayes to middle grades, partners, parents, and the community, the Administrative Team will coordinate school-wide communication, collaboration, and coordination. It is likely, for example, that selected students will develop programs of study that include a configuration of modules drawn from multiple career areas and pathways. In order to facilitate such activity, the Administrative Team will develop and implement strategies for working across all career areas.

Career Areas

A CAC will lead each Career Area Faculty Team (CAFT) in each of the career areas. This team will have selected autonomies consistent with the overall structure of the school. For example, the CAFT will establish special norms and expectations and school schedules, and build relationships with industry and postsecondary organizations. Each CAFT will work closely with the appropriate Advisory Board subcommittee. The Technical Team has selected four career areas for Max Hayes:

- Building and Construction
- Information Technologies
- Manufacturing
- Transportation / Automotive

Max Hayes will also offer a fifth career area, Open Pathways. The five career areas are described in Chapters 4 and 5.

Staff Recruitment, Selection, and Support

The Administrative Team will conduct a formal process of “recruiting” all existing Max Hayes faculty members to embrace the proposed design and to commit to developing the details of the new school, program, and curriculum designs. Max Hayes will hire new faculty members as needed to develop and lead new career areas and pathways within those areas. Moreover, existing staff may choose to leave Max Hayes to work in a different school or program. A “new” Max Hayes faculty will emerge from these changes, one that embraces the Max Hayes mission, principles, and vision and commits to developing and prototyping new program and curriculum components.

Max Hayes will require that all teachers operate as members of a team. They will commit to developing program components and curriculum modules to accommodate student and industry needs. Max Hayes teachers will work closely with external experts and expert practitioners to provide needed student learning experiences. Max Hayes teachers will be entrepreneurial and committed to innovating on behalf of their students. All faculty members, not just the technical teachers, will be knowledgeable about the Max Hayes career areas.

CMUSD will create memoranda of understanding with the faculty union to reflect new faculty roles and responsibilities, including managing *ad hoc* teams of external experts and expert practitioners, developing curriculum modules focused on projects, and employing a range of performance assessments for examining and validating student learning and work.

Partnerships

The industry, postsecondary, and community partners will operate as “co-owners” of Max Hayes. The Administrative Team, with the Max Hayes Advisory Board, will coordinate these partnerships.

One particular area in which new forms of partnerships might emerge is with respect to the new Max Hayes facility. While the district will build a state-of-the-art facility and provide state-

of-the-art equipment in all of the career clusters and pathways, it is unlikely that the district will be able to maintain such facilities over an extended period. Therefore, C/BPL recommends that the district establish public-private partnerships that ensure that students have available to them state-of-the-art learning environments and facilities and can work with state-of-the-art equipment.

CMSD will develop agreements with industry partners and postsecondary education partners that allow for flexible arrangements for procuring space. In some instances, both industry and postsecondary partners will use space at the Max Hayes facility. In other arrangements, Max Hayes students will use space and equipment located at industry sites or at postsecondary institutions.

C/BPL advocates the use of public-private partnerships, shared facilities and equipment, and targeted partnership activities that bring a range of resources into the school and bring the students into the industries and the community to perform projects that benefit the industry and the community. While a public-private arrangement is more complicated, it is also much more realistic. These agreements can be developed at both the school and the career area levels and can be customized within each particular pathway. The goal is that CMSD maximize the use of public funds while appropriately extending the benefits of its facilities to industry and the community. Appendix C provides a description of public-private partnership agreements.

Organizational Structures and Processes

Ninth Grade Team

The ninth grade class will serve approximately 200 students and operate as a distinct organizational structure in the school. The ninth-grade faculty will organize students into small learning teams of approximately 20 students led by a faculty member who will serve as the students' advisor until they are ready to enter a career area and work with a CAFT.

Grade 10-12: Career Area Teams

Each of the four designated career areas will serve approximately 130-150 students in grades 10-12.² The CAFTs will be responsible for organizing the programs of study within each of these career areas for all students.

Learning Time

² Total Max Hayes enrollment will be approximately 800 students. A fifth Open Pathways career area will serve some of these students. The ninth grade will serve approximately 200 students.

Because Max Hayes will graduate every student with demonstrated proficiency in all three skill areas (academic, technical, and college and workplace readiness), time structures will be sufficiently flexible to accommodate the different rates and ways in which students will work toward competence in and across learning modules. Specifically, the school day, week, and year will be highly flexible so that individual students and small groups of students have numerous opportunities to receive customized and intensive assistance in addressing knowledge and skill requirements.

Each career area will establish its own schedule. This schedule will be based on the needs of the industry and career area as well as the needs of students who need to participate in activities outside of school. The CAFTs will give particular attention to the way that time is allocated and used.

Max Hayes will operate year round and employ an extended day schedule. The expansion of time will allow for customizing learning opportunities for those students needing more time to achieve basic proficiency on core learning standards. Equally important, those students who demonstrate proficiency on core learning standards more quickly will have numerous opportunities to expand the scope and depth of their learning well beyond the core learning standards. These opportunities will include completing more learning modules addressed to certificates, taking college courses, and participating in other postsecondary learning experiences. Extended time schedules during the summer will allow for faculty to design and manage paid and unpaid internships and other cooperative learning experiences through which students can earn credit.

Providing additional time for faculty learning and work is essential. Common planning time will be required daily in order to refine modules, manage student learning plans and portfolios, and discuss program and curriculum implementation issues with colleagues.

This expansion of faculty time will result in improved quality and effectiveness in implementing the new designs and in realizing enhanced student performance. Max Hayes will provide opportunities for students to engage in supplementary activities, perhaps on Saturdays. For example, labs and fitness centers will be open every day to the community as well as the students. Max Hayes students will also have access to online learning resources in their homes so that they can engage in developing skills and understandings in their areas of interest.

Linkages with the Middles Grades

The middle grades (6-8) will provide for all of their students career awareness and exploration learning opportunities integrated throughout the entire middle grades curriculum experience. Career awareness learning opportunities help students make informed occupational choices and contextualize their learning. Career awareness activities help students learn about the world of work and careers and specific jobs. Students learn what knowledge, skills, and dispositions are required for careers that interest them and what educational courses and programs they need to select in order to prepare themselves for that career. Career

awareness activities include: job shadowing, career interest assessments, and learning how school subjects and disciplines are used in various career areas. A principal curriculum focus is on incorporation of work readiness and applied learning skills in all subject areas and disciplines.

Middle grades career exploration builds on career awareness by providing a more focused and in-depth investigation of careers and work. Its purpose is to help students examine work and the workplace with respect to specific careers through such learning opportunities as internships, cooperative education, work-study, work-based learning activities, and academies. Exploration includes the integration of formal and informal career assessment activities that aid students in discovering their strengths, career interests, and appropriate preparation opportunities to reach their career goals. The ninth grade program at Max Hayes will build on the career awareness and exploration learning accomplished in the middle grades.

Assessment and Accountability

Accountability at the school level is the primary responsibility of the Administrative Team, which must give an account to the community and CMSD regarding progress in achieving the school goals and student performance objectives/benchmarks. Typically, this account will focus on data regarding attendance, retention, behavior, suspensions, and core student performance data, including the Ohio Graduation Tests (OGT), most of which is required by CMSD. The Administrative Team, in collaboration with the faculty, will identify additional indicators of quality and effectiveness that reflect the special mission and goals of the school. For example, the school could report on these indicators:

- Number of student internships
- Number of mentors working with students
- Number of students taking college courses
- Number of partnerships with industry, postsecondary, and community sectors
- Number of hours of community use of the Max Hayes facilities
- Number of adults working with the MHS faculty as *ad hoc* “adjunct faculty”
- Number of graduates engaged in postsecondary learning
- Number of graduates working

The first and most essential obligation that Max Hayes has to its students is to ensure that they graduate with a diploma that indicates they are ready for success in postsecondary learning and the workplace. Since it is essential that every student graduate with a diploma, students must ensure that their learning plans and portfolios provide ample evidence of their having achieved proficiency on all state and district required academic learning standards. In addition, each student must demonstrate proficiency in having addressed work readiness learning standards. Finally, the students will provide evidence of having achieved proficiency in one or more sets of technical skills related to a career area or pathway.

The Administrative Team will be responsible for monitoring the implementation of the new school, program, and curriculum designs. The Administrative Team will work with the faculty in

identifying indicators of quality implementation and developing measures for monitoring those indicators.

Facilities Requirements

Max Hayes students will use facilities, space, and equipment in the new school and in out-of-school locations. Max Hayes spaces will serve as a magnet for bringing resources to the school. One of the ways to ensure that the school can be continually supported is to design a relatively low cost facility that can be maintained with regular school budgets. While Max Hayes will procure appropriate equipment for each of the career areas and pathways, it will aggressively seek out ways to use equipment in the field as well as in the school.

The Max Hayes School, program, and curriculum designs will require these spaces:

- Flexible spaces, (including acoustic quality movable walls, demountable partitions in some spaces, and flexible HVAC, plumbing and electrical outlets as much as possible) to accommodate program changes.
- Spaces with natural light. Spaces with natural ventilation and/or alternative “green” design features.
- Outdoor spaces adjacent to some spaces for outside project based work.
- Small and large group social gathering spaces for students and/or faculty.
- Spaces where industry might establish training centers.
- Fabrication lab open to community.
- Smaller fabrication labs in selected classrooms.
- Arts and design lab open to the community.
- Health, nutrition, and fitness center open to the community.
- Integrated classroom and “shop” spaces for each industry area.
- Office space for industry and postsecondary “adjunct faculty.”

The facility will provide three large spaces—a fabrication lab, an arts and design lab, and a fitness center—that will be open to industry and postsecondary partners as well as the community. Community, industry, and postsecondary partners will be interested in collaboratively managing the space and ensuring that the equipment remains up to date and in good repair. For example, the proposed school site is close to the Cleveland’s Zone Recreation Center. CMSD will consider developing a partnership with the Center to provide all or some of the fitness facilities requirements for Max Hayes students. Finally, the school will have a basic communications infrastructure that includes ubiquitous Internet access, access to basic workplace technology tools and applications, and appropriate technology equipment.

The Max Hayes facilities will be open to all students in all career areas and pathways. For example, the proposed fabrication lab will be used by students in the metal working, welding, and woodworking pathways, and can be used by students working across one or more of the cross-career area themes. The arts and design lab will provide a learning environment for all career areas.

4. PROGRAM DESIGN FRAMEWORK

The school design framework of features and components provides a foundation for the program and curriculum design frameworks. This chapter provides a description of the framework for developing detailed program components and addressing several program design features that are based on the core school design requirements presented in Chapter 2.

The Max Hayes program will include two essential school-wide components: 1) the health, nutrition, and fitness program, and 2) the student support services program. Following a description of those components, this chapter describes the ninth-grade program and presents the framework for developing schoolwide programs. Within that framework are the four cross-career forces at work, or “drivers,” that will be addressed within all of the career areas. The framework for the four career areas and the pathways within those areas is then presented. The chapter concludes with a section on several program-level considerations for the development phase work.

Program Features

These program design features respond to the school design requirements presented in Chapter 2:

- Assist each student in developing a program of study that becomes increasingly focused during the student’s progression through grades 10-12.
- Include in each student’s learning plan and program of study a pathway to postsecondary learning, particularly to community colleges and technical schools.
- Employ the learning plan and the program of study as the central reference for all student learning and focus the faculty and other “adjuncts” on the required competencies and expected performances delineated in the plan.
- Provide choices in career areas and pathways for each learner and opportunities for customization within pathways based on his or her interests.
- Provide pathways to established certificates and endorsements, and create customized certificates and endorsements where appropriate.
- Establish organizational structures to provide the flexible schedules and time necessary to support individual and small group learning in a variety of in-school and out-of-school settings.
- Bring many adults—experts and expert practitioners—into each career area to serve as models, mentors, coaches, and assessors.
- Provide multiple opportunities for students to get out of school into industry and postsecondary settings and contexts in order to work with adults doing work the students wish to do.
- Develop industry, postsecondary, and community partnerships that support each career area and pathway.
- Provide ready access to the support services essential for keeping students focused on productive learning and work and to help faculty respond successfully to students’ needs and circumstances.

- Provide customized, just in time tutoring through a variety of in school, out-of-school, and digital learning resources.

Program Components

Max Hayes will establish two major school-wide programs, one providing all students with a comprehensive health, nutrition, and fitness program and the second providing an array of support services focused on helping each and every student with readiness to participate successfully in his or her program of study within a selected career pathway. CAFTs will determine how students in their career areas access and use these services as part of their learning plans and programs of study.

Health, Nutrition, and Fitness

The Max Hayes school design framework will include a comprehensive health, nutrition, and fitness program that is customized for each student. Max Hayes faculty will, in collaboration with specialists, establish health, nutrition, and fitness outcomes for their students and provide a diversity of learning opportunities for addressing those standards. This program component will be given major prominence in the school and will be integrated into all career areas and particularly the ninth grade experience. This component will communicate to students, their parents, and the entire community that Max Hayes cares about its students and their well-being.

Although an interscholastic team sports program is considered an essential in most high schools, Max Hayes will not offer such a program. Several school, program, and curriculum design features and components militate against providing such a program at Max Hayes:

- A longer school day for all students will limit their availability for team sports that require after school participation.
- A longer school week open to all students will be offered as an option, and will similarly limit student availability.
- Differential scheduling across clusters may interfere with student schedules that include team sports.

The Administrative Team will investigate what options are available for those students who wish to participate in team sports at nearby high schools.

Student Support Services

Max Hayes will provide an array of school-wide support services that can be customized by the CAFTs for use within each career area. This component is essential to the success of the open enrollment system proposed in Chapter 3.

The Partnership Design Framework developed by C/BPL³ describes the overall structure for organizing the many support services provided by CMSD and the many public and private organizations and groups. A delineation of the core elements of this in-school support services component is provided here.

The support services system will provide an academic, social, and emotional safety net system that addresses academic and non-academic needs for students who enter school with significant barriers to learning. It is likely that many entering ninth graders will have significant achievement gaps, particularly with respect to literacy and numeracy skills. Many students, previously unsuccessful in their former schools, will require extra-ordinary support in order to succeed in the career pathway of their choice. At the other end of the spectrum, some students who enter Max Hayes will be above average intellectually, but have experienced school failure because they did not engage well in their previous school. The proposed support system will serve all students well through individualized learning.

Students' literacy and numeracy skills will be enhanced through work group activities, small group workshops, and targeted individual projects. Assessments will be conducted early in the school year to measure literacy and numeracy levels as well as non-cognitive variables that serve as indicators in predicting student success in high school and post-high school endeavors. Gaps in these measures will be targeted for intervention and support.

The Support Services System will address non-academic student needs as a prerequisite for all students being ready and able to learn. Some students will likely enter the ninth grade with mental health, behavioral, and unresolved family issues that impede their learning and development. Many of these students may have experienced these barriers to learning without appropriate resolution.

The Support Services System will use an expanded "Response to Intervention" (RTI) approach in order to address the social and emotional needs of students on multiple levels. The system will "catch" students at each stage of need, in order to provide appropriate intervention. This intervention must be woven into strong parent/family relationships as well and will often involve the family as a level of support and intervention.

A student member of the Technical Team alerted C/BPL to B.R.I.C.K. (Brotherhood-Respect-Intelligence- Conduct-Knowledge), a Cleveland-based organization with a mission to "save lives in the inner-city by teaching young men how to think critically and solve problems through respecting self, others and the environment, while creating a healthy long term support system" (Webb, 2009). Several similar organizations are identified in the companion C/BPL report, *Developing School-Community Partnerships*. The Max Hayes Administrative Team and

³ See the C/BPL report prepared as part of this project, *Developing School-Community Partnerships*.

faculty will engage similar organizations in the greater Cleveland community that can work with the school to design and provide appropriate support services for all students.

