IMSA Core Competencies: Micro-Credentials for Teacher Development

INQUIRY-BASED TEACHING	PROBLEM-CENTERED LEARNING	COMPETENCY-DRIVEN CURRICULUM	INTEGRATED STEM
Introduction	Introduction	Introduction	Introduction
Learning Experience #1	Learning Experience #1	Learning Experience #1	Learning Experience #1
Learning Experience #2	Learning Experience #2	Learning Experience #2	Learning Experience #2
Learning Experience #3	Learning Experience #3	Learning Experience #3	Learning Experience #3
Learning Experience #4	Learning Experience #4	Learning Experience #4	Learning Experience #4
Learning Experience #5	Learning Experience #5	Learning Experience #5	Learning Experience #5
Portfolio	Portfolio	Portfolio	Portfolio
IMSA MICRO-CREDENTIAL INQUIRY-BASED TEACHING	IMSA MICRO-CREDENTIAL PROBLEM-CENTERED LEARNING	IMSA MICRO-CREDENTIAL COMPETENCY-DRIVEN CURRICULUM	IMSA MICRO-CREDENTIAL INTEGRATED STEM

= IMSA IMSA EDUCATOR MICROCERTIFICATION

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State and Federal Educator Development

Illinois Mathematics and Science Academy

Illinois Mathematics and Science Academy (IMSA) – Who we are

The Illinois Mathematics and Science Academy® (IMSA) develops creative, ethical leaders in science, technology, engineering and mathematics. As a teaching and learning laboratory created by the State of Illinois, IMSA enrolls academically talented Illinois students (grades 10-12), in its advanced residential academic program.

IMSA is both a public residential Academy and a catalyst and laboratory for the advancement of STEM teaching and learning statewide, with responsibility to stimulate further excellence for all Illinois schools in mathematics and science through student and educator outreach, teacher training and turnkey STEM curricula, student enrichment and entrepreneurship and makerspace education.

Legislative Charge – 2 parts

Residential Academy

The primary role of the Academy shall be to offer a uniquely challenging education for students talented in the areas of mathematics and science.

Outreach & Development
Center for Teaching and Learning

The Academy shall also carry a responsibility to stimulate further excellence for all Illinois schools in mathematics and science.

IMSA Core Competencies

Residential Academy

Inquiry-Based

Problem-Centered

Competency-Driven

Integrative

Center for Teaching & Learning
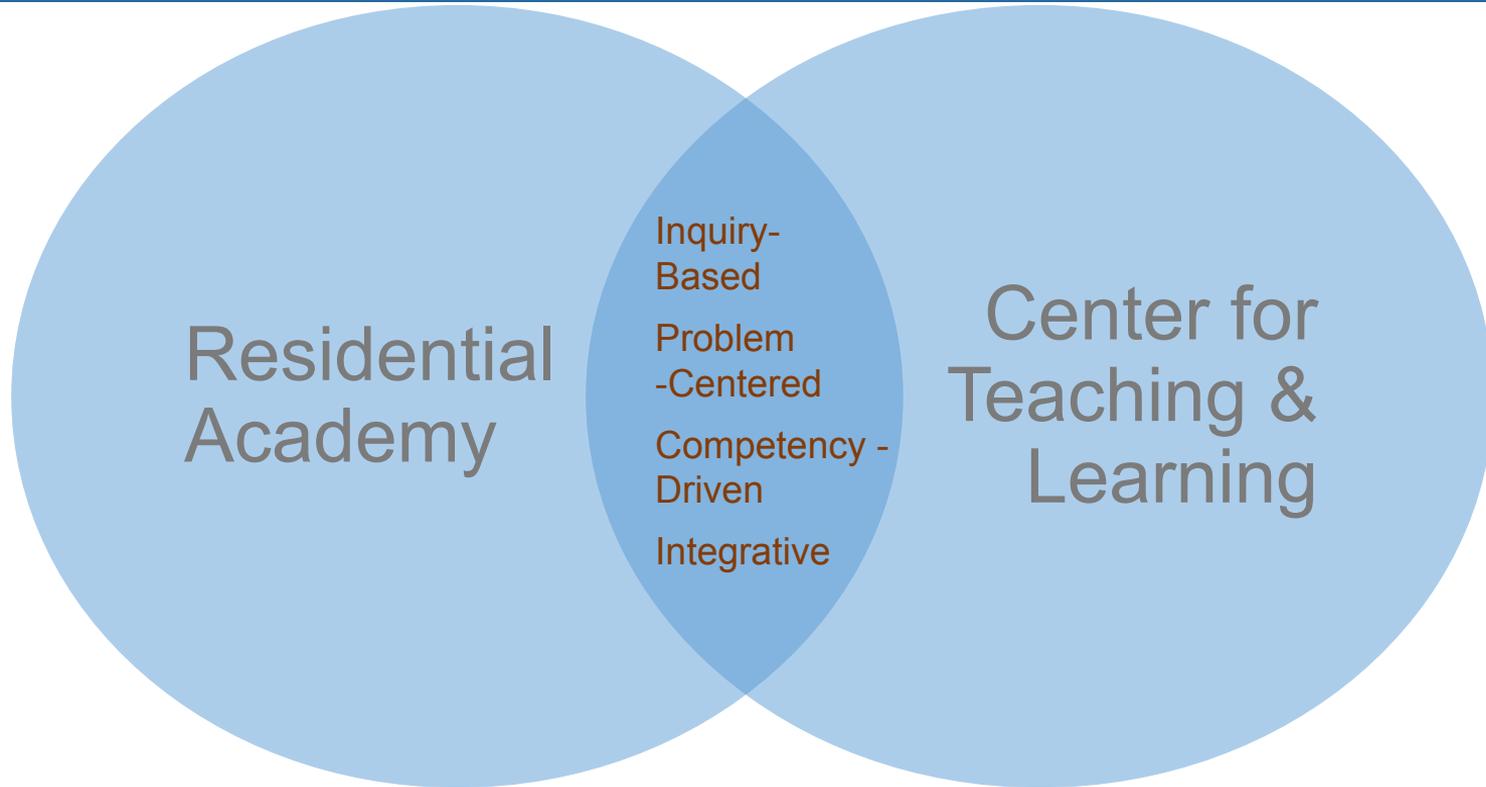
City Development

