

STEAM Programming at Prairie Central Prairie Central CUSD #8

K-6 Integrating STEAM into the classroom

7-8 STEAM Curriculum Integration

9-12 New STEAM Coursework

What will STEAM look like at Prairie Central?

Kindergarten-1: Introduction to scientific inquiry

- STEAM Units with supplies on cart for teachers to integrate hands-on discovery within the classroom

2-6: Integrating STEAM approach to new science and math curricula

- 2-4 STEAM Units for immersion in math and science themed units based on classroom skills and hands-on learning
- 5-6 STEAM Classroom dedicated to STEAM labs for materials and resources that expand student learning through investigation and hands-on discovery

7-8: Creation and implementation of STEAM Rotational course and Transforming Algebra course

- Building-wide STEAM units completed each quarter
- STEAM Rotational Course to further connect students to careers in the STEAM fields
- Transforming Algebra Course for collaboration of staff in developing STEAM units within the Algebra Curriculum

9-12: Creation of and implementation of two new courses, Freshman STEAM and Senior year

Transitional Math: STEAM Focus

- Building-wide STEAM units each quarter
- Four steam modules in the PCHS Career Lab
- Development and Implementation of Freshman STEAM Course
- Development and Implementation of Senior Transition Math STEAM Course

What will STEAM look like at Prairie Central?

Guest-teaching opportunities

- Our district is currently seeking partnerships with Livingston County employers to create an awareness with students of all ages of the opportunities they have in their hometowns, county, and beyond.
- As partnerships develop, employers will be invited into the classrooms to share their skills and provide feedback to students as they participate in STEAM Units of inquiry and learning
- These guest-teachers will have the opportunity to expose students to the careers and opportunities that are available for all career pathways

Career Fairs

- Prairie Central Elementary: History and Opportunities in our Communities Unit focuses on the resources and employment opportunities within the Prairie Central School District
- Prairie Central Upper Elementary: Discovery Day--a day where local employers come to the buildings to share their careers and expertise with the students
- Prairie Central Junior High: Employment Interest surveys are completed in the rotational course "I Can" and this data is then used to determine presenters at the annual Career Fair
- Prairie Central High School: Employers are sought to provide a presentation twice a year for all PCHS Students as a means to showcase the area workforce.

Teacher Collaboration

- Kindergarten - 1: Teachers will work together to enhance learning through planning and training on STEM Kits
- 2-4: Rotational STEAM courses are developed and will be implemented this fall for all students
- 5-6: STEAM Lab for teachers to utilize in completing STEAM Units with all students
- 7-12 Professional Development and planning time for current and new course implementations

STEAM Curriculum at Prairie Central

Currently in place

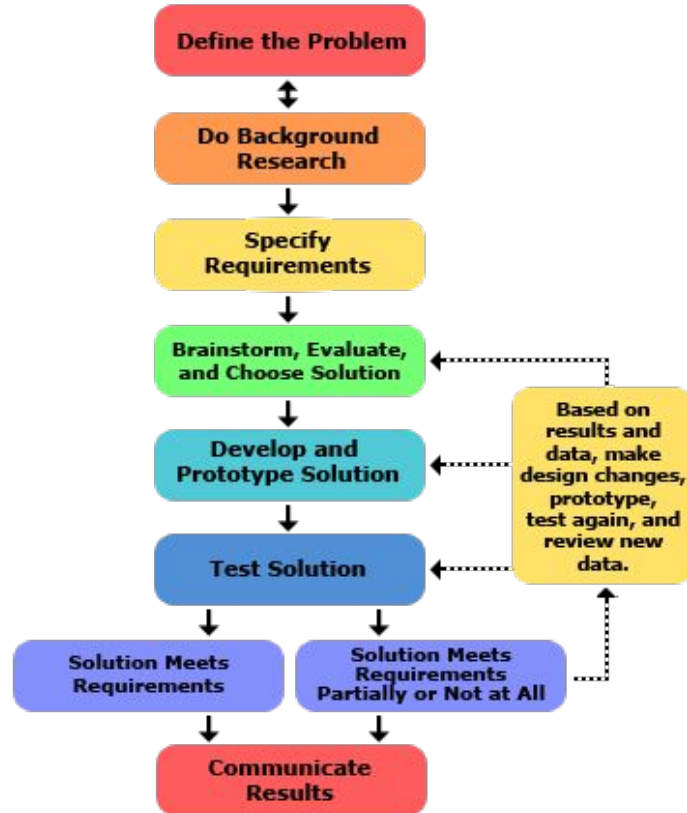
- K-4: Mystery Science®, MyMath®, and Coding units
- 5-8: Discovery Ed Science®, MyMath®, enVision Math®, and Coding units
- 9-12: Discovery Ed Science®, Freshman Coding, Computer Programming, AP Computer Science, Digital Photography, MultiMedia and Graphic Design, Standards-Aligned Math Curriculum.

