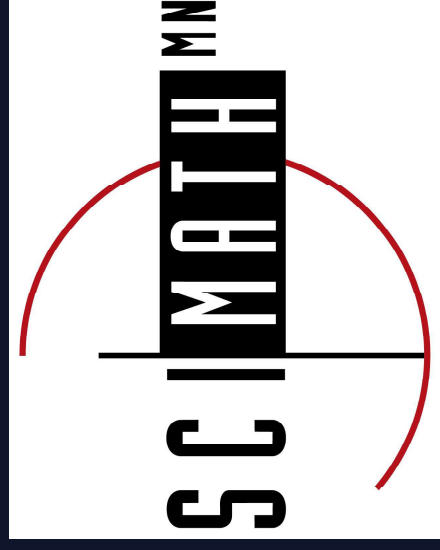


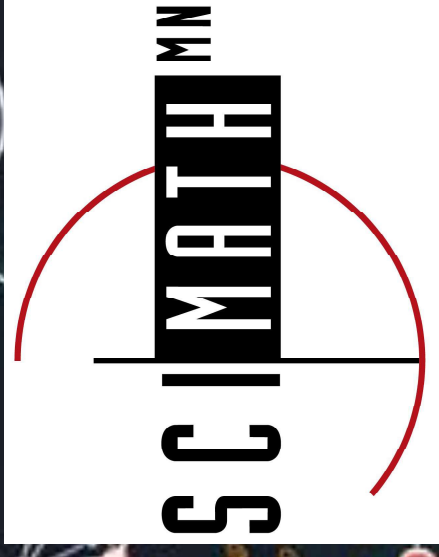


Meet Your New Thought Partner: A Hands On Introduction to Google Gemini Gems

Streamlining Prep, Lesson Planning, Classroom Activities, Assessment Writing,
and Family Communications with the SciMathMN STEM Teacher Center



Vic Dreier
Regional STEM Specialist
Southern Minnesota

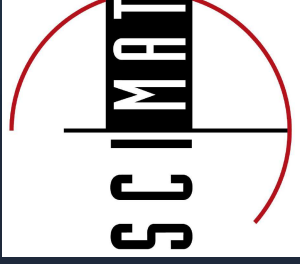


MINNESOTA
STEM
ECOSYSTEM



FORGE
by  **FutureForward™**

Mobile
Science Labs
Fueled by Mayo Clinic and Southeast Service Cooperative



Mighty trees grow from tiny seeds.

Transforming Teaching with AI

Enhancing pedagogical efficiency and student learning while grounding lessons in Minnesota Academic Standards and trusted STEM Frameworks.

Best Practices: Teacher Prep

Examining Administrative Workflows

Resource Aggregation: Rapidly draft unit outlines, reading lists, and lab equipment checklists in minutes.

Time Reclamation: Automate repetitive administrative tasks, saving 5–10 prep hours weekly.

Standard Mapping: Align preliminary lesson topics directly with Minnesota Academic Benchmarks.

Human-in-the-Loop: Always review, fact-check, and customize AI output prior to classroom implementation.



Designing Dynamic Lesson Plans



Standards Alignment

Use AI to generate lesson plans that align with the Minnesota Math & Science standards. Prompt AI using exact MN Math & Science benchmark codes to ensure every lesson addresses mandated grade-level outcomes.



Differentiated Pathways

Generate multi-tiered lesson variations, modified texts, and ELL scaffolds to meet diverse student learning profiles.



5E Instructional Model

Structure engaging STEM units using the 5E model: Engage, Explore, Explain, Elaborate, and Evaluate instructional phases.