Challenge: What city plan will produce the most profit according to the infrastructure (homes, apartment complexes, hotels, sports centers, etc.)

Materials: map template(s), large and small sticker dots, calculator (optional)

Procedure: Read the rules for city planning. Work with you team to fill in the table below using the map template and your infrastructure design

Rules:
➢ Must have 1 park for every 10 homes
➢ Must have 1 shopping center for every 20 homes, but no more than 5 total shopping centers
➢ Must have 1 park for every apartment complex
➢ Must have no more than 8 apartment complexes
➢ Must have a minimum of 2 sports centers, but no more than 5
➢ Draw streets where needed, every building must have street access
➢ Cannot build on natural areas: lakes, forests, or mountains

Infrastructure	Investment	Income	Profit/Loss
Home	$1	$3	
Apartment complex	$3	$12	
Sports Center	$5	$7	
Shopping Center	$8	$13	
Park	$3	$0	

City Development

Investment Planning

| Type of Infrastructure	Profit/Loss	Amount	Total $
Home			
Apartment complex			
Sports Center			
Shopping Center			
Park			
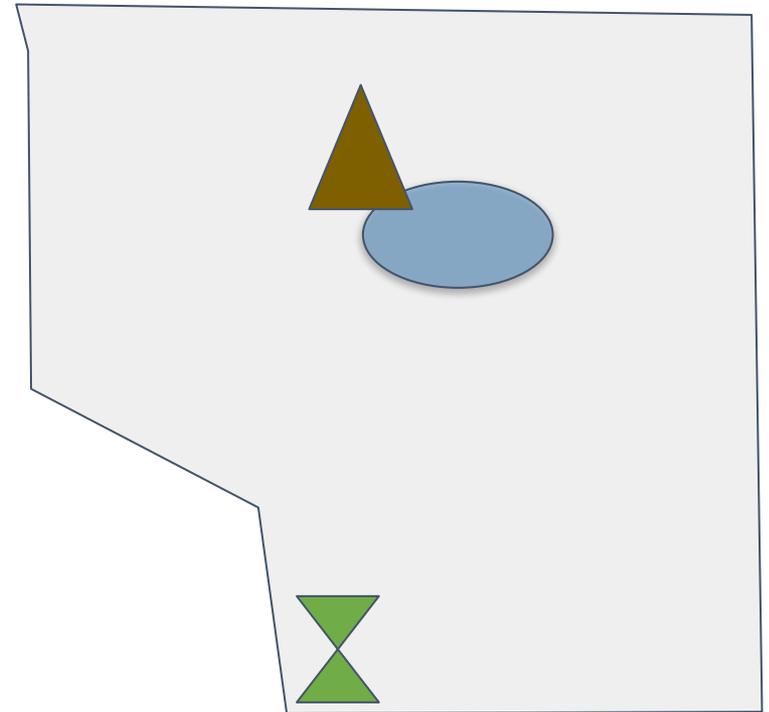
City Development

Now, it's your turn to design a city that fits on a sheet of paper. You have the freedom to create any shape. You need to include at least one lake, forest, and mountain. Remember, the goal is to obtain the most profit based on the infrastructure of the city.