The Max Hayes faculty will develop collaborations with organizations like BRICK in designing and implementing the student support system. The Administrative Team will bring community leaders and experts on student support systems onto the Max Hayes Advisory Board and form a subcommittee that focuses primarily on community partnerships and leveraging community resources to help the faculty respond to their students' needs and circumstances. Max Hayes will also consider designating an experienced faculty member to identify and manage these support resources.

Support System Features and Components

Intensive literacy training program. In addition to the literacy and numeracy strategies previously stated, students who still fall below benchmarks will be provided with targeted individual and small group instruction specifically designed to improve their literacy levels and connected to their career pathway work. Max Hayes will use the Orton-Gillingham (O-G) method, a multi-sensory approach to literacy, to support this endeavor.

Executive functioning challenges. Some students will enter Max Hayes with both diagnosed and undiagnosed difficulties in the area of executive functioning. Many of these students come diagnosed with ADHD or other learning differences. These students will have difficulty planning, organizing, and executing project work, and materials management, resulting in poor performance. The support services team will help the faculty learn effective strategies to address executive functioning issues.

Intensive math intervention program. Students with significant gaps in math achievement will be supported through a variety of creative and multi-modal means to enhance math skills. This includes advisory activities, small workshop formats, project-based math skill development, and individual math tutoring, as needed.

Awareness of student learning styles. Support system specialists and faculty members will be trained in the strength-based model of "all kinds of minds," understanding various student learning styles. Training on these various styles of learning, and looking through a strengths-based lens will enable Max Hayes faculty to help students identify the ways they learn best. This approach empowers students with language to talk about their learning styles and for faculty to differentiate instruction ensuring that students can learn regardless of their unique styles.

Just as enlightened businesses care about the health and overall well-being of all of their employees, Max Hayes will help all of its students develop a sound mind in a sound body. Over time, support services will morph from a remedial to a preventative stance. This will require that support services staff develop alliances with faculty serving grades six through eight.

The school-wide program structure has three components: career areas, pathways, and programs of study.

Career Areas

A career area (or career cluster) is a grouping of occupations and industries based on commonalities. Most states use the 16 career clusters identified by the States' Career Clusters Initiative (www.careerclusters.org). Max Hayes School will address four career areas: 1) Building and Construction, 2) Information Technologies, 3) Manufacturing, and 4) Transportation/Automotive. Additionally, C/BPL recommends that Max Hayes consider offering a fifth "Open Pathways" career area in which students can design a customized grade 10-14 program of study that spans two or more career areas or pathways within those areas.

Pathways

Within the four career areas, the Technical Team designated specific pathways for detailed development. These pathways are described later in this chapter. A career pathway is a series of academic and technical career-focused learning experiences leading to a career specialty and employment in a career field. Pathways facilitate a seamless transition from high school to postsecondary education (including apprenticeships, adult education, two- and four-year colleges, and graduate school) and from postsecondary education to the workplace (Ohio Department of Education, 2009).

Each pathway offered at Max Hayes will focus on an occupation within a career area. Each pathway will provide a sequence of modules and related applied learning experiences, including work, that incorporates both secondary and postsecondary education elements and includes coherent and rigorous content aligned with challenging technical, academic, and work readiness standards and relevant career and technical content in a coordinated, non-duplicative progression of courses and applied learning experiences that align high school education with postsecondary education to adequately prepare high school students to succeed in postsecondary education/training. In addition, a program of study may include the opportunity for high school students to participate in dual or concurrent enrollment programs or other ways to acquire postsecondary education credits, and may potentially lead to an industry-recognized credential or certificate, as available and appropriate, at the postsecondary level or an associate or baccalaureate degree.

Max Hayes will consider allowing students to customize a pathway in order to focus on special areas of interest and opportunity. Students will be able to construct a grade 10-14 program of study by working across two or more of the career areas or concentrating in one or more of the special focus areas: technology applications, sustainability, arts and design, and entrepreneurial ventures.

Program of Study

A program of study is the individual student's sequence/configuration of learning modules and other learning activities organized for grades 10-14. The program of study is part of the

student's learning plan and portfolio, which is updated formally twice a year and more frequently as needed throughout the year.

The program of study is the configuration of specific modules in a designated or customized pathway that lead to a certificate or other credential. A national organization or industry group may award such certifications; others may be custom-designed in collaboration with specific industries in the greater Cleveland area. Some students will elect to develop a customized program of study that is patterned after certificate programs developed at the national state level.

For those students who pursue a formal technical certificate program, such postsecondary learning opportunities may be guided by formal articulation agreements developed by Max Hayes with postsecondary institutions, particularly community colleges and technical programs. The program of study will identify the academic, technical, and employability skills for which demonstrations of competence are required and the sequence of modules and other applied learning experiences the student will pursue within and, optionally, across pathways.

NINTH-GRADE PROGRAM

Learning the Max Hayes way will require that many entering ninth grade students unlearn old ways of learning and working. The ninth grade must provide a significant and substantial transition, helping students to reassess and recommit to a new kind of learning. The faculty will design a totally new experience and help all students to be successful in that new environment.

Specific aspects of the proposed design will be new and most challenging for many students. For example, the move away from seat time and to demonstrations of competence will challenge many students. Also new and challenging is the requirement that each student pursue his or her own individual program of study as detailed in his or her own individual learning plan. Despite these challenges, the relaxation of the time-based curriculum, with its unchanging sequences and schedules, will contribute to success in the proposed performance-based system. Moreover, the ninth grade program will focus on knowing each student well and using that insight to craft a learning plan with and for the student.

The goals of the ninth grade program are to help all students:

- Build a profile of themselves as learners and discover and investigate their career interests.
- Develop a learning plan with their parents and their Max Hayes workgroup leader/faculty member.
- Understand and contribute to the Max Hayes culture.
- Unlearn unproductive behaviors and dispositions and form productive ones.
- Take increased responsibility for their learning and personal development.
- Build a foundation of essential skills, particularly in literacy, quantitative and empirical reasoning, and work readiness skills.

- Develop a preliminary program of study for refinement in the 10th grade.

Ninth Grade Program Components

The ninth grade program will have several components, which, in addition to ensuring that each ninth-grade “graduate” is ready to pursue a grade 10-14 pathway-focused program of study, is also comfortable and competent with employing new ways of learning and working.

Workgroups

The ninth grade will be organized into 10 workgroups of approximately 20 students each.⁴ These workgroups will serve as a form of advisory and have as their goal that “no child is left unknown” and that parents and families are deeply engaged in their child’s learning program as well as in the life of the school. A faculty member will serve as the workgroup leader. Students will be randomly assigned to these workgroups.

The faculty’s work with students will include developing an individual learning plan and profile, building a strong relationship with each of their students and with their parents, and meeting with each student at least weekly and with the work group daily. Especially important will be work on school culture and climate and ensuring that each student is deeply engaged in learning. This work can be guided by attention to Sedlacek’s (2004) non-cognitive variables related to students’ social and emotional development (see Appendix D).

The workgroup serves as the anchor for the students as they pursue a variety of learning activities. The faculty will designate how workgroups will be configured to accommodate special needs students. The faculty will use the workgroup as the principal means for orienting ninth grade students to the school culture and to the school, program, and curriculum design. Such activities will include regularly bringing all of the workgroups together for ninth-grade activities.

The faculty will develop a student orientation program that precedes the opening of school. This orientation program will continue into the opening weeks of school until the faculty feels the culture is taking hold and positive patterns regarding learning and work are established. Workgroups will be formed during the summer orientation program.

Individual Learning Plan / Portfolio

One major task for the ninth-grade faculty is building a learning plan and portfolio with and for each student. The learning plan/portfolio has three components: 1) a learning plan that delineates what the student will do to address required learning standards, 2) a program of study that identifies the learning modules the student will complete as part of a career pathway program, and 3) a profile of work and accomplishments, including a portfolio of artifacts that provide evidence of competence with respect to require learning standards and other competencies. While the ninth-grade faculty will begin building this plan with students, it will be expanded and deepened as the student moves into a career area and selects a pathway. This

⁴ Total Max Hayes enrollment will be approximately 800 students.

is particularly so with respect to the program of study, which is established during the 10th grade and refined as it is implemented throughout grades 11 and 12. The learning plan is a negotiation between the student, his or her parents, and the faculty.

The learning plan and portfolio consists of a careful selection of learning modules⁵ and related learning experiences (e.g., workshops, online learning, and individual projects) to ensure that the student has enough of the appropriate experiences to demonstrate proficiency on core academic, technical, and work readiness competencies. Competencies are groups of skills, knowledge, and dispositions that are identified as performance standards.

This learning plan will be based on whatever performance data are available from the students' middle grades and be supplemented by newly collected data on each student's learning profile. Max Hayes faculty will use such tools as the College Board's Accuplacer online test system to build a learner profile for each student. Special attention will be given to identifying each student's interests and talents, social and emotional development, and health and fitness.

The learning plan and an accompanying portfolio of student work and accomplishments will grow in scope and depth throughout the student's program of study at Max Hayes and will be used to continue learning after graduation. Max Hayes will use a digital plan and profile that can serve as a supplementary or alternative "certification" and provide postsecondary institutions and potential employers with an in-depth understanding of each student's competencies.

Projects: Individual and Group

Students will select various projects to join and will have roles and responsibilities within each project as a member of the project team. Students will also develop individual projects with their ninth-grade workgroup leader. These individual projects will stress in creative and engaging ways learning standards that the student needs to address as part of his or her learning plan.

Workshops

Projects are the essential building blocks of the ninth grade experience, but will not be sufficient to ensure that every student has achieved proficiency with respect to essential learning standards. The faculty will design workshops and seminars to focus on particular competencies that all or many ninth graders need to address. For example, the faculty may choose to develop a required workshop module dealing with OSHA (safety) requirements or address specific learning and work readiness skills. Max Hayes will use online learning tools to supplement faculty instruction in developing basic literacy and numeracy competence.

⁵ See Chapter 5 for a detailed definition of a learning module and related curriculum components.

Field Work

The Max Hayes faculty will integrate out-of-school learning experiences into the entire ninth-grade program, including projects and workshops. The world outside of schools provides opportunities for working with adults doing significant learning and work, for observing the way that the academic disciplines operate in real-world settings, for understanding how technology tools are used in specific work settings, and for discovering real-world standards of excellence. Max Hayes will have a permeable membrane that lets the inside out and the outside in. The Max Hayes faculty will design and implement fieldwork that maximizes student engagement and supports powerful learning.

Entrepreneurial Ventures

All Max Hayes students will have numerous experiences to learn about the business aspects of their career interests and to develop and use those skills and understandings in developing entrepreneurial ventures. In many cases, these ventures will take the form of community service projects and initiatives undertaken by the students to address identified community needs. Entrepreneurism is the lifeblood of both the business and the community. Social entrepreneurial activities require that students engage the world and all of its messiness in order to learn deeply and productively and contribute to solving its most intractable problems.

Organization

Max Hayes faculty will develop a detailed organization for the ninth grade. Figure 4 provides a sample of a weekly schedule of the activities to illustrate how the several ninth-grade components can be configured into a program that addresses small groups as well as individual students. Time allocations will undoubtedly shift over time as the faculty modifies priorities to address student needs, for example, to provide more time for projects and workshops and less time for workgroup activities.

This sample time allocation includes considerable time for the faculty to meet for professional development, including curriculum and instructional development. On four days, one half of the faculty will meet while the other half of the faculty works with all students between 3:30 and 4:30 pm. On Wednesday, students will be dismissed at 3:00 pm so that the entire faculty can meet in small or large groups depending on the work that needs to be accomplished. Such faculty meeting time is essential to establishing the appropriate culture and climate. These planning sessions will be supplemented by full-day retreats and longer professional development sessions during the summer. This sample schedule will be modified as appropriate to accommodate the needs and circumstances of the grade 10-12 program.

Ninth Grade Staffing

The ninth grade program will require a special configuration of faculty members who will play multiple roles. Ten faculty members representing the five core disciplines (English/language arts, mathematics, science, social studies, and arts and design) will serve as workgroup

leaders, project leaders, and workshop providers. This core faculty will work with the support service specialists and literacy and numeracy specialists. The Career Area Coordinators will also work closely with the ninth-grade faculty in designing projects and workshops.

Figure 4
Sample Ninth Grade Weekly Schedule

	Monday	Tuesday	Wednesday	Thursday	Friday	Saturday	
8:30	WG	WG	WG	WG	WS	Optional Work in Labs, Fitness Center, or Online Learning System	
9:00	WG	WG	WG	WG	WS		
9:30	WG	WG	WG	WG	WS		
10:00	GP	WS	GP	WS	WS		
10:30	GP	WS	GP	WS	GP		
11:00	GP	WS	GP	WS	GP		
11:30	GP	WS	GP	WS	GP		
12:00	Lunch	Lunch	Lunch	Lunch	Lunch		
12:30	WS	GP	WS	GP	WS		
1:00	WS	GP	WS	GP	WS		
1:30	WS	HNF	WS	HNF	WS		
2:00	WS	HNF	WS	HNF	WG		
2:30	GP	HNF	WS	HNF	WG		
3:00	GP	HNF	FM-All	HNF	WG		
3:30	IP / FM- Half	IP / FM- Half	FM-All	IP / FM- Half	IP / FM- Half		
4:00	IP / FM- Half	IP / FM- Half	FM-All	IP / FM- Half	IP / FM- Half		
4:30	Formal Dismissal						
After School & Evening	Optional Work in Labs, Fitness Center, or Online Learning System						

Codes: WG-Workgroup; WS-Workshops; GP- Group Project; IP- Individual Project; HNF- Health, Nutrition, & Fitness; FM- Faculty Meetings

The faculty will require the support of skills specialists, particularly in literacy and math. These faculty experts will supplement and complement the English/language arts and mathematics teachers working with ninth-grade students. These specialists will allow for maximum use of extended time—day, week, and year—to meet the needs of those students needing extra attention in basic skills areas in order to be successful in accomplishing their projects and related learning activities.

Career Areas and Pathways

In grades 10-12 Max Hayes will provide students with four career areas in which to do their learning and work. Each of these career areas will provide at least three designated pathways identified by the Technical Team (see Figure 5). In selecting these pathways, the Team asked industry experts in all four career areas to identify specific pathways that were valuable within their industries and hold promise for providing work and career opportunities for young people.

The designated pathways typically will lead to some form of certificate or endorsement either at graduation or at the postsecondary level. Students will pursue these pathways in their entirety or may develop customized programs of study that cut across two or more pathways or even two or more career area areas. The career area design will be sufficiently open and flexible to allow students to develop programs of study that pursue one of the cross-career drivers (i.e., technology applications, sustainability, arts and design, and entrepreneurial ventures; see below) across two or more pathways.

Figure 5
Career Areas and Pathways

Career Areas and Pathways				
Building, and Construction	Information Technology	Manufacturing	Transportation / Automotive	Open Pathways
Construction Management	Networks	Metalworking / Machining	Automobile Repair / Electronics	Customized
Woodworking	Technical Support	Welding / Fabrication	Transportation Systems	
Building Trades	Media / Gaming / Social Networking	Robotics / Electronics	Automobile Design	
Customized	Customized	Customized	Customized	

Each of the four program areas will serve approximately 130-140 students across grades 10-12. These numbers will vary depending on student interest and on the faculty's decision regarding the student enrollment in Open Pathways, what might be considered a fifth career area with multiple, customized pathways.

Open Pathways

Consideration will be given to creating a fifth career area which is open to students who wish to custom design their own learning program and portfolio by working across two or more of the existing career areas offered at Max Hayes. In this way, a student who is interested in a particular pathway or skill set within a pathway, can create a customized program of study that

assembles in a coherent fashion a scope and sequence of modules that address academic, technical, and work readiness skills.

