



Effective, Engaging Methods for Writing in Science

September 30, 2015

Welcome to Day 1!

Wireless ID: Montcalm_Guest

User Name: ADMGUEST

Password: Welcome2MAISD

Welcome

- **Introductions**
 - **Karen Meyers, Director**
 - **Kathy Agee, Science Program Coordinator**
- **Workshop Information**
 - **Grant Funding**
 - **SCECHs**
 - **Substitute Reimbursement Forms**
 - **Registration form**
 - **Housekeeping**



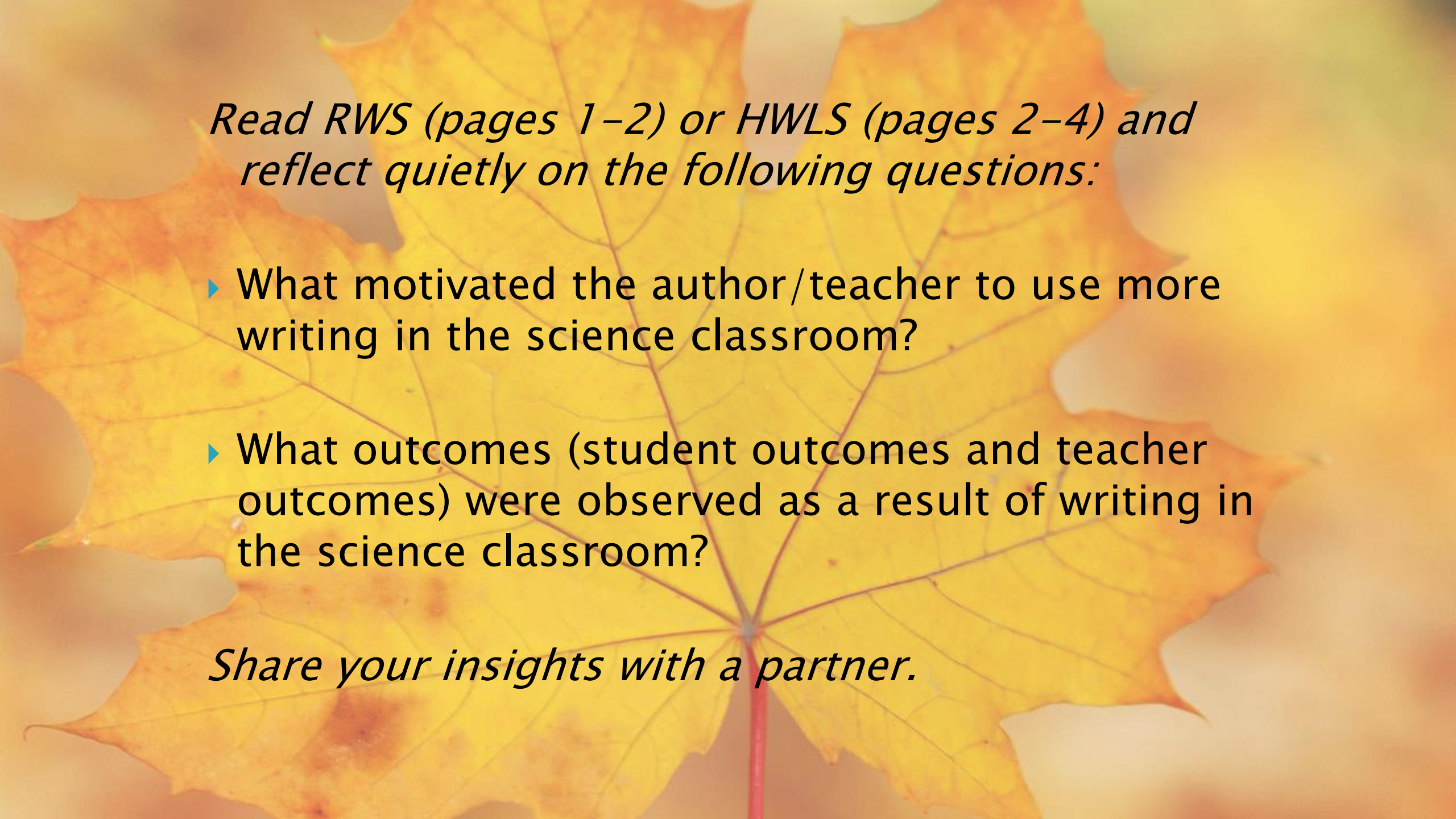
Silent Argument



Introducing Our Texts

*Reading and Writing in Science: Tools to Develop
Disciplinary Literacy* by Maria C. Grant and Douglas
Fisher (RWS) Pages 1-2

