The MSTe Peer Coaching Component

Peer coaching is a process in which education professionals assist each other in acquiring new skills or teaching strategies and applying them effectively. Especially important to successful coaching is agreement that curriculum and instruction need constant improvement and that expanding one's repertoire of teaching skills requires hard work and the help of colleagues.

Coaching has several purposes, among them to build communities of teachers as learners who continually engage in the study of their craft; to develop a shared language and set of common understandings necessary for the collegial study of new knowledge and skills; and to provide a structure for the follow up to enhancement that is essential for acquiring new teaching skills and strategies.

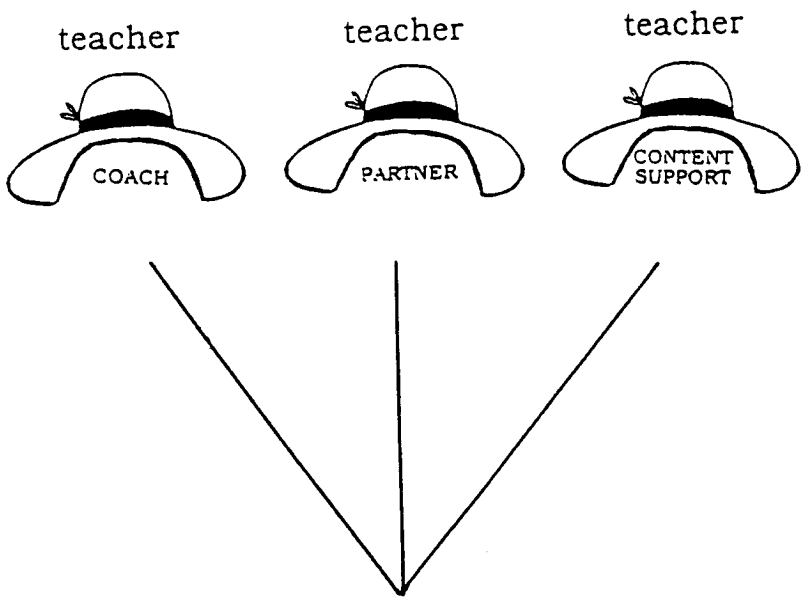
Implementation of coaching requires a reduction of judgmental pronouncements about teaching. Research has shown it desirable to omit verbal criticism as a coaching component because collaborative activity tends to disintegrate and peer coaches find themselves slipping into supervisory, evaluative roles.

Coaching is like leading from the side. When teachers observe each other, the one teaching is the "coach" and the one observing is the "coached." Observing teachers learn from their colleague. The primary activity of coaching teams becomes planning and developing curriculum and instruction in pursuit of shared goals.

The MSTe coaching system builds a community of practitioners which inquires into teaching with the support of Project staff. Daily planning time for team members to reflect on and implement MST strategies needs to be provided by participating schools.

A MODEL FOR COACHING

All partners assume the role of coach based on the partnership agreement. The coach is the person teaching and orchestrating the lesson.



OPTIONS

A Technical Coaching: focuses on the transfer of instructional skills and strategies into one's instructional repertoire.

