RIVER ROUGE STEM ACADEMY

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Curriculum Reference List / Guide for STEM 2024-2025

River Rouge STEM Academy provides a rigorous science, technology, engineering, and mathematics-focused education. We aim to equip students with the skills and knowledge necessary to excel in these fields through hands-on learning, innovative projects, and a collaborative environment. We emphasize critical thinking, problem-solving, and real-world applications to prepare students for future academic and career success in a rapidly evolving technological landscape. Below is a description of our curriculum and course offerings for pre-k through 8th grade.

Pre-K

Overview of Pre-K at STEM:

Our Pre-K program is a part of the **Great Start Readiness Program (GSRP)**, which begins at age 4. We utilize the HighScope Curriculum, which supports active participatory learning to help children succeed academically and socially. Our class size is designed to promote individualized attention and learning, with a maximum of 18 students per class, supported by 3 adults. This structure ensures a nurturing and effective learning environment that caters to the unique needs of each child. We aim to provide a strong foundation for our students' future learning and success.

Elementary

ELA

Teacher Responsibilities for teaching ELA:

-reading and writing
-silent sustained reading
-syntax
-reading comprehension
-engaging lessons
-differentiated lessons
-use of the Design Process
-linguistic / communication skills
Pattern-Based Writing
-grammar/semantics
-thematic writing
-vocabulary
-use of centers
homework/classwork
-student-talk
-cursive writing
-spelling and sight word tests
-use of centers
-use of facilitation
-project-based lessons
-guided reading
-small group instruction -
-use of pre/post assessments
-grammar
-projects
-cooperative learning groups
-meaningful -

Curriculum for Elementary ELA used at STEM:

i-Ready ELA - (K-5) -The i-Ready Magnetic Foundations Reading curriculum is designed to develop students' literacy skills through a balanced approach that includes phonics, vocabulary, comprehension, and fluency. By integrating engaging texts and interactive activities, the curriculum aims to foster a love of reading while equipping students with the critical skills necessary for academic success and lifelong learning.

Common Core Language Arts - The State of Michigan adopted the Common Core, a set of English Language Arts standards for K-12 students to reach by the end of each grade level.

Guided Reading - Guided reading is an instructional approach that involves a teacher working with a small group of readers. During the lesson, the teacher provides a text that students can read with support, coaching the learners as they use problem-solving strategies to read the text. The ultimate goal is independent reading.

IXL - IXL is an online program teachers can use in ELA, Math, Social Studies, and Science. It provides continuous diagnostic data and helps each student fill their knowledge gaps.

i-Ready Magnetic Reading - i-Ready ELA for K-5 is a comprehensive, adaptive program designed to meet students at their reading levels and provide personalized instruction. It combines engaging, interactive lessons with assessments that help teachers identify strengths and areas for growth, ensuring that each student receives targeted support to build foundational literacy skills and advance their reading proficiency.

Math:

The teacher aims to help pupils develop critical-thinking abilities by understanding mathematical concepts.

Teacher's Responsibility for Teaching Math:

-use of centers
-use of facilitation
-differentiated lessons
-vocabulary
-problem-solving skills
-cooperative learning groups
-use of manipulatives
-project-based activities
-meaningful homework/classwork
-3rd - 5th Multiplication Memorization
-engaging activities
-critical thinking exercises
-use of data
-use of student-talk
-use of writing/describing
-Imagine Learning
-use of the Design Process
- pre/post assessments
-unit tests/quizzes

Curriculums for Elementary Math used at STEM:

i-Ready Math (K-5) - The i-Ready Math curriculum focuses on building a solid foundation in mathematical concepts, problem-solving, and critical thinking skills. Students are encouraged to explore, understand, and apply mathematical principles through hands-on activities, interactive lessons, and real-world applications, preparing them for higher-level math and everyday problem-solving.

Common Core Math - The State of Michigan adopted the Common Core, a set of math standards for K-12 students to reach by the end of each grade level.

Khan Academy - Khan Academy is a free online website that provides a personalized learning experience for students. It contains practice exercises, short lessons in blackboard videos, and immediate incentives when students reach their goals. It also provides teachers with the opportunity to differentiate and monitor the progress of student's work.

IXL - IXL is an online program teachers can use in ELA, Math, Social Studies, and Science. It provides continuous diagnostic data and helps each student fill their knowledge gaps.

i-Ready Math - i-Ready Math for K-5 is an adaptive learning program that provides personalized instruction tailored to each student's unique needs and skill levels. It features interactive lessons and assessments that help teachers identify

strengths and areas for improvement, ensuring targeted support to build strong mathematical foundations and advance students' problem-solving abilities.

