CTE AND STEM CAREER PATHWAYS IN MIDDLE AND EARLY COLLEGES

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Today's agenda

- About STEM and CTE pathways.
- Tools for creating pathways.
- Pathways at Bassick High School

What is career technical education?

Traditionally

- "Voc ed"
- For students not expected to go to college
- Associated with tracking and limited options

Emerging

- "Career technical education"
- A college pathway
- Leading to career ladders
- Not limiting options

What is STEM education?

- *Science* –the study of the natural world.
- *Technology*— the study of the human-made world, its artifacts and processes.
- *Engineering*—creating the human-made world, the artifacts and processes that never existed before.
- *Mathematics*—the study of patterns and relationships among quantities, numbers, and shapes.

(Katehi, Pearson, & Feder, 2009)

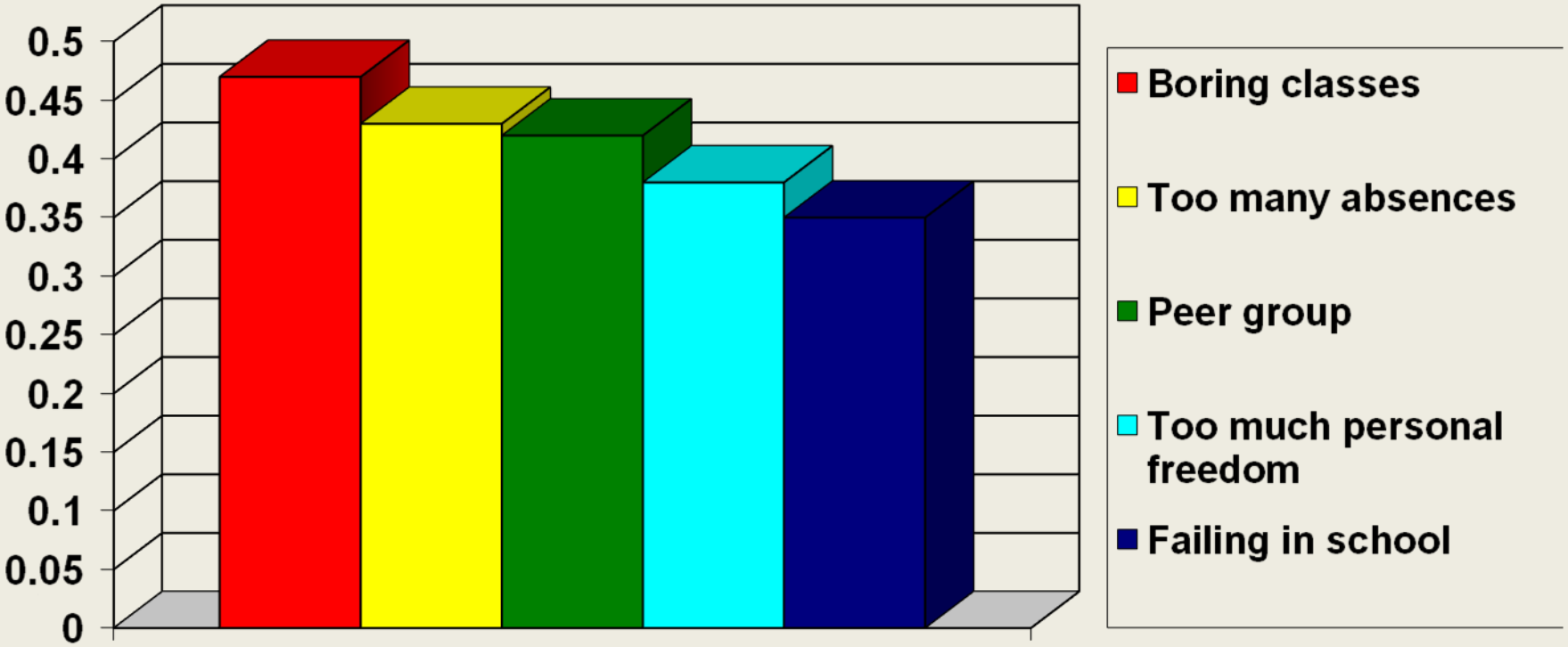
In STEM, science and math serve as bookends for technology and engineering. Science and math are critical to a basic understanding of the universe, while engineering and technology are means for people to interact with the universe.

(Christenson, 2011)

WHY focus on CTE and STEM

- All students will have careers; education can help them be successful (along with other goals).
- CTE and STEM allow students to try out different career paths and life options.
- CTE dual enrollment may be a particularly effective for low-income students and males.
- Good CTE and STEM education inspires and promotes academic learning.

Why do students drop out?