What STEAM will bring to the students and staff

- K-1: Extension of current math, science, and technology courses into investigative learning through STEM Nasa units
- 2-4: STEAM units built by cross-curricular teams to further integrate instruction
- 5-6: Discovery learning through STEAM with the introduction of careers aligned to units
- 7-8: Course content focused on STEAM-based instruction, taught by teams of teachers with added career focus
- 9-12: New coursework based on STEAM content and collaboration of Math/Science/Art/Technology teaching staff with added influence on careers that are tied to STEAM Themes.

A new style of instruction and learning...

STEAM Curriculum at Prairie Central



The Depth of Inquiry and Knowledge will look different across our grade levels, but the process will be the same.



Kindergarten Units

Unit	Description
<u>Pushes/Pulls/Force</u>	Students explore slopes and surfaces as they are challenged to build a ramp that allows Ron, a skateboarding armadillo, to go far—but not too far. By using critical thinking, communication, and collaboration to build a ramp, students prepare for essential skills of the 21st century. Students work through the Engineering Design Process – to learn the value of rethinking and supporting multiple solutions.
<u>Weather and Seasons</u>	Students explore the warming effects of the sun and engineering. By using critical thinking, communication, and collaboration to design and build a covering to block the sun, students prepare for essential skills of the 21st century. Students work through the Engineering Design Process – to learn the value of rethinking and supporting multiple solutions.
<u>Plant and Animal Needs</u>	Students explore habitats and what animals need to survive. By using critical thinking, communication, and collaboration to design a patch to help an injured turtle survive, students prepare for essential skills of the 21st century. Students work through the Engineering Design Process – to learn the value of rethinking and supporting multiple solutions.

Year 1 - IMSP Teachers train Teachers

Year 2 - Add two more investigatory units per grade; all teachers lead lessons

First Grade Units

Unit	Description
<u>Sun, Moon, Stars</u>	Study the properties, locations, and movement of the sun, stars, moon, and clouds. Through hands-on activities, students will understand how these objects in the sky affect life on earth.
<u>Property of Light & Sound - Vibrations</u>	Students explore light and shadows by planning, resting, and redesigning scenery for a shadow box theater. By using critical thinking, communication, and collaboration to design a shadow box theater, students prepare for essential skills of the 21st century. Students work through the Engineering Design Process – to learn the value of rethinking and supporting multiple solutions.
<u>Plant and Animal Structures</u>	Students explore the connection between nature and the human-made world by designing hiking shoes that use nature for inspiration. By using critical thinking, communication, and collaboration to build hiking shoes, students prepare for essential skills of the 21st century. Students work through the Engineering Design Process – to learn the value of rethinking and supporting multiple solutions.
<p>Year 1 - IMSP Teachers train Teachers</p> <p>Year 2 - Add two more investigatory units per grade; all teachers lead lessons</p>	

Prairie Central Elementary Units

Second Grade	Third Grade	Fourth Grade
Biological Evolution: Unity and Diversity	Build a Hazard-Proof Home	Engineering Design & Energy
Matter and Its Interactions	Force and Motion	Natural Disasters
Matter and Ecosystems	Animals	STEAM Challenge
Year 1 - IMSP Teachers train Teachers Year 2 - Add three more investigatory units per grade; all teachers lead lessons		

Prairie Central Upper Elementary Units

Fifth Grade	Sixth Grade
Wind Energy STEAM Module	Space unit- making rockets/or rovers
STEM in Action® Rainwater Runoff	NASA STEAM projects
STEAM Challenge	STEAM Challenge
Year 1 - IMSP Teachers train Teachers Year 2 - Add three more investigatory units per grade; all teachers lead lessons	