Social Studies

Teacher Responsibilities for Teaching Social Studies:

-engaging activities
-critical thinking exercises
-use of data -
-use of student-talk
-use of student-talk
-cooperative learning groups
-unit tests/quizzes
-Project-based activities
-use of facilitation
-projects
-use of facilitation
- pre/post assessments
-provide meaningful homework
-vocabulary
-meaningful homework/classwork
-use of Design Process
-MC3
-differentiated lessons
-problem-solving skills

Curriculum for Elementary Social Studies used at STEM:

K-6-Studies Weekly - Studies Weekly standards-based curriculum applies a Balanced Literacy approach to education. The combination of printed weekly units and web-based primary source media, audio reader, and other features creates a high level of Student Engagement. Teacher-created lesson plans include rigorous and relevant assessment, word study, writing prompts, reading (modeled, shared, guided, and independent), and more.

MAISA - The Michigan Association of Intermediate School Administrators (MAISA) put together the Social Studies Standards for the State of Michigan using the Common Core State Standards. Using the Atlas system, educators have full access to these Common Core units in Social Studies.

IXL - IXL is an online program teachers can use in ELA, Math, Social Studies, and Science. It provides continuous diagnostic data and helps each student fill their knowledge gaps.

Science

Teacher Responsibilities for Teaching Science:

-use of centers	-use of manipulatives	-engaging lessons
-use of facilitation	-project-based activities	-critical thinking exercises
-differentiated lessons	- pre/post assessments	-use of data
-vocabulary	-cooperative learning groups	-use of student-talk
-problem-solving skills	-use of writing logs/journals	-use of Design Process
-use of NGSS	-use of phenomenon	-engaging videos
-unit tests/quizzes		-project-based lessons
-hands-on activities-experiments	-meaningful homework/classwork	

Curriculum for Elementary Science used at STEM:

For K-5: Supplemental Science Subscriptions

Mystery Science - Mystery Science - Mystery Science is a program aligned to the Next Generation Science Standards and Common Core and provides open-and-go science lessons. These lessons contain hands-on activities, short videos, discussion questions, and opportunities for critical thinking.

Generation Genius -Generation Genius is a digital learning platform designed to make science and math engaging and fun for kids[1]. It's a K-8 teaching resource that brings school science standards to life through educational videos, lesson plans, activities, quizzes, and reading materials[2]. These resources are produced in partnership with the National Science Teaching Association and are aligned with standards in all 50 states[2]. The platform aims to inspire students and save teachers' time, making it a valuable tool for modern education[3].

K-2 Science Curriculum

Solid Start is a literacy-based science curriculum for K-2 developed through MSU. Solid Start

Open SciED -**OpenSciEd** empowers educators to go beyond traditional science teaching methods by bringing together leading science researchers and educators to

craft a curriculum aligned with how students learn best[2]. The materials are an Open Education Resource (OER), free for all educators and students to use, customize, and share[3]. This approach supports inspired educators and motivated learners, creating classrooms that foster curiosity and active learning[2].

3-5 Science Curriculum

ML PBL - **ML-PBL (Multiple Literacies in Project-Based Learning)** is a curriculum that approaches science instruction intending to increase students' engagement and help them develop deep, meaningful understanding[1]. It integrates English Language Arts (ELA)/literacy and mathematics in the context of science[1]. The curriculum was built as part of research to test project-based, literacy-focused elementary science curriculum and teacher professional development[1]. It promotes academic, social, and emotional learning and equity in elementary students by using features of project-based learning and the three dimensions of scientific knowledge[1]. The curriculum engages elementary students in making sense of the world[2]. Science educators and researchers from MSU's CREATE for STEM Institute and the University of Michigan partnered to develop, test, and revise 3-dimensional, phenomena-based curricula, teacher professional learning materials, and assessments[2].

Open SciED -**OpenSciEd** empowers educators to go beyond traditional science teaching methods by bringing together leading science researchers and educators to craft a curriculum aligned with how students learn best[2]. The materials are an Open Education Resource (OER), free for all educators and students to use, customize, and share[3]. This approach supports inspired educators and motivated learners, creating classrooms that foster curiosity and active learning[2].

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STEM

Teacher Responsibilities for Teaching STEM:

use of manipulatives -engaging lessons -very little teaching

-use of facilitation
-differentiated lessons
-vocabulary
-problem-solving skills
-use of NGSS
-hands-on activities
-project-based activities
- pre/post assessments
-use of student-talk
-use of writing logs/journals
-use of phenomenon
-cooperative learning groups
-meaningful homework/classwork
-critical thinking exercises
-use of data
-experiments
-use of Design Process
-engaging videos

Curriculum for Elementary STEM:

Vivify STEM -Vivify STEM is a comprehensive K-12 STEM curriculum designed to make learning engaging and accessible[1]. The curriculum concerns engineering design practices, 21st-century skills, and real-world connections[2]. It offers over 250+ STEM units and a full scope and sequence for grades K - 8[2]. The curriculum includes activities that explore inventions and feats of engineering from around the world[2]. Vivify STEM also provides professional development videos and members-only support[2]. The curriculum aims to develop critical STEM skills and awareness of real-world STEM concepts and careers[2]. It's designed by a team of educators and engineers, ensuring the lessons are low-prep and classroom-tested[1]. Vivify STEM

Elementary is Engineering: Engineering is Elementary (EiE) is a project that fosters engineering and technological literacy among elementary school students and educators. EiE has created a research-based, standards-driven, and classroom-tested curriculum integrating engineering and technology concepts and skills with elementary science topics. Engineering is a new subject for most elementary school teachers. So far, only a few states (e.g., Massachusetts and Minnesota) have developed educational learning standards that include engineering at the elementary level.

Lego Education - Lego Education is a hands-on curriculum in which students use Legos to problem-solve and discover how science, technology, engineering, and math affect their everyday lives.

21st Century Ed - 21st CentEd uses hands-on activities, teacher facilitation, problem-solving strategies, and critical thinking to empower students to develop and apply in-demand, transportable skills in Science, Technology, Engineering, and Math. It also teaches students how to communicate and collaborate with others by using trial and error while working together as a team to solve problem-based challenges.

Middle School

ELA

Teacher Responsibilities for teaching ELA:

-writing in more styles
-silent sustained reading
-expand on vocabulary
-reading comprehension
-engaging lessons
-meaningful homework/classwork
-differentiated lessons
-use of Design Process
-linguistic / communication skills Instruction
-meaningful homework/classwork
-use of pre/post assessments
-cooperative learning groups
-grammar/semantics
-small group instruction
-student-talk
-thematic writing
-vocabulary tests
-use of centers
-cursive writing
-use of facilitation
-engaging lessons
-guided reading
-unit tests/quizzes
-grammar
-syntax
-cursive writing
-Project Based Lessons
-progressive reading

Curriculum for Middle School ELA used at STEM:

Open Up Resources Illustrative ELA - The curriculum is designed for two hours of rich content-based literacy instruction per day: one hour of module lessons and one hour of the Additional Language and Literacy (ALL) Block. These two hours of curriculum are considered comprehensive, explicitly teaching and formally assessing ELA/literacy standards for each grade level. At the heart of the curriculum—at all grade levels—are the hour-long module lessons. All ELA standards are taught and assessed in the module lessons. The ALL Block is to

support and reinforce the skills learned in module lessons. Each grade level includes four modules, which span a full school year. The four modules allow students to build important content knowledge based on a compelling topic related to science, social studies, or literature. Each module uses rich, authentic text throughout. *will change this school year

Common Core Language Arts - The State of Michigan adopted the **Common Core**, a set of English Language Arts standards for K-12 students to reach by the end of each grade level.

Flocabulary - Flocabulary is an online, multisensory approach to teaching vocabulary for all grades. It uses educational hip-hop music to engage students and increase their vocabulary achievement by using pattern-based lessons to learn how to spell and, later, how to write.

Guided Reading - Guided reading is an instructional approach that involves a teacher working with a small group of readers. During the lesson, the teacher provides a text that students can read with support, coaching the learners as they use problem-solving strategies to read the text. The ultimate goal is independent **r**eading.

IXL - IXL is an online program teachers can use in ELA, Math, Social Studies, and Science. It provides continuous diagnostic data and helps each student fill their knowledge gaps.

Math

Teacher Responsibilities for Teaching Middle School Math:

-use of centers	-use of manipulatives	-engaging activities
-use of facilitation	-project-based activities	-critical thinking exercises
-differentiated lessons	- pre/post assessments	-use of data
-vocabulary	-use of student-talk	-problem-solving skills
-use of Design Process	-use of writing / describing	-unit tests/quizzes
-projects	-Imagine Learning	-cooperative learning

-meaningful homework/classwork

-Memorization of Multiplication Facts if not known

Curriculum for Middle School Math used at STEM:

Open Up Resources Illustrative Mathematics - Open Up Resources Illustrative Mathematics is our primary middle school mathematics curriculum. It is known for turning students into mathematical thinkers by teaching them how to communicate verbally, visually, and in writing mathematically.

Common Core Math - The State of Michigan adopted the **Common Core**, a set of math standards for K-12 students to reach by the end of each grade level.