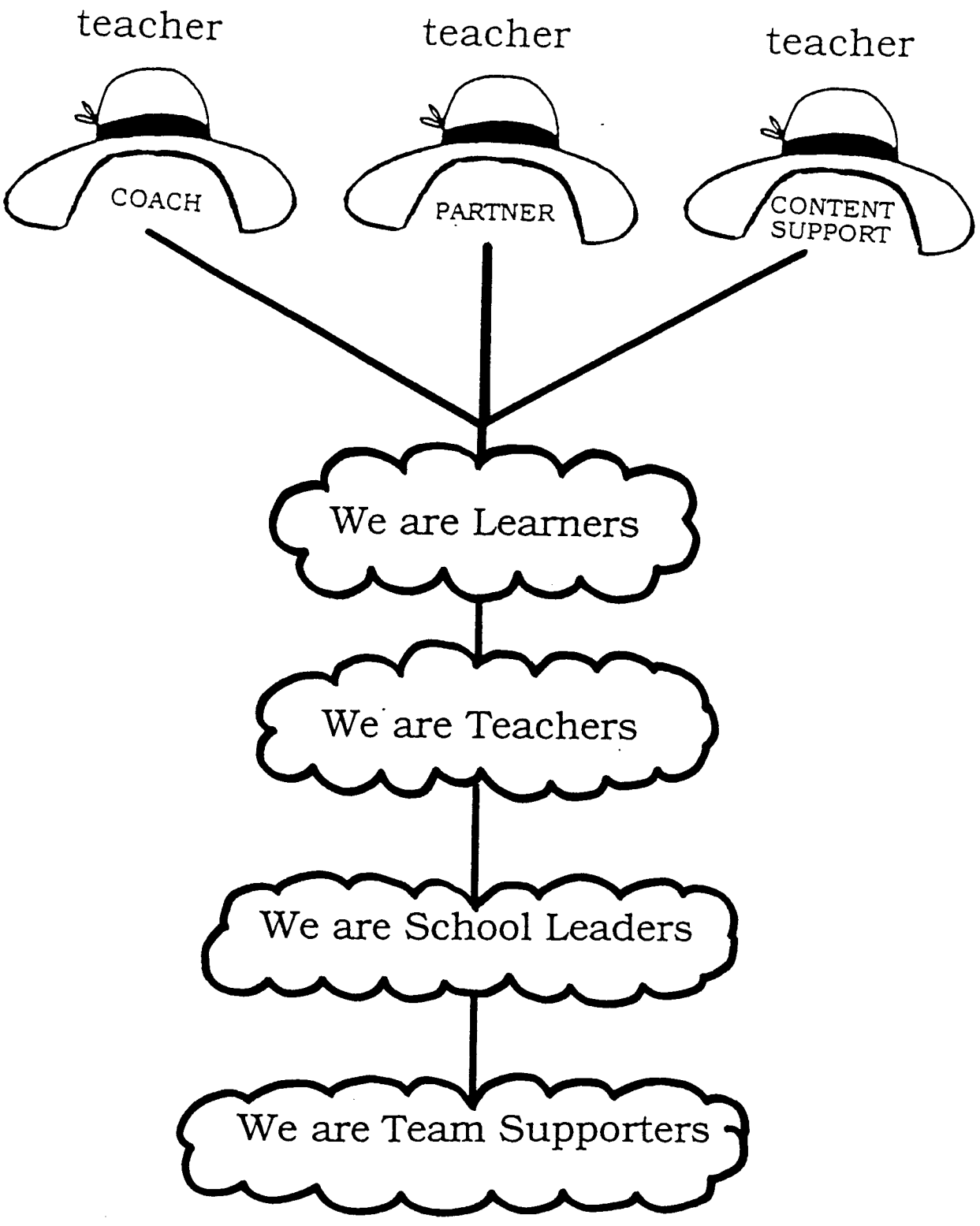
B Collegial Coaching: helps teachers work together to reflect on their work and become more articulate about classroom actions and student learning.

All Coaching Relationships:

- Are built on trust and support
- Involve professionals who have a common understanding of the skills, strategies, or other areas being coached
- Enable the sharing of teaching through activities that typically include co-planning lessons, classroom visitations, and follow-up discussions.