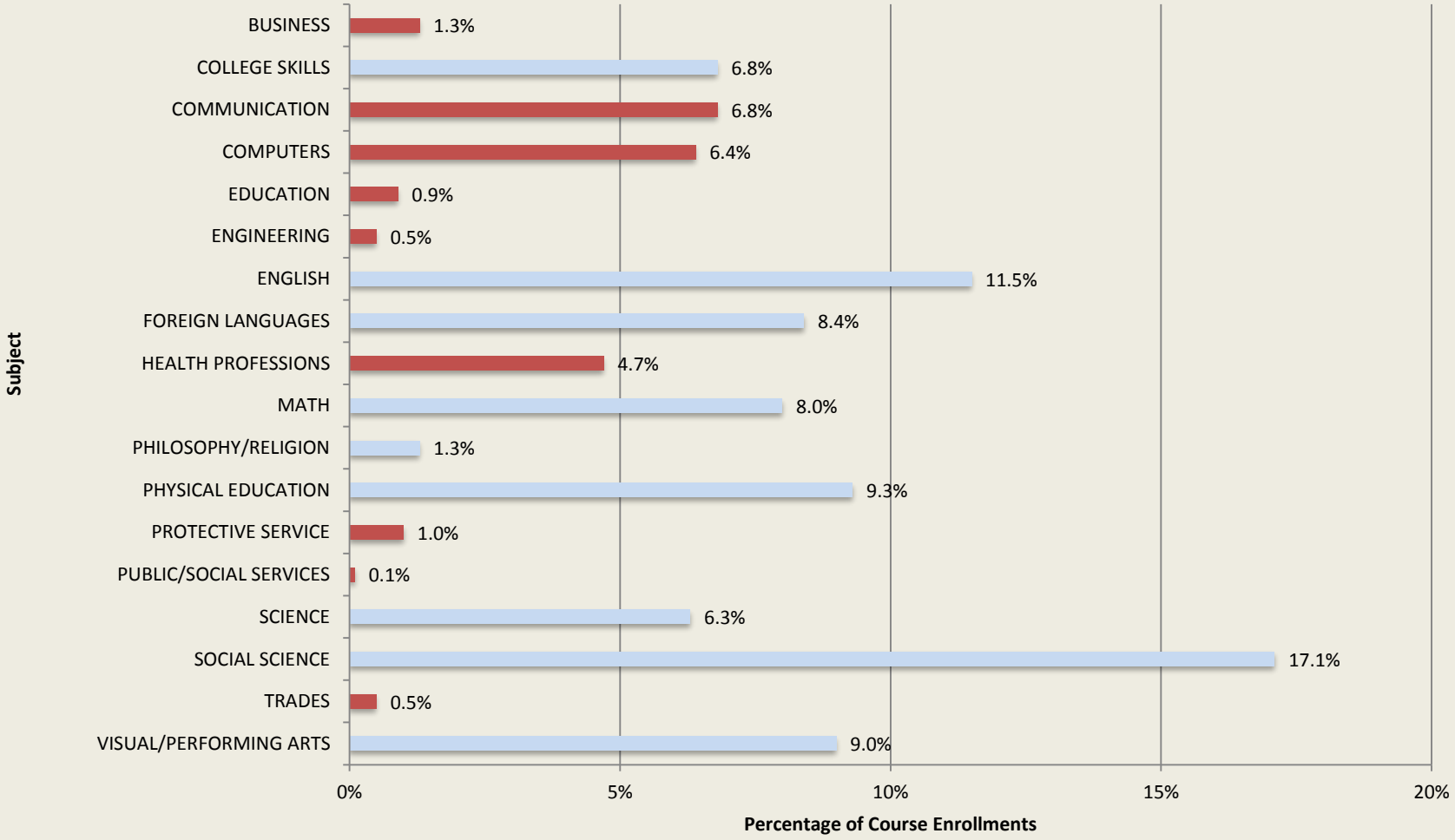


From CCTI: The silent epidemic: Perspectives of high school dropouts – Civic Enterprises, 2006

What counts as CTE?

General Education	Career Technical Education	Other
ENGLISH	BUSINESS	COLLEGE SKILLS
FOREIGN LANGUAGES	COMMUNICATION	PE
MATH	COMPUTERS	
PHILOSOPHY/RELIGION	EDUCATION	
SCIENCE	ENGINEERING	
SOCIAL SCIENCE	HEALTH PROFESSIONS	
VISUAL/PERFORMING ARTS	PERSONAL/CULINARY SERVICES	
	PROTECTIVE SERVICE	
	PUBLIC/SOCIAL SERVICES	
	TRADES	

MCNC COLLEGE ENROLLMENTS BY SUBJECT- Focus on CTE (N=46,338)