The faculty will establish criteria for participation in Open Pathways. For example, students wishing to pursue this option will need to be highly motivated, self-directed, and self-managed, with their career interests reasonably well formed and a highly focused learning plan that can serve as a basis for constructing a program of study. Many students will not be ready for such a program, particularly in grade 10. Therefore, Open Pathways will likely start with very few students in grade 10 and add students in grades 11 and 12.

Open Pathways will allow Max Hayes to reach out to highly talented young people who wish to earn their high school diploma while pursuing their interests and developing their special talents. This program essentially wraps a career academy around a student's career interests.

Figure 6 provides a suggested staffing for the career areas framework. Each career area will have a coordinator as well as a specialist for each pathway. A team of 10 academic specialists (2 in each of the 5 academic areas: English/language arts, science, math, social studies, and the arts and design) will work in and across the career areas to provide project and module support as well as provide targeted workshops. A team of support specialists will work similarly. This team will include specialists to implement the support services system and the health, fitness, and nutrition program (see Chapter 4).

Figure 6
Suggested Staffing for Career Areas

Career Areas and Pathways				
Building, and Construction	Information Technology	Manufacturing	Transportation / Automotive	Open Pathways
Career Area Coordinator (1)	Career Area Coordinator (1)	Career Area Coordinator (1)	Career Area Coordinator (1)	
Pathway Specialists (3)	Pathway Specialists (3)	Pathway Specialists (3)	Pathway Specialists (3)	
Academic Teachers (10)				
Support Services Specialists (6)				

Cross-Career Area Drivers

Each of the career areas will be significantly impacted by key cross-area drivers or forces at work, each of such significance that they might constitute a career area or pathway themselves but selected because they are central to the way in which each of the four career areas and selected pathways will develop in the future. These drivers are: 1) new and emerging technologies, 2) sustainability, 3) design and the arts, and 4) entrepreneurial ventures (Figure 7). At the heart of these drivers is the relentless innovation they bring to any

career area. In many respects, they constitute the cutting edge of each of these career areas and hold substantial promise for providing challenging and productive work opportunities. Students in any of the career areas who can demonstrate competence in addressing one or more of these special drivers will undoubtedly enhance their success in finding work they enjoy and that pays well.

New and Emerging Technologies

All career areas are deeply affected by some form of technology—tools, processes, or materials—that change products and services and the nature of work and how it is performed. Technology is a major source of productivity, eliminating or drastically changing many jobs while creating many new ones.

Sustainability

As with technology, issues of a sustainable environment impact every career area. Also as with technology, there are many opportunities for students to develop valuable skill sets that will be needed to respond to the requirements of a sustainable environment in every industry. Max Hayes students will see themselves as citizens and stewards of an environment needing innovative ways to improve the health of the planet. Sustainability includes attention to resource and waste management, productivity and efficiency, lean manufacturing, alternative materials, and scores of other important topics.

Design and the Arts

There are numerous opportunities for integrating design and the arts into many pathways. This driver embraces design and design thinking as well as applications of the formal arts in each of the career area areas. Design thinking is employed in many industries. For example, in the information technology career area, students can blend design thinking, media arts, and technology applications to identify new products and services. Design and the arts bring a special set of skills, understandings, and dispositions that are applicable in all career areas and pathways.

Figure 7: Cross-Career Area Drivers

Drivers	Career Areas			
	Building, and Construction	Information Technology	Manufacturing	Transportation / Automotive
New Technologies				
Sustainability				
Arts and Design				
Entrepreneurial Ventures				

Entrepreneurial Ventures

Entrepreneurism is at the heart of business and is increasingly applied to addressing community and social needs. Each career area will incorporate student designed and operated entrepreneurial ventures that are appropriately integrated into pathways and learning modules. The Max Hayes faculty will develop and offer a workshop or learning module on entrepreneurship as an elective offered to all students. This module will address such skills as business planning and development, marketing and sales, and production. Such a module allows for integration of academic, technical, and work readiness skills. These entrepreneurial ventures may result in income-producing activities, but most often will be of the social entrepreneurship variety. Students might not only design products and services for sale, but might establish entrepreneurial ventures linked to community service.

Each career area will incorporate cross-disciplinary endeavors that integrate academic and experiential learning with a focus on complex problem solving/critical thinking skills applied to each of these four drivers. For example, pathways and learning modules can provide students with opportunities to use leading edge digital technologies and green-building design to produce practicable solutions to endemic community problems. More specifically, students could demonstrate how small-scale manufacturing can produce environment-friendly products.

Questions such as these can serve as prompts for designing learning modules that integrate the four drivers into projects and other learning opportunities:

- How are technology tools, processes, and materials employed in the industry and in specific pathways?
- What opportunities are there for enhancing productivity and quality through increased attention to a sustainable environment?
- What specific competencies related to design and the arts are particularly valuable in this industry and the career pathways?
- How are design and design thinking employed in these career areas and pathways?
- What impact are these drivers having on the career areas and pathways?
- What new jobs are emerging as a result of the impact of these drivers on each of the four career areas?
- What new or expanded competencies are required in these jobs?
- What opportunities exist to bring these competencies into learning and work in this career area and in specific career pathways?
- Where are the business opportunities in this industry?
- What opportunities exist for providing valuable services to the community?
- What specific competencies related to entrepreneurship are particularly valuable in this industry and the career pathways?
- Who in the community is developing entrepreneurial ventures in the Max Hayes career areas and pathways?

Some Max Hayes students in the Open Pathways option may wish to “major” in one of the cross-area drivers and develop their entire program of study around a driver. For example, students may wish to develop a specialization in sustainability, even to the point of earning certificates, and then apply that specialization across the career areas offered at Max Hayes.

Similarly, students may wish to develop specializations in applying the arts and design across multiple career areas and pathways. The faculty will develop learning modules that emphasize these cross-area drivers and introducing them as early as the ninth grade. Further, the faculty will share these modules with the middle grades faculty for use as part of their career exploration activities.

Career and Pathway Development

For each of the pathways within each area, the faculty will develop these components as part of an integrated and coherent program:

Curriculum Specifications

The curriculum will delineate specific student learning standards, learning activities, learning environments, learning resources, and assessments. For most of the designated pathways, national curriculums prepared by industry or trade groups can be adopted or, more likely, adapted. Where existing curriculum is already developed for particular certificate programs, the faculty will employ whatever assessments are required for demonstrating readiness to earn the certificate. The faculty will supplement these assessments with whatever is required for the student to demonstrate proficiency on required academic and work readiness skills. Industry partners will help with certificate programs, identifying and validating competencies, participating in student assessments, suggesting instructional practices, and identifying appropriate technology applications.

Faculty

The pathway plan will identify the faculty required to implement the career pathway program. The plan will identify the teams of technical and academic faculty for the pathway and identify the specific faculty competencies required to teach. The plan will also identify the external experts and expert practitioners who might be engaged as support staff in each career pathway.

Internships and Apprenticeships

The pathway plan will identify the internships and apprenticeships (paid and unpaid) available or that could be created for the career pathway. The form and substance of apprenticeships will vary across the four career areas. Therefore, most will require customized development within each pathway for selected students. Developing apprenticeship opportunities at Max Hayes presents several challenges across all of the career areas and pathways. Not only is the number of opportunities diminishing, those few are awarded to older, unemployed adults, and most require either a high school diploma or a GED. It is unlikely that most Max Hayes students will be ready for acceptance into an apprenticeship program before graduation. Therefore, it may be more productive to consider pre-apprenticeships in each pathway, to identify the specific sets of competencies (skills, knowledge, and dispositions) required, and to incorporate those competencies into student learning modules which students can select if they wish to progress along such a certificate pathway following graduation.

Partnerships

The pathways plan will delineate the partnerships with the business and postsecondary education sectors that will be essential to developing and implementing each career area and its pathways. What places and spaces, equipment and tools, and expert staff can partners contribute? What places and spaces at Max Hayes might be open to use by partners? What arrangements might be made at postsecondary institutions for taking courses? How can dual enrollment and articulation agreements be expanded and enhanced? How can high school to college transition programs be designed?

Partnerships, both the specific ones created and the organizational structures and processes for developing and maintaining them, are the lifeblood of the pathways program. Max Hayes's success with its students is highly dependent on the scope and depth of partnerships it establishes with the industry, postsecondary, and community sectors.

Postsecondary Options

The pathway plan will describe the postsecondary learning options, particularly with respect to community colleges and technical programs. This plan will also include a description of the opportunities to pursue postsecondary learning as part of the grade 10-12 program of study. The Max Hayes faculty will develop learning and work pathways that are located within businesses that agree to provide learning opportunities aligned with work. This aligned learning can begin while students are still at Max Hayes. They can discover the way that professionals advance their expertise by adding new knowledge and skills to reflect the rapidly changing needs and circumstances of their industries.

Organizational Arrangements

The pathway plan will describe the specific organizational arrangements that need to be incorporated into planning for the career pathway. For example, the pathway program might require a different school schedule (day-week-year) or require specific out-of-school learning environments and contexts. Max Hayes will need to make provisions for student transportation to learning and work sites outside of school.

Space and Equipment

The pathway plan will describe the specific space and equipment requirements, including a delineation of the out-of-school places and spaces that will support the curriculum and instruction in this career pathway. The plan will specify the space and equipment that will be provided by businesses or postsecondary institutions.

General Considerations

Each career area must accommodate students who have a range of career interests. They will typically fall into three categories:

1. Some students will select the career area merely because they wish to do their learning within that area of career interest. These students may not be interested in obtaining any special certifications, but wish to obtain a high school diploma and pursue postsecondary learning.

2. Other students may wish to pursue a much more intensive focus on technical skills in addition to the required academic learning standards. These students also may not be interested in a certificate at the high school level, but may be interested in pursuing such a certificate in postsecondary learning.
3. Finally, many students will wish to obtain one or more certifications while earning their high school diplomas.

Max Hayes will serve all three types of students. Earning a high school diploma, however, is the primary mission of Max Hayes and will be given priority.

All four career areas and pathways within those areas will provide opportunities for linking to postsecondary education. Each student's learning plan will address, at a minimum, a projection of learning activities through the community college level. These linkages to the postsecondary sector can be formal, as is accomplished through such programs as Tech Prep programs and articulation agreements, or informal through having students take college courses as part of their learning plans and programs of study at Max Hayes.

Staffing

A Career Area Coordinator (CAC), who is also a member of the Administrative Team, will lead each career area, which will have a Career Area Faculty Team (CAFT) consisting of teachers with specific academic or technical credentials. There will be one set of faculty members for each career area, although some career area faculty members will work across clusters, particularly with respect to responsibility and authority for leading/facilitating student learning on specific academic skill sets. Moreover, selected faculty who focus on one or more of the cross-area drivers (i.e., technology applications, entrepreneurial ventures, arts and design, and sustainability) may work across clusters.

Each CAC will establish a shared leadership mechanism for the career area, including liaison with the Max Hayes Advisory Board. Moreover, the CAC will be responsible for designing, with the CAFT, the many ways in which partnerships will be established with the community, industry, and postsecondary institutions most relevant to that career area.

Faculty Roles and Responsibilities

The CAFT in each career area will be responsible for assisting each student in updating his or her learning plan and portfolio and for monitoring that plan and portfolio for addressing the essential academic learning standards as well as technical skills and work readiness skills. The CAFT will give special attention to the program of study, which constitutes the student's plan for pursuing a specific pathway leading to a certificate or set of certificates and endorsements either at graduation or at the successful completion of a postsecondary program.

Faculty members will assume the role of learning team leaders, with teams consisting of Max Hayes faculty, supplemented by community, industry, and postsecondary faculty who serve as

mentors and coaches to students as well as provide technical assistance to the faculty in curriculum design, instructional practice design, and assessment.

Additional CAFT responsibilities include:

- Organizing all external mentors, coaches, assessors, and other human resources, including online access to special expertise located in the US or globally.
- Establishing the overall organizational structure, culture, and climate of the learning environment, including the formation and operation of student advisories, student voice/governance activities, facilities utilization, out-of-school settings for learning, and linkages to postsecondary learning programs.
- Developing schedules that include faculty planning time and time for advising students regarding their learning plans and portfolios.
- Determining what equipment and materials, including general-purpose and specific technology tools and applications (e. g., online and in-school simulations), are needed and how those materials and equipment will be obtained, either through purchasing with the school budget or in “renting” or “borrowing” from out-of-school resources such as the community and local businesses. For example, it might be more cost-effective for the school to rent (or otherwise obtain through donations, for example) the use of expensive equipment that is used for only a small portion of the students and or for a small portion of the curriculum.
- Configuring the learning and workspaces available and how equipment is used in those spaces. Chapter 3 provides general recommendations regarding those spaces, but each team will customize those requirements. Priority will be given to creating flexible spaces that allow for such customization. Further, each CAFT will determine how it will organize and allocate student access to the three large spaces—a fabrication lab, and arts and design lab, and a fitness center—that will be open to industry and postsecondary partners as well as the community.
- Establishing and maintaining partnerships with the industry, postsecondary, and community sectors.

Assessment and Accountability

As a supplement and complement to the schoolwide assessment and accountability program, each CAFT will be responsible for establishing a program and student assessment system that is consistent with the career area and pathways. The CAFT will identify specific indicators of program success and collect and disseminate information on those indicators at least yearly.

Each semester, students and faculty will review all learning plans and portfolios to monitor progress in addressing required academic learning standards. Particularly in grades 11 and 12, students and faculty members will give priority to learning activities that address academic learning standards not yet addressed in the student’s learning plan/program of study. The CAFT in each area will be responsible for determining if each student has achieved enough competencies to graduate with a high school diploma and relevant certificates.

The CAFT will organize other national, state, and local assessments that are related to the specific career area and pathways. For example, Skills USA (www.ohioskillsusa.org) provides an important assessment system component for many career pathways.

Max Hayes graduates will use their learning plans and portfolios to provide to postsecondary institutions and to potential employers substantial and significant evidence of the competencies they have acquired and the products they have developed. Max Hayes will work with postsecondary institutions and employers to ensure that they are ready and able to examine such portfolios as part of their assessment of the students' readiness for postsecondary learning and/or work. In effect, each student will be compiling his or her own customized "certification" of competence and readiness for further learning and work. The portfolio will provide a much more comprehensive set of information than the high school diploma or the high school transcript.

Accountability at the program level is the responsibility of the CAFT, which will collect data about their students and about the quality of the programs offered. In addition to the school-wide indicators, each CAFT might provide data on additional indicators such as:

- Number of certificates and pre-apprenticeship opportunities provided
- Number of awards and endorsements earned

Each CAFT will focus on 2-3 indicators that are unique to its career area. Moreover, the CAFT will provide not just numerical data, but images and stories/cases that illustrate the quality and impact of their program on student success. Each career area will provide all of its students with an opportunity to use the Ohio competency assessment system. The application of this system is described in Chapter 5.

5. CURRICULUM DESIGN FRAMEWORK

The school and program design frameworks provide a foundation for the curriculum design frameworks. This chapter provides a description of the framework for developing detailed curriculum components, addressing several curriculum design features that are based on the core school design requirements presented in Chapter 2.

The Max Hayes curriculum will employ several school-wide components: 1) the student learning plan and portfolio, 2) the program of study, 3) a modular curriculum structure, and 4) a performance-based assessment system. Following a description of these and related components, this chapter presents several considerations in managing the modular and individualized curriculum and student assessment.

The curriculum is what students most directly experience at school. At Max Hayes, students will be required to demonstrate their competence in essential and valuable skills and understandings. More important to their long-term futures, however, students will experience every day a totally new and refreshing experience—the Max Hayes way of learning and working—that they will draw on for the rest of their lives.

