Race to the Top

STEM Learning Exchange Update

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Agenda

- Welcome and Introductions
- Agenda Overview
- Illinois Pathways
- STEM Learning Exchanges
- What is a Program of Study?
- Individualized Learning Plan
- Pathways Resource Center

ILLINOIS

Pathways

Science, Technology, Engineering & Math

www.illinoisworknet.com/ilpathways

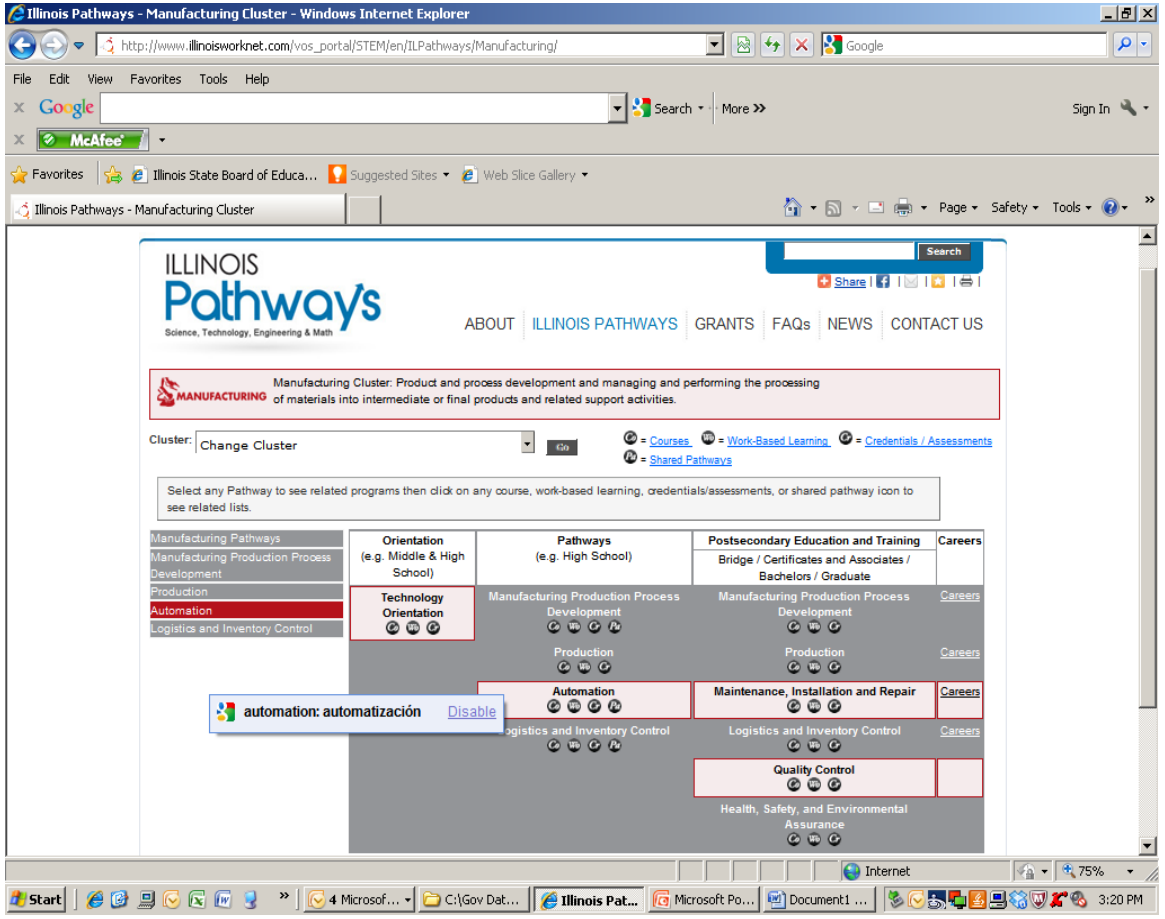
Illinois Pathways – Support

- Supports local programs that empower students to explore their academic and career interests in STEM fields aligned to Illinois' economic development interests and competitiveness.
- Supports networks of local programs in achieving greater economies of scale through the launch of new statewide, public-private partnerships known as STEM Learning Exchanges that better coordinate investments, resources and planning .
- Improves P-20 education, workforce, and economic development coordination in order to build more effective talent pipelines throughout the state in critical STEM fields.
- Provides a strategy to help achieve the P-20 Council's goal of 60 percent of all Illinois residents attaining a high-quality academic degree or industry recognized certificate or credential by 2025.