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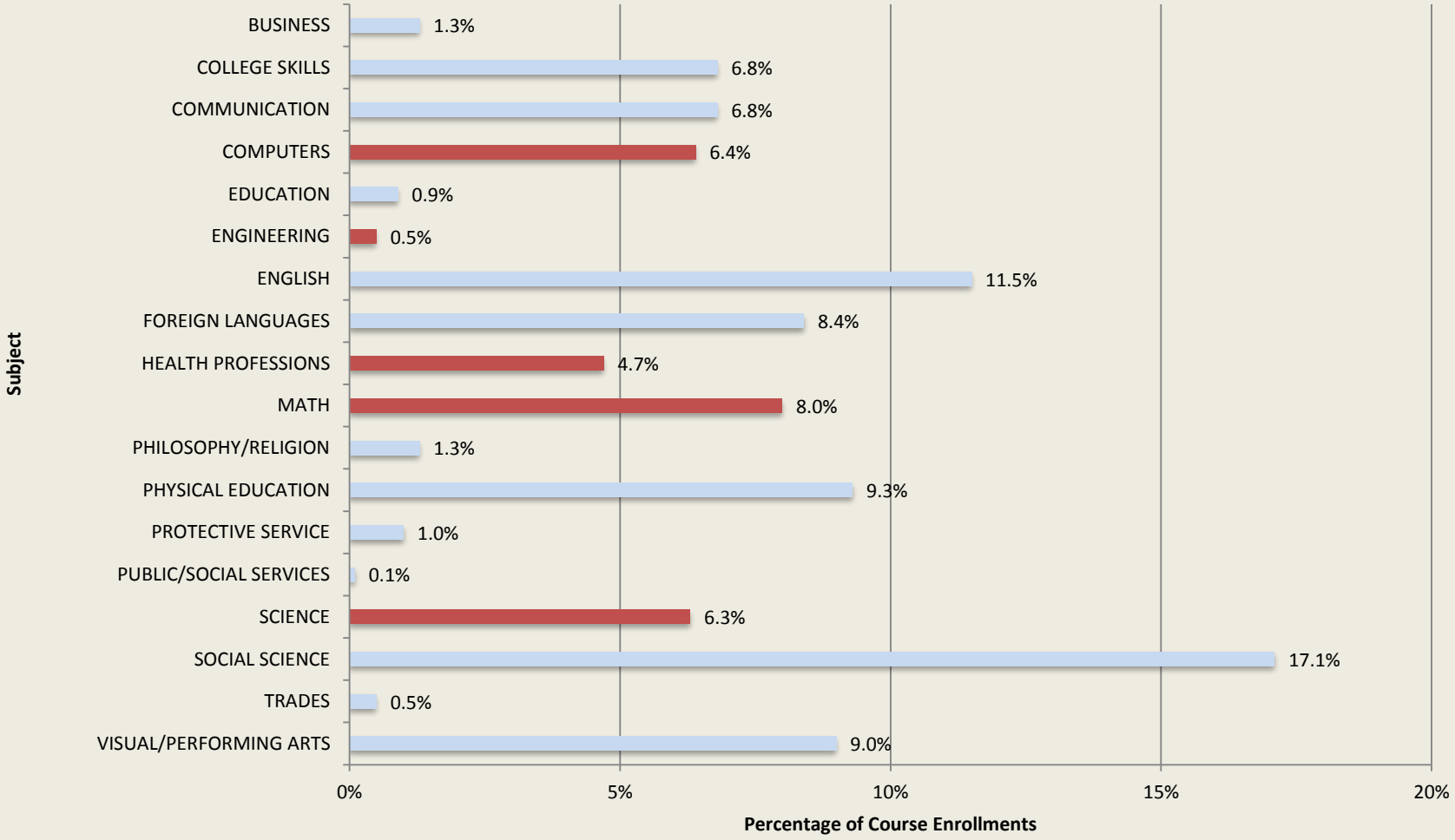


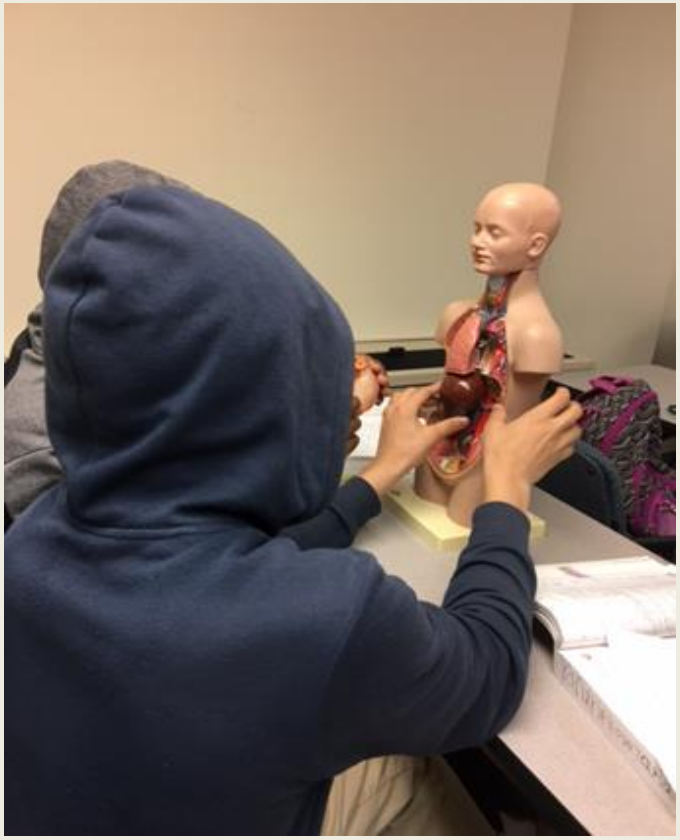
What is a career pathway?