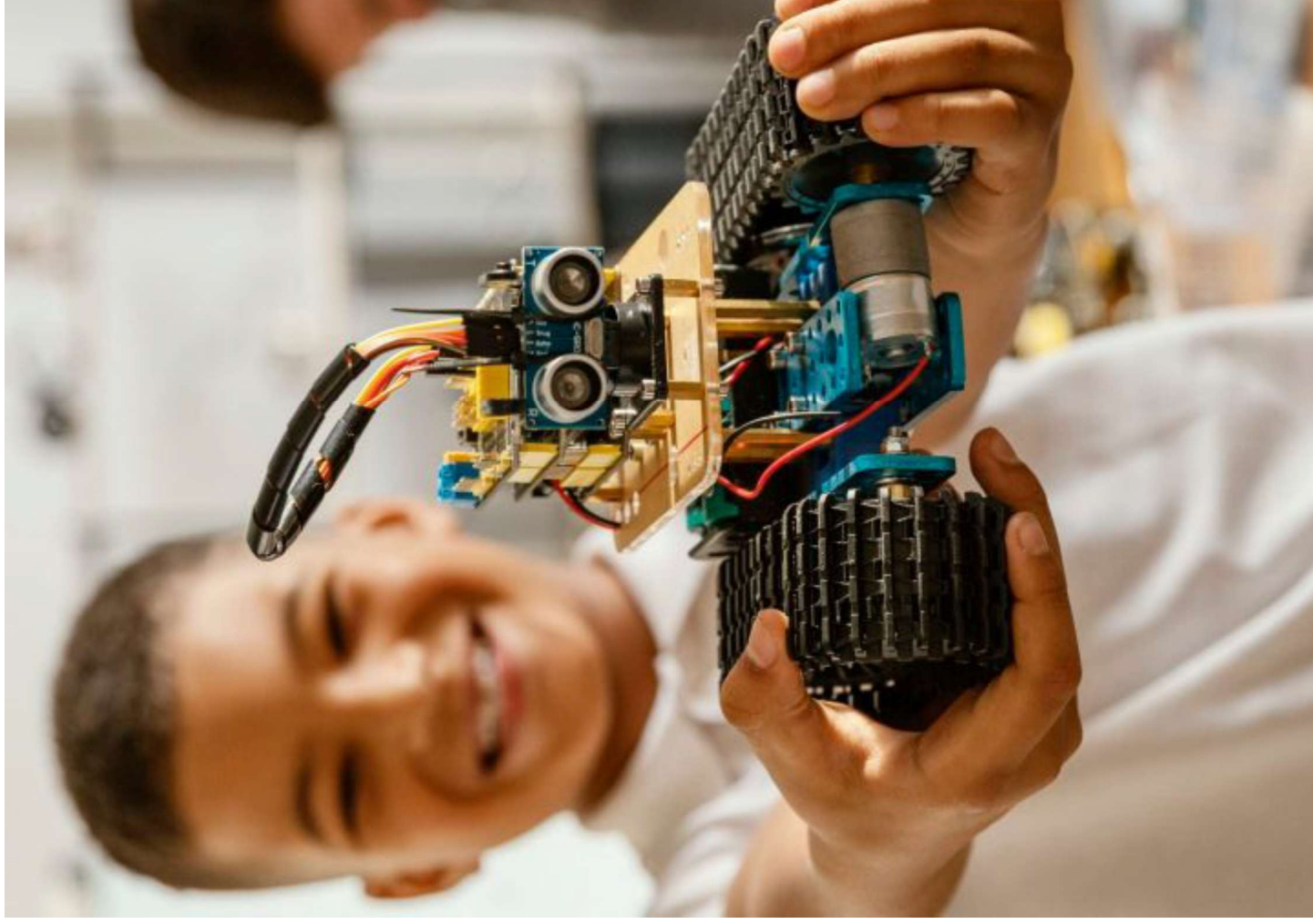
Engaging Classroom Activities

Active STEM Learning

World Scenarios: Use generative AI to craft localized problem-solving prompts focused on Minnesota ecosystems, renewable energy, and regional industries.

Play & Simulation: Generate inquiry scenarios where students take on roles as environmental engineers, data analysts, or other scientists.

Critical Questioning: Create tiered inquiry prompts that spark collaborative group dialogue and deeper mathematical reasoning.



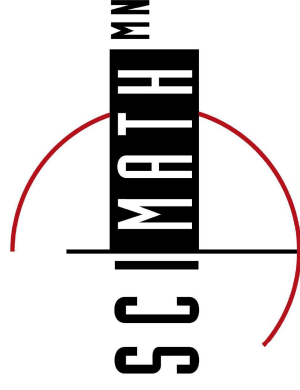
Writing Assessments & Rubrics

Targeted Formative Tools

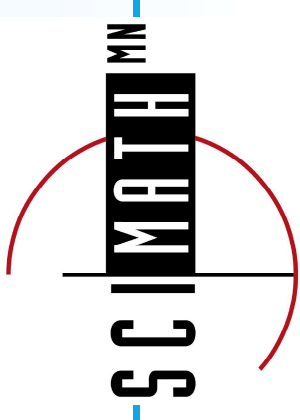
Develop formative exit tickets, multi-step math tasks, and conceptual science questions tailored to detect common student misconceptions early. Construct diagnostic item banks aligned with MCA test specifications for Minnesota benchmark readiness.

