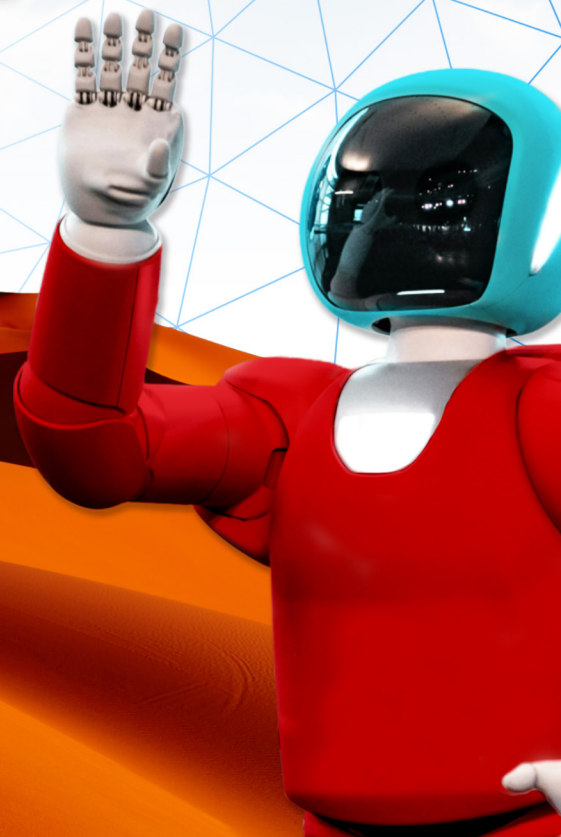




STEM Talk Toolkit

Creating a culture of thinking, talking, and learning in STEM



Conversation Starters

Prompt Cards

Classroom Resources for STEM Learning

Accelerate **LEARNING**
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Teacher Quick Guide

Why STEM Talk Matters

Scientists, engineers, mathematicians, and problem-solvers don't just find answers; they ask questions, explain their thinking, evaluate evidence, and collaborate with others.

This STEM Talk Toolkit provides sentence starters that help students engage in meaningful conversations, articulate their ideas, and participate confidently in STEM learning experiences.

These prompts support classroom discourse by giving students the language they need to:

- **Share** their thinking
- **Explain** their reasoning
- **Support** claims with evidence
- **Collaborate** with peers
- **Reflect** on their learning

How the Cards Are Organized

There are 10 cards in total. The first 7 cards are organized by the purpose of the conversation, making them flexible tools that can be used across science, technology, engineering, mathematics, and integrated STEM learning experiences. To further support discipline-specific discourse, we've also included 3 STEM-focused cards designed for Math Reasoning, Scientific Argumentation, and Engineering & Problem Solving.

CARD	PURPOSE
 Make Sense of It	Explore ideas, ask questions, and identify patterns
 Explain My Thinking	Describe reasoning and problem-solving processes
 Use Evidence	Support claims with data, observations, and examples
 Build on Ideas	Collaborate and connect with others' thinking
 Ask Questions	Clarify, challenge, and deepen understanding
 Reflect & Improve	Monitor learning and identify next steps
 Compare & Evaluate Solutions	Compare ideas, evaluate strategies, and justify decisions.
 Math Reasoning	Communicate mathematical thinking and justify solutions
 Scientific Argumentation	Develop claims supported by evidence and reasoning
 Engineering & Problem Solving	Design, test, evaluate, and improve solutions

When to Use the Cards

The cards can be incorporated into a variety of learning experiences:

- **Before Learning**
Use *Make Sense of It* and *Ask Questions* to activate curiosity and explore new phenomena, problems, or challenges.
- **During Learning**
Use *Explain My Thinking*, *Use Evidence*, *Math Reasoning*, and *Scientific Argumentation* to support discussion, collaboration, and sense-making.



Teacher Quick Guide

- **During Design Challenges**

Use *Engineering & Problem Solving* to guide students through the engineering design process.

- **After Learning**

Use *Reflect & Improve* to encourage metacognition and self-reflection.

Classroom Implementation Ideas

- **Partner Discussions**

Invite students to select one sentence starter before discussing with a partner.

- **Group Work**

Place a set of cards at each table and encourage students to choose prompts that match the conversation.

- **Think-Pair-Share**

Assign a specific card to focus student discussion.

- **Gallery Walks**

Ask students to use prompts from Use Evidence, Ask Questions, or Build on Ideas when responding to classmates' work.

- **STEM Notebooks**

Students can reference the cards when writing explanations, claims, reflections, and design justifications.

Tips for Success

- ✓ Model the sentence starters regularly.
- ✓ Encourage students to adapt prompts into their own words.
- ✓ Celebrate thoughtful explanations and evidence-based reasoning.
- ✓ Focus on building confidence, not perfect responses.
- ✓ Gradually reduce reliance on the prompts as students develop independent discourse skills.



REMEMBER

The goal isn't for students to memorize sentence starters. It's to develop the communication habits used by Scientists, Engineers, Mathematicians, and Problem-Solvers every day.

MAKE SENSE OF IT



When I'm trying to understand a problem...

- I notice...
- I wonder...
- A pattern I see is...
- This reminds me of...
- I think this is happening because...
- My prediction is...

USE EVIDENCE



When I'm supporting a claim...

- My evidence shows...
- The data suggest...
- I know this because...
- According to the graph...
- One example is...
- This supports my claim because...

EXPLAIN MY THINKING



When I'm sharing my reasoning...

- I approached the problem by....
- First I..., then I...
- The strategy I used was...
- I chose this method because...
- My thinking is...
- I figured this out by...

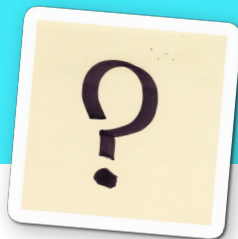
BUILD ON IDEAS



When I'm working with others...

- I agree with _____ because...
- I'd like to add...
- Building on that idea...
- I noticed something similar...
- Another example is...
- That connects to...

ASK QUESTIONS



When I want to learn more...

- Can you explain...?
- What evidence supports that?
- Why do you think that?
- Can you clarify...?
- How did you determine...?
- What makes you say that?

COMPARE & EVALUATE SOLUTIONS



When I'm comparing ideas, strategies, or solutions...

- One similarity between our approaches is...
- One difference is...
- One advantage of this solution is...
- One limitation of this approach is...
- I would choose this method because...
- The tradeoff is...

REFLECT & IMPROVE



When I'm thinking about my learning...

- One thing I learned....
- A challenge I had...
- My understanding changed when...
- Next time I would...
- I was successful because...
- I still wonder...

MATHEMATICAL REASONING



When I'm explaining my thinking...

- I know this answer makes sense because....
- The pattern I notice is...
- I represented the problem by...
- My strategy worked because...
- The relationship between ___ and ___ is...
- I checked my answer by...

ENGINEERING DESIGN & PROBLEM SOLVING



When I'm designing, testing, and improving a solution...

- The problem we are trying to solve is...
- Our solution works because...
- One constraint we considered was...
- We tested our design by...
- We improved our design by...
- Next, we could make it better by...

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SCIENTIFIC ARGUMENTATION



When I'm making a scientific claim...

- My claim is...
- The evidence shows...
- The data suggest that...
- One observation I made was...
- This supports my claim because...
- An alternative explanation could be...

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