Source: Carol Rolheiser and Kim Gordon, OISE/UT

ADVANCE ORGANIZER

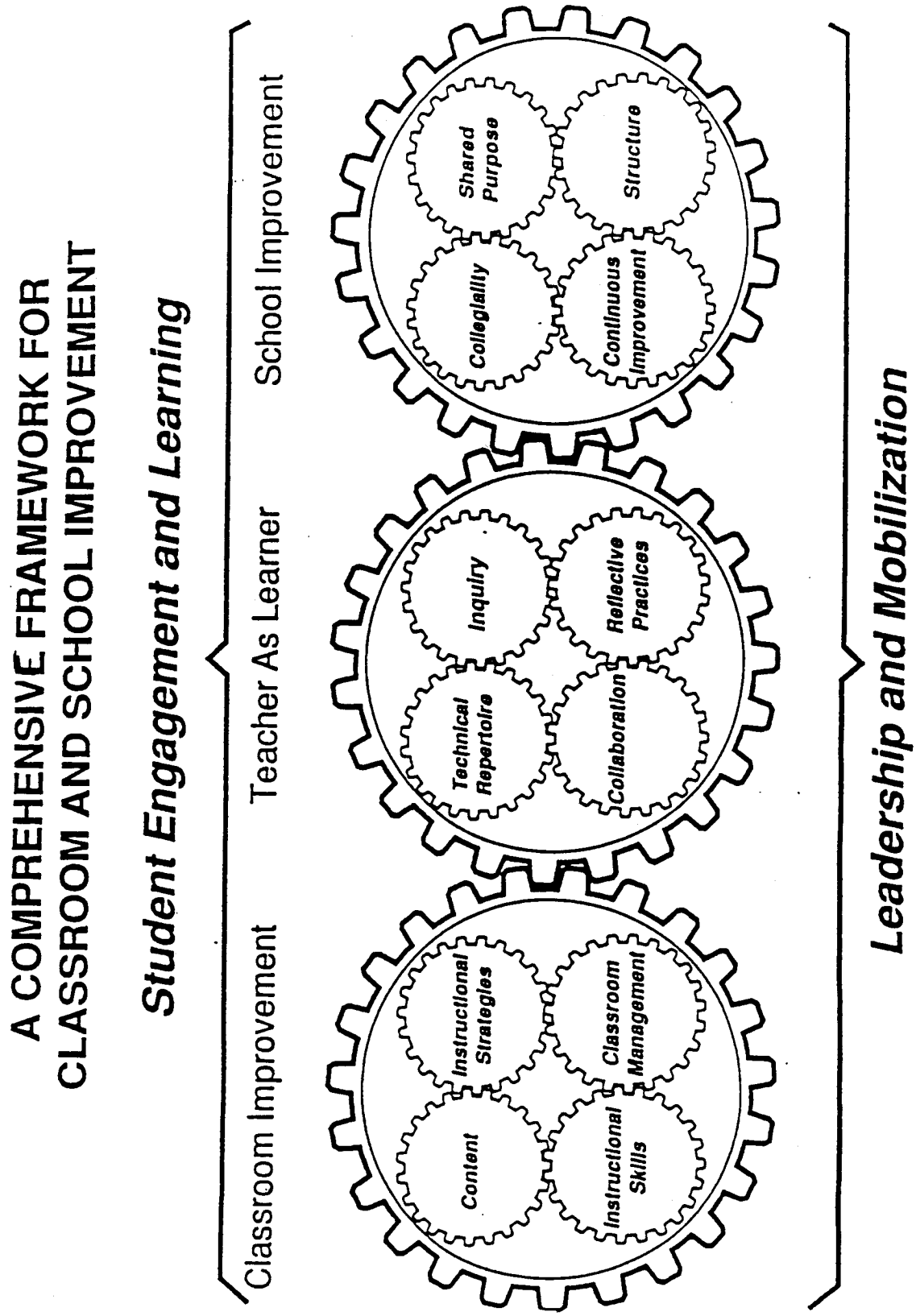


Source: Carol Rolheiser and Kim Gordon, OISE/UT

PEER COACHING
-Definition Attributes-

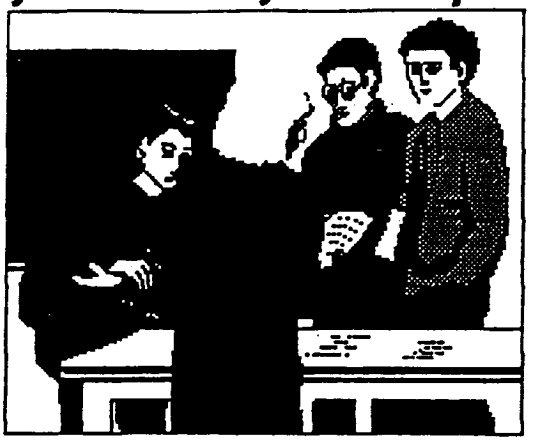
- risk-free, non-evaluative supportive relationship between peers
- helping bring "the best" out in another person
- teachers working cooperatively with one another to improve outcomes for students
- peers working together equally for personal/professional growth
- emotional/professional chemistry
- mutual observation/feedback between peers

