IMaST
At-A-Glance

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National Academy of Engineering

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Introductions

- Your name
- What state you're from
- Which discipline

Today's Challenge

Look for things that separate **IMaST** from other curricula

What is IMaST?

- ✓ An Integrated Mathematics, Science & Technology curriculum for middle school
- ✓ Developed by the Center for Mathematics, Science & Technology (CeMaST) at Illinois State University
- ✓ Funded by the National Science Foundation

Curriculum Module Titles

6th Grade	7th Grade	8th Grade
Tools for Learning	*The Body Works*	*Animal Habitats*
Patterns of Mobility	*Shaping Our World*	*Human Settlements*
Patterns Within Us	*Living on the Edge*	*Systems*
Patterns Around Us	*Manufacturing*	*Communication Pathways*
Patterns of Weather	*Forecasting*	
Patterns Above Us		
Patterns Below Us		

The IMaST program:

- Integrates concepts and skills of Mathematics, Science, and Technology
- Uses a constructivist approach to teaching & learning
- Promotes teamwork among teachers from different disciplines
- Utilizes authentic, relevant methods of assessment

The IMaST program:

- Encourages student group work
- Meets benchmarks for national standards in Mathematics, Science and Technology
- Relates to disciplines beyond M/S/T
- Responds to the latest research in teaching/learning and cognitive science

Today's Activity

- *The Body Works*
  - *Go to learning cycle 4 titled "Circulating Blood" on page 79*
  - *Find a partner and begin reading the Introduction*
  - *Follow the directions in the book*
  - *You may have to share some of the tools*

What Makes IMaST Different?

- ✓ IMaST activities address real world problems
- ✓ Students are encouraged to explore, make predictions, and create solutions while applying their knowledge and skills to various challenges

IMaST Modules

- Teach big ideas in global contexts
- Go beyond Mathematics, Science, & Technology
- Relate to the real world
- Promote problem solving – DAPIC
- Promote critical thinking skills
- Contain experience-based learning activities
- Facilitate individual and team growth
- Develop student understanding

Why Use IMaST?

It raises the standard of teaching and learning by:

- Providing an integrated curriculum
- Promoting hands-on learning for students
- Promoting teamwork among teachers from different disciplines