How to Write to Learn Science (2nd ed). Bob Tierney
and John Dorroh (HWLS) Pages 2-4



Read RWS (pages 1–2) or HWLS (pages 2–4) and reflect quietly on the following questions:

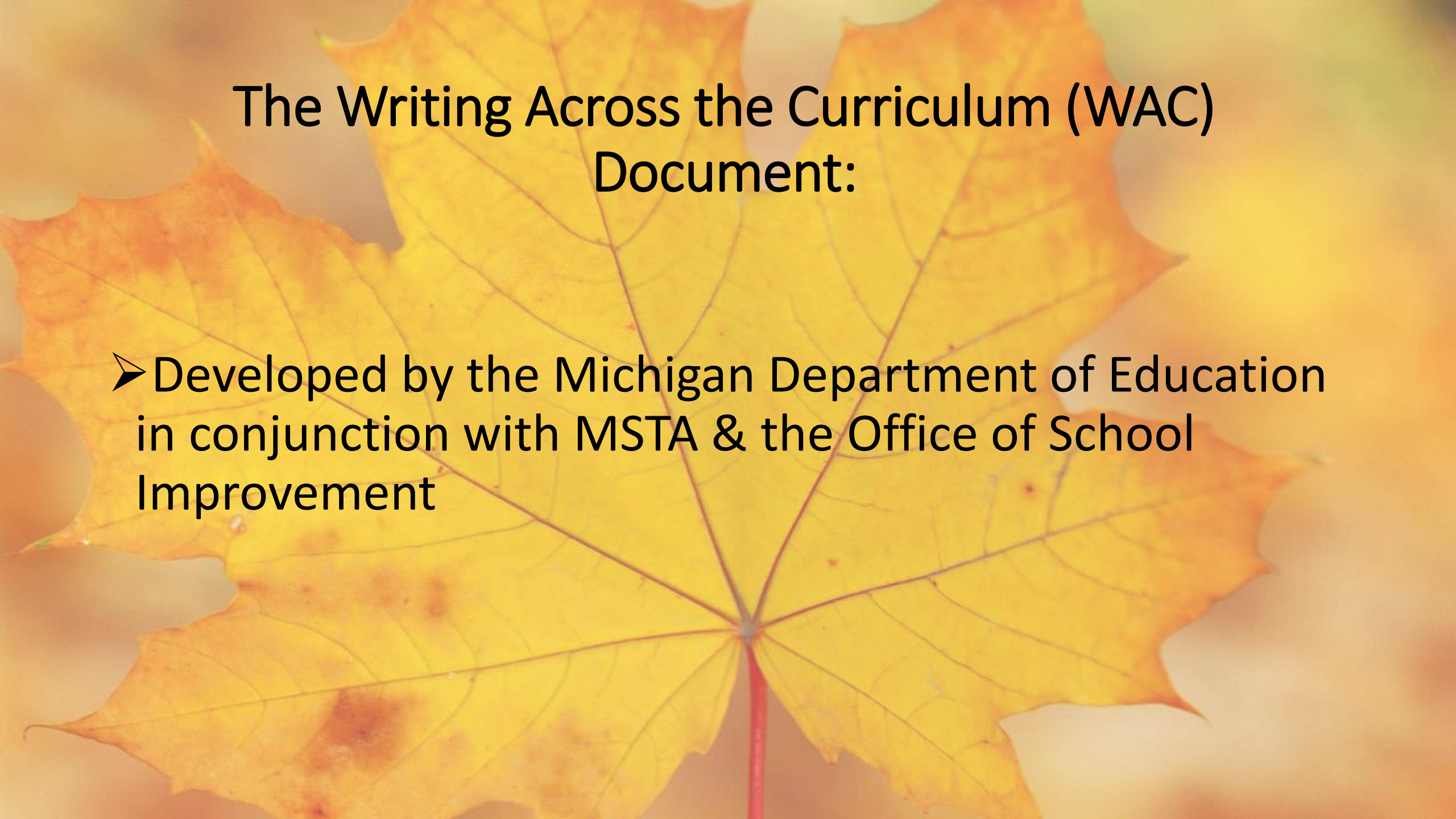
- ▶ What motivated the author/teacher to use more writing in the science classroom?
- ▶ What outcomes (student outcomes and teacher outcomes) were observed as a result of writing in the science classroom?