Illinois Pathways – P-20 STEM Programs of Study Clusters

Illinois Pathways builds off of the National Career Cluster Framework and supports Programs of Study in nine STEM application areas:

Illinois Pathways – www.illinoisworknet.com/ilpathways

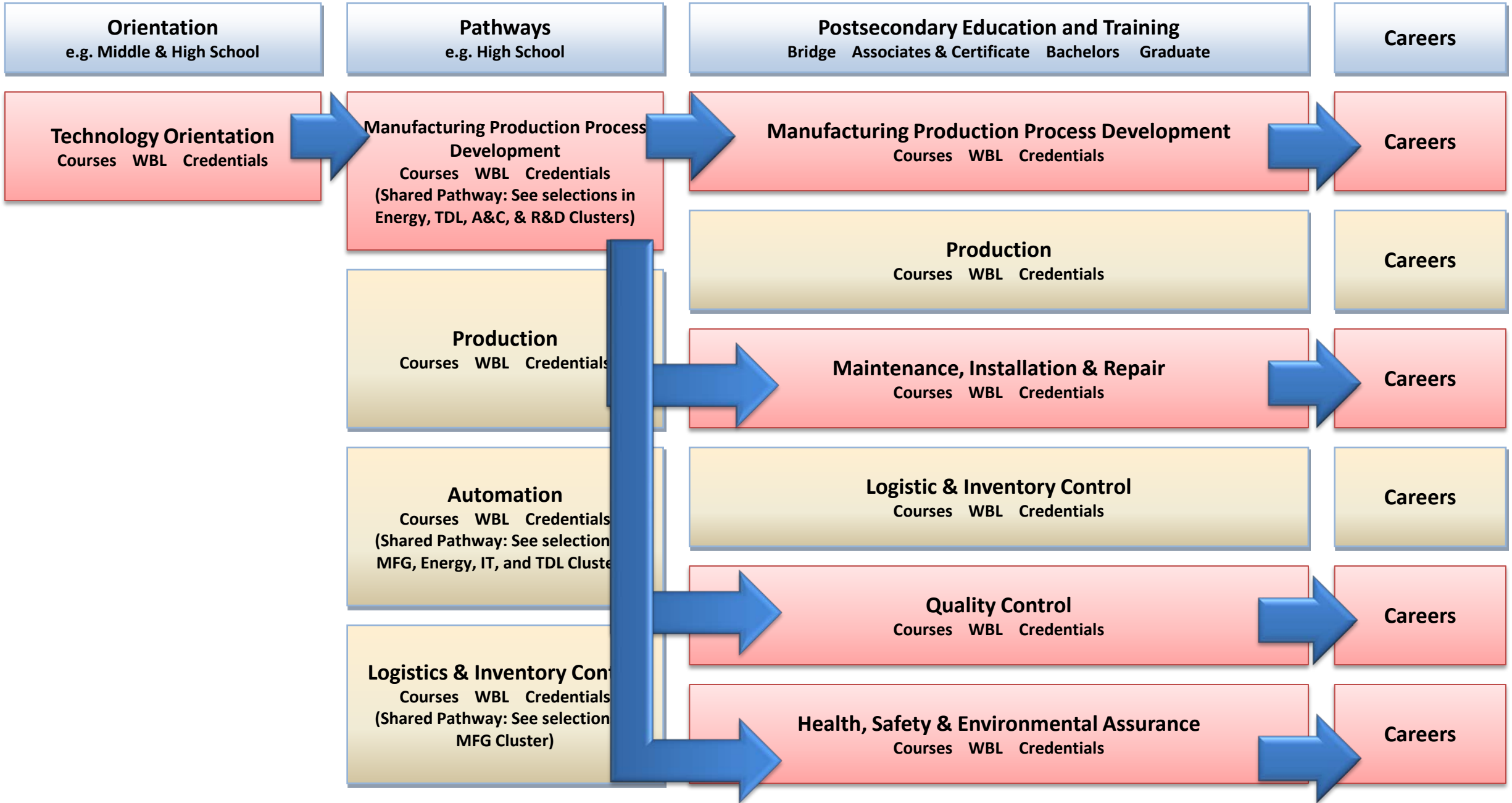


Illinois Pathways – P-20 STEM Program of Study Components

- **Cluster Selection** – Identified based on economic development need and community objectives.
- **Personalization** – Education and career plan aligned to academic and career interests.
- **Applied Learning** – Access to work-based learning opportunities.
- **Orientation & Shared Pathway Courses** – Foundational skills across clusters and reduced switching costs.
- **Early College** – Dual credit in "gateway" courses to improve transfer and reduce costs.
- **College & Career Readiness Assessments** – 1) Academic, 2) Career, and 3) Technical.
- **Professional Development** – Training and work-based learning supports for educators.
- **Diverse Delivery System and Partnerships** – Build program capacity through academic core, CTE, electives, regional centers, virtual courses, and colleges as well as coordinate with local businesses and statewide STEM Learning Exchanges.
- **Evaluation and Continuous Improvement** – Data-driven program review and talent pipeline updating.

Note: P-20 STEM Programs of Study also fully align to the design elements for CTE Programs of Study, including Leadership, Organization & Support; Access, Equity & Opportunity; Alignment & Transition; Enhanced Curriculum & Instruction; Professional Preparation & Development; and Program Improvement & Accountability.

Manufacturing Statewide STEM Model



Illinois Pathways – STEM Learning Exchanges

Defining STEM Learning Exchanges

- Statewide public-private partnership networks organized to support local implementation of P-20 STEM Programs of Study by improving coordination and reducing the transaction cost among network partners.