- Sequence of CTE and academic courses spanning K-12 and higher education
- Rigorous coursework
- Student supports
- Leading to high quality education and employment.

Core ideas in CTE/STEM (career) pathways

- Course sequences that span high school and college
- Stackable credentials
- Integrated CTE and "academics"

  (contextual learning)
- Workplace learning
- Student support



CCTI Career Pathways Template

COLLEGE:
HIGH SCHOOL(S):

CLUSTER:
PATHWAY:
PROGRAM:

	GRADE	ENGLISH	MATH	SCIENCE	SOCIAL STUDIES	REQUIRED COURSES RECOMMENDED ELECTIVE COURSES OTHER ELECTIVE COURSES CAREER AND TECHNICAL EDUCATION COURSES			
SECONDARY	9								
	10								
	11								
	12								
POSTSECONDARY	Year 1 1st Quarter								
	Year 1 2nd Quarter								
	Year 1 3rd Quarter								
	Year 2 1st Quarter								
	Year 2 2nd Quarter								
	Year 2 3rd Quarter								

ADULT LEARNER ENTRY POINTS

Rigorous Academics

CTE for all

Dual Enrollment

Early Assessment in H.S.

Required Courses
Recommended Elective Courses
Other Elective Courses
Career and Technical Education Courses
Credit-Based Transition Programs (e.g., Dual/Concurrent Enrollment, Articulated Courses, 2+2+2
Mandatory Assessments, Advising, and Additional Preparation

League.org FOR INNOVATION IN THE COMMUNITY COLLEGE CCTI College and Career Transitions Initiative

Funded by the U. S. Department of Education
(V051B020001)

Example: Anne Arundel Career Pathway

COLLEGE: Anne Arundel Community College
HIGH SCHOOL(S): Annapolis, Arundel, Chesapeake, Glen Burnie, Meade, North Co., Northeast, Old Mill, Severna Pk

CLUSTER: Education and Training
PATHWAY: Teaching/Training
PROGRAM: Academy of Teaching Professions

ADULT LEARNER ENTRY POINTS

	GRADE	ENGLISH	MATH	SCIENCE	SOCIAL STUDIES	REQUIRED COURSES RECOMMENDED ELECTIVE COURSES OTHER ELECTIVE COURSES CAREER AND TECHNICAL EDUCATION COURSES			
SECONDARY	9	English 9 (1)	Algebra I or Geometry (1)	Biology (1)	US Government (1)	Health (.5)	Physical Education (.5)	Keyboarding (.5)	Intro to Computers (.5)
SECONDARY	10	English 10 (1)	Geometry or Algebra II (1)	Chemistry or Earth, Space Science (1)	AP European History or World Civ. (1)	Foreign Language (1)	Child Development I (1)	Bus. Pres (.5), Parenting (.5)	Intro to Teaching Prof. I (.5)
	Accuplacer administered second sumester, 10th grade to assess college readiness and address areas of weakness								
SECONDARY	11	AP English Language or English 11 (1)	Algebra II or Pre-Calculus (1)	AP Sci. elective, Physics or Chem. or Physical Sci. (1)	AP US History or US History (1)	Foreign Language (1)	Child Development II (1)	SAT Prep (.5), Psychology (.5)	Intro to Teaching Prof. II (.5)
SECONDARY	12	AP English Literature or English 12 (1)	AP Calculus, Pre-Calculus or Math elective (1)	AP Science or other science elective, (1)	AP Psychology (1)	Prof. Career Internship (.5-1)	Found. of Ed.(3) [Concurrent]	Content area courses if Secondary Ed.	Content area courses if Secondary Ed.
	Administer college placement exams (reading, math and writing) and other assessments to determine academic readiness and career skill preparedness; provide academic/career advising and additional preparation								
POSTSECONDARY	Year 1 1st Semester	■●Composition and Intro to Lit. I (3)	●Fundamental Concepts of Math I (4)	■●Fund. of Bio. or Envir. Sci. (4)	■●Intro to Psychology (3)	●Foundations of Education (3)			
POSTSECONDARY	Year 1 2nd Semester	■●Composition and Intro to Lit. II (3)	●Fundamental Concepts of Math II (4)	●General Physical Science (4)	●World Geography (3)	●Growth and Development (3)			
	Passage of Praxis exam required for AAT								
POSTSECONDARY	Year 2 1st Semester	●Fund. of Oral Comm. (3)	●Fundamental Concepts of Math III (4)	●The Solar System (4)		■●Educational Psychology (3)	●Introduction to Special Education (3)		
POSTSECONDARY	Year 2 2nd Semester				■●American History 1 or 2 (3)	●Foundations of Reading & Lang. Arts (3)	●Personal & Community Health (3)	■●American Government (3)	●Introduction to Fine Arts (3)