Curriculum Features

These curriculum design features respond to the school design requirements presented in Chapter 2:

- Employ a modular curriculum that integrates attention to academic, technical, and work readiness skills within projects related to specific career pathways.
- Use project-based learning as a core curriculum and instructional strategy in all modules, projects, and workshops, as appropriate.
- Assist students in customizing programs of study.
- Provide flexible time structures and allocations so that students have sufficient time for deep practice that enables proficiency on essential learning standards.
- Employ a performance-based assessment system.
- Address the four cross-career drivers in all career areas and pathways, as appropriate.
- Provide students with in-school and at-home access to an array of online learning resources and instructional programs and materials that are embedded and integrated with the specific pathway focus of modules and projects.
- Provide students with choice and flexibility in selecting learning modules and projects within modules.
- Provide focused skills development to individual students that is connected to their pathways work.
- Provide multiple ways for students to demonstrate competence, including particularly performances that demonstrate both skill and understanding.
- Employ the Ohio Competency Assessment System as a means of helping students demonstrate proficiency on important learning standards based on learning and work accomplished both in school and in out-of-school settings.

Curriculum Components

Learning Plan and Portfolio

The learning plan was described in Chapter 4. It serves as an anchor for the highly individualized Max Hayes design. As students select modules and projects, they use the learning standards provided in the learning plan to guide them in configuring their own learning. For example, students, with faculty guidance, will track which learning standards they have not yet addressed and begin to incorporate those into particular modules or other learning activities. Faculty members, based on an assessment of the student's performance, will require that new projects focus on particular sets of learning standards that the student has not yet addressed or where the student has not yet demonstrated proficiency. Each student's learning plan will reflect his or her ever-changing performance profile.

The learning plan and portfolio structure places considerable responsibility on students for ensuring that their projects are helping them to develop competencies that they can then demonstrate through performances. In effect, the learning plan and portfolio wraps a career pathway around each student, built on student self-assessment, faculty assessment, parents' insights and recommendations, student career goals, talents to be developed, and considerable performance data gleaned from existing school records and from assessments conducted in the ninth grade (e.g., Accuplacer online tests). Student responsibility for designing and executing the learning plan typically grows gradually between the ninth grade and graduation. The student learning plan and profile constitutes the essential record keeping system for verifying that a student has addressed specific standards within a module and that the assessments provide evidence of proficiency.

Programs of Study

Programs of study, also previously described in Chapter 4, will, in most cases, be based on national, state, or industry certificate programs that include detailed sets of learning standards and appropriate assessments. Many of these programs also provide detailed learning objectives and learning activities, accompanied by teacher and student materials. The faculty will draw on these programs in developing the configuration of learning modules that constitute a specific designated pathway in a career area.

Many of the national certificate programs assume that the technical skills will be taught separately from academic ones and, sometimes, even separate from general work readiness skills. Moreover, the available curriculum guidelines and materials are not "integration friendly" in that they are often employ a standard time-based scope and sequence in addressing learning objectives. Nevertheless, these materials are extremely useful in providing "ingredients" for the faculty in selecting specific learning objectives and configuring them into modules focused on a series of projects of various scope, depth, and complexity. These national curriculums also identify the assessments that provide evidence of proficiency. Even in cases where a national or industry-based pathway program is available, the faculty will ensure that each student has sufficient opportunity to address the essential academic and work readiness skills and competencies within the learning modules.

Consistent with the curriculum design requirements, learning modules will be integrated. In that sense, therefore, all pathways will be to some degree customized if only to ensure that there is a holistic integration of all three sets of competencies within the projects and other learning activities in a module.

Some students will develop customized programs of study that assemble a set of modules to form a rigorous, comprehensive, and coherent progression that leads to a high school diploma and, in some cases, to special certificates or endorsements and in all cases to postsecondary learning. Thus, for example student may wish to create a customized program of study around landscape design, construction, and maintenance. The student would complete several of the core Building and Construction career area modules in the 10th grade and begin the specialized landscaping modules in grades 11 and 12. The progression in the program of study requires not only that students expand the range of competencies they address but, through opportunities for deep practice, also develop competence and even expertise over time.

Workshops

The faculty will develop workshops that focus on specific sets of skills. For example, the faculty will develop mini-workshops for small groups of students that focus almost exclusively on developing specific skill sets in such areas as literacy, mathematics and quantitative reasoning, and empirical reasoning. It is likely that the faculty will develop mini-workshops addressed to preparing students to take the Ohio Graduation Test or the SAT or ACT. These will be conducted as standalone workshops or be incorporated into other modules. The benefit of a modular approach is that faculty can integrate as much attention as is required for particular skills for a particular student. Students will participate in these workshops based on their own and their teachers' assessments of skills needed to make good progress in their projects and pathways.

Individual Projects

The faculty will use individual projects to focus a student on addressing specific competencies or skill sets that need to be addressed. As with all projects, the core focus will be on a problem, challenge, or product related to the specific career area or pathway interests. Individual projects will have a structure similar to that used for learning modules.

Modules

Modules are the basic building blocks of the curriculum in each career area and pathway. Their purpose is to organize the curriculum into manageable chunks and to allow for the integration of discipline-based content and skills with college and work readiness and technical skills. Modules are built around sets of performance expectations that are linked to sets of academic, work, and technical standards. The organizing frame is typically a project addressed to a particular set of problems or challenges that requires a product or specific outcome. Modules make the learning more manageable for learners and allow the faculty and

students to incorporate attention to one or more of the cross-career area drivers (technology applications, sustainability, design and the arts, and entrepreneurial ventures).

Each module will contain materials for students that describe the learning standards addressed, the specific learning objectives to be accomplished, and an overview of the assessments that will be administered to determine proficiency in addressing the learning objectives. This descriptive material will help the student in selecting modules for his or her program of study. The student and his or her faculty advisor will modify modules as needed and appropriate. For example, additional learning objectives and activities could be added to a module to ensure that the student has sufficient opportunity to address the requirements for those objectives.

Modules can be highly structured parts of a certificate-focused pathway and can vary considerably in length from a few hours to several weeks. Modules can be thought of as small-scale syllabi for a semester or year-long course, but there are several aspects of modules that distinguish them from syllabi, the most prominent being that they are multidisciplinary, incorporate attention to several different skill sets, and are based on one or more projects of varying scope and complexity.

By using a modular structure, the faculty can create relatively standard configurations and sequences that constitute a specific standard pathway within a career area (e.g., welding/fabrication or construction management) or a customized pathway addressed to a particular cross-career area theme (e.g., sustainability) across two or more career areas or pathways within a career area. Thus, a student may choose to specialize in sustainability as it applies within an industry or career area or across several industries in multiple career areas.

Modules have these components or “ingredients:”

Standards and learning outcomes. These are drawn from national and state learning standards in three areas: academic, college and work readiness, and technical skills relating to a particular pathway. Several resources provide sample configurations and sequences of courses.

Focus Statement. Essential questions, problem statements, and challenges that frame the module and contextualize the learning and work.

Learning Tasks. Description of learning tasks and activities, required and optional, as well as the context and setting.

Expected Results. Specification of the quality standards and requirements for success.

Assessments. Paper and pencil, online assessments, and performance-based exhibitions.

Modules can be of any length and topic. For example, the faculty may develop several modules that focus on particular skill sets or learning objectives. These modules can then be configured with others to form a coherent sequence that addresses key learning standards. All career area modules will require attention to the four cross-area drivers (technology applications, sustainability, design and the arts, and entrepreneurial ventures), the four core

academic disciplines, and the technical skills. In addition to these three skill sets, the Max Hayes faculty will give particular attention to specific non-cognitive variables that have been demonstrated to promote success in postsecondary learning and work. Appendix D provides a description of these variables.

This proposed modular design, as distinct from traditional semester-long and yearlong courses, although challenging to design and implement, provides several distinct advantages for both teachers and students. The modular approach allows students to move at their own pace, thereby accommodating the diversity of student learning styles and learning abilities that Max Hayes will serve. The modular approach also provides teachers with more opportunities to customize their instruction for the individual student and provide just the right amount of challenge that brings every student to the edge of his or her competence, where significant and authentic learning can take place. Appendix E provides a sample module template.

Industry experts and postsecondary faculty can help the faculty with curriculum development by identifying essential skills and competencies and providing examples of what those competencies look like in the workplace. Similarly, postsecondary representatives can help the faculty include those competencies that are essential for success in postsecondary learning, particularly in the community college and technical school programs. This work can build on traditional articulation agreements.

Managing the Modular and Individualized Curriculum

It is challenging to design and manage a modular and individualized curriculum, but there are tools and processes for accomplishing this task. Appendix F provides an example of a tool for ensuring that the Max Hayes curriculum, including whole career areas and programs of study, address all essential learning standards. Other tools can be used to track individual student learning plans against these learning standards to ensure that, over grades 9-12, each student addresses all essential learning standards and provides performance data, quantitative and qualitative, as evidence of proficiency.

Students, with guidance from the faculty and support from experts and expert practitioners, will select projects that allow them to address required skills academic, technical, and work readiness. Digital tools are also available for helping the faculty and students manage this work.

Faculty in grades 9 and 10 will provide more structure for students even as they move toward increasing degrees of independent learning and learning management over time. The faculty will offer these students a variety of projects from which they can choose. Some individual projects will be introduced in both grades, and the faculty will make judgments on each student's readiness to move to increasing levels of independence. Grade 12 students who have made good progress in demonstrating proficiency in core modules will have increasing amounts of flexibility in designing their learning plans and in preparing evidence of their proficiency. The learning plan and profile provides a vehicle for increasing degrees of self-management as the student proceeds through the program of study.

In building a learning plan and portfolio, the student and faculty will identify those modules that each student must complete successfully in order to progress through the program of study delineated in the learning plan. The learning plan will also describe a postsecondary learning component.

The ninth grade curriculum will feature a wide variety of projects that include entrepreneurial ventures, community service, and introductions to problems, projects, and challenges related to all four career areas and the cross-career drivers. The faculty will design several workshops that address core learning standards that many students need to address. Students will then be advised to sign up for various workshops, which will be connected to students' interests by integrating fieldwork, interesting problems, and related authentic experiences so that students understand that the skills they need to develop are connected to work that they want to do.

The progression from grades 10-12 will include an increasing focus on the program of study supplemented and complemented by specific workshops, individual projects, and participation in the health, nutrition, and fitness program. Each learning plan will specify the out-of-school work to be accomplished after school, during school, and during the summer. Most of the summer work, paid and unpaid, will be linked to student progress in his or her program of study. Most of this work will be at the 11th and 12th grade levels.

Student Assessment

All Max Hayes students will take all required CMSD and state tests. In addition, student assessment will be conducted at three levels: 1) module or project, 2) learning plan and portfolio, and 3) program of study.

Assessment will be built into each module and will include multiple ways of providing evidence of proficiency giving special attention to performances that demonstrate skill, understanding, and dispositions. Self-assessments with rubrics will be employed and will be used both formatively and summatively. Paper and pencil assessments will be employed as appropriate, but primary attention will be given to performances. All assessment information will be recorded in the student learning plan and portfolio.

All modules will include detailed specifications regarding the performances and other outcomes that the student must produce in order to demonstrate competence. These demonstrations will be based on learning that the student has done in or outside of school or online. Students will be able to "test out" of a module or demonstrate proficiency on selected competencies. The student learning plan and portfolio will allow for ongoing documentation of skills addressed in each project and the performance outcomes.

Students will take the Ohio Graduation Test (OGT) for the first time in the spring of their sophomore year. Students can continue to take the OGT in the fall and spring of their junior and senior years and during the summer. Students who do not pass the OGT will need to include more projects and workshop time devoted to mastering the test.

The Max Hayes faculty will, in alignment with CMSD policies and the Ohio Department of Education's plan for credit flexibility, develop a plan that enables students to earn units of high school credit based on a demonstration of competency instead of, or in combination with, completing hours of classroom instruction. Such a plan is consistent with the Max Hayes design to move away from time-based modules and other learning activities that apply to all students and move toward variable time and proficiency.

6. FRAMEWORK FOR DEVELOPMENT AND IMPLEMENTATION

“If you can connect all the dots between what you see today and where you want to go, then it's probably not ambitious enough or aspirational enough” (Bryant, 2009).

Shantanu Narayen, CEO of Adobe Systems

The design phase will culminate with the acceptance of some adaptation of this proposed design framework, which describes a very different design for the new Max Hayes. The scope and breadth of the proposed changes will require considerable review and discussion. CMSD and the Max Hayes Administrative Team and faculty will need to prepare the detailed designs once the framework is established based on these recommendations. This chapter provides recommendations for a staging of that work.

Max Hayes will need to be designed—programmatically and architecturally—for flexibility in response to changing needs and circumstances. Ongoing dialogue with the industry, postsecondary, and community sectors is essential. The Administrative Team, with CMSD leadership, needs to establish structures and processes for facilitating that dialogue.

Staging the Development Work

Although the new Max Hayes facility will not be ready until fall 2013, the Administrative Team can begin, in the fall 2010, a staged implementation of selected features and components of the proposed school, program and curriculum designs. Figures 8-11 provide a recommended staging of the development and implementation work beginning in the fall of 2010 and continuing through the first year of school opening in the fall of 2013. This next phase of the work includes five stages: develop, prototype, revise, scale, and maintain (including ongoing improvement).

Several of the recommended design features and components in the school, program, and curriculum frameworks, as well as in the ninth grade design, can be developed during the 2010-2011 school year. These include such components as strengthened partnerships, seat time wavers, individual learning plans and profiles, and the new culture and organization. Several other design features and components will require multiple years to prototype, refine, and scale throughout the school.

The faculty will review this proposed design framework and adapt it to fit their students, keeping foremost in mind the recommended design requirements and ensuring that the interests of the students and their parents and families remain paramount. This staging framework is predicated on the assumption that there will be a major investment in faculty education, training, and support (ETS) that will be embedded in the faculty's work on the development and prototyping tasks identified in the charts. Development work can be accomplished by faculty teams, facilitated by the Administrative Team, particularly the principal, and supported by expert practitioners and CMSD district leaders and resource staff. The faculty will facilitate student engagement in development and prototype work. Students will also have opportunities to contribute to, and learn from, the facilities design work and the building construction.

Prototyping can be accomplished through a variation of the Japanese lesson study process. This process includes fast prototyping coupled with careful monitoring and documentation with feedback loops back into design and ahead into the refinement process. Prototyping needs to be aligned with faculty education, training, and support.