- A separate statewide Learning Exchange will be launched in each of the identified STEM application areas.
- Designed to support participating Race to the Top districts, but are available to partner with and support other K-12, postsecondary, and workforce programs throughout the state.

Illinois Pathways – Learning Exchange Members

Who makes up a STEM Learning Exchange?

- Employers and employer-led organizations
- Labor unions
- Professional associations
- Secondary and postsecondary teachers and faculty
- Students and student organizations
- Community colleges and universities
- School districts and regional
- Economic and workforce agencies
- STEM education experts
- Federal labs and research centers
- Local workforce investment boards
- Museums and non-profit organizations
- Community-based organizations

Types of STEM Learning Exchanges

Implementation

- Agriculture, Food, and Natural Resources
- Manufacturing
- Information Technology
- Research and Development
- Health Science

Planning

- Energy
- Transportation, Distribution, and Logistics
- Finance

* Note: Architecture and Construction is neither Implementation nor Planning.

STEM Learning Exchange Implementation Clusters

Will Develop and Produce over the next 3 years:

- E-learning curriculum resources
- Expand access to classroom and laboratory space and equipment
- Support student organizations and their activities
- Provide internships and other work-based learning opportunities
- Sponsor challenges and project management resources
- Provide professional development resources for teachers and administrators
- Provide career development and outreach resources
- Provide tool and resources to assist students and schools with ILPs
- Review and report on performance of STEM Programs of Study.