League.org FOR INNOVATION IN THE COMMUNITY COLLEGE **CCTI** College and Career Transitions Initiative

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Required Courses
Recommended Elective Courses
Career and Technical Education Courses
Credit-Based Transition Programs (e.g. Dual/Concurrent Enrollment, Articulated Courses, 2+2+2
(◆=High School to Com. College) (●=Com. College to 4-Yr Institution) (■=Opportunity to test out)
Mandatory Assessments, Advising, and Additional Preparation

- To complete the Associate of Arts in Teaching (AAT), a student must submit passing Praxis scores, and earn a 2.75 cumulative grade point average and a C or better in all coursework.
- Upon successful completion of an AAT and acceptance into any Maryland public or private education program, a seamless transfer without loss of credit is guaranteed.

NAM stacked credentials

Integrated, contextual learning

- Perkins IV requires “integration of rigorous and challenging academic and career and technical education in POS/career pathways.” (NRCCTE)
- Many jobs require good math and literacy skills.
- Students often learn better if the material is relevant to their interests.

Sample map from NRCCTE

Math-in-CTE Curriculum Map:
Architecture and Construction

CTE Course/Unit	CTE Concepts	Math Concepts	Middle School Common Core Math Standards	High School Common Core Math Standards
Safety	Tool usage; Shop safety	Statistics (Accidents in industry or schools); Reading and following flow charts	6.SP.4; 6.SP.5; 7.SP.2; 7.SP.3; 7.SP.4; 7.SP.5; 8.SP.1; 8.SP.3; 8.SP.4; 6.EE.2; 6.EE.3; 6.SP.4; 6.SP.5; 8.SP.3; 8.SP.4	S.ID.1; S.ID.2; S.ID.3; S.ID.5; S.ID.6; S.IC.1; S.IC.3; S.IC.4; S.IC.6; S.MD.1; S.CP.1; S.IC.1; S.IC.2; S.IC.5
Architectural design; Careers; Project design; Site layout; Types of drawings;	Residential structure design types; Careers in construction and design; Layout of	Symmetry; Earning potential; Trigonometric angle; Scale, ratio, and proportion;	7.G.5; 6.RP.1; 6.RP.2; 6.RP.3; 7.RP.1; 7.RP.2; 7.RP.3; 7.EE.3; 6.G.1; 6.G.2; 6.G.3; 7.G.1; 7.G.4; 7.G.6;	G.CO.9; G.CO.12; G.CO.13; G.SRT.6; G.SRT.8; F.TF.1; F.TF.2; F.TF.7; G.MG.3;