Transparent Rubric Generation

Draft detailed, multi-tier scoring rubrics with clear performance indicators across knowledge, inquiry, and application dimensions. Provide students with objective, standards-based criteria that make success criteria explicit and actionable.



Parent & Family Communications



Dear Classroom Updates

Transform technical STEM concepts into engaging, jargon-free weekly newsletters highlighting student achievements and upcoming projects.



Multilingual Outreach

Leverage translation capabilities to communicate effectively with non-English speaking families, fostering inclusive school communities.



Constructive Progress Notes

Draft balanced, growth-oriented student conference summaries that emphasize strengths while offering clear actionable next steps.

Technical AI in MN Classrooms



Responsible Usage Guardrails

-  **Data Privacy & FERPA:** Never input student personally identifiable information (PII) or sensitive records into AI
-  **Educator Oversight:** Treat AI as a collaborative co-pilot; teacher expertise must always evaluate pedagogical appropriateness.
-  **Academic Integrity:** Establish transparent classroom policies defining appropriate student use of AI tools for research and learning.

Custom Gemini Gems for Teacher Support & Prep

Empowering educators with persistent, tailored AI assistants to streamline lesson plan, differentiate classroom instruction, and reclaim valuable planning time.

1x Text AI Query Uses ~10x More Energy Than a Traditional Search

Standard Google search consumes roughly **0.3 watt-hours (Wh)** of electricity. By comparison, a basic text query to a Large Language Model (like ChatGPT) consumes roughly **0.3 to 3 watt-hours**—about 10 times more energy.

Day comparison: Running 10 text AI queries uses about the same electricity as powering a high-efficiency LED lightbulb for 20–30 minutes or running a laptop for ~30 minutes.

AI's Carbon Footprint (Daily Use) Outweighs Model Training

Environmental discussions focused heavily on the massive energy needed to *train* AI models. However, global research (including recent findings) estimates that **80% to 90% of AI's total lifetime energy consumption** comes from *inference*—the billions of daily predictions across the world after the model is built.

AI Generation (Images & Video) Uses Dramatically More Power Than Text

AI queries are equal. Generating complex media requires vast computational resources compared to plain text:

Image query: ~0.34 Wh (powers an LED bulb for ~2 minutes).

Video generation: ~2.9 Wh to ~10 Wh (powers an LED bulb for 15–20 minutes).

Video generation: Up to 250+ Wh for a brief video (enough to power that same LED bulb for over 24 hours straight or run 200,000 text queries).

AI's Direct Water Footprint per Text Query Is Tiny, but Compounds Globally

Data centers require water both directly (for cooling server racks) and indirectly (for the electricity generation powering the grid).

Individual query: A single standard text response consumes roughly **0.32 mL (1/15th of a teaspoon)** of water. You would need text queries to equal the water in one 500 mL water bottle.

Media: Generating a single AI image consumes about 2 tablespoons (29 mL) of water, while generating a complex AI video can require hundreds of liters.

AI's Carbon Footprint: Micro-Grams vs. Daily Human Activity

A single AI prompt generates approximately **2 to 4 grams of CO₂ emissions** (depending on whether the data center runs on fossil fuels or clean energy).

Day comparison: Driving a gas-powered car for **1 mile** emits roughly **400 grams of CO₂**—equivalent to making roughly 10 text AI prompts. If using AI for 5 minutes replaces a 2-mile car trip to the library, the AI interaction actually results in a net saving of emissions.