STEM Learning Exchange Planning Clusters

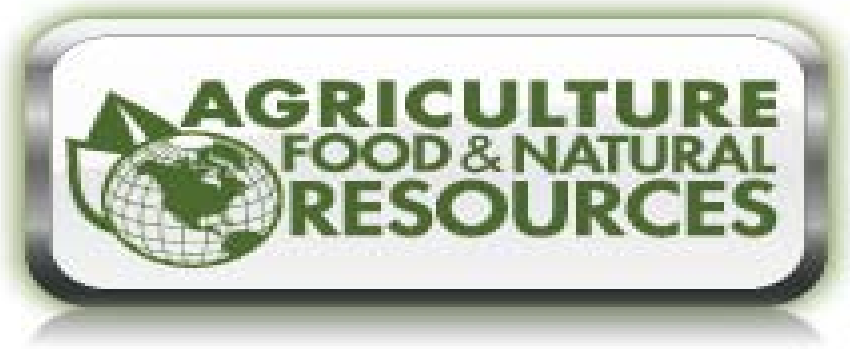
Will undertake planning activities over the next year to:

- E-learning curriculum resources
- Expand access to classroom and laboratory space and equipment
- Support student organizations and their activities
- Provide internships and other work-based learning opportunities
- Sponsor challenges and project management resources
- Provide professional development resources for teachers and administrators
- Provide career development and outreach resources
- Provide tool and resources to assist students and schools with ILPs
- Review and report on performance of STEM Programs of Study.

9 STEM Learning Exchange Cluster Areas

www.illinoisworknet.com/ilpathways

STEM Learning Exchanges and the Selection of 2 POS



Development, production, processing, distribution of agricultural commodities and resources, including food, fiber, wood products, natural resources, horticulture, and other plant and animal products/resources.

Lead Entity – Illinois Foundation FFA

STEM Learning Exchanges and the Selection of 2 POS

Developing, planning, and managing the production of energy including renewable energy and clean coal technology and its distribution through smart grid technologies.

Lead Entity – Illinois State University

STEM Learning Exchanges and the Selection of 2 POS

Product and process development and managing and performing the processing of materials into intermediate or final products and related support activities.

Lead Entity – Illinois Manufacturers' Association Education Foundation

STEM Learning Exchanges and the Selection of 2 POS

Designing, developing, managing, supporting and integrating hardware and software systems.

Lead Entity - CompTIA

STEM Learning Exchanges and the Selection of 2 POS

Designing, planning, managing, building, and maintaining the built environment, including the use of green technologies.

No Lead Entity

STEM Learning Exchanges and the Selection of 2 POS

Planning, management, and movement of people, materials, and goods across all transportation modes as well as maintaining and improving transportation technologies.

Lead Entity - Illinois Chamber of Commerce Foundation

STEM Learning Exchanges and the Selection of 2 POS

Scientific research and professional and technical services including laboratory and testing services as well as biomedical research and development.

Lead Entity - Illinois Science & Technology Institute

STEM Learning Exchanges and the Selection of 2 POS

Planning, managing, and providing therapeutic, diagnostic, health informatics, and support services as well as biomedical research and development.

Lead Entity – University of Illinois at Chicago

STEM Learning Exchanges and the Selection of 2 POS

Securities and investments, business finance, accounting, insurance, and banking services.

Lead Entity – Chicagoland Chamber of Commerce

Race to the Top
Expectation for STEM Programs of Study

STEM Programs of Study and Individual Learning Plans (D9)

"For districts serving grades 9-12, the district establishes two or more Programs of Study promoting critical STEM application areas; for other districts, as applicable, the district establishes an individual learning plan program, commencing in 7th grade, that aligns to a Programs of Study model in the predominant feeder schools for high schools implementing STEM Programs of Study."

- Grades 9-12: Research and select two Programs of Study
- Grades 7-8: Research and select an individual learning plan model
- Pilot "individual learning plan" model in 2013 – 2014
- Full implementation in 2014 – 2015

NOTE: For K-8 districts: If your predominant feeder schools for high schools that have Programs of Study – not just STEM Programs of Study, you are required to develop an individual learning plan program.