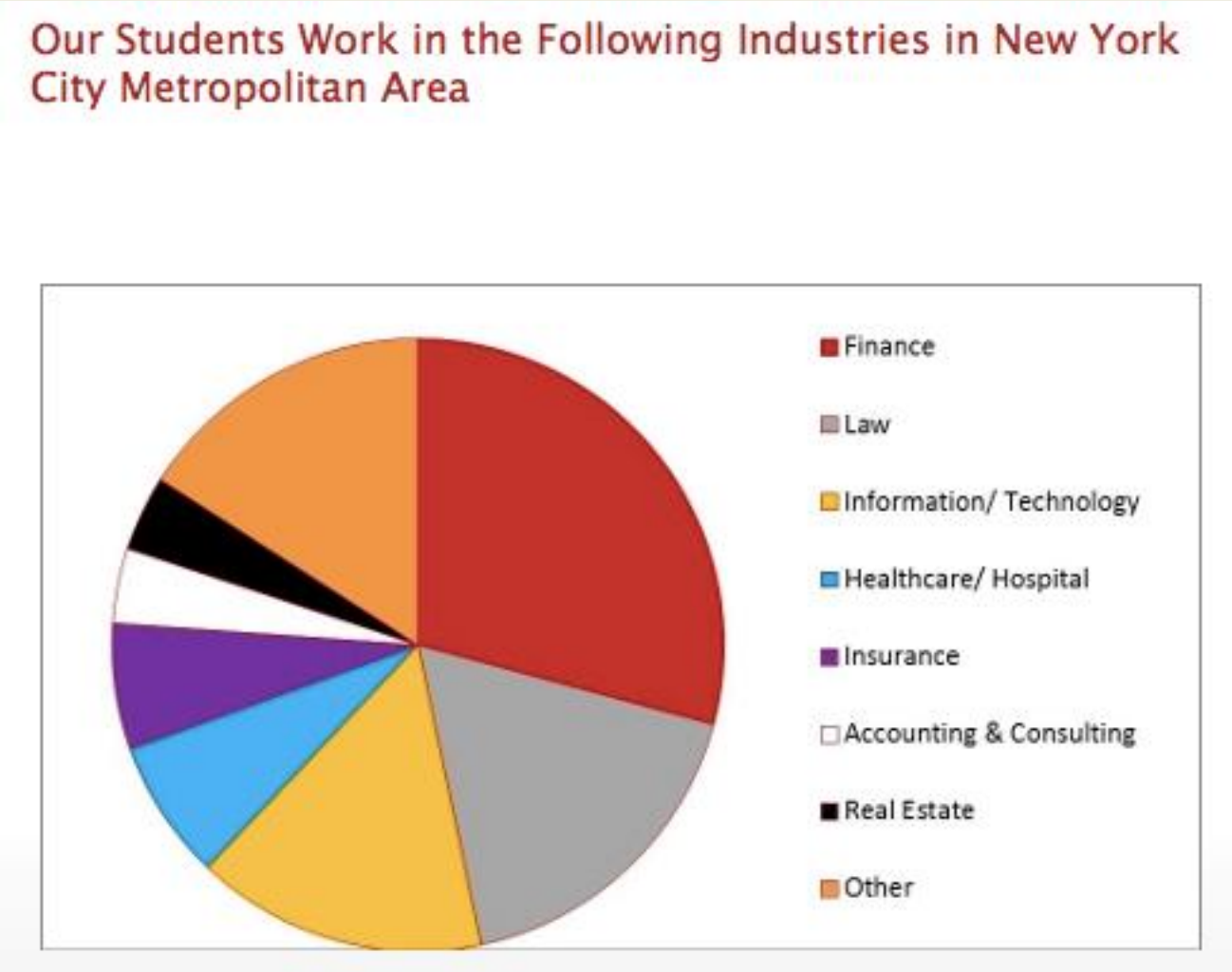
Workplace learning- National Academy Foundation

CONTINUUM OF COLLEGE & CAREER EXPERIENCES

The NAF Continuum of College & Career Experiences includes work-based learning, in which students directly interact with business partners, as well as additional experiences which prepare students for college and careers.

Awareness	Exploration	Preparation
Work-Based Learning Experiences		
• Guest speaker • Worksite tour • Career fair • Mentor with business partners	• Job shadow • Mock interview • Informational interview	• Paid internship • Virtual or school-based enterprise led by business partner • Senior presentation to business partner
Career Experiences		
• Individualized student learning, college & career plan • Career interest inventory • NAF Curriculum	• Community planning project • Industry competition or conference • Resume development • Business dress, behavior, and etiquette training • NAF Curriculum	• Industry certificates • Community planning project • Academy student recruitment • NAF Curriculum

Cristo Rey Internships/Jobs



BASSICK HIGH SCHOOL

DUAL ENROLLMENT PROGRAMS PERSPECTIVE

Advanced Manufacturing at Housatonic Community College (HCC)

Advanced Manufacturing at Housatonic Community College

HCC INFORMATION

- 5,288 total enrollment
  - 1,836 full-time
  - 3,452 part-time
- 38% male / 62% female
- Minority enrollment 63% (majority Latino and Black)
- Student to teacher ratio 15:1
- https://www.communitycollegereview.com/housatonic-community-college-profile
- 37 Degree Programs – A.A and A.S.
- 24 Certificate programs

BASSICK ENROLLMENT

- AY 2015-2016 enrolled 10 rising juniors (Cohort 1) 9 boys and 1 girl
- AY 2016-2017 we enrolled 15 new rising juniors (Cohort 2) 11 boys 4 girls
- Current enrollment
  - Cohort 1-5 boys (1 death of parent;1 drug use;2 focus on post-secondary;1 struggling academically)
  - Cohort 2-8 boys 3 girls (1 girl moved;1medical;2 boys academically struggling)
- TOTAL 16 students

HCC STUDENT RECRUITMENT

BASSICK'S ADVANCED MANUFACTURING CLASS

AT HOUSATONIC COMMUNITY COLLEGE

ONLY YOU WERE CHOSEN!!

A UNIQUE EXPERIENCE

A PATH TO A CAREER

EARN HIGH SCHOOL & COLLEGE CREDITS AT THE SAME TIME

HCC ADVANCED MANUFACTURING PROGRAM

- **The Southwestern Connecticut Advanced Manufacturing Center**, established at HCC in 2012, is part of a statewide initiative to provide skilled employees for the growing manufacturing industry.
- **Advanced Manufacturing is the path** to a growth-oriented career that is hands-on and high-tech, in **Aerospace, Submarines, Biomedical Technology** and other exciting fields.
- The Advanced Manufacturing Program is a **one school year (9 month) certificate program**. It is an intense thirty-five hour per week, thirty-four college credits* program. Students can choose a day or night schedule.