Discussion Questions:
- What was your reasoning behind your investments?
- What was the most profitable infrastructure in your plan?
- Why did you have to provide parks and sports centers if there was little or no profit in them?
- Why is there a limitation about the number of apartment complexes you can have in a specific area?
- What other infrastructure(s) would you like to have as an option for your city? Explain why they should exist.

Inquiry-Based Teaching

Inquiry-based teaching promotes **analytic thinking**, **knowledge generation** and **application**, and **construction of meaning** through mindful **investigation** driven by compelling **questions** that engage the learner's curiosity.
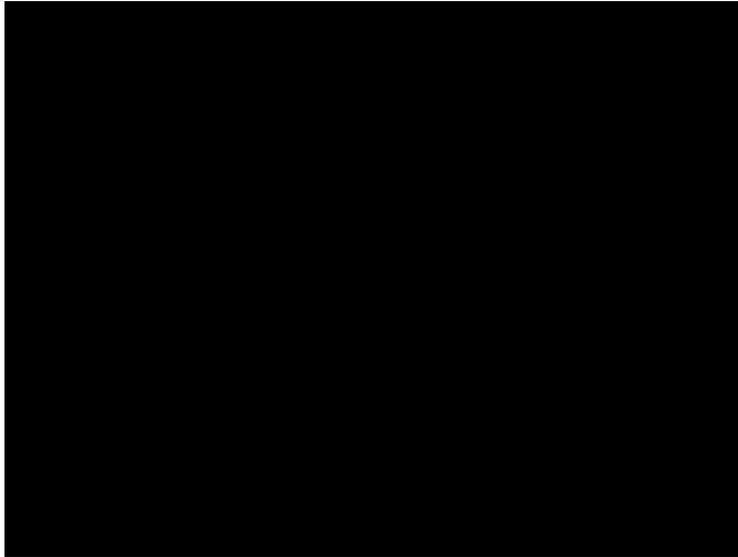
Where did we see **Inquiry** in the city design?

Problem Centered Learning

Problem-centered learning provides experiences in which learners grapple with complex, meaningful, open-ended problems of our world. Learners provide potential evidence based solutions or responses to these problems.

- **The problem is presented first and serves as the context for learning**
- **Students are active problem-solvers and learners**
- **Teacher are cognitive and metacognitive coaches**
- **Information is shared, but knowledge is a personal construction of the learner**
- **Discussion and challenge expose and test thinking**
- **Assessment is an authentic companion to the problem and process.**

Where did we see **Problem Centered** in the city design?

Competency Driven Experiences

Competency-driven experiences are those which enable students (1) to acquire strong bases of disciplinary content knowledge and skills; (2) to use the ideas, processes, and tools of the disciplines for acquisition and generation of new knowledge; and (3) to apply knowledge when addressing issues and solving real-world problems.

IMSA's Definition of Competency Driven Teaching and Learning

Learning Objectives
- Foundational
- Clearly stated and utilized
- Helps set learning progression

Learning Progression
- Sequencing of teaching and learning
- Outlining how information is presented
- Awareness of learning styles, social and emotional factors, prior knowledge

Academic Rigor
- Appropriately challenging
- Push students toward a higher/ deeper level of thinking/knowledge/skill
- Assessments

Where did we see **Competency Driven** in the city design?

Integrative STEM

Integrative learning experiences are those which forge meaningful connections of concepts, constructs, and principles within and across academic subjects and real-world situations.

IMSA: Integrative Focus from the Beginning

"Scientists must function in a complex world and an early appreciation of this will be enormously valuable... the applications of these disciplines have vast implications to society... In all of this it is our philosophy to seek to blend the humanities and the sciences so as to illuminate the unity of knowledge." – Leon Lederman

How was the city design **integrative**?

Why Micro-Credentials?