Race to the Top:
STEM Programs of Study

- Course sequences and learning experiences in 1 or more pathways within one of the 9 STEM cluster/Race to the Top (RTTT) application areas that include orientation coursework commencing in middle school/early high school grades and pathway-specific curriculum in high school (typically 11th or 12th grades) that is articulated with postsecondary education.
- Course sequences available at: www.illinoisworknet.com/ilpathways
- Districts may vary from these proposed models to fit particular course offerings and learning experiences.

Other critical elements of STEM Programs of Study

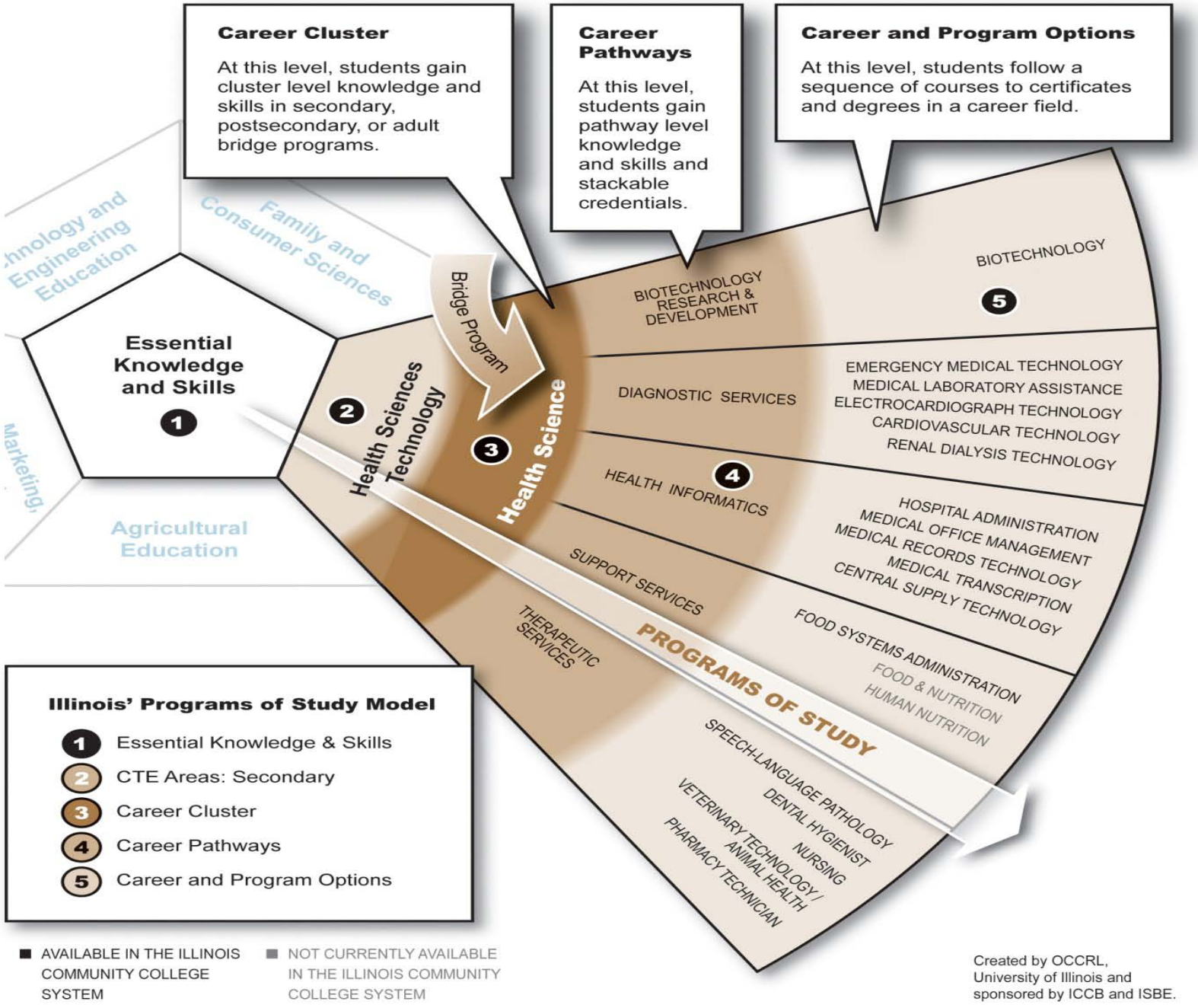
- Professional development
- Real-world connections with adult mentors
- Education and career guidance systems
- Identification of credentials, such as an industry certificates and college degrees
- Partnerships with postsecondary education to increase dual credit and develop structured programs that transition college- and career-ready students to postsecondary education