FAQs

TRANSPORTATION
- Students will be transported to Housatonic via bus provided by BOE
- Students will be given bus pass for transportation home

HOURS
- At Bassick regular school hours 7:53-11:40
- At HCC classes 12:00-2:30

CREDITS
- High School 40 points: for Math , Science, English, History and an additional 30 points for classes at HCC
- Housatonic 18 points at the end of 2 years
  - The 18 credits towards the 34 credits required to receive your CERTIFICATION IN ADVANCED MANUFACTURING

GRADUATION
- Students will graduate June 2017 with all required credits

FUTURE
- CERTIFICATION prepares students for the demanding workforce with beginning salaries at $35,000-40,000 per yr.
- CERTIFICATION points can be credited toward an ASSOCIATES IN SCIENCE DEGREE
- The ASSOCIATES DEGREE can be transferred to Central Ct State University for a BACHELORS DEGREE

ACTIVITY, SPORTS ETC
- Students can participate in any extra-curricular / after-school team or activity they are eligible for.

BUILDING A FUTURE

CAREER PATH	AVG YEARLY SALARY
• CAD/CAM Programmer	Avg Starting Salary: $47,214
• CNC (Computer Numeric Control) operator	Avg Starting Salary: $40,638
• CNC Programmer	
• Assembler	
• Careers in Manufacturing.	
○ Lean Manufacturing	Avg Starting Salary: $74,260
○ Quality Control Inspector-Metrology	Avg Starting Salary: $43,158
○ Tool and Die	Avg Starting Salary: $55,102
○ Machining-Operator	Avg Starting Salary: $42,110

http://www.ct.edu/makeithere

THE CURRICULUM

Year 1-Junior Year

HCC's course	High School Alignment
Introduction to CAD	Tech Ed Elective
Blue Print Reading I	Tech Ed Elective
Manufacturing Machinery-Drill Press and Saw	Tech Ed Elective
Manufacturing Machinery-Benchwork	Tech Ed Elective
Manufacturing Machinery-Milling I	Tech Ed Elective
Metrology	Tech Ed Elective

Year 2-Senior Year

HCC's course	High School Alignment
Manufacturing Machinery-Grinding	Tech Ed Elective
Manufacturing Machinery-Lathe	Tech Ed Elective
Manufacturing Machinery-CNC I	Tech Ed Elective
Lean Manufacturing	Tech Ed Elective
Manufacturing Math	Math Elective
Career Awareness	Business Elective
Computer Applications	Business Elective

18 College Credits upon completion**-16** more credits needed for Certification- addt'l **26** credits needed for A.S

BASSICK HIGH SCHOOL

DUAL ENROLLMENT PROGRAMS PERSPECTIVE

Healthcare Career and College Readiness Program (HCCRP) at St. Vincent's College

Healthcare Career and College Readiness Program at St. Vincent's College

St. Vincent's information:

- Private institution
- 675 total enrollment
- Male to female student ratio of 13% male to 87% female.
- Student to teacher ratio 13:1
- http://colleges.startclass.com/l/775/St-Vincent-s-College
- 4 Degree Programs – 2 A.S and 2 B.S.
- 14 Certificate programs

BASSICK ENROLLMENT

- AY 2016-2017 we enrolled 18 rising freshman (Cohort 1) 11 boys 7 girls
- AY 2017-2018 anticipating enrolling 10 rising freshman (Cohort 2)
- CNA Certificate Program enrollment 2 Juniors and 2 Seniors through Continuing Ed

Current enrollment 17 students (1 student transferred to another school)

ST. VINCENT'S COLLEGE RECRUITMENT

TO LEARN MORE:
COME TO OUR INFORMATION SESSION
ON WEDNESDAY, AUGUST 17 @ 11:00 AT BASSICK

LIMITED SPACE
ONLY 18 STUDENTS WILL BE SELECTED
REGISTRATION STARTS WEDS. 8/17
DECISION WILL BE MADE ON FRIDAY 8/19

HEALTH CARE CAREER OPPORTUNITY FOR INCOMING 9TH GRADERS

A UNIQUE EXPERIENCE
AT
ST VINCENT'S COLLEGE
A PATH TO A CAREER IN HEALTH CARE
FOR 18 SELECTED STUDENTS

EARN HIGH SCHOOL & COLLEGE CREDITS AT THE SAME TIME
AT
BASSICK AND ST. VINCENT'S COLLEGE
HEALTHCARE CAREER AND COLLEGE READINESS PROGRAM

ST. VINCENT'S COLLEGE- HEALTHCARE CAREER AND COLLEGE READINESS PROGRAM

Certified Nursing Assistant-CNA

- The certificate program prepares you to function as an assistant within the healthcare team, utilizing multiple skills.