Source: N. Watson, 1989



Source: Barrie Bennett, Carol Rolheiser and Michael Fullan, 1990

Coaching is...
Definitions of the Experts



- Coaching is a cooperative strategy for the support of personal growth and change.
  Peel Board of Education

- A method of professional development where partners interact for personal growth, reflection and the development of collegiality among peers.
  Dodgson: 1989

- A collegial study for professional growth.
  Seller: 1988

- Two or more teachers making a decision to focus on specific professional learning and support one another in the growth process.
  Bennett & Rolheiser: 1989

Source: Carol Rolheiser and Kim Gordon, OISE/UT

Coaching Is...

➲ A partnership is forged in the continuing career- long experiment on how to teach more effectively.

B. Joyce

➲ Peer coaching is a confidential process through which two or more professional colleagues work together to reflect on current practices; expand, refine and build new skills; share ideas; teach one another; conduct classroom research; or solve problems in the workplace.

Pam Robbins

➲ Peer coaching involves the observation of teaching and subsequent discussion of what was observed.

Watson & Kilcher: 1990

➲ Coaching is the provision of on-site personal support and technical assistance for the teacher.

Baker & Showers: 1984

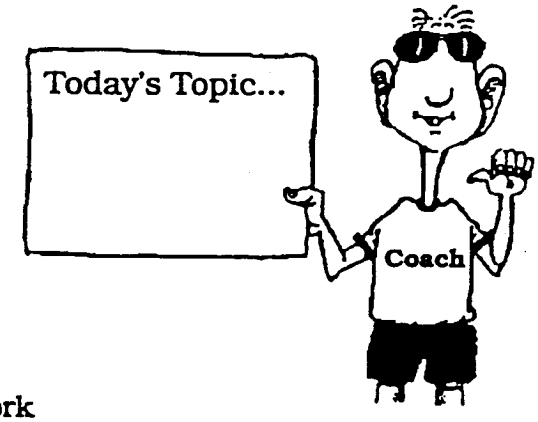
Source: Carol Rolheiser and Kim Gordon, OISE/UT

Topics For Coaching Cooperative Learning

The following are *possible* topics of focus for coaching cooperative learning. What others would you add?

Basic Elements of Cooperative Learning:

- Positive Interdependence
- Individual Accountability
- Face-to-face Interaction
- Social Skills
- Processing of Social Skills



Teacher's Role:

- Organizational decisions prior to teaching
- Setting the lesson
- Monitoring and intervening during group work
- Evaluating the product and process of group work

Cooperative Structures:

Simpler:	Think-Pair-Share, Roundtable/Roundrobin, etc.
More Complex:	Jigsaw, Teams-Games-Tournaments, Group Investigation, etc.
Integration of Structures:	Using Think-Pair-Share to initiate a Jigsaw in one or more phases of Group Investigation, etc.

Integration of Other Instructional Skills:

Motivation:	• Was the lesson meaningful, interesting? • Did the students experience success? • Did the lesson link to the students' experiences?
Participation:	• When questions were asked, were all students in the group held accountable?
Thinking:	• What levels and types of thinking were being encouraged by the questions and activities? • Were the objectives clear and obtainable?

Student Learning:

- Appropriate use of social skills
- On-task behavior
- Ability to take responsibility for learning and resolving conflicts

Source: B. Bennett, C. Rolheiser-Bennett, and L. Stevahn, *Cooperative Learning: Where Heart Meets Mind*, 1991

COACHING - IN A NUTSHELL

A. Selecting a partner

B. Common focus (e.g. training in MST)

trust
rapport ...