States' Career Cluster Framework

- **Career Clusters**
- **Career Pathways**
- **Programs of Study**
  - Sequences of courses that incorporate a non-duplicative progression of secondary and postsecondary elements which include both academic and career and technical education content, curriculum alignment to challenging standards, rigorous content, and lead to the attainment of an industry recognized credential, certificate, or degree.

Career Cluster Framework

Career Cluster: Health Science



Updated December 14, 2010

SAMPLE
STEM Plan of Study

are indicative of the courses needed to complete a pathway.

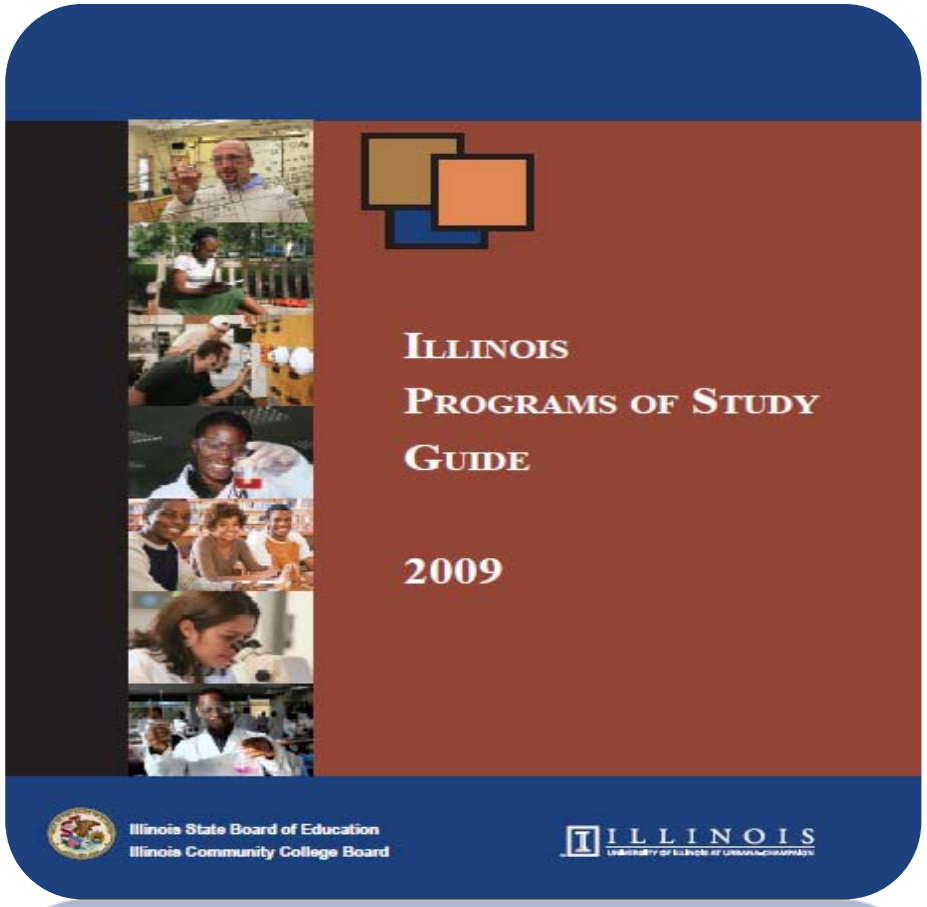
EDUCATION LEVEL	GRADE	English/ Language Arts	Math	Science	Social Studies/ Sciences	Career and Technical Courses *Central* to this Pathway	Other Career and Technical Education Courses, Electives, and Student Organizations *Related* to the Pathway	SAMPLE Occupations Relating to This Pathway
	Career Interest Inventory Administered and Program of Study Initiated for all Learners.							
SECONDARY	9	Freshman Eng. or Hon. Freshman Eng.	Any Algebra class *Honors Algebra Pre-Engineering Inegrated Algebra & Geometry	Biology or Honors Biology	World Cultures and History of American Democracy	Introduction to Engineering, Electronics	►SkillsUSA ►Courses in World Languages ►Metals ►Autos ►Woods ►Agriculture and Natural Resources ►Work-based Learning Activities ►Computer Applications and Living Online	►Aeronautical Engineer ►Aerospace Engineer ►Agricultural Engineer ►Agricultural Technician ►Application Engineer ►Architectural Engineer ►Automotive Engineer ►Biomedical Engineer ►Biotechnology Engineer ►CAD Technician ►Chemical Engineer ►Civil Engineer