Share your insights with a partner.

PROFESSIONAL REFLECTION

- What do you hope to accomplish with your students as a result of this workshop?

Record your response on a 3x5 card and turn it in at the end of the session.



The Writing Across the Curriculum (WAC) Document:

- Developed by the Michigan Department of Education in conjunction with MSTA & the Office of School Improvement



The WAC Document has two sections:

▶ WRITING-TO-LEARN

▶ WRITING TO DEMONSTRATE KNOWLEDGE



WAC COMMON FORMAT FOR WRITING STRATEGIES

- Name of the strategy
- Definition of the strategy
 - What does it do?
- How does one implement it?
- Examples with science content

WRITING TO LEARN

What is it?

A Writing-to-Learn strategy is one that teachers employ throughout and/or at the end of a lesson to engage students and develop big ideas and concepts.



WRITING TO LEARN

- ▶ Requires higher-level thinking skills
- ▶ Focuses on ideas rather than correctness of details
 - ▶ The WAC lists 15 writing strategies



WRITING TO LEARN

There is a strong connection between
Writing to Learn strategies
and Formative Assessment.

WRITING TO DEMONSTRATE KNOWLEDGE

What is it?

A Writing to Demonstrate Knowledge strategy is one that allows students to show what they have learned by synthesizing information and explaining or applying their understanding of concepts and ideas.

Students write for an audience with a specific purpose. Products may apply knowledge in new ways or use academic structures for research and/or formal writing.

WRITING TO DEMONSTRATE KNOWLEDGE

A Writing to Demonstrate Knowledge assignment:

- Requires a report, essay, project or other more formal paper
- Is a “finished product” which adheres to format and style guidelines or standards.
- May requires a period of weeks of work including revising and editing.
- The WAC includes material on eight different Writing to Demonstrate Knowledge strategies



WRITING TO DEMONSTRATE KNOWLEDGE

Writing to Demonstrate Knowledge
has a strong connection to
Summative Assessment.



TRY A NEW STRATEGY

- COLUMN NOTES (p. 10)
- CONCEPT / VOCABULARY DEVELOPMENT (p. 17)
- METAPHORICAL THINKING (p. 32)
- JOURNALISTIC REPORTING (p. 52)



Science in the ELA Common Core



Text in the Middle



NGSS Practices



LUNCH

A large, vibrant yellow maple leaf with a red stem, serving as a background for the text. The leaf is centered and fills most of the frame, with its veins clearly visible. The background is a soft, out-of-focus mix of warm autumn colors like orange and yellow.

ARGUMENTATION

What is Argumentation?



Changing how we DO science



- Students must get beyond concept that science is just something that is known and passed down from expert to novice.
- Science is a *verb* and they are *scientists* evaluating evidence to develop their content knowledge.
- Claim ← Evidence ← Reasoning

THE DEADLY FACTS ABOUT WATER!

FACT!

WATER CAN BE CHEMICALLY
SYNTHESIZED BY BURNING
ROCKET FUEL!!!

FACT!

OVER CONSUMPTION CAN CAUSE
EXCESSIVE SWEATING, URINATION,
AND EVEN DEATH!!!

FACT!

100%
OF ALL SERIAL KILLERS,
RAPIST AND DRUG DEALERS HAVE
ADMITTED TO DRINKING WATER!!!



FACT!

WATER ONE OF THE PRIMARY INGREDIENTS
IN HERBICIDES AND PESTICIDES!!!

FACT!