- Theory
- Demo
- Practice & Feedback

Common language & understanding

C. Exchanging ideas

- planning
- informal discussion
- scheduled meetings

D. Observation & Conferencing

- video/audio/live

general ←→ technical & specific

↓

ONGOING PROCESS

REFOCUS

Source: Carol Rolheiser

MSTe Second-Wave Teacher Training

Sample Workshop Planning Calendar

Twelve Sessions: two school days, two weekend days, ten summer days

First School Day - Spring 1999
- Model MST Activity - Ice Smart
- Update on MST Curriculum Initiatives and Testing - Local, State, National
- Sample MST Activities by Grade Level
- Introduction to MSTing the Curriculum - problem solving, design portfolios
- Math Update and MST from the Math Perspective

First Weekend Day- May 15,1999
- MST Conference at Hofstra University

First Summer Day - July 12, 1999
- Introduction to the Technology of MST
- Begin MST Animal Exploration - ongoing throughout the two weeks

Second Summer Day - July 13, 1999
- Independent Study Project (exploration of exemplary materials, constructivism, classroom materials, MST content or skills, interdisciplinary connections, literature, computer software, internet, etc.)
- Internet introduction and scavenger hunt

Third Summer Day - July 14, 1999
- Independent Study - continued
- Field Trip - Clarke Gardens

Fourth Summer Day - July 15, 1999
- Scale Model of a Microhabitat
- Independent Study - continued

Fifth Summer Day - July 16, 1999
- Scale Model of a Microhabitat - continued
- Guest Speaker - MSTe in Schools

Sixth Summer Day - July 19, 1999
- Independent Study - continued
- Introduction to tools
- Design Project

Seventh Summer Day - July 20, 1999
- Design Project – continued

Source: Elena Jackson, Nicole DeSantis, and Scott McMullen, Mineola UFSD

Eighth Summer Day - July 21, 1999

Design Project - continued
Guest Speaker - Math integration

Ninth Summer Day - July 22, 1999

Field Trip to Liberty Science Center

Tenth Summer Day - July 23, 1999

Presentation of Independent Study
Animal Exploration Sharing
Wrap-up, Plans for the Future

Other topics to add to the summer outline as the schedule is finalized

Assessment
MSTing our existing curriculum
Videos - "Private Universe," "Just Think"
Inquiry
MST Competition
Presentations by other MST teams
Common themes

Partial List of Materials

FOSS
Project Update
STEP
Insights
GEMS
AIMS
STC
Checkcards
Tools and materials from Technology Teaching Systems and The Science Source

Second School Day - Fall 1999 - all elementary teachers

Discussion of MST curriculum initiatives and testing - local, state, national
MST activities by grade level
MSTing the curriculum - problem solving, design portfolios, common themes
MST connections to other disciplines

Second Weekend Day- Fall 1999

Design challenge
Follow-up on summer experiences
Classroom sharing

Workshop Organizational and Logistical Details Checklist

Some Items to Address

What is the title of your workshop?

Who is the target audience?
- grade level(s)
- special area teachers
- administrators, other staff members
- neighboring district(s)
- private school(s)
- parents, parents/students

Who can help you:
- teach the class?
- recruit participants?
- handle the administrative details?

What other kinds of help may you need?
- secretarial
- custodial
- aide or assistant

Who may sponsor your workshop?
- your district
- teacher centers
- Eisenhower funds, other grants
- BOCES

What are the financial considerations?
- stipends for staff
- compensation for instructors
- food and drink
- materials
- books and other resources

What about the facility?
- application to use
- lavatories
- furnishings
- sinks
- heat and/or AC
- proximity to supplies
- handicap accessibility

How do you publicize the workshop?
- flyers
- faculty meetings
- newsletter(s)

What will the course requirements be?
- attendance
- readings
- projects

What are other considerations?
- length of sessions, frequency of meetings, total hours
- snow days/make-up days
- food
- district policies for stipends and/or in-service credit
- audio-visual, computer needs
  - overhead pens
  - back-ups
  - extension cords, extra bulbs, Windex (check before each session)
- hand-outs
- photocopying
- maximum/minimum class size
- name tags
- advance readings

Source: Scott McMullen, Mineola UFSD

The Workshop Participant Questionnaire

Evaluation of the progress and effectiveness of National Science Foundation projects has become increasingly important. Legislators and taxpayers, as well as educators, need to know how funded projects are contributing to teachers' knowledge and understanding of how to teach mathematics, science, and technology more effectively. The following Workshop Participant Questionnaire has been developed to help the MSTe Project conduct an evaluation of the Second-wave Teacher Workshops in order to determine the Project's effectiveness and to gain direction for improving the project in subsequent years.