SECONDARY	10	Comm. Arts or Honors Comm. Arts	Geometry, Hon. Geometry, Algebra I	Chemistry or Honors Chemistry	World History, or Hon. World History	Digital Electronics, Civil Engineering and Architecture		
SECONDARY	11	American Lit. I & II or Two One Semester Electives	Recommended: Algebra II, Advanced Algebra, Precalc	Recommended: Physics, Honors Physics	U.S. History	Principles of Engineering, Advanced Electronics		
	College Placement Assessments-Academic/Career Advisement Provided (ACT, SAT, etc.)							
SECONDARY	12	Sen. Studies, Sen. Lit., Hon. Eng. Lit, or AP Eng. Lit.	Calculus		One Semester Elective Senior Year	Engineering Design and Development Advanced Technical Electronics		
	Gen Ed Courses							
POST-SECONDARY	13	Written Communications Technical Reporting	College Technical Math 1A Intermediate Algebra College Technical Math 1B College Technical Math 2	Elective Elective	Intro to Psychology Economics	Digital Electronics DC\AC I DC\AC II Electronic Devices II		
POST-SECONDARY	14	Elective Elective	Elective Elective	Physics I Elective	Elective Contemporary American Society	Electronic Devices II Digital Curcuits II Microprocessors Industrial Electronics Electronic Communications Optoelectronics Fabrication Techniques		
	Courses Related to Major or Minor							
POST-SECONDARY	15	Continue courses in the area of specialization	Continue courses in the area of specialization	Continue courses in the area of specialization	Continue courses in the area of specialization	Continue courses in the area of specialization		