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Social Studies

Teacher Responsibilities for Teaching Social Studies:

-engaging activities
-use of facilitation
-use of data
-use of student-talk
-use of student-talk
-cooperative learning groups
-problem solving skills
-project-based activities
-critical thinking exercises
-differentiated lessons
- pre/post assessments
-provide meaningful homework
-vocabulary
-use of Design Process
-unit tests/quizzes
-MC3
-use of Design Process
-critical thinking exercises

-meaningful homework/classwork

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Science

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-use of facilitation	-project-based activities	-critical thinking exercises
-differentiated lessons	- pre/post assessments	-use of data
-vocabulary	-use of student-talk	-experiments
-problem-solving skills	-use of writing logs/journals	-use of Design Process
-use of NGSS	-use of phenomenon	-engaging videos
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STEM

Teacher Responsibilities for Teaching STEM:

-use of manipulatives	-engaging lessons	-very little teaching
-use of facilitation	-project-based activities	-critical thinking exercises
-differentiated lessons	- pre/post assessments	-use of data
-vocabulary	-use of student-talk	-projects
-problem-solving skills	-use of writing logs/journals	-use of Design Process
-use of NGSS	-use of phenomenon	-engaging videos

-hands-on activities -cooperative learning groups -experiments
-meaningful homework/classwork

Curriculum for Middle School STEM:

21st Century Ed - 21st CentEd uses hands-on activities, teacher facilitation, problem-solving strategies, and critical thinking to empower students to develop and apply in-demand, transportable skills in Science, Technology, Engineering, and Math. It also teaches students how to communicate and collaborate with others by using trial and error while working together as a team to solve problem-based challenges.

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Elective Courses:

Lego Education/Robotics- LEGO® bricks are naturally engaging to elementary students. When they are introduced into the learning environment, they boost

motivation. It's through this active, engaged experience that LEGO Education Elementary teaching solutions help you to lay the foundation for lifelong learning. The hands-on solutions ignite children's natural desire to explore and discover. Students will learn subjects like math, science, technology, and engineering more effectively while improving and developing 21st-century skills like problem-solving, collaboration, and communication. In middle school, students' creative problem-solving skills enable them to become critical thinkers and creators of the future. LEGO® Education solutions support your teaching efforts with effective, structured, and curriculum-relevant teaching solutions for science, technology, engineering, and math (STEM).

Yoga for Kids- The organization aims to promote peace, a healthy lifestyle, self-empowerment, and a fun, effective learning method for children. Unlike yoga for adults, the YogaKids program explicitly supports the capacities of children of all ages. The idea of yoga, breathing, and mindfulness as powerful tools for change in the classroom began in 1986 when Marsha Wenig taught poetry to children in a Los Angeles elementary school. After years of research, the study of numerous educators such as John Dewey, Maria Montessori, Rudolf Steiner, Magda Gerber, and Howard Gardner, along with lessons gleaned from hundreds of children, the company was founded in 1991 with one simple idea: help kids make a better world through yoga.

Tynker - Tynker is an online coding and computer programming curriculum that allows students to work independently. This virtual program will allow students to engage in gaming and coding programs in a remote learning environment or in person. Funding is needed for professional development and to maintain the program.

Kids Explore Japan (1st, 6-8)-This program enhances our students' education BY helping them develop their Japanese reading, writing, listening comprehension, and oral communication. It will also help our students understand and correctly respond to basic Japanese spoken language and obtain a basic understanding of reading Hiragana and Katakana. This program uses tablets to help students practice their written and verbal language skills with interactive applications.

Photography (6-8)- The photography courses enable the students to understand the utility of different camera parts, working out the lights while clicking pictures, and the art of taking candid shots. Other aspects that the candidates can learn from the program are studio lighting, portrait photography, and portfolio design.

Physical Education (K-8) - The physical education course is based on acquiring knowledge and skills that are the foundation for engaging in physical activity. Our mission is to empower all students to sustain regular, lifelong physical activity as a foundation for a healthy, productive, fulfilling life. The Physical Education curriculum is a sequential educational program. It is based on physical activities undertaken in an active, caring, supportive, and non-threatening atmosphere where every student is challenged and successful. We aim to provide every student with various physical activities and challenges that will contribute to developing and maintaining their physical, cognitive, and affective well-being. Ultimately, students will be provided with the foundation for making informed decisions that will empower them to achieve and maintain a healthy lifestyle.

Music (K-5)- This instrumental music course is designed as an introduction to the basics of performing on a wind or percussion instrument. Students prepare for and participate in concerts, developing skills specific to their instrument. The course includes note reading, basic music vocabulary, and beginning music theory. In addition to listening to, describing, and performing music from various cultures, students demonstrate knowledge of performance etiquette and work together in an ensemble. Course goals: demonstrate care and maintenance of an instrument; Develop the ability to play simple melodies within a limited range; Perform concert pieces, exhibiting concert etiquette; Learn to read and interpret rhythmic notation; Listen to, describe, and perform music of various styles from various cultures.

Graphic Arts & Design(6-8) - The Graphic Arts and Design course introduces students to visual communication and design principles. Students will learn to use industry-standard software to create digital artwork, explore typography, layout, and color theory, and develop print and digital media skills. This course emphasizes creativity, entrepreneurship, technical proficiency, and professional portfolio development.