The Workshop Participant Questionnaire is designed to be completed by each workshop participant at the end of one or more workshops. If your Leadership Team has presented a standalone, one-shot workshop, then this questionnaire can be used to assess the effectiveness of that workshop. If your Leadership Team has presented a unified series of workshops for the same group of participants, you might choose to administer the questionnaire to the participants only at the conclusion of the last workshop in the series.

Each participant should be encouraged to complete the questionnaire and return it to the person designate by the Leadership Team for this responsibility. Participants should be advised that these questionnaires are confidential and anonymous. All information collected will be used exclusively for the purposes of assessing the MSTe Project. The questionnaire does not ask for the participant's name or in any other way seeks to identify the individual respondent.

Once the questionnaires are completed and collected, please convey them to the Project Staff member assigned to your team who, in turn, will convey them to the Project Evaluator. The Project Evaluator will analyze the questionnaires and provide the Project Management Team with a detailed report on the effectiveness of the Second-wave Workshops. The Project Staff member assigned to your team will be able to discuss with you the overall results of the workshops as well as the specific results of your Team's workshops.

Your help with this important task is very much appreciated. If you have any questions, please don't hesitate to contact our Project Evaluator, Dr. Penelope Haile, at (516) 463-5743 or edapjh@hofstra.edu

MSTe Workshop Participant Questionnaire

Workshop Date(s):_____

Workshop Leaders:_____

Workshop Location:_____

1. Please check the role you represented at this workshop:
❑ Second-wave teacher (grade last year:)
❑ School administrator
❑ Teacher, not affiliated with the MSTe Project
❑ Other _____

2. Which of the following teaching approaches have you used in your math, science, and/or technology education lessons during the past year? (check all that apply)
❑ Concrete experiences with applications to daily life
❑ Cooperative learning groups
❑ Alternative forms of assessment such as portfolios, hands-on performance, and observation
❑ Integrated lessons in math, science, and technology
❑ Not applicable; I was not a classroom teacher last year

3. Please provide your opinion about each of the following statements. (check one box on each line)

	Strongly Disagree	Disagree	No Opinion	Agree	Strongly Agree	Not Applicable
a. Active participation of all was encouraged and valued in this workshop.						
b. Pedagogical content was appropriate for my purposes.						
c. Disciplinary content was appropriate for my purposes.						
d. The workshop included *explicit* attention to classroom implementation issues.						
e. I will change my teaching methods as a result of this workshop.						
f. My ability to identify and understand important ideas of science/mathematics/technology has been enhanced in this workshop.						
g. I found this workshop useful as I plan for the upcoming academic year.						
h. The workshop effectively built on my knowledge of content, teaching, learning, and the reform/change process.						
i. The design of the workshop reflected careful planning and organization.						
j. This workshop helped me better understand the NYS MST Learning Standards						
k. I feel prepared to support the other teachers in my school in the implementation of the MST Learning Standards.						

4. Please use the space on the back of this sheet to record any additional comments.

THANK YOU!

Source: Dr. Penelope Haile, Hofstra University

Planning for the MSTe Nights at Minisink Valley

Initially, we wrote a grant for an MSTe Night to accommodate 25 students and their parents for an introduction to the discovery process through several activities which would be conducted in a classroom-type setting. We received $500 from a local business. In discussing the evening with our Assistant Superintendent for Curriculum and Instruction, we decided expand it so all interested first and second graders and their parents could come. The district agreed to add any additional funds needed.

We limited it to first and second graders because of space constraints and the fact that this was our first attempt and we were not at all sure how it would work out. One of the kindergarten teachers offered to help plan the evening.