Figure 8 Staging School Design Features and Components Development

School Design Features and Components	Fall 2010	Spring 2011	2011-12	2012-13	2013-14
Partnerships–Industry	D & P	P	P & R	P & R	R & S
Partnerships–Parents / Families	D	D	D & P	R & S	M
Partnerships–Postsecondary	D	D & P	P & R	P & R	R & S
Partnerships–Community	D	D	D & P	R & S	M
Establish School Advisory Board	D	D	P & R	S	M
Outreach to middle grades: faculty, students, and families	D	D & P	D & P	R & S	M
Administrative Team	D	D	D & P	D & P	P & R
Faculty-led teams	D	D	D & P	P & R	R & S
Faculty education, training, and support	D	D & P	P & R	R & S	M
Student voice	D	D	P & R	P & R	R & S
Open to community and adults	D	D & P	P & R	R & S	M
Open enrollment	D	D	D	P & R	R & S
Organization: time and staff	D	D	D & P	P & R	R & S
Establish evaluation system	D	D	P	R & S	M

Code: D = Develop, P = Prototype, R = Refine, S = Scale, M = Maintain

Figure 9 Staging Program Design Features and Components Development

Program Design Features and Components	Fall 2010	Spring 2011	2011-12	2012-13	2013-14
Cross-career area “drivers”	D	D	D & P	R & S	M
Area autonomies	D	D	D & P	P & R	R & S
Community service	D	D	D & P	R & S	M
Learning plan / portfolio	D	D	D & P	P & R	R & S
Programs of Study	D	D	D & P	D & P	P & R
Student Support Services	D	D	D & P	P & R	R & S
Secondary-postsecondary continuum	D	D	D & P	R & S	M
Performance assessments	D	D	D & P	P & R	R & S
Health, nutrition, & fitness	D	D	D & P	D & P	P & R

Code: D = Develop, P = Prototype, R = Refine, S = Scale, M = Maintain

Figure 10
Staging Ninth Grade Design Features and Components Development

Ninth Grade Transition Design Features and Components	Fall 2010	Spring 2011	2011-12	2012-13	2013-14
Workgroups / Advisory system	D	D	P	P & R	R & S
Student profile / Plan	D	D	P	R & S	M
Culture and climate	D	D	R & S	M	M
Projects—individual and group	D	D	R & S	M	M
Entrepreneurial ventures	D	D	P & R	R & S	M
Out-of-school learning	D	D & P	R & S	M	M
Seminars and workshops	D	D	P & R	R & S	M

Code: D = Develop, P = Prototype, R = Refine, S = Scale, M = Maintain

Figure 11
Staging Curriculum Design Features and Components Development

Curriculum Design Features and Components	Fall 2010	Spring 2011	2011-12	2012-13	2013-14
Competency-focused modules	D	D	D & P	R & S	M
Individual learning plans / profiles	D	D	D & P	R & S	M
Programs of study	D	D	D & P	R & S	R & S
Integrated skills development	D	D	P	R & S	M
Secondary—postsecondary continuum	D	D	P	R & S	M
Projects—individual and group	D	D	P	R & S	M
Out of school learning	D	D	P	R & S	M
Online learning systems	D	D	P	P & R	S & M
Seat time wavers / Flexible credit	D	D	D & P	R & S	S & M
Performance assessments	D	D	D & P	R & S	S & M
Certifications and endorsements	D	D	D & P	P & R	R & S

Code: D = Develop, P = Prototype, R = Refine, S = Scale, M = Maintain

The faculty will operate within the constraints of the existing facility until 2013. Nevertheless, beginning in 2010-11, any new requirements for space and equipment required for prototyping will be met by going outside the existing Max Hayes facility and tapping industry, community, and postsecondary resources. Moreover, the new facility will be designed to allow for bringing industry partners into the school and bringing their equipment and expert practitioners with them.

This development work will be accomplished using high quality organizational structures and processes. The Administrative Team will use these standards in leading that work:

- **Strategically.** The development and implementation phase will be guided by an understanding of the students Max Hayes needs to graduate to be successful in the twenty-first century and the nature of work and the workplace that is emerging in and across the career areas and pathways.
- **Systemically.** The development and implementation phase will address all school, program, and curriculum components systemically, that is, understanding their interrelationships and interactions and proposing an interconnected set of initiatives.
- **Collaboratively.** Max Hayes will be designed, implemented, and sustained through collaborative action among individuals, organizations, and agencies in the community. Such collaboration will require shared decision making within an overall framework established by the Administrative Team and the CMSD.
- **Comprehensively.** Max Hayes will address the needs of the whole child and every child. Programs will focus on student learning outcomes and be addressed through an integrated teaching and learning process. This process will include all of the teaching and learning environments in which students might develop their competencies, as well as the many external support services available to support students' readiness to learn.
- **Intelligently.** The development and implementation phase will be supported by comprehensive, high quality information that will inform decision makers about all levels of school, program, and student performance. Information from research and exemplary practice must guide the designs.
- **Deliberately.** The Administrative Team will establish an overall design or framework in which ongoing, incremental, and sustained improvements are made. By moving incrementally within an overall framework, the Administrative Team and faculty can learn and adjust, based on experience.

Essential Tasks and Activities

To begin the development and implementation phase, several tasks and activities must be completed in 2010-11.

Recruit and select a principal. A capable and committed principal is the linchpin of the Max Hayes Administrative Team. This person will be a strong leader as well as an exceptional innovator and entrepreneur. The principal will work closely with community, industry, and postsecondary partners in order to establish and maintain ongoing working relationships and partnerships. He or she will also provide vigorous leadership and support to the faculty.

Recruit and select program leaders and establish a school administrative team. The Administrative Team will have primary responsibility for establishing the structures and processes for engaging the faculty in the new Max Hayes, even as they provide the education, training, and support to enable faculty to implement the recommended design features and

components. High quality education, training, and support can prepare teachers not merely to implement someone else's design but also learn to craft their own. Making is essential to learning. That is the benefit of prototyping, which entails learning while doing. Program and curriculum development go hand in hand with professional development.

Develop a faculty "recruitment" process. Communicate the new roles to existing and prospective faculty members, emphasizing the team structure and culture. Describe the faculty responsibilities to develop learning modules for specific students and working with industry and community experts and expert practitioners. Request that teachers "enlist" to work on and within the new design.

Develop a memorandum of understanding with the faculty union. There is precedent in CMSD for creating agreements around such factors as time and calendar structures, roles and responsibilities, and organizational arrangements. For example, a memorandum of understanding might need to address the roles that Max Hayes faculty will play in monitoring out-of-school learning at work sites or in coordinating the several "adjunct faculty" from the industry, postsecondary, and community sectors. The design will require a non-traditional school day, week, and year.

Develop faculty program and curriculum development teams. This framework recommends a different organizational structure based on the core program and curriculum features and components relating to modular curriculum that is focused on project-based learning addressed to carefully crafted sets of academic, technical, and work readiness competencies. The formation of Career Area Faculty Teams that include academic and technical teachers will require new roles, relationships, and responsibilities.

Develop and implement a comprehensive education, training, and support system. This ETS will address the needs of all members of the Max Hayes community: The school leadership team, the faculty, and support staff, including external experts and expert practitioners. Suggested ETS topics for 2010-11 include using outside experts, developing and using project-based learning, using performance-based assessments, and using online tools.

Develop a marketing program for middle grades faculty, students, and families. This proposed framework will significantly expand and deepen relationships between Max Hayes and the middle grades. A faculty team supported by experienced guidance staff and the Max Hayes Administrative Team will coordinate this work. A "Take it to the Max" campaign will communicate something different and better.

Establish the Max Hayes Advisory Board. Develop bylaws. Determine roles and responsibilities and structures and processes. Investigate the possibility of establishing a not-for-profit organization that finds and organizes resources for Max Hayes in addition to providing advice regarding program and curriculum features and components and organizing community partnerships.

Develop the industry, community and post-secondary partnerships. (explain)

Develop a student orientation program. This program will be ready for implementation beginning in the summer and fall of 2011 and continue each year thereafter. Consider expanding the orientation program in the fall of 2012 to embrace a comprehensive student recruitment and selection process.

Establish a program and curriculum implementation monitoring system. Track the implementation of the school, program, and curriculum features and components. The Max Hayes principal will coordinate this system and engage the faculty in dealing with the information.

Faculty Education, Training, and Support

One of the most significant changes in this proposed design concerns the role of the core faculty. Increasingly, they will take on new authority and responsibilities as CAFT members. The organizational structure will offer sufficient opportunities for faculty communication, collaboration, and coordination, particularly with respect to the program and curriculum design and implementation. The core faculty will manage the “adjunct faculty” drawn from the industry, community, and postsecondary sectors. Finally, the core faculty will be responsible for monitoring student management of their learning plans and portfolios of work.

The Administrative Team will design and implement a comprehensive faculty education, training, and support program. CMSD has already invested considerable resources in developing a professional development system to support its transformation initiative. CMSD will extend that level of commitment to supporting the proposed staging and phasing tasks.

The ETS system is based on an understanding that simple conceptualizations of training are inadequate to support ongoing learning and its application to significant work. Often training (i.e., skills development) is provided before participants have had an adequate opportunity to form clear images of what specific changes the new behaviors require in their current practice. These images help participants to determine what competencies they need to develop.

Once these images and a clear understanding of the gap between their vision and reality are established, attention can be given to developing new competencies and building new knowledge, skills, and dispositions. Moreover, research and experience indicate that transfer of the learning to actual work practices does not take place unless there are structured, guided opportunities for practice and feedback.

The “education” component of the professional development system is particularly important for Max Hayes because the design is so very different from what exists presently. Max Hayes faculty will need opportunities to understand the design and its implications for change. Based on that shared understanding, detailed and intensive training and support can go forward. In

this case, knowing how and knowing what will be necessary but not sufficient. Knowing why and caring why will be equally important.

For this reason, the new Max Hayes faculty will need to be “recruited,” not in the sense that a new faculty will be brought on to implement the design, but rather to “sign-up” the existing faculty to the design and have them commit to learning how to adapt, use, and improve it. Understanding and agreeing with the conceptual underpinnings of the new design are essential to moving forward with professional development. Only through such an understanding can the faculty adapt with fidelity the proposed school, program, and curriculum designs.

The **education component** is devoted to building a shared foundation of knowledge and understanding about the use of the competencies in authentic work contexts. The education component helps learners form individual and collective images of the ways that the new competencies can enhance effectiveness and productivity. The education component helps learners get ready for more formal skills development (i.e., training) and includes such activities as readings, discussions, visits to exemplary organizations, and viewing and discussing videotapes and presentations by experts and expert practitioners.

The **training component** is devoted to developing competencies for use in a wide variety of new work contexts. Special attention is given to modeling the effective use of the skills. The training component includes such activities as workshops, seminars, hands-on practice addressing specific competencies, and self-study.

The **support component** includes a variety of assistance activities to provide ongoing help to teachers as they apply their new knowledge and skills. This component includes such activities as demonstrations and modeling, coaching, peer feedback, action research, peer tutoring, and informal exchanges.

REFERENCES AND BIBLIOGRAPHY

- American Educational Research Association [AERA]. (2000). Position statement of the American Educational Research Association concerning high-stakes testing in preK-12 education. *Educational Researcher*, 29, 24-25. doi: 10.3102/0013189X029008024.
- Annie E. Casey Foundation, The. (2007). *Kids count*. Retrieved July 1, 2010, from <http://www.aecf.org/MajorInitiatives/KIDSCOUNT.aspx>
- Arnold, K., Fleming, S., DeAnda, M., Castleman, B., & Wartman, K. L. (2009). The summer flood: The invisible gap among low-income students. *Thought & Action: The National Education Association Higher Education Journal*. Retrieved from National Education Association <http://www.nea.org/assets/docs/HE/TA09SummerFlood.pdf>
- Association for Career and Technical Education [ACTE]. (2006, January). *Reinventing the American high school for the 21st century: Strengthening a new vision for the American High School through the experiences and resources of career and technical education*. Retrieved July 1, 2010, from Author http://www.acteonline.org/uploadedFiles/Issues_and_Advocacy/files/ACTEHSReform_Full.pdf
- Bailey, T. R., Hughes, K. L., & Moore, D. T. (2004). *Working knowledge: Work-based learning and education reform*. New York: RoutledgeFalmer.
- Bainbridge, W. L. (2006, April 15). High school dropouts cost nation billions in lost wages and taxes. *The Florida Times-Union - Jacksonville.com*. Retrieved from <http://www.schoolmatch.com/articles/ftu2006Apr15.cfm>
- Baker, E. L. (2007). The end(s) of testing. [2007 Presidential Address for the American Educational Research Association]. *Educational Researcher*, 36(6), 209-317. doi: 10.3102/0013189X07307970.
- Barone, M. (2004). *Hard America, soft America: Competition vs. coddling and the battle for the nation's future*. New York: Crown Forum.
- Bedsworth, W., Colby, S., & Doctor, J. (2006, October). *Reclaiming the American dream*. Retrieved January 2, 2007, from The Bridgespan Group <http://bridgespangroup.org/PDF/ReclaimingtheAmericanDreamWhitePaper.pdf>
- Belfanz, R. (2006, July 12). Closing 'dropout factories': The graduation-rate crisis we know, and what can be done about it [Commentary]. *Education Week*, pp. 42-43.
- Berger, J. (2006, October 4). On Education: Demoting advanced placement. *The New York Times*, p. 7. Retrieved from <http://www.nytimes.com/2006/10/04/education/04EDUCATION.html>

- Berger, R. (2003). *An ethic of excellence: Building a culture of craftsmanship with students*. Portsmouth, NH: Heinemann.
- Berryman, S. E. (1993). Learning for the workplace. *Review of Research in Education*, 19, 343-401.
- Bloom, J. (2007). (Mis)reading social class in the journey towards college: Youth development in urban America. *Teachers College Record*, 109(2), 343-368.
- Bloomberg, M. R. (2006, December 14). Flabby, inefficient, outdated. *The Wall Street Journal*, p. A20.
- Blustein, D. L. (2004). *The relationship between career development and educational development: A selected review of the literature*. Retrieved July 1, 2010, from http://www.pacareerstandards.com/documents/RA-3_Career_Development.pdf
- Blustein, D. L. (2006). *The psychology of working: A new perspective for career development, counseling, and public policy*. Mahwah, NJ: Lawrence Erlbaum Associates.
- Blustein, D. L., Juntunen, C. L., & Worthington, R. L. (2000). The school-to-work transition: Adjustment challenges of the forgotten half. In S. D. Brown & W. R. Lent (Eds.), *Handbook of Counseling Psychology* (pp. 435-470). New York: Wiley.
- Borg, L. (2004, March 9). Some pupils ill-prepared for college. *The Providence Journal*, pp. A1, A15.
- Borja, R. R. (2006, July 12). Technology update: Calif. and Michigan focus programs on career skills. *Education Week*, p. 16.
- Boss, S., & Krauss, J. (2007). *Reinventing project-based learning: Your field guide to real-world projects in the digital age*. Washington, DC: International Society for Technology in Education.
- Bottoms, G. (2006). Reinventing America's high schools: A vision of the 21st century. *Techniques*, 81(5), 14-16.
- Bottoms, G., & McNally, K. (2005). *Actions states can take to place a highly qualified career/technical teacher in every classroom*. Atlanta, GA: Southern Regional Education Board. Retrieved from http://publications.sreb.org/2005/05V73_career_tech_state_actions.pdf

- Bottoms, G., Presson, A., & Han, L. (2006). *Students can't wait: High schools must turn knowledge into action*. Atlanta, GA: Southern Regional Education Board. Retrieved from http://publications.sreb.org/2006/06V19_Students_Cant_Wait.pdf
- Brown Lerner, J., & Brand, B. (2006, September). *The college ladder: Linking secondary and postsecondary education for success for all students*. Retrieved July 1, 2010, from American Youth Policy Forum
<http://www.aypf.org/publications/The%20College%20Ladder/TheCollegeLadderlinkingsecondaryandpostsecondaryeducation.pdf>
- Brown Ruzzi, B., & Kraemer, J. (2006, April). *Academic programs in alternative education: An overview*. Retrieved July 1, 2010, from National Center on Education and the Economy
http://www.doleta.gov/youth_services/pdf/ae_overview_text.pdf
- Brown, S., & Vaughan, C. (2009). *Play: How it shapes the brain, opens the imagination, and invigorates the soul*. New York: Penguin Group.
- Bryant, A. (2009, July 19). Connecting the dots isn't enough [Electronic version]. *The New York Times*, p. BU2. Retrieved from
<http://www.nytimes.com/2009/07/19/business/19corner.html>
- Bureau of Labor Statistics Division of Occupational Outlook. (2009, December 17). *Overview of the 2008-18 projections*. Retrieved July 1, 2010, from
<http://www.bls.gov/oco/oco2003.htm>
- Callan, P. M., & Finney, J. E. (2003, June). *Multiple pathways and state policy: Toward education and training beyond high school*. Retrieved July 1, 2010, from Jobs for the Future
<http://www.jff.org/jff/PDFDocuments/Multpathstate.pdf>
- Carnevale, A. P. (2007, June 12). Diplomas Count 2007 - Ready for what? Preparing students for college, careers, and life after high school (Annual Report): Access to opportunity - The need for universal education and training after high school [Commentary]. *Education Week*, p. 34.
- Carnevale, A. P., Smith, N., & Strohl, J. (2010). *Help wanted: Projections of jobs and education requirements through 2018*. Washington, DC: Georgetown University Center on Education and the Workforce. Retrieved from
<http://www9.georgetown.edu/grad/gppi/hpi/cew/pdfs/FullReport.pdf>
- Carter, G. R. (2006, September). *Is it good for the kids? High school reform - What will it take to engage teens?* Retrieved July 1, 2010, from
http://www.ascd.org/news_media/Is_It_Good_for_the_Kids_Editorials/Is_It_Good_for_the_Kids_-_September_2006.aspx