Prairie Central Junior High Units - Year 1

Seventh Grade	Eighth Grade
Gardening In The Prairie	Fan Car Racing
"Cell-phies" Seeing Your Cells	Newton's Law
Lego Mindstorms	Bio-Chem Fish Chemistry
Math & Science Olympics	Math & Science Olympics

Prairie Central Junior High Courses- Year 2

STEAM Rotation Fall 2019	Transforming Algebra - STEAM Pilot Fall 2018
All 7th grade students	Pilot: 25 8th grade students
One quarter each year in addition to units	Full year in addition to units
PD: 3 Lead Teachers	PD: 1 Math and 1 Science Teacher

Prairie Central Junior High School 3 Year Plan

Year	Classroom Based Units	Courses
2018-19	8 units total	Pilot <i>Transforming Math</i> Plan <i>STEAM 7</i>
2019-2020	Add 4 units 12 units total	Implement <i>STEAM 7</i> Implement <i>Transforming Math</i> Plan <i>STEAM 8</i>
2020-2021	Add 4 units 16 units total	Implement <i>STEAM 8</i>
Baseline of units and courses More will be implemented if time and resources allow		

Prairie Central Junior High 3 Year Plan - Units

2018-19	2019-20	2020-21
Gardening In The Prairie (Classroom-based)	<u>Smart Grid</u> (Classroom-based)	Shark Tank (Classroom-based)
"Cell-phies" Seeing Your Cells (Classroom-based)	Energy and Food (IMSP) (Classroom-based)	City Designer (Classroom-based)
Lego Mindstorms (Classroom-based)	Pass It Along (Classroom-based)	Soft Impact (Classroom-based)
Math & Science Olympics 7 (Classroom-based)	CSI: A Body in Pieces (Classroom-based)	Circle of Life (Classroom-based)
Fan Car Racing (Classroom-based)	Transforming Algebra (New course)	
Newton's Law (Classroom-based)	STEAM 7 (New course)	
Bio-Chem Fish Chemistry (Classroom-based)		
Math & Science Olympics 8 (Classroom-based)		

Prairie Central High School Units - Year 1

9-12 Grades	9-12 Grades
Industrial Design: Furniture	Body Blueprint
Roller Coasters	Design Time
Copper Pendant and Cellular Structures	Remote Aquabotics
PCHS STEAM Challenge	Bio Research

Prairie Central High School Courses- Year 2

<i>Freshman STEAM Pilot Fall 2018</i>	<i>Transition Math - STEAM Fall 2019</i>
40-50 Freshman	40- 50 College Bound Seniors
2 Blocks (90 minutes each) full year in addition to modules	2 Blocks (90 minutes each) half year in addition to modules
PD: 2 Lead Teachers	PD: 2 Math and 2 Science Teachers

Prairie Central High School 3 Year Plan

Year	Classroom Based Units	Career Module Units	New Courses
2018-19	4 units total	4 STEM modules total	Pilot Freshman <i>STEAM</i> Plan <i>Transition Math</i>
2019-2020	Add 4 units 8 units total	Add 2 modules 6 STEM modules total	Implement <i>Freshman STEAM</i> Implement <i>Transition Math</i> Pilot <i>Sophomore STEAM</i>
2020-2021	Add 4 units 12 units total	Add 2 modules 8 STEM modules total	Implement <i>Sophomore STEAM</i> Pilot <i>Junior STEAM</i>
<p style="text-align: center;">Baseline of units and modules More will be implemented if time and resources allow</p>			

Prairie Central High School 3 Year Plan - Units

2018-19	2019-20	2020-21
Industrial Design: Furniture (Classroom-based)	<u>Smart Grid</u> (Classroom-based)	<u>Electric Vehicle Design</u> (Classroom-based)
Roller Coasters (Classroom-based)	<u>Redbird Chopper</u> (Classroom-based)	Teen Policy Costs (Classroom-based)
Copper Pendant and Cellular Structures (Classroom-based)	Sustainable House (Classroom-based)	Parking Lot Math (Classroom-based)
PCHS STEAM Challenge (Classroom-based)	Plastic Money (Classroom-based)	Affordable on Any Budget (Classroom-based)
<u>Body Blueprint</u> (Career Lab Module)	<u>A Closer Look</u> (Career Lab Module)	Pollinator 2.0 (Classroom-based)
<u>Design Time</u> (Career Lab Module)	<u>Innovating Solutions</u> (Career Lab Module)	Minimizing Crash Damage (Classroom-based)
<u>Remote Aquabotics</u> (Career Lab Module)	Freshman STEAM (Classroom-based)	The Green of Going Green (Classroom-based)
<u>Bio Research</u> (Career Lab Module)	Transition Math (Classroom-based)	<u>Dragster Design</u> (Career Lab Module)