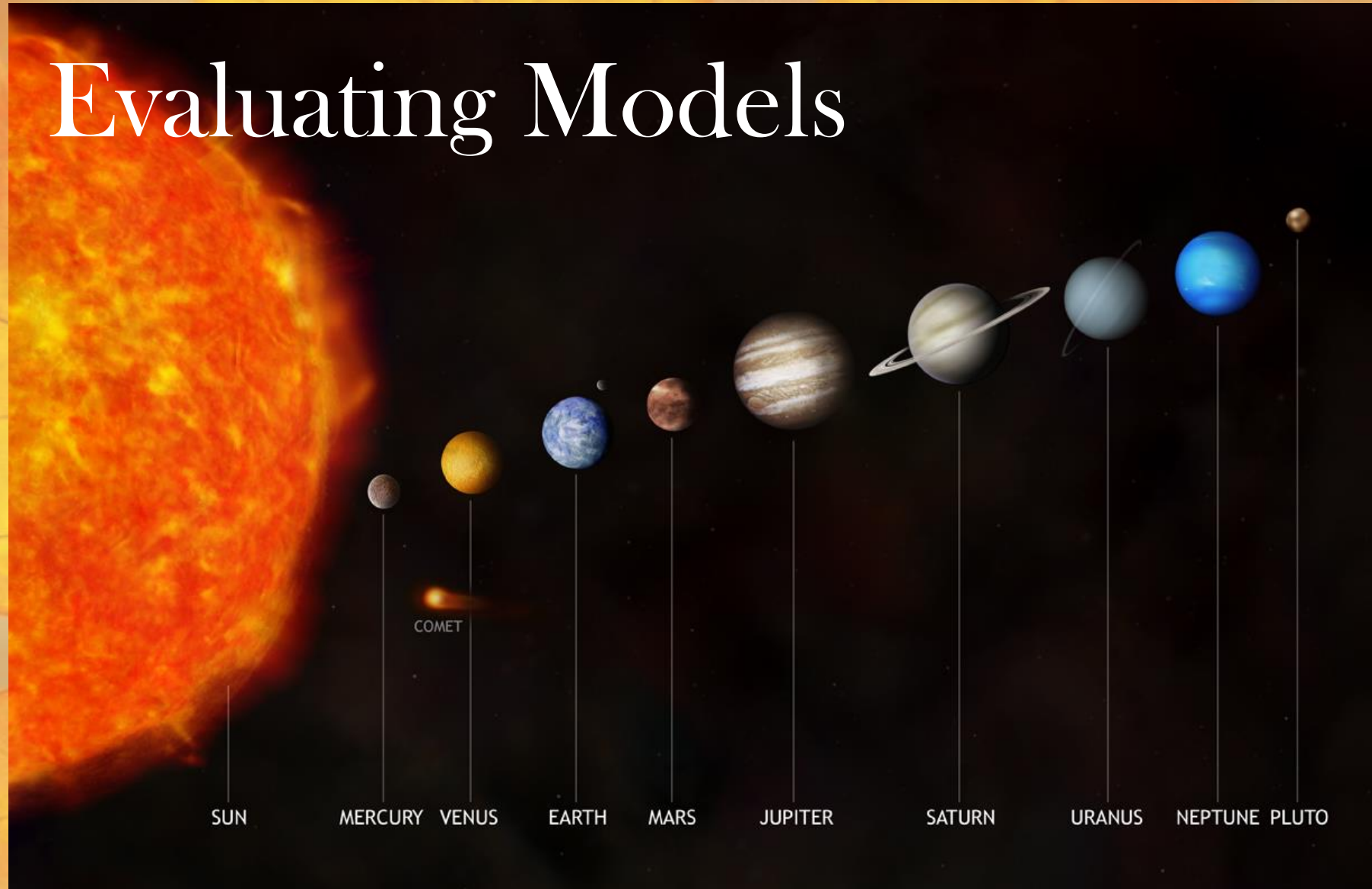
WATER IS THE LEADING
CAUSE OF DROWNING!!!