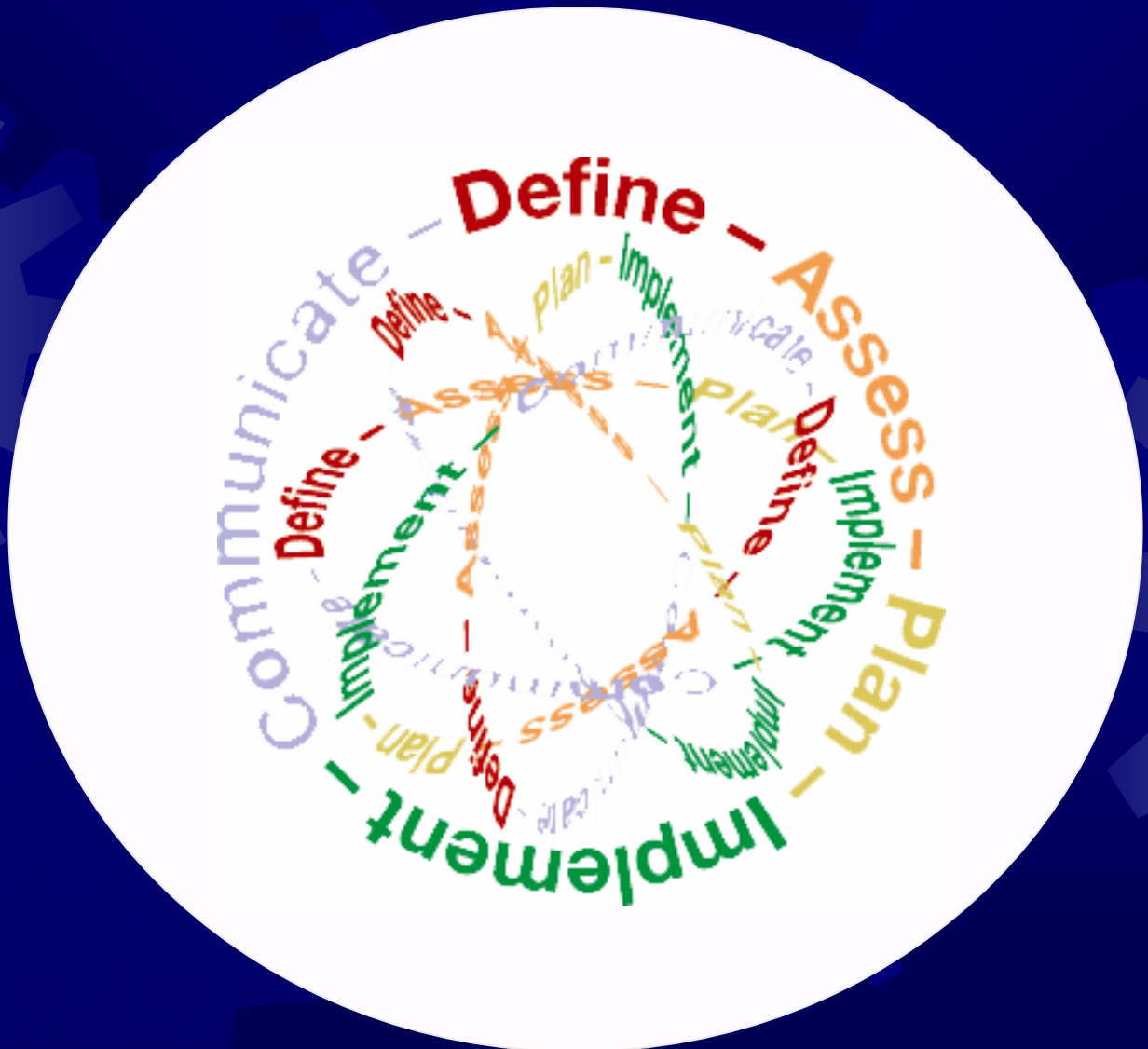
Investigation & Reflection

- Look at the IMaST modules
- What is the purpose of the Challenge?
- Why are there several “key concepts”?
- What are the stages in the IMaST learning cycle?
- What is the purpose of the “Making Connections” readings?

Reflection continued

- Why are there “Career Connections” readings?
- What is role of the teacher in IMaST?
- What is the role of the student?
- How is problem solving taught?

DAPIC



Professional Development

- Workshop for teachers and administrators
- Introduction to IMaST
- Teach several learning cycles
- Learn new skills (tools, techniques, class room management, etc.
- Learn new content
- Learn to plan and work together

Results (6th Grade)

- TerraNova mathematics and science sub-tests
- Used to check knowledge gain in 6th grade
- Mathematics—IMaST gained more, but not statistically significant
- Science—IMaST gained more and it was statistically significant

Results (7th Grade)

- Stanford Achievement Test was used for the 7th grade to make sure students kept pace with control group
- Qualitative data indicated that students were much better at problem solving and they naturally made connections among the disciplines

Results (8th Grade)

- TIMSS was used for the 8th grade
- Students in IMaST scored higher than control group and the predicted USA level in mathematics
- Students scored higher at a statistically significant level in science

Overall results

- Have yet to test students that have been in three years of IMaST—need more research
- Related developments
  - IMaST students become better communicators—both oral and written
  - IMaST students do well on standardized tests even though IMaST is not designed to help in this area

Results continued

- Teachers learn new content
- Teachers learn new pedagogy
- Teachers learn to work together
- Students make connections
- Students relate mathematics to real world!

IMaST is idealistic but

- The results are worth the extra effort!
- Technology education is on par with mathematics and science!
- Technology education has a big influence on the learning cycles in math and science!
- And students LEARN to LEARN!

For more IMaST Details

IMaST Website

http://www.ilstu.edu/depts/cemast/imast/imasthome.htm

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