We looked through all our GEMS, AIMS, and other MSTe support materials and selected a variety of activities that could be self-directed once directions were written out. We included several stations on bubblology, magnetism, patterns, tangrams, and balance. Each station was set up to accommodate 6-8 students and their parents.

In order to be prepared we asked for a pre-registration. Though we knew the response would not be absolutely accurate, it did give us an idea of the number we could expect. Rather than use funds for the snacks, we decided to ask the first graders to bring a can of juice and the second graders were to bring a box of cookies. This way there was something to munch on and a place to go to take a break. It worked very well. We sent out a reminder at the beginning of the week advising them to wear comfortable clothes with short sleeves and telling them where to drop of their snack.

Many hours were spent collecting supplies and preparing sets of directions. All directions were put on colorful construction paper and laminated. There were 4-6 sets of directions for each station. All supplies were put into Zip Lock Bags and labeled so they could be easily set up.

We kept the faculty informed and asked for whatever help they could offer. Many did help. Some cut strips of paper towel for an absorption activity; one tried out several activities to see if they worked; others cut out directions and laminated them. Many faculty members offered supplies and helped organize the stations.

At the beginning of the week we made 22 gallons of bubble solution so it would set and we could test it out. We collected hundreds of newspapers to put over any spills which occurred. This works much better than trying to mop it up. All tables that had bubble activities were covered with large garbage bags which had been opened at the bottom and slit down the side to form a tablecloth. This made clean up easy. Though it did not happen, we also figured it would be an easy way to change a table which got messy.

A registration table was set up and staffed by one of our secretaries who volunteered. Each child was asked to register, and clipboards with the welcome sheet were handed out. Each family also received a handout from the Home & School Connection suggesting 24 things which could be done at home.

People were asked to help out that night. We had ten volunteers, who situated themselves between tables so they could offer guidance where it was needed.

The session ran from 6-8 p.m. on a Thursday night, and it went off like clockwork. Three of us stayed to set up between 3:30 and 5:30. Even though everything was prepared it still took time to arrange the tables and get things set out in time for the opening. At 6:00 there was a line waiting to get in. Everyone was excited and very cooperative. We set up the stations so there was no particular order. People could move around freely to whatever station had open spaces. This was never a problem.

The stations were set up in our large cafeteria. Snacks, bubble walls, and a building activity took place in the adjoining smaller cafeteria. The building activity involved making dowels and adding them to a free-form structure. Two third graders helped out at the building station. They instructed participants on how to make the dowels and how they could be connected to the structure. Some students also decorated the dowels with designs so they could point theirs out when they showed others.

Throughout the evening we took pictures of families having a wonderful time learning. It's hard to say who had the best time...the children, the parents, or those of us who watched the magic. It was a great night. At the end of the event, or whenever a child had to leave, families were given a colorful certificate; they seemed quite pleased. Families were also asked to fill out a very brief evaluation so we knew what to improve upon. The evaluation form asked:

1. My two favorite stations were.
2. The best part of the evening was _____
3. One thing I learned _____
4. I would like to see more of this type of event – yes/no
5. Name (optional)
6. Additional comments and suggestions may be added on the reverse side.

The responses were wonderful. All comments were positive. A few teacher/parents asked where these things could be found so they could do them in their classes. Some people took the time to write extra comments, and almost everyone came by to say thanks and hoped we would do more of this type of thing.

At 8:00 promptly we began cleaning up. Several parents even stayed to help as their way of saying thanks. We were cleaned up and ready to go home in about 45 minutes.

The feedback in the days to follow was great. From Central Office on down there were lots of positive comments about the experience. We know that the Minisink Valley community has been exposed to MST as more than just the new State Standards. They know it is an exciting way to explore learning.

You are invited !!

to attend Minisink Elementary's first. . .

MSTe Festival

An Evening of *Discovery* for First and Second Graders and Their Parents

Students and their parents will explore **Math, Science and Technology** through experiences at a variety of stations. Activities will allow for creative and practical learning in all three areas. These experiences will help participants to construct new understandings and skills with numerous real-life connections. Come and see how exciting it is to **learn through discovery**. Fun! Fun! Fun!