- Castellano, M., Stringfield, S., & Stone, J. R. (2003). Secondary career and technical education and comprehensive school reform: Implications for research and practice. *Review of Educational Research, 73*, 231-272.
- Cavanagh, S. (2007, June 12). Diplomas Count 2007 - Ready for what? Preparing students for college, careers, and life after high school (Annual Report): What kind of math matters? *Education Week*, pp. 21-23.
- Christensen, C. M., Horn, M. B., & Johnson, C. W. (2008). *Disrupting class: How disruptive innovation will change the way the world learns*. New York: McGraw Hill.
- Colvin, G. (2006, July 5). The imagination economy. *Fortune, 154*, p. 53.
- Commission on the Whole Child, The. (2007). *The learning compact redefined: A call to action*. Alexandria, VA: Association for Supervision and Curriculum Development. Retrieved from <http://www.ascd.org/ASCD/pdf/Whole%20Child/WCC%20Learning%20Compact.pdf>
- Conference Board, The, Corporate Voices for Working Families, Partnership for 21st Century Skills, & Society for Human Resources Management. (2006). *Are they really ready to work? Employers' perspectives on the basic knowledge and applied skills of new entrants to the 21st century U.S. workforce*. Washington, DC: Author. Retrieved from http://www.p21.org/documents/FINAL_REPORT_PDF09-29-06.pdf
- Conley, D. T. (2005). *College knowledge: What it really takes for students to succeed and what we can do to get them ready*. San Francisco: Jossey-Bass.
- Conley, D. T. (2007). The challenge of college readiness. *Educational Leadership, 64*(7), 23-29.
- Cox, W. M., Alm, R., & Holmes, N. (2004, May 13). Where the jobs are [Op-Ed]. *The New York Times*, p. A25.
- Coyle, D. (2009). *The talent code: Greatness isn't born. It's grown. Here's how*. New York: Bantam Books.
- Dobelle, E. S. (2006, December 13). N.E. governors must boost higher ed [Commentary]. *The Providence Journal*, p. B4.
- Dounay, J. (2006, January). *Ensuring rigor in the high school curriculum: What states are doing*. Retrieved July 1, 2010, from Education Commission of the States <http://www.ecs.org/clearinghouse/66/67/6667.htm>
- Douthwaite, B. (2006). Enabling innovation: Technology- and system-level approaches that capitalize on complexity. *Innovations, 1*(4), 93-110.

- Dweck, C. S. (2006). *Mindset: The new psychology of success*. New York: Random House.
- Economist, The. (2009, December 28). *The manufacturing shibboleth*. Retrieved July 1, 2010, from http://www.economist.com/blogs/freeexchange/2009/12/the_manufacturing_shibboleth
- Edwards, V. B., & Chronister, G. (2007, June 12). Diplomas count 2007 - Ready for what? Preparing students for college, careers, and life after high school (Annual Report): Executive summary. *Education Week*, p. 5.
- Epstein, J. L. (2009). *School, family, and community partnerships: Your handbook for action*. New York: Corwin Press.
- Erikson, E. H. (1968). *Identity: Youth and crisis*. New York: W. W. Norton & Company.
- Fahey, J. (2004, September 6). Bumper-to-bumper education. *Forbes*, pp. 77, 80.
- Finn, C. E., & Ravitch, D. (Eds.). (2007). *Beyond the basics: Achieving a liberal education for all children*. Washington, DC: Thomas B. Fordham Institute.
- Florida Legislature, The. (2009). *Career and professional academies [Florida Statute No. 1003.493]*. Retrieved July 1, 2010, from http://www.leg.state.fl.us/statutes/index.cfm?mode=View%20Statutes&SubMenu=1&App_mode=Display_Statute&Search_String=1003.493&URL=CH1003/Sec493.HTM
- Foster, R., & Kaplan, S. (2001). *Creative destruction: Why companies built-to-last are last to change*. New York: Financial Times Prentice Hall.
- Friedman, T. L. (2006, December 13). Learning to keep learning [Opinion-Editorial]. *The New York Times*. Retrieved from http://select.nytimes.com/2006/12/13/opinion/13friedman.html?_r=1
- Furger, R. (2005, August 7). High school goes high tech. *Parade Magazine*, pp. 14-15.
- Gates, A. (2005, April 23). Television review: Students tell Nickelodeon what's wrong with school. *The New York Times*, p. A24. Retrieved from <http://query.nytimes.com/gst/fullpage.html?res=9505EEDB1431F930A15757C0A9639C8B63&partner=rssnyt&emc=rss>
- Gewertz, C. (2007, June 12). Diplomas Count 2007 - Ready for what? Preparing students for college, careers, and life after high school (Annual Report): 'Soft skills' in big demand. *Education Week*, pp. 25-27.

- Gray, K. (2004). Is high school career and technical education obsolete? *Phi Delta Kappan*, 86(2), 128-134.
- Greater Cincinnati Workforce Network. (2010, June/July). *Construction career pathways updates*. Retrieved July 1, 2010, from <http://archive.constantcontact.com/fs038/1101400832746/archive/1103480141462.html>
- Gross, D. (2006, September 10). Economic view: Behind that sense of job insecurity. *The New York Times*, p. 4.
- Grubb, W. N. (2007, June 12). Diplomas Count 2007 - Ready for what? Preparing students for college, careers, and life after high school (Annual Report): Life after high school - Taking the Education Gospel seriously [Commentary]. *Education Week*, p. 33.
- Gustavson, L. (2007). *Youth learning on their own terms: Creative practices and classroom teaching*. New York: Routledge.
- Halpern, R. (2009). *The means to grow up: Reinventing apprenticeship as a developmental support in adolescence*. New York: Routledge.
- Hoachlander, G. (2005, April 27). Does vocational education have a role to play in high school reform? *Education Week*, pp. 38, 48.
- Hoachlander, G. (2006). Ready for college and career. *The School Administrator*, 63(1), 38-39, 41.
- Holzer, H., & Smith Nightingale, D. (2007). Introduction. In H. Holzer & D. Smith Nightingale (Eds.), *Reshaping the American workforce in a changing economy*. Washington, DC: Urban Institute.
- Hughes, K. L., & Mechur Karp, M. (2006). *Strengthening transitions by encouraging career pathways: A look at state policies and practices*. American Association of Community Colleges (Washington, DC) and League for Innovation in the Community College (Phoenix, AZ). Retrieved from <http://ccrc.tc.columbia.edu/Publication.asp?UID=380>
- Hyslop, A. (2007). Dramatically improve how and where academic content is taught. *Techniques*, 82(1), 40-43.
- Hyslop-Margison, E. J. (2005). *Liberalizing vocational study: Democratic approaches to career education*. Lanham, MD: University Press of America.
- Jacobs, H. H. (Ed.). (2010). *Curriculum 21: Essential education for a changing world*. Alexandria, VA: Association for Supervision and Curriculum Development.

- Janofsky, M. (2005, July 15). Students say high schools let them down. *The New York Times*, p. A9.
- Jenkins, D. (2006, August). *Career pathways: Aligning public resources to support individual and regional economic advancement in the knowledge economy*. Retrieved July 1, 2010, from <http://www.workforcestrategy.org/publications.html>
- Jenkins, D., & Spence, C. (2006, October). *The career pathways how-to guide*. Retrieved July 1, 2010, from Workforce Strategy Center <http://www.workforcestrategy.org/publications.html>
- Jobs for the Future. (2005, January). *Building skills, increasing economic vitality: A handbook of innovative state policies*. Retrieved January 2, 2007, from <http://www.jff.org>
- Jordan, D. (2006, November 15). 8th-graders face major decision. *The Palm Beach Post*. Retrieved from <http://www.palmbeachpost.com>
- Jordan, J. D. (2006, November 30). R.I. high school dropout rate a 'wake-up call'. *The Providence Journal*, p. B1.
- Kahlenberg, R. D. (Ed.). (2004). *America's untapped resource: Low-income students in higher education*. New York: The Century Foundation Press.
- Kolb, C. E. M. (2006, July 12). The cracks in our education pipeline [Commentary]. *Education Week*, pp. 56, 45.
- Lee, J. (2006, July 19). College makes way for internships. *The New York Times*, p. A21.
- Lesgold, A. (2009). *Better schools for the 21st century: What is needed and what it will take to get improvement*. Learning Policy Center - University of Pittsburgh. Retrieved from <http://www.lpc.pitt.edu/index.php/content/search/lesgold>
- Levine, E. (2002). *One kid at a time: Big lessons from a small school*. New York: Teachers College Press.
- Levy, F., & Murnane, R. J. (2004). *The new division of labor: How computers are creating the next job market*. Princeton, NJ: Princeton University Press.
- Lewis, A. C. (2006). Washington commentary: Jobs and schooling. *Phi Delta Kappan*, 88(3), 179-180.
- Lewis, T., & Cheng, S. Y. (2006). Tracking, expectations, and the transformation of vocational education. *American Journal of Education*, 113(1), 67-99.

- Linn, R. L. (1994). Performance assessment: Policy promises and technical measurement standards. *Educational Researcher*, 23(9), 4-14.
- Lloyd, S. C. (2007, June 12). Diplomas Count 2007 - Ready for what? Preparing students for college, careers, and life after high school (Annual Report): Few states define 'ready'. *Education Week*, p. 37.
- Malone, T. W. (2004). *The future of work: How the new order of business will shape your organization, your management style, and your life*. Boston: Harvard Business School Press.
- McCormack, R. (2009, December 21). *The plight of American manufacturing*. Retrieved July 1, 2010, from http://www.prospect.org/cs/articles?article=the_plight_of_american_manufacturing
- McNeil, M. (2007, June 12). Diplomas Count 2007 - Ready for what? Preparing students for college, careers, and life after high school (Annual Report): Careers come into focus. *Education Week*, pp. 29-31.
- Mojkowski, C., & Washor, E. (2007). Seeding the edge of career and technical education. *Techniques: Connecting Education and Careers*, 82(7), 2-5.
- National Governors Association. (2003). *Ready for tomorrow: Helping all students achieve secondary and postsecondary success – A guide for governors*. Retrieved July 1, 2010, from <http://www.nga.org/cda/files/0310READY.pdf>
- National Governors Association Center for Best Practices. (2007, June 13). *Retooling career technical education*. Retrieved July 1, 2010, from <http://www.nga.org/portal/site/nga/menuitem.9123e83a1f6786440ddcbbeb501010a0/?vgnextoid=e75acaf65cb23110VgnVCM1000001a01010aRCRD>
- O'Toole, J., & Lawler, III, E. E. (2006). *The new American workplace*. New York: Palgrave-Macmillan.
- Oakes, J., & Saunders, M. (Eds.). (2008). *Beyond tracking: Multiple pathways to college, career, and civic participation*. Cambridge, MA: Harvard Education Press.
- Ohio Department of Education. (2009, July 23). *Ohio CTE career fields/pathways/specializations*. Retrieved May 18, 2010, from <http://education.ohio.gov/GD/Templates/Pages/ODE/ODEDetail.aspx?page=3&TopicRelationID=1759&ContentID=15398&Content=85161>
- Olson, E. (2006, October 24). Community colleges want you. *The New York Times*, p. 2.

- Olson, L. (2006, May 24). Ambiguity about preparation for workforce clouds efforts to equip students for future. *Education Week*, pp. 1, 18-20.
- Olson, L. (2007, June 12). Diplomas Count 2007 - Ready for what? Preparing students for college, careers, and life after high school (Annual Report): What does 'ready' mean? *Education Week*, pp. 7-10, 12-13.
- Orfield, G. (Ed.). (2004). *Dropouts in America: Confronting the graduate rate crisis*. Cambridge, MA: Harvard Education Press.
- Partnership for 21st Century Skills. (2004). *The road to 21st century learning: A policymakers' guide to 21st century skills*. Washington, DC: Author. Retrieved from http://www.p21.org/index.php?option=com_content&task=view&id=30&Itemid=32
- Partnership for 21st Century Skills. (2006). *Results that matter: 21st century skills and high school reform*. Tucson, AZ: Author. Retrieved from <http://www.p21.org/documents/RTM2006.pdf>
- Pink, D. H. (2009). *Drive: The surprising truth about what motivates us*. New York: Riverhead Hardcover.
- Pinkus, L. (2006). *Who's counted? Who's counting? Understanding high school graduation rates*. Washington, DC: Alliance for Excellent Education. Retrieved from <http://www.all4ed.org/files/WhosCounting.pdf>
- Quartz, K. H., & Washor, E. (2008). Small schools as multiple pathways to college, career, and civic participation: Can they balance the individual and collective aims of schooling? In J. Oakes & M. Saunders (Eds.), *Beyond Tracking: Multiple Pathways to College, Career, and Civic Participation*. Cambridge, MA: Harvard Education Press.
- Reese, S. (2006a). Elements of an effective mentoring program. *Techniques*, 81(6), 20-21.
- Reese, S. (2006b). The art of mentoring. *Techniques*, 81(6), 15-19.
- Resnick, L. B., & Wirt, J. G. (Eds.). (1996). *Linking school and work: Roles for standards and assessment*. San Francisco: Jossey-Bass.
- Rising above the gathering storm: Energizing and employing America for a brighter economic future*, 109th Congress (First Session) Sess. (2005) (testimony of Norman R. Augustine, P. Roy Vagelos, and William A. Wulf).
- Rose, M. (2004). *The mind at work: Valuing the intelligence of the American worker*. New York: Viking.