Patient Care Technician-PCT

- If already a certified CNA you will learn additional skills in acute/hospital patient care setting, data processing, basic phlebotomy and electrocardiograms. The program prepares you to become an allied healthcare worker.

Pharmacist Technician- CPhT

- As a Pharmacist Technician you will help licensed pharmacists provide medications and other healthcare products to patients.

Lay Navigator/Community Health Aide-CHA

- A Lay Navigator or Community Health Aide is an individual who is familiar with the communities and acts as an advocate or liaison between community members and the health care system.

FAQs

WHO WILL ATTEND:
- All incoming 9th graders may apply
- All applications will be screened by a Selection Committee * Director of Guidance; Director School of Nursing; MA Coble
- **ONLY 18 STUDENTS WILL BE CHOSEN FROM ALL APPLICANTS.**

HOURS
- At Bassick regular school hours 7:53-11:40 (periods 1-4)
- At St. Vincent's classes 12:00-2:30

POINTS/CREDITS
- HIGH SCHOOL POINTS:
  - 40 POINTS for Math , Science, English, History
  - 30 POINTS for classes taken at St. Vincent's. ** *HAS BEEN AMENDED 5 PTS PER SEMESTER*
- COLLEGE POINTS
  - 3 POINTS/CREDITS per semester for classes at St Vincent's ; Total 6 POINTS/CREDITS per year. (Dual Enrollment).
  - The POINTS/CREDITS earned at St, Vincent's go towards CERTIFICATION Health Care Careers

GRADUATION
- Students will graduate June 2020 with all required High School Credits and additional College Credits (approx. 24 credits)

FUTURE
- CERTIFICATION prepares students for careers in Health Care:
  - Certified Nurse Assistant-CNA;
  - Patient Care Technician-PCT;
  - Certified Pharmacy Technician; CPhT
  - Community Health Aide-HCA
- CERTIFICATION points/credits can be credited toward an ASSOCIATES and BACHELOR'S DEGREES

BUILDING A FUTURE

CAREER PATH	AVG YEARLY SALARY
• **Certified Nurses Aide**	$25,000
o Nursing homes and assisted living	
o Hospice and long-term care settings	
o Community based long-term care	
o Correctional institutions	
• **Patient Care Technician**	$37,813
o Healthcare facilities	
o Hospitals	
o Nursing homes	
• **Lay Navigator/Community Health Aide-CHA**	$37,952
o Health Care Agencies	
• **Pharmacist Technicians**	$29,525-$36,530
o Retail Pharmacy	
o Compounding Pharmacy	
o Hospital Pharmacy.	
o **Nursing Homes / Assisted Living / Mental Health**	
o Mail-order Pharmacy	

THE CURRICULUM

COHORT 1	
St. Vincent's course	**High School Alignment**
2016-2017 (9th grade	
Semester 1 Keyboarding and Word Processing	Business Elective
Semester 2 Medical Terminology	Science Elective
2017-2018 (10th grade)	
Semester 1 Introduction to Information Systems	Business Elective
Semester 2 Illness & Disease	Science Elective
2018-2019 CNA Classes (Pathways) (11th grade)	
Semester 1 Certified Nurse Aide	Science Elective
Semester 2 Patient Care Technician	Science Elective
2018-2019 Pharmacy Tech Classes (Pathways) (11th grade)	
Semester 1 Introduction to Sociology	Humanities Elective
Semester 2 Introduction to Psychology	Humanities Elective
2019-2020 CNA/PCT Classes (Pathways) (12th grade)	
Semester 1 Informatics & Electronic Health Records	Business Elective
Semester 2 Community Health Aide	Science Elective
2019-2020 Pharmacy Tech Classes (Pathways) (12th grade)	
Semester 1 Pharmacy Technician	Science Elective
Semester 2 Community Health Aide	Science Elective

18-24 credits upon completion

CHALLENGES

Retention Rate

- Bridgeport has a highly transient population. Students move in and out of the district frequently

Supplies

- Families have limited resources….
- For 2 years Bassick has needed to purchase 60% of the students' work boots
- This year Bassick purchased supplies for Medical Terminology class

Revenue

- The District paid for school bus transportation to the college and monthly bus passes to get home
- St Vincent's commitment to Bassick is tuition-free through 2017-18
- Question of sustainability

REWARDS AND BENEFITS

- Many are 1st generation high school graduates
- Most students are 1st generation college students
- Most are immigrants
- Pride when they are referred to as our “college students” especially when making school wide announcements
- Earning college credits
- Experiencing life on campus
- Experiencing academic rigor of college

Contact information

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- Marjorie Coble, Assistant Principal, Bassick High School, Bridgeport Public Schools (CN), mcoble@bridgeportedu.net