Prairie Central Professional Development - Year 1

Name of Professional Development	Staff	Funding Provided By
2018 Moveable Feast	Six Staff K-12	Prairie Central CUSD #8
IL Math & Science Partnership (IMSP) STEM Program	Seven Staff 2-12	Regional Office of Education #17 And Prairie Central CUSD #8
Pitsco Module Training	Two Staff 9-12	Prairie Central CUSD #8
CeMaST: Transforming Algebra	Three 7-12 Science Teachers Three 7-12 Math Teachers	STEAM Grant through Livingston County Board and GLCEDC

PD: Illinois Math and Science Partnership STEM - Year 1

- Summer 2017 involved several (3 PCE, 1 PCUE, 1 PCJH, 2 PCHS) staff for training and unit development; Summer 2018 Trainers check in and collaborate to extend units
- Summer 2017 was for one month; follow-up in Summer 2018 2 days
- Provides resources for creation of new STEM programs
- Allows for teams to attend and plan new units of instruction
- Sessions are relative to all grade levels
- ROE 17 provided trainers and resources while PC provided release time throughout school year for preparation and training
- Details concerning the event can be found at [ISBE](#)

PD: Pitsco Module Training - Year 1

- Summer 2018 2 PCHS Staff for 1 day training in Joliet
- Provides training for the Learner Management Systems and the implementation of Pitsco Modules for Career Exploration
- Allows for teachers/counselors to attend and plan the implementation of four new STEAM units of instruction
- Fees covered by Prairie Central CUSD #8
- All 9-12 grade students will have access to the modules
- Pitsco Support will be provided throughout the year
- Details concerning the event can be found at [Pitsco](#)

PD: CeMaST - Year 1

- Summer 2018 3 PCHS and 2 PCJH Staff for 1 day training at ISU
- Provides training for implementing STEM-based *Transforming Algebra* Course
- Materials and resources are included in the training
- Twice monthly visits from ISU CeMaST staff to coach staff that attended training
- Fees covered by Livingston County Board and GLCEDC Grant
- Algebra course to be piloted and implemented at the Junior High and High School
- Details concerning the event can be found at [CeMaST](#)

Prairie Central Professional Development - Year 2

Name of Professional Development	Staff	Funding Provided By
2019 Moveable Feast	21 Staff K-12	Prairie Central CUSD #8 and STEAM Grant through Livingston County Board and GLCEDC
CeMaST/IMaST	4 Staff 7-12	Prairie Central CUSD #8

PD: Moveable Feast - Year 2

- Multiple STEAM Sessions offered
- One week event (5 days)
- Provides resources for expansion of existing programs
- Allows for teams to attend and plan new units of instruction
- Sessions are relative to all grade levels
- Prairie Central covered cost for Summer 2018
- Prairie Central will cover \$200 of cost per teacher and request through Livingston County Board and GLCEDC \$250 per teacher for Summer 2019
- Details concerning the event can be found at <http://thefeast.org/home>

PD: CeMast/IMaST - Year 2

- Integrated Math, Science, and Technology Program
- Content focused on Math at grades 6,7, and 8
- One week event (5 days)
- Allows for teams to attend and plan new units of instruction that integrate math, science, and technology
- Sessions are relative to Junior High and High School staff
- Prairie Central covered cost for Summer 2019
- IMaST staff from ISU will provide ongoing feedback throughout 2019-20 school year onsite
- Details concerning the event can be found at [IMaST](#)

PD: Livingston County STEAM Swap & Share

- Host event February 15, 2019 for all Livingston County Schools
- Schools will be invited to meet at Prairie Central to...
 - Showcase programs currently in place in Livingston County
 - Swap STEM/STEAM Units of instruction
 - Share experiences and lessons learned implementing the programs
 - Brainstorm ideas focused on expanding programming at all Livingston County Schools
- Workspace and materials will be provided by Prairie Central CUSD #8
- Audience would include Administration and Teachers from content areas of Science, Technology, Art, and Mathematics