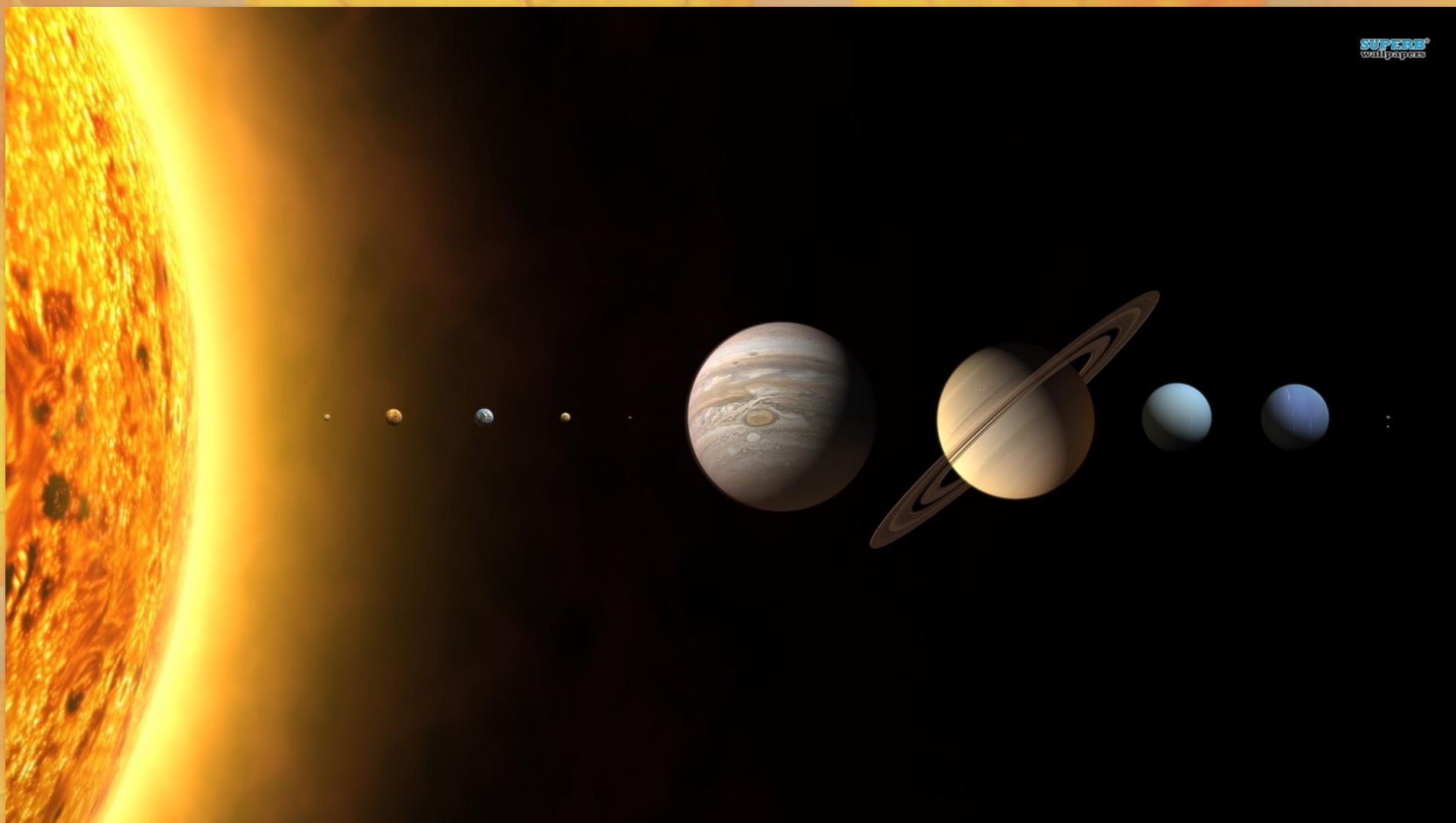
FACT!

100 PERCENT OF ALL PEOPLE
EXPOSED TO WATER WILL DIE!



Evaluating Models







Exothermic or Endothermic?

Isn't this gneiss?





TED Talk

“Debate: Does the world need nuclear energy?”

Stewart Brand + Mark Z. Jacobson



Science:

If you don't make mistakes,
you're doing it wrong.

If you don't correct those mistakes,
you're doing it really wrong.

If you can't accept that you're mistaken,
you're not doing it at all.

-Anon

Writing-To-Demonstrate-Knowledge

Focus Strategy: ARGUMENTATION

Argumentation has its basis in:

- ❑ **CLAIM:** A statement about the solution to a problem or answer to a question
- ❑ **EVIDENCE:** Scientific data that supports the claim.
- ❑ **REASONING:** A logical scientific argument that explains why the data counts as evidence in support of the claim.

Writing–To–Demonstrate–Knowledge

Focus Strategy: ARGUMENTATION

Activities to Scaffold C–E–R

- Deadly Chain Reaction
 - Using the worksheet, identify:
 - Claim the author is making.
 - Three pieces of Evidence used to support claim.
 - Author's Reasoning connecting evidence to claim.

Article Jigsaw

- Read the article assigned to your group silently, with each person highlighting text that answers the questions at the top of the grid.
- Once everyone has completed the reading, discuss the questions as a group based on what was highlighted.
- Record a summary of your group's conversation in the appropriate section(s) of the grid.

Exit Cards

- On one side: Your goal to achieve with your students related to writing in science.
- On the other side:
 - POMS / Point of Most Significance
 - POMC / Point of Most Confusion

Strategies for Incorporating Writing

- Please implement a strategy and bring back student work to share for next time.
- See you Tuesday, October 27!

gvsu.edu/s/JJ