Guiding Principles

1. Leadership, Organization and Support
2. Access, Equity and Opportunity
3. Alignment and Transition
4. Enhanced Curriculum and Instruction
5. Professional Preparation and Development
6. Program Improvement and Accountability

Illinois Programs of Study Guide

- Illinois' framework for implementation and evaluation.
- Connections to federal, state, and local level activities.
- Guiding principles and design elements



Office of Community College Research and Leadership

- Director:
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Individualized Learning Plan

- Developing individualized learning plans for middle-school students that are aligned to P-20 STEM Programs of Study at the high school level.
  - RTTT3 Participating LEAs will be required to:
    - Implement a strategy to link student data across local systems to enable the creation of integrated learner profiles that can support learning plans and other personalized learning tools;
    - Establish an individual learning plan program, commencing in the 7th grade, that identifies students' academic and career interests and aligns to a P-20 STEM Program of Study model. The individual learning plan program must be implemented at minimum in the predominant feeder schools for high schools implementing P-20 STEM Programs of Study

Individualized Learning Plan

An **individual learning plan** is a tool that students use – with support from school counselors and parents – to define their personal interests and goals related to their education, career and postsecondary education and to plan what courses to take and what activities to participate in during their educational experiences to further their interests and achieve their goals.

Individualized Learning Plan

- Is not a one time activity
- On-going process
- Usually begin in middle school
- Usually started with parents and school guidance counselor communicating with student
  - Career interest
  - Personal strengths
  - Work values
- Computer-based interest and inventory skills can be accessed via the internet
  - What's next Illinois - https://secure.whatsnextillinois.org/High_School_Planning/_default.aspx
  - Career Cruising – http://public.careercruising.com/us/en
  - Kudor - http://www.kuder.com/

Individualized Learning Plan (ILP)

Student's can use a ILP to guide decision making and monitor the progress toward goals and may include:

- Skills
- Abilities
- Hobbies
- Accomplishments
- Current and past classes
- Grades and test scores
- Examples of student work
- Results from career, college, and interest assessments
- Personal goal statements
- Accommodation needs
- Career Exploration
- Job Search
- College and financial planning activities
- Contact information for parents, advisors, teachers, mentors and other supportive adults

ILPs continued

For High School Students' ILPs can be used to guide decision making and monitor the progress toward goals and may include:

- Review school and Illinois specific information
  - High School Graduation Requirements
  - High School Course Options
  - Post-secondary education and training programs offered
  - Occupations/career clusters in demand locally and statewide
- How to search for job opportunities
- Find Community Resources
- Services Relevant to their Personal Needs

Race to the Top 3
Participating LEA Implementation Timeline

	2012 Jan - July	2012 July - Dec	2013 Jan – June	2013 July - Dec	2014 Jan - June	2014 July - Dec	2015 Jan - June	2015 July - Dec
Learner Profiles and Pathways	• Identify STEM application areas	• STEM POS systems designed • Individual Learning Plan model selected		• Continued POS design, preliminary implementation • Individual Learning Plan piloted		• Full implementation of POS and Individual Learning Plan		

Pathways Resource Center

Office of Community College Research and Leadership

Pathways Resource Center Goals

1. Develop and position the PRC as a strategic vehicle for P-20 change in Illinois, with key responsibilities for communication and support of STEM programs of study.
2. Develop the capacity of the local school districts to implement STEM/career clusters, pathways, and programs of study.
3. Develop a resource bank of evidence-based materials, which can be accessed by local school districts and Learning Exchanges, that support development and implementation of STEM programs of study.
4. Support the sustainability of the STEM programs of study, through continuous efforts to identify external funding opportunities for the STEM Learning Exchanges.

Goal 1: *PRC as strategic vehicle for P-20 change in Illinois*

- Develop the PRC structure and hire key personnel
- PRC representation at regional and statewide meetings of key stakeholder groups
- Facilitate communication and information flow across the STEM Learning Exchanges
- Promote ongoing collection and distribution of data by STEM Learning Exchanges and school districts
- Disseminate the work of the PRC

Goal 2: *Develop school districts' capacity to implement STEM programs of study*

- Determine expectations of local districts for implementation of programs of study
- Identify capacity and needs of local districts to implement programs of study
- Conduct professional development and workshops on STEM programs of study
- Support POS planning and implementation
- Conduct Annual Conference on STEM programs of study
- Conduct STEM Administrator Academy

Goal 3: *Develop resource bank for districts and STEM Learning Exchanges*

- Update *Illinois Career Cluster Framework*
- Develop new PTR modules to support districts' curriculum reform activities
- Develop training materials for coaches and consultants
- Develop materials for websites, webinars, and other dissemination channels
- Scan and access evidence-based resources and materials for dissemination

Goal 4: *Support sustainability of STEM education*

- Identify targeted research areas for which external funding may be available
- Explore collaborative partnerships to seek funding
- Create a resource bank of faculty with STEM research interests
- Identify and disseminate funding opportunities for STEM education
- Provide grant-writing support

Selected PRC Products

- PTR curriculum reform modules
- *Illinois Career Cluster Framework* revision
- White paper for high schools and programs of study
- Resource directories
- PRC Website and electronic newsletter
- *OCCRL E-Info* and *Research Spotlights*
- Briefs on critical topics
- Summary report on formative evaluation results for the PRC

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Questions and Answers