Specific outcomes to define progress

Areas of Growth	Data to Track	Outcomes
Knowledge	STAR Math & Reading PARCC ISA SAT Pre-Post Data Collection	Increased student academic performance
Workforce Readiness	College & Careers Roundtable Attendance Classroom co-teaching experiences Career Fair attendance Career surveys	Increased opportunities for staff and students with workforce partnerships
Post-secondary Preparedness	Student College & Career Pathways Graduation rate Post-high school plan in place	Students will be prepared to move to their post-high school plan upon graduation

Financial Budgeting/Requests for Implementation

	2018-19		2019-20	
Category	PC Commitment	Grant Request	PC Commitment	Grant Request
Professional Development	\$ 4,650	\$ 12,000	\$9,050	\$ 3,300
Consumables & Materials	\$48,000	\$89,807	\$60,000	\$0
Staffing	\$56,160	\$ 0	\$110,160	\$ 0
Total Expenditures	\$ 108,810	\$ 101,807	\$ 179,210	\$3,300

Grand total: Prairie Central : \$288,020 Grant: \$ 105,107

Prairie Central Financial Commitment - 2 year start-up plan

Category	2018-19	2019-20
PD Moveable Feast	\$2,100	\$4,200
PD IMSP STEM Program	\$1,350	\$450
PD Pitsco Module Training	\$1,200	\$1,200
PD IMaST	\$0 (planning)	\$3,000
Consumables & Materials	\$48,000	\$60,000
Staffing	\$56,160	\$110,160
Total Expenditures	\$108,810	\$179,010

Grant Request Master Expense Sheet - 2 Year Plan

Prairie Central STEAM Application for GLCEDC STEAM Grant

Building	Grade Level	Number of students	Title of Unit	Trimester/Quarter Implemented	Materials Total	PD Total	Total Spent
PCPE/PCPW	K	130	Pushes/Pulls/Force	1	5719	700	6419
PCPE/PCPW	K		Weather and Seasons	2			
PCPE/PCPW	K		Plant and Animal Needs	3			
PCPE/PCPW	1	135	Sun, Moon, Stars	1	4848	700	5548
PCPE/PCPW	1		Property of Light/Sound - vibration	2			
PCPE/PCPW	1		Plant and Animal Structures	3			
PCE	2	115	Biological Evolution: Unity and Diversity	1	5285.43	450	5735.43
PCE	2		Matter and its Interactions	2			
PCE	2		Matter and ecosystems	3			
PCE	3	120	Build a Hazard-Proof Home	1	5518.03	450	5968.03
PCE	3		Force and Motion	2			
PCE	3		Animals	3			
PCE	4	120	Engineering Design & Energy	1	4573.3	450	5023
PCE	4		Natural Disasters	2			
PCE	4		STEAM Challenge	3			
PCUE	5	140	Wind Energy STEAM Module	1	6393.03	900	7293
PCUE	5		STEM in Action® Rainwater Runoff	3			
PCUE	6	130	Space unit- making rockets/or rovers	1	8888.69	450	9339
PCUE	6		NASA STEAM projects	3			
PCJH	7	160	Gardening In The Prairie	1	11537.24	450	11987
PCJH	7		Math & Science Olympics	4			
	7		"Cell-phies" Seeing Your Cells	2			
	7		Lego Mindstorms	3			
PCJH	8	140	Fan Car Racing	1	5194.18	4700	9894
PCJH	8		Math & Science Olympics	4			
	8		Newton's Law	2			
	8		Bio-Chem Fish Chemistry	3			
PCHS	9-12	545	STEAM Challenge	1	31850.17	8000	39850
PCHS	9-12		Industrial Design: Furniture	2			
PCHS	9-12		Rollercoaster	3			
PCHS	9-12		Copper Pendant & Cellular Structures	4			
PCHS	9-12		Pitsco STEAM Modules	1-4			
					\$89,807.07	\$17,250.00	\$107,057

Prairie Central Commitment Year 3 and Beyond

- Continue to expand and explore relationships with Livingston County Businesses
- Train additional staff to further include and institute STEAM Principled Instruction
- Continue to grow Prairie Central College & Career Roundtable and foster relationships that expand our students LACC and ICE experiences
- Collaborate with Livingston County schools not only with lessons and experiences but work towards an instructional formats that are familiar to the students and families that move communities but remain in county