What is a micro-credential:

Micro-credentialing is a form of professional development that is quickly gaining popularity among people looking to continue their education or advance in their careers. Specific characteristics of these professional development systems highlight its usefulness to providing quality education outreach. According to French and Berry, a micro-credential is described as being a set of "**competency-based, personalized, small-scale professional development modules that are suited for anytime/anywhere learning and allow teachers to show what they can do, not only what they know.**" (Berry, 2017). These professional development systems are often designed as **courses, or a set of online or blended modules offering bite-sized methods to acquire new knowledge or skills** (ALA TechSource, 2019). With micro-credentials being offered at a variety of levels across multiple disciplines and areas of study within those disciplines (ALA TechSource, 2019), **this form of continuing education presents a personalized route for professional development.**

IMSA Educator MicroCertification and Micro-Credentials Program
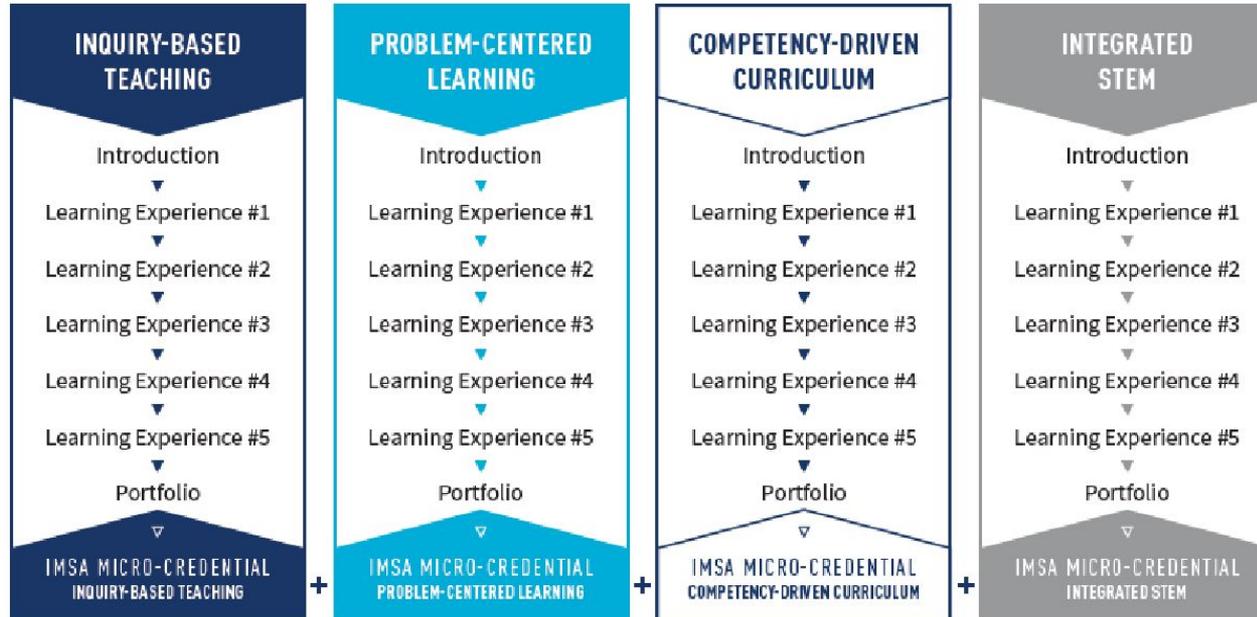
IMSA Micro-Credentials

Educators in Illinois and across the globe can earn a MicroCertification as an IMSA Educator. This MicroCertification qualifies an educator to be trained in and present IMSA Professional Development throughout their area. The MicroCertification is structured in four micro-credentials representing IMSA's four core competencies. Educators who complete all four micro-credentials are awarded the MicroCertification as an IMSA Educator. The micro-credentials include:

 *INQUIRY-BASED TEACHING   *PROBLEM CENTERED LEARNING   *COMPETENCY-DRIVEN CURRICULUM   *INTEGRATED STEM

LEARNING EXPERIENCES
- Approx 3 hour experience + application and dissemination
- Available to all educators, any grade level and discipline.
- Include a research base, pedagogy, instructional strategies and sample lesson plans focused on increasing student learning.
- Identified with a grade level band, content area, and instructional focus
- Includes an "Apply and Reflect" assignment

SUMMATIVE PORTFOLIO
- Demonstration of teaching of the Micro-Credential strand
- Artifacts supporting the implementation and professional learning
- Professional Reflection on impact on instructional practice

Micro-C Learning Experience examples

Learning Experience	Grade Level	Core competency Strand
Scale and Size: Modeling Powers of 10	4th-8th	Competency-Driven
Code of the WIld	K-2nd	Integrated STEM
Build a Better Recycling Truck	6th-8th	Problem Centered
Not Just a Story: Genetics and Probability	6th-12th	Integrated STEM
Perfecting the Teaching Of Parabolas Using Technology	9th-12th	Competency Driven
PBL (Formal Problem Based Learning) Course 1,2,3	K-12	Problem Centered
Breaking the Mold of Traditional Chemistry Labs	9th-12th	Inquiry Based
Teaching with a Full Deck of Cards	PreK-8	Inquiry Based
www.imsa.edu/educator-development		

Questions?