- Rosin, H. (2010, July/August). The end of men: Women are dominating society as never before. *The Atlantic*, 306, pp. 56-73. Retrieved from <http://www.theatlantic.com/magazine/archive/2010/07/the-end-of-men/8135/>
- Sarason, S. B. (2006). *Letters to a serious education president*. Thousand Oaks, CA: Corwin Press.
- Sedlacek, W. E. (2004). *Beyond the big test: Noncognitive assessment in higher education*. San Francisco: Jossey-Bass.
- Sennett, R. (2008). *The craftsman*. New Haven, CT: Yale University Press.
- Silva, E. (2008, November 10). *Education Sector Reports: Measuring skills for the 21st century*. Retrieved July 1, 2010, from Education Sector http://www.educationsector.org/research/research_show.htm?doc_id=716323
- Singh, A. (2006a, August 15). Firms court new hires - in high school: Companies aim to build relationships earlier through scholarships, internships and jobs. *The Wall Street Journal*, p. B5.
- Singh, A. (2006b, August 15). Students get push to become 'social entrepreneurs'. *The Wall Street Journal*, p. B5.
- Sipchen, B. (2007, February 26). Work skills winning new respect [Commentary]. *Los Angeles Times*. Retrieved from <http://articles.latimes.com/2007/feb/26/local/me-schoolme26>
- Southern Regional Education Board [SREB]. (2006). *Building transitions from high school to college and careers for Louisiana's youth*. Retrieved July 1, 2010, from http://publications.sreb.org/2006/06V13_CCTI_Louisiana.pdf
- Southern Regional Education Board [SREB]. (2007). *Using the new Perkins legislation to advance high school reform: The Federal Carl. D. Perkins Career and Technical Education Improvement Act of 2006*. Atlanta, GA: Author. Retrieved from http://www.isbe.state.il.us/career/pdf/new_perkins_legislation21.pdf
- Southern Regional Education Board [SREB]. (n.d.). *Industry credentialing in Virginia: A growing program that works*. Atlanta, GA: Author.
- Stasz, C., & Bodilly, S. (2004, June). *Efforts to improve the quality of vocational education in secondary schools: Impact of federal and state policies*. Retrieved January 1, 2007, from U.S. Department of Education <http://www.ed.gov/rschstat/eval/sectech/nave/impact-2004.pdf>

- Steinberg, A., Johnson, C. O., & Almeida, C. A. (2006, June 7). Making good on a promise: More school topics that Oprah might explore. *Education Week*, pp. 36, 48.
- Tight, M. (2002). *Key concepts in adult education and training*. New York: Routledge.
- Trilling, B., & Fadel, C. (2009). *21st century skills: Learning for life in our times*. San Francisco: Jossey-Bass.
- Trotter, A. (2007, June 20). School-business partnerships target STEM subjects. *Education Week*, p. 10.
- Viadero, D. (2006, December 13). Rise of youth mentoring outpaces knowledge base. *Education Week*, pp. 8-9.
- Wallis, C., & Steptoe, S. (2006, December 10). How to bring our schools out of the 20th century. *Time*, 168, pp. 50-56.
- Washor, E., & Mojkowski, C. (2007, January 17). The college juggernaut: Just who is it that needs to get ready? [Commentary]. *Education Week*, pp. 30-31.
- Webb, C. (2009). *Make it out [Proposal]*. Retrieved July 1, 2010, from <http://canyoumakeitout.com/make%20it%20out%20film%20proposal.pdf>
- Whitehouse, M. (2010, February 3). Radical shifts take hold in U.S. manufacturing. *The Wall Street Journal*. Retrieved from <http://online.wsj.com/home-page>
- Wisconsin Department of Workforce Development. (2010, March 24). *2010-11 local youth apprenticeship grants request for proposal (RFP)*. Retrieved July 1, 2010, from <http://www.dwd.state.wi.us/youthapprenticeship/rfp.htm>
- Wolk, R. A. (2005, June 29). Follow the money: R.I. must redesign public schools [Commentary]. *The Providence Journal*. Retrieved from http://www.projo.com/opinion/contributors/content/projo_20050629_29wolk.1c9d90a.html
- Zimmer-Gembeck, M. J., & Mortimer, J. T. (2006). Adolescent work, vocational development, and education. *Review of Educational Research*, 76(4), 537-566.

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Appendix A

Participants in the Design Process

Technical Team

Big Picture Learning	Charlie Mojkowski
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Catalyst Consulting Group, Inc.	Leslie Yerkes
City of Cleveland, Mayor's Office	Monyca Price
Cleveland Foundation	Maggie McGrath
Cleveland Metropolitan School District	Ahmed Abonamah
	Annette Darby
	Brian McIntyre
	Christine Fowler-Mack
	Eric Gordon
	Gary Sautter
	Karen Thompson
Concordia, LLC	Bobbie Hill
	Steven Bingler
TDA- Cleveland Educational Design Alliance	Chris Smith
Employment Connection	Sandra Bizzell
Greater Cleveland Partnership	Shana Marbury
Hyland Software	Radu Dragan
Jergens, Inc.	Jack Schron Jr.
Kitzel & Sons, Inc.	Thomas Schumann
MAGNET	Judith Crocker
	Karen Herpel
Max S. Hayes	Destiny Jones
	Dave Mikita
	Kern Peale
	Dave Reiman
	Brittany Roldan
	Kenneth Thomas
Mechanical & Plumbing Industry Council	Tom Wanner
Metropolitan Cleveland Consortium for STEM	Sonya Pryor Jones
Northeast Ohio Carpenter's Joint Apprenticeship Program	Mike Papalia
Ohio & Vicinity Regional Council of Carpenters	Bob Peto
Ohio State Building & Construction Trades Council	Loree Soggs

Precision Metalforming Association Education
 Foundation
 Volpe Millwork
 WIRE-Net

Dave Sansone
 John Volpe
 John Colm

Technical Team Meetings

Meeting Date	Topics
November 21-22, 2009	Develop design process Develop work plan Identify sites for visits
January 6, 2010	Review research support Develop mission and vision Review preliminary design framework
February 11, 2010	Revise mission and vision Develop guiding principles Identify essential partnership components Develop career areas and pathways
March 31, 2010	Revise career area / pathways designs Develop ninth grade design
April 13, 2010	Revise ninth grade design Develop partnership components
May 11, 2010	Discuss site visit reports Review partnership plan Develop pathways Discuss possible fifth career area
June 15, 2010	Discuss site visit report Review core design features and components

Industry Partner Meeting Participants

Alcohol, Drug Addiction and Mental Health
 Services Board of Cuyahoga County
 Airflex
 Alcoa Forged and Cast Products
 American Greetings Corporation
 ArcelorMittal

Linda Torbert
 Don Danko
 Greg Bashore
 Kyle Ludwick
 Marsha Harris
 Summer Paris

Big Picture Learning

Bond Accountability Commission

Bush Integrated

Case Western Reserve University

Catalyst Consulting Group, Inc.

Cleveland Educational Design Alliance/ TDA
Architecture

Central Cadillac-Hummer

Cleveland Clinic

Cleveland Foundation

Cleveland Metropolitan School District

Cleveland Urban Minority Alcoholism &
Drug Abuse Outreach Program

Cliffs Natural Resources Inc.

Concordia, LLC

Contractors Assistance Association

Council of Smaller Enterprises

Cuyahoga Community College

Charlie Mojkowski

Elliot Washor

Alfonso Sanchez

Eric Paszt

Jim Darr

Lillie Bell

Patrick Bush

Wendy Shapiro

Leslie Yerkes

Chris Smith, RA, LEED AP,
NCARB

D. Brower

Sidney Brown

Helen Williams

Annette Darby

Brian McIntyre

Christine Fowler-Mack

Eric Gordon

Eugene Sanders

Eugenia Cash

Gary Sautter

Karen Thompson

Marie Cipra

Patrick Zohn

Wesley Sanderson

Carlos Ramos

Jessica Horne

Brett Beech

Asante Salaam

Bobbie Hill

Glen Shumate

Brad Nellis

Craig Follins

Dave Grabski

Edward Kopp

Kenneth Hale

Lorraine Hartley, D.B.A.

Cuyahoga County Family & Children First	Zerrine Bailey
Detroit Shoreway Community Development Corporation	Mike Chapuran
Doty & Miller Architects	William Doty, Jr.
Eaton Corporation	Barry Doggett
Employment Connection	Sandra Bizzell
Federal Reserve Bank of Cleveland	Kelly Banks
FIT Technologies	Michelle Tomallo
George Gund Foundation	Ann Mullin
Greater Cleveland Partnership	Shana Marbury
Hard Hatted Women	Terri Burgess Sandu
Hyland Software, Inc.	Radu Dragan
Jergens, Inc.	Jack Schron, Jr
Journeyman Plumbers Union Local 55	Jason Shank
Kitzel & Sons, Inc.	Thomas Schumann
Lakeland Community College	Gary Eith
	Tony Ruque
Lorain County Community College	Robert Verhoff
MAGNET	Karen Herpel
Max S. Hayes, Student	Abdul-Hak Ali
Student	Ashley Harvy
Student	Brittany Roldao
TEAM Academy Coordinator	Dave Mikita
Principal	David Reiman
Student	Destiny Jones
Student	Joseph Olivo
Student	Kenneth Thomas
Student	Kern Peale
Student	Marcos Riviera
Student	Michael Smigel
Student	Michael Vura
Student	Sylvia Torres
NASA Glenn Research Center	Antoine Moss
	Herb Schilling
	Susan Kraus
Northeast Ohio Regional Sewer District	Raymond Weeden
	Russell Rys
Ozanne Construction Company, Inc.	Dominic Ozanne
Cleveland Plain Dealer	Tom Ott

Precision Metalforming Association Education
Foundation
RBB Systems, Inc
RPM International, Inc.
Sherwin-Williams Company

Stamco Industries, Inc
Swagelok Company
Talan Products, Inc.
Tempcraft
The Presidents' Council
The Riverside Company
Third Federal Savings & Loan
University Hospitals of Cleveland
Volpe Millwork
WIRE-Net

Dave Sansone
Ross Lilley
Randell McShepard
Colleen Carpenter
Tom Lucas
Bill Sopko Sr.
Mark Bennett
Kathy Rhubart
Alicia Love
Nicole Bell
Scott Bogard
Kurt Karakul
Margaret Hewitt
John Volpe
Anne Schaum
Colleen Kushlak
John Colm
Mike Hoag

**Parents & Faith Community
Partners Meeting**

Brian McIntyre
Eric Gordon
Leslie Yerkes
Jeanette Peeples
Ed Reiff
David Reiman
Dave Mikita
Janet Benak
Rev. David Hunter
Danielle Conley
Marcia McCoy
Marquettios Bearden
Pastor Aaron Phillip

Benefactors

The Cleveland Foundation
Cleveland Cliffs Foundation
The George Gund Foundation
Eaton Corporation
Greater Cleveland Partnership
Fred Lennon Charitable Trust
Lincoln Electric
The Harold C Schott Foundation
Swagelok Foundation

Appendix B Site Visit Research

Sites Visited

MC2STEM High School, Cleveland, OH

<http://www.mc2stemhub.org/SchoolsPrograms/MC2STEMHighSchool.aspx>

The Cleveland School of Science and Medicine, Cleveland, OH

<http://www.cssmnet.net/>

Design Lab High School, Cleveland, OH

<http://www.mc2stemhub.org/SchoolsPrograms/DesignLabHighSchool.aspx>

Austin Polytechnical Academy, Chicago, IL

<http://www.austinpolytech.com/>

Polaris Career Center, Middleburg Heights, OH

<http://www.polaris.edu/>

David H. Ponitz Career Technology Center, Dayton, OH

<http://www.dps.k12.oh.us/school-ponitz/>

Toledo Technology Academy, Toledo, OH

<http://www.toledotechnologyacademy.org/>

Penta Career Center, Perrysburg, OH

<http://www.pentacareercenter.org/>

Francis Tuttle Technology Center, Oklahoma City, OK

<http://www.francistuttle.edu/>

Site Visit Participants

Chicago	Kitzel & Sons, Inc. MAGNET Max S. Hayes	Thomas Schumann Judith Crocker Dave Mikita Israel Burgos Kenneth Thomas Tim Blausner Dave Sansone John Colm
Dayton	PMA WIRE-Net Cleveland Metropolitan School District Max S. Hayes	Ahmed Abonamah Annette Darby Bernadette Manzo Brian Register Dave Mikita Destiny Jones Jim Mulgrew Joe McKay Mike Ebeid MJ Rindflerisch Hamed Thornton Wess Sanderson
Oklahoma City	Employment Connection Max S. Hayes WIRE-Net	Sandra Bizzell Dave Mikita Mike Hoag
Polaris	Hyland Software, Inc. Max S. Hayes Ozanne Construction Company, Inc.	Radu Dragan Brittany Roldan Dave Mikita Jim McDowell Lee Browning Dominic Ozanne

Site Visit Protocol

Directions: In preparing for your site visit, review the Max Hayes School Design Outline (attached) to identify those features or components you wish to observe during the visit. List those in the **left column** on the next page. Then, during your visit, observe those features and components and engage site staff in learning about them. Record what you learn in the **middle column**. When the site visit is complete, review the “data” you have collected in the middle column and reflect about the implications of that data for the Max Hayes design. Record those reflections in the **right column**.

Also, during your visit, note any other design components that catch your attention. List those in the **left column** as well and use the same process in collecting and reflecting on that data.

Site information

Site	
Location	
Web Address	
Other site information	

Site Contact Person

Name	
Phone	
Email	

Data Form

School Design Feature/Component (Refer to Max Hayes Design)	What (did you hear or see?)	So What (implications for the Max Hayes design?)
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Notes

Appendix C

Public-Private Partnerships for Developing School Facilities⁶

Background on Public–Private Partnership (PPP) Models for Schools

Cities can reform failing schools by leveraging the skills of the private sector. One such approach recruits the private sector to aid new small schools in the enormous task of identifying and developing quality facilities in which to operate. Rising real estate costs have made acquiring land for school construction prohibitively expensive, increasing the need for innovative alternate approaches to school placement. A public-private partnership that optimizes the respective benefits schools and private developers can reap from working together in larger mixed-use projects is especially worth exploring to deliver these facilities.

Most mixed-use developers have not actively engaged schools as partners either because of the perceived risks of working with start-up schools or perceived co-tenancy risks when schools are placed within larger mixed-use projects. There is, however, a growing interest among key financing and equity partners within the development industry to understand the value of having schools as partners. In fact, there are substantial benefits to both schools and developers who work together, especially in scenarios structured to use each partner's natural ability to optimally absorb the various stages of development risk throughout the project. For example, where the school can more easily absorb site control risk and the early pre-development risk that is often a deterrent for most developers to become engaged, developers can in turn absorb financing risk for the facility costs themselves where schools struggle to obtain initial funding for capital costs but can guarantee a long-term lease.

There are many examples of how these collaborations work successfully. Private developers can benefit from such partnerships in these ways:

1. Developers can rely on the relatively high creditworthiness of public schools to obtain strong financing terms by including stable long-term anchor tenants.
2. Developers can securitize a school's rent payments where a long-term lease is in place.
3. Where applicable, developers can gain density bonuses for including community uses such as schools.
4. In dense markets with tight conditions, this can have enormous value.
5. In soft edge markets where new development is still nascent, schools mitigate absorption risk upfront when it is otherwise difficult for banks to underwrite, allowing developers to finance projects that banks would deem too speculative without the school.
6. When schools have options for site control in desirable locations through the local authorities, they can reduce early carrying costs for the developer as well as decrease entitlement risk in cases where zoning is fast-tracked to open the school.

⁶ This prospectus was adapted by Big Picture from materials prepared by Christie Pizziconi, CFA, an international consultant dealing with public private partnerships in the United States and the United Kingdom.

The benefits to schools for working with private developers are similarly significant:

1. If schools guarantee a long lease term and absorb a large amount of space in a building, many private developers will finance major capital construction costs upfront and amortizing them throughout an initial period of the lease term. This benefit allows new schools with little start-up capital to construct quality permanent facilities.
2. Developers manage best the complexities of a construction project from identifying viable sites to the multi-faceted execution required for completion. With PPPs, facility issues are managed by experts so that schools can focus on their core competency of pedagogical development. The result is a cheaper project often with more amenities for the school.
3. Mixed-use developers can widen the pool of viable school sites by creating tax revenues from additional residential or commercial uses on site thus eliminating the conflict for cities to offer desirable land exclusively to tax-exempt uses. Over time, these tax revenues actually offset the cost to the city of the school's operations (tax-increment financing being the analogy). Some cash flows could even go to the school itself for discretionary spending.
4. Schools can pay competitive office rents in some markets from per pupil revenues after operating overhead is covered. Working with mixed-use developers offers schools sites in central locations such as business districts. This fosters student access to primary labor markets where they benefit from internships and even casual interactions with business professionals. These locations also help to retain quality teachers, as studies indicate that quality teachers migrate to safer, more central neighborhoods and better facilities over time.
5. Developers offer on-going property management, which is more cost-efficient and superior in quality because they must also satisfy other tenants of the building. There are myriad facility factors optimal in office space in particular that benefit student achievement including the maintenance of thermally conditioned space with maximum natural light.

Synergies of Education Development and Urban Revitalization (Benefit to Cities)

The concept of leveraging schools to ignite the larger revitalization of their surrounding communities is a well-established principle. However, it is most successful when the school is truly able to serve as an anchor destination around which the community can gather and utilize its resources. With on-going PPP collaborations, a private developer can enter the market and then undertake a much larger redevelopment initiative combining retail, housing and/or office space in addition to the school use. When planned properly and in close collaboration with the school as the anchor tenant, this larger project can be the driver for a positive market reaction that sparks other mixed-use projects in close proximity. This PPP model also encompasses the best practices of sustainable development in which multiple uses are congregated and appropriate density is encouraged, which is a critical strategy for the healthy revitalization of any urban core. Therefore, a PPP model can benefit local governments in search of successful revitalization initiatives.