Come and Join us
Thursday, February 18,1999
6:00 - 8:00 PM

Please fill out the REGISTRATION FORM below and **return** it to your child's teacher by **February 10, 1999**

- -

Student Name________________________ Grade______
Child's Teacher________________________
Number of adults attending with child 1 or 2

We request that **first graders** bring a can of **juice** and **second graders** bring a **box of cookies** so we can share a snack during the Festival.

Mark the date on your Calendar!

I would like be a volunteer to work at the stations or help with refreshments
Name_____________________

Mste Night

Source: Eileen Candito – Minisink Valley Elementary School

Materials List for Stations

1. **Eggs - Sound**
   - glue sticks
   - directions
   - answer key
   - scissors (lefty)

2. **Bubble Colors**
   - laminated houses
   - directions
   - straws
   - garbage bags
   - paper towels
   - newspapers
   - solution

3. **Bubble Shapes**
   - directions
   - solution
   - straws
   - garbage bags
   - paper towels
   - newspapers

4. **Drops on a Coin**
   - pennies
   - droppers
   - water
   - sheets

5. **Magnets Attract Through**....
   - wooden rulers
   - cardboard
   - cup or pan with water
   - fabric
   - aluminum foil
   - tin can
   - glass jars

6. **Fill a Shape Challenge**
   - pattern blocks
   - sheets

7. **Shape Recipe**
   - pattern blocks
   - sheets
   - pencils

8. **Wiggly Board Challeng**e
   - directions
   - balls
   - flower pots
   - wiggly boards
   - wooden blocks

9. **H_20 Race and H_20 Stretch**
   - directions
   - sheets
   - water
   - droppers
   - paper towels

10. **Bubble Ring**s
    - straws
    - solution
    - rulers
    - paper towels

11. **Sink or Float**
    - sheets
    - materials to test
    - tub
    - water

12. **Paper Towel Absorption**
    - paper towel strips (three different kinds)
    - pencil or dowel
    - tape
    - markers
    - sheet with 18 centimeters marked

13. **My Tangram Creation**
    - tangrams
    - scissors
    - glue

Mste Night
Materials List for Stations
continued

14. **Tug of War**
    - magnets (ring and bar)
    - sheets

15. **Bubble Windows**
    - solution
    - paper towels
    - newspapers
    - strings
    - straws
    - directions

16. **It's Electric**
    - yarn
    - containers with tissue papers cut up
    - balloons
    - rug
    - tissue paper for heads and crayons and markers
    - glue
    - tape
    -

17. **Bubble Skeletons**
    - forms
    - solution
    - paper towels
    - garbage bags
    - toothpicks
    - newspapers
    - directions

18. **Body Bubbles**
    - directions
    - solution
    - paper towels
    - garbage bags

19. **Fish and Clips**
    - brown bags
    - fishing rods
    - paper clips
    - directions

20. **Fold and Float**
    - water
    - tub
    - foil sheets 5"x5"
    - directions

Welcome to Minisink Elementary's

MST*e* Night

There are many stations to explore. Each of these can be done in any order. Those which are part of the Water Olympics will be on one sheet, but do not need to be done in any particular order.

Below is a list which will help guide you through the stations. There are several volunteers and assistants. Ask for help or guidance at any time.

Stations:

Guess What is in the Egg
Bubble Shapes
Magnets Attract Through....
Shape Recipe
Water Olympics:
- H_2O Race/ H_2O Stretch
- Paper Towel Absorption
- Fold and Float

Bubble Skeletons
Sink and Float
Bubble Colors
Drops on a Coin
Fill a Shape Challenge
Wiggly Board Balance Challenge
My Tangram Creation
Tug of War with Magnets
Bubble Windows
Fish and Clips
It's Electric
Bubble Rings

When you are done with the stations or when you want to take a break... go into the hallway for a snack. Throughout the evening participate in the Building Challenge by creating your own dowels, decorating them and adding them to our structure.

Have a wonderful time and **be sure to collect your Certificate** at the Registration Table before leaving.

Please take time to fill in the short evaluation form.