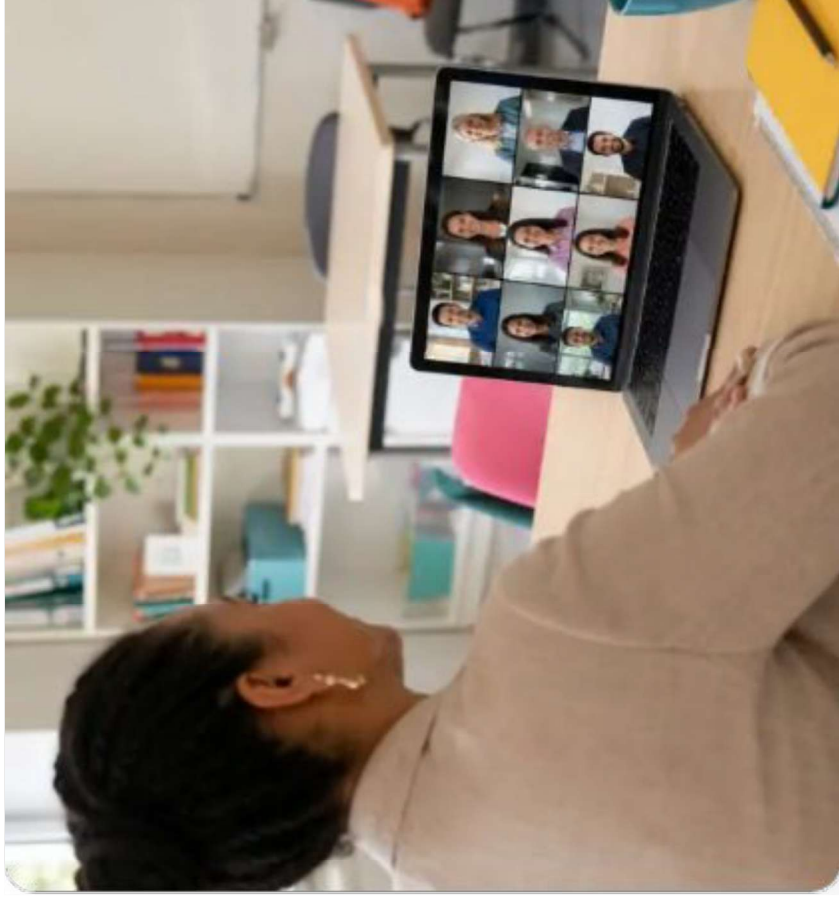
What Are Gems & Why Teachers Need Them

Personalized AI Assistants: Pre-programmed custom Gemini personas that remember your grade level, subject standards, and pedagogical style across every chat.

Instant Lesson & Resource Prep: Generate differentiated reading prompts, rubrics, IEP adaptations, and exit tickets in seconds rather than hours.

Deep Context Retention: Upload syllabus guidelines, district curriculum PDFs, or unit goals once—your Gem automatically references them every time.

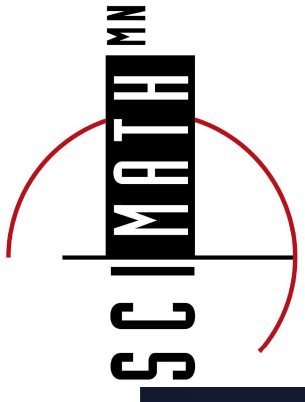
Custom Gemini Gems for



MathMN STEM Teacher Center

Using AI Prompts with MN Standards

- Statewide Frameworks:** Access curated frameworks developed by SciMathMN and MDE to translate Minnesota Math and Science standards into practice.
- Precision Prompting:** Combine SciMathMN benchmark guidance directly with AI prompts for accurate, grade-appropriate rigor.
- Expert Practice Hub:** Leverage expert classroom resources, teaching strategies, and assessment examples tailored for Minnesota schools.



Minnesota STEM Resource Hub

The SciMathMN STEM Teacher Center provides invaluable frameworks that help educators translate academic standards into classroom reality.

Visit: stemtc.scimathmn.org

e 4-Part Prompt Strategy

4

Core Prompt Pillars for Effective Results

A Reliable Prompt Formula

- 1 **Persona:** Define the role (e.g., "Act as a Minnesota 8th Science Teacher...").
- 2 **Standard:** Include SciMathMN framework codes (e.g., "Targeting MN Standard 8.1.1...").
- 3 **Task:** State the exact task (e.g., "Draft a 3-level differentiated inquiry activity...").
- 4 **Format:** Specify required output (e.g., "Provide as a table with teacher notes & student rubric").



Help Us Build the New MN STEM Teacher Center

SciMathMN is reaching out to ensure we capture valuable feedback from Minnesota

Educators to help shape the new STEM Teacher Center website.

We need your input to inform our design and tools to support STEM Education for all Minnesota Educators.



Giveaway prizes include:

- Upper Story games
- Amazon gift cards
- Starbucks cards



TAKE THE SURVEY

Explore Lesson Frameworks: stemtc.scimathmn.org | Learn More: www.scimathmn.org

Questions & Discussion

Empowering Minnesota Educators through AI Innovation and STEM Excellence

Acting Executive Director

Vic Dreier, Southeast Service Cooperative

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