The other advantage of working with private sector partners to identify and then execute strategies to redevelop school sites into mixed-use projects is the increase in tax revenues. While schools are historically located to minimize the loss of taxes to the local government, redeveloping school sites

to include commercial and residential uses allows the government to recoup tax revenues that can become quite substantial when considered in the context of the longevity of the school. Though these revenues do not necessarily circle back directly to support the schools, they do contribute to the overall base from which schools are funded. Much as tax-increment financing (TIF) has become a popular engine of governments to fund major commercial developments, this strategy becomes like a “soft TIF” in which the government can justify additional expenditures for the schools from the proceeds of these newly created tax revenues on site. Overall, the notion of mixed-use sites completely frees up the inherent conflict governments face between locating schools in desirable locations for the children to be integrated in the communities and minimizing the loss of tax revenues from dedicating commercially viable sites to schools.

Illustrative Steps in Executing a Public Private Partnership

1. Identify facility priority list and programmatic scope with the district leadership.
2. Identify several possible sites for acquisition and development.
3. Establish timeline for development of site after site identification.
4. Coordinate local stakeholders in conjunction with school leadership to obtain maximum resources for school development project.
5. Identify and coordinate potential facility partners for school including nearby universities, colleges, and commercial entities in conjunction with the efforts of school leadership.
6. Source potential architects, construction cost estimators and other pre-development subcontractors subject to the approval of the school leadership.
7. Work with architect(s) to generate several conceptual design schemes to be approved by school leadership based on previously approved facility priority list.
8. Identify on-going revenue-generating opportunities for future development site as part of conceptual design process to maximize future discretionary funding opportunities for school.
9. Manage approved subcontractors during pre-development on behalf of school leadership.
10. Create financial valuations for priority sites to obtain alternative sources of equity and financing to undertake the development of the site.
11. Negotiate with potential sources of equity and financing to obtain construction financing.
12. Work with construction manager/general contractor to establish GMP for project.
13. Act as development partner for school solely or in conjunction with an additional joint venture partner approved by the school leadership.

Appendix D Sedlacek's Noncognitive Variables

Variable #	Variable Name
1	Positive Self-Concept Demonstrates confidence, strength of character, determination, and independence.
2	Realistic Self-Appraisal Recognizes and accepts any strengths and deficiencies, especially academic, and works hard at self-development. Recognizes need to broaden his/her individuality.
3	Understands and Knows How to Handle the System (Racism) Exhibits a realistic view of the system based upon personal experience, which may include racism. Committed to improving the existing system. Takes an assertive approach to dealing with existing wrongs, but is not hostile to society, nor is a "cop-out." Able to handle racist system.
4	Prefers Long-Range to Short-Term or Immediate Needs Able to respond to deferred gratification, plans ahead and sets goals.
5	Availability of Strong Support Person Seeks and takes advantage of a strong support network or has someone to turn to in a crisis or for encouragement.
6	Successful Leadership Experience Demonstrates strong leadership in any area of his/her background (e.g. church, sports, non-educational groups, gang leader, etc.).
7	Demonstrated Community Service Participates and is involved in his/her community.
8	Knowledge Acquired in or about a Field Acquires knowledge in a sustained and/or culturally related ways in any field.

**Appendix E
Sample Module Template**

Module Title	
Grade / Discipline / Career Area / Pathway	
Overview of Project(s)	
Academic Competencies Addressed	
Workplace Competencies Addressed	
Technical Competencies Addressed	

Cross-Area Drivers

--

Student Products--Culminating

--

Learning Tasks / Performances

--

Assessments

--

Standards Alignment

--

Appendix F
University of California a-g Alignment Matrices⁷

Course Title: Algebra 1

Course Description:

Symbolic reasoning and calculations with symbols are central in algebra. Through the study of algebra, a student develops an understanding of the symbolic language of mathematics and the sciences. In addition, algebraic skills and concepts are developed and used in a wide variety of problem-solving situations.

In this course, all topics and units will be covered. A minimum of 50% of the units will be covered in-depth through a variety of instructional experiences that may include: internships, independent projects, workshops, individual and small group seminars, college classes, online courses, field studies, traditional research, written reflections, tutoring, student exhibitions, and lectures from outside experts. A credentialed instructor in this subject area will analyze the rigor of the work completed in order to ensure that the learning objectives were addressed with adequate depth.

In addition, all students will be expected to demonstrate each unit in a compilation of at least two project-based assignments for the course. Along with the project work, students will be required to complete all assigned readings and conduct active research embedded in their internship projects centered on the selected topic/s agreed upon by their advisor/teacher and mentor as they relate to the course standards. In keeping with the Big Picture philosophy, academic learning will be linked to student interests and connected to real world experiences. This active learning must include both primary and secondary source analysis and written reflections of these source materials as supporting study for successful completion of the final products for all student work.

Students will use the textbook *Mathematics: Modeling Our World* as a reference. Relevant homework problems will be assigned for each student to enhance his or her understanding of key concepts involved in the project work. Students will have access to other standards-based academic texts, the Internet, primary and secondary sources, mathematics tutorials and specialized sequential workshops as well as expertise at their internship site and outside experts as lecturers. Since Mathematics is a sequential discipline, often students will be required to demonstrate more basic skills in order to complete higher level units. Students at Big Picture Schools utilize a variety of resources to demonstrate mastery of sequential skills, from directed instruction with standards-based textbooks and assessments, to standards-based online or software programs and assessments, to college entrance math assessments and courses.

⁷ These matrices were developed by Big Picture Learning to align the Big Picture Learning curriculum with the University of California course standards.

Assessment of students will be threefold. First, a credentialed instructor in this subject area will analyze the rigor of the work completed in order to ensure that the learning objectives were addressed with adequate depth. Second, students will demonstrate their skill proficiency and conceptual understanding through quarterly presentations of their mathematics portfolio. Students will be asked to discuss the reasoning behind the work they've done, as well as the logic behind sequential steps. Third, each student's advisor will insure breadth of coverage of the standards through assessment of the student's learning plan and detailed project work.

Course Outline:

TOPIC	UNITS	SAMPLE ACTIVITIES & PROJECTS
<p>Basic Numbers:</p> <p><i>CA (1.0) Students identify and use the arithmetic properties of subsets of integers and rational, irrational, and real numbers, including closure properties for the four basic arithmetic operations where applicable:</i></p> <p><i>CA (2.0) Students understand and use such operations as taking the opposite, finding the reciprocal, taking a root, and raising to a fractional power. They understand and use the rules of exponents.</i></p> <p><i>CA (3.0) Students solve equations and inequalities involving absolute values.</i></p> <p><i>CA (4.0) Students simplify expressions before solving linear equations and inequalities in one variable, such as $3(2x-5) + 4(x-2) = 12$.</i></p>	<ul style="list-style-type: none"> ▪ Number Lines ▪ Order of Operations ▪ Basic Statistics ▪ Equations and Functions 	<p>Number Lines</p> <ul style="list-style-type: none"> ▪ Piece movement on a board game ▪ Weather/temperature charting ▪ Time in different time zones around the world ▪ Checking account project (Independent Living) Students chart balance of checking account on a number line. <p>Order of Operations</p> <ul style="list-style-type: none"> ▪ Investments – buying/tracking stock values ▪ Perimeter problems ($P= 2s + 2(s+3)$) ▪ Figuring the volume of pyramids in Egypt, Peru, Mexico ▪ Elevator Project – elevator goes up and down, track absolute value of movement. ▪ \$1,000,000 spreadsheet project where students are required to use Excel to spend \$1,000,000, accounting for all costs for a year. <p>Basic Statistics</p> <ul style="list-style-type: none"> ▪ MPG study of new cars ▪ Weights of students in class ▪ Number rounding problems ▪ Mutant Candy Project – what is better, 1 candy and doubling it every hour, or 100 candies per hour ▪ -graphs ▪ -exponential growth vs. linear growth <p>Equations and Functions</p> <ul style="list-style-type: none"> ▪ Study the Distributive Property

	<ul style="list-style-type: none"> ▪ Rational Numbers 	<ul style="list-style-type: none"> ▪ Study the Commutative Property ▪ Study the Associative Property <p>Rational Numbers</p> <ul style="list-style-type: none"> ▪ Students research and design word problems dealing with adding and subtracting rational numbers ▪ Students research and design word problems dealing with multiplying and dividing rational numbers ▪ Culminating problem, written by students, involving all four routines with rational numbers
<p>Linear Equations:</p> <p><i>CA (5.0) Students solve multistep problems, including word problems, involving linear equations and linear inequalities in one variable and provide justification for each step.</i></p> <p><i>CA (6.0) Students graph a linear equation and compute the x- and y-intercepts (e.g., graph $2x + 6y = 4$). They are also able to sketch the region defined by linear inequality (e.g., they sketch the region defined by $2x + 6y < 4$).</i></p> <p><i>CA (7.0) Students verify that a point lies on a line, given an equation of the line. Students are able to derive linear equations by using the point-slope formula.</i></p> <p><i>CA (8.0) Students understand the concepts of parallel lines and perpendicular lines and how those slopes are related. Students are able to find the equation of a line perpendicular to a given line that passes through a given point.</i></p> <p><i>CA (9.0) Students solve a system</i></p>	<ul style="list-style-type: none"> ▪ Solve Equations With Addition and Subtraction ▪ Solve Equations With Multiplication and Division ▪ Solve Multi-Step Problems 	<p>Solve Equations With Addition and Subtraction</p> <ul style="list-style-type: none"> ▪ Use equations to compare how one NFL team did over the season than another ▪ Design problems utilizing the Addition Property of Equality ▪ Design problems utilizing the Subtraction Property of Equality <p>Solve Equations With Multiplication and Division</p> <ul style="list-style-type: none"> ▪ Wheelchair ramp problem where rise can be no higher than 1" for a run of 12". ▪ Design problems utilizing the Multiplication Property of Equality ▪ Design problems utilizing the Division Property of Equality <p>Solve Multi-Step Problems</p> <ul style="list-style-type: none"> ▪ Phone Cost Project: $y = mx + b$, where the y-intercept (b) = monthly rate and the slope (m) = cost per minute. ▪ Pool Filling Problem: $y = mx + b$, where b = number of gallons in the pool at the start (most likely 0), and m = gallons per minute that go into the pool. ▪ Cricket Chirps/Temperature Problem ▪ Taxi Project: $y = mx + b$, where b = starting cost and m = cost per mile. ▪ Mountain Hiking Problem: $y = mx + b$, where b = starting elevation and m = steepness of the trail. ▪ Pointing Lines <ul style="list-style-type: none"> ○ graph lines given ○ name point on line given x-value ▪ Ruler of Your Domain

<p>of two linear equations in two variables algebraically and are able to interpret the answer graphically. Students are able to solve a system of two linear inequalities in two variables and to sketch the solution sets.</p>	<ul style="list-style-type: none"> ▪ Solve System of Linear Equations and Inequalities 	<ul style="list-style-type: none"> ▪ Ex. $p(t) = 2.50t - 450$ graph domain and range ▪ Simple Interest vs. Compound Interest <p>Solve System of Linear Equations and Inequalities</p> <ul style="list-style-type: none"> ▪ Playing Catch Up – two hikers starting on same trail at different times with different rates of speed. How fast does one need to travel to catch up to another hiker in front going a certain speed after a certain time hiking. ▪ Graph a system of populations of two different kind of species to see when the populations equaled each other ▪ Study Supply and Demand curves (Economics) of a certain product and ascertain the precise selling price to bring the highest income
<p>Polynomials:</p> <p>CA (10.0) Students add, subtract, multiply, and divide monomials and polynomials. Students solve multistep problems, including word problems, by using these techniques.</p> <p>CA (11.0) Students apply basic factoring techniques to second- and simple third-degree polynomials. These techniques include finding a common factor for all terms in a polynomial, recognizing the difference of two squares, and recognizing perfect squares of binomials.</p> <p>CA (12.0) Students simplify fractions with polynomials in the numerator and denominator by factoring both and reducing them to the lowest terms.</p>	<ul style="list-style-type: none"> ▪ Polynomials in Art ▪ Polynomials in Business ▪ Using tiles of different sizes and patterns to understand polynomials. 	<p>Polynomials in Art</p> <ul style="list-style-type: none"> ▪ Students study Piet Mondrian’s art <p>Polynomials in Business</p> <ul style="list-style-type: none"> ▪ Students invest money using the px^t formula <p>Using tiles of different sizes and patterns to understand polynomials.</p> <ul style="list-style-type: none"> ▪ Patio Building Project ▪ Box Design Project
<p>Graphs:</p>	<ul style="list-style-type: none"> ▪ Cartography 	<p>Cartography</p> <ul style="list-style-type: none"> ▪ Longitude/Latitude project

<p>CA (17.0) Students determine the domain of independent variables and the range of dependent variables defined by a graph, a set of ordered pairs, or a symbolic expression.</p> <p>CA (18.0) Students determine whether a relation defined by a graph, a set of ordered pairs, or a symbolic expression is a function and justify the conclusion.</p>	<ul style="list-style-type: none"> ▪ Scatter Plots ▪ Technical Graphing 	<p>Scatter Plots</p> <ul style="list-style-type: none"> ▪ Biology populations charts ▪ Endangered species exportation graphs <p>Technical Graphing</p> <ul style="list-style-type: none"> ▪ Students know Definition of the Domain and Range of a Relation ▪ Economics: Unemployment graphs ▪ Economics: Retail sales ▪ Probability: Students learn odds of number combinations of two dice rolled randomly
<p>Quadratic Formula:</p> <p>CA (19.0) Students know the quadratic formula and are familiar with its proof by completing the square.</p> <p>CA (20.0) Students use the quadratic formula to find the roots of a second-degree polynomial and to solve quadratic equations.</p> <p>CA (21.0) Students graph quadratic functions and know that their roots are the x-intercepts.</p> <p>CA (22.0) Students use the quadratic formula or factoring techniques or both to determine whether the graph of a quadratic function will intersect the x-axis in zero, one, or two points.</p> <p>CA (23.0) Students apply quadratic equations to physical problems, such as the motion of an object under the force of gravity.</p>	<ul style="list-style-type: none"> ▪ Understanding the Quadratic Formula by graphing real life problems. 	<p>Understanding the Quadratic Formula by graphing real life problems.</p> <ul style="list-style-type: none"> ▪ Bouncing Ball Project – Looking at angle of trajectory and speed, graph the path of a bouncing ball at various time intervals. Use the quadratic equation to describe this path. ▪ Shooting a Basket Project ▪ Volunteering numbers vs. age of volunteers ▪ Students study the SkillsTutor. Louis Arch which is a catenary. The shape of the arch can be approximated by the graph of the function $f(x) = -0.00635x^2 + 4.0005x - 0.07875$, where $f(x)$ is the height of the arch in feet and x is the horizontal distance from one base

Learning Outcomes. The student will be able to understand:	Learning Activities and Projects that address the stated Learning Outcomes (Be sure to include how mastery of the learning outcomes will be evaluated):	How Standard was Met	Grade for Topic	Advisor Initials	Date Year Tri.
1. Basic Numbers					
2. Linear Equations					
3. Polynomials					
4. Graphs					
5. Quadratic Formula					

Key:

Internship = LTI Independent Project = IP Workshops = W Advisory = A	Summer School = SS Field Studies (day trips, summer travel) = FS Pick Me Ups / Lecture = L Test = T
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College Classes = CC Online Courses = OC	Interviews = IV
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Date Code: Number of the quarter, and the year (for example: Q1 0405)