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ABSTRACT

This stand-alone workshop session explores the connections between home and school mathematics learning through the lens of equity. It is appropriate for use with teachers, staff developers, after-school program providers, and other educators who work with parents. All three session activities can be done, or the leader can opt to keep the session to one hour by doing the first activity, "Who Are the Parents and Caregivers?", and then choosing either "Promoting Math Interactions at Home" or "Math Messages" and the videotape "What Are You Teaching My Child?" (Includes blackline masters, details of activities, and handouts.) (MM)

Home-School Connections

This stand-alone workshop session explores the connections between home and school mathematics learning through the lens of equity. It is appropriate for use with teachers, staff developers, after-school program providers, and other educators who work with parents. All three session activities can be done, or the leader can opt to keep the session to one hour by doing the first activity, "Who are the parents?", and then choosing either "Promoting math activities at home" or the video activity.

Summary/Activities:

- **Who are the parents and caregivers? (35 minutes)**

Description: Participants identify the characteristics of parents of students in their own classes, and think about parent characteristics more generally. They review statistics about parents' educational involvement and concerns.
Materials: Handout 1: Who Are The Parents/Caregivers of Your Students? Transparency 1: Characteristics of Parents

- **Promoting Math Interactions at Home (25 minutes)**

Description: Participants examine specific mathematics activities and how these are effective in engaging parents in math with their children at home. They share these activities with all participants at their grade level..
Materials: Handout 2: Selecting Home Math Activities; Handout 3, Guidelines for Math Work at Home; Transparency 2: Criteria for Selecting Home Math Activities, and a completed example (at least one, preferably more) of rating sheet. Also needed is a set of curriculum books specific to participants' school or after-school program.

- **Math Messages (25 minutes)**

Description: Participants view the Marilyn Burns' tape, "What Are You Teaching My Child?" paying particular attention to how the tape addresses issues they face with families and parents. They discuss how they would use this tape with parents.
Materials: Videotape, "What Are You Teaching My Child?"

Goals:

In doing this session, be aware that "one size does not fit all." Workshop leaders point out that there could be different purposes of this session, and that these purposes needed to be congruent with the needs of the group with whom they are working. Here are some of the possible goals of the Math at Home session.

- The purpose is *motivational*. The goal of this session is to help teachers understand parents'/caregivers' realities and that parents (defined broadly) want to do what's best for their children. (Activity 1 addresses this.)

- The purpose is *practical*. The goal is to give teachers suggestions about specific activities from Investigations that work best at home, and to help them see ways of using these activities. (Activity 2 addresses this.)

- The purpose is *educational*. The goal is to help teachers educate parents about mathematics and the changing nature of math education. (Activity 3 addresses this.)

Any one of these goals could be the entire focus of this workshop session.

Planning Ahead for the Session:
• Read Marlene Kliman's article (Teaching Children Arithmetic), "Beyond Helping with Homework: Parents and Children Doing Mathematics at Home."
• Prepare the handouts and transparencies.
• Gather and display any parent books, materials, games, and other resources for parents that would be helpful for teachers to know about.
• Review the set of completed rating sheets prepared by "Investigations" teacher-leaders if you are using these for Activity 2.
• If you use Activity 3, "Math Messages," you can purchase the Marilyn Burns video "What Are You Teaching My Child" from Cuisinaire at http://www.etacuisenaire.com or by calling 1-800-445-5985.

Activity 1: Who Are the Parents/Caregivers?

(35 Minutes)

Activity Synopsis:

Participants write about and discuss the characteristics of parents (including guardians, grandparents, relatives, and other primary caregivers with whom they work.) They discuss these characteristics in order to understand the realities of parents' lives and how teachers might be responsive to these realities.

The aim of this session is to reflect on parent/caregiver involvement and how this can become part of your math agenda. Before deciding how you might effectively work with parents, it's important to think about yourself in the role of parent or caregiver.

Ask participants to choose a child, either their own child or grandchild, or a child of a neighbor, relative, or friend. It should be someone that they are personally close to. Ask them to write for 5 minutes about the following:

What are your educational hopes and dreams for this child? What do you want for his/her schooling and future?

Keep this writing short and focused. It is used as a springboard for thinking about other parents' hopes and dreams for their children.

Now that you've written about your own hopes and dreams for a child, we will turn to the hopes and dreams of the parents with whom we work. We will consider who these parents are, their concerns for their children, and the realities of their lives.

Distribute Handout 1: "Who Are the Parents of Your Students?"

Ask participants to think about the parents of students in their class (or students they recently worked with.) Point out that parents come from all different backgrounds and perspectives, and the aim of this exercise is to consider the particular groups of parents with whom they work.

Participants spend a few minutes jotting down responses on the handout. As they finish, ask them to pair up with a partner from a *different* school or school system. They share descriptions of the parents with whom they work.

As they work with a partner, participants consider how the groups of parents they work with are similar to/different from each other. Ask participants to explore the assumptions that they as teachers may bring to their involvement with parents based on such information.

Filling out the sheet and talking with a partner about responses should take about 20 minutes.

Reconvene the group and Show Transparency 1: Statistics about parents.

Think about the characteristics of your own group of parents as we consider a national perspective on parents' realities and concerns for their children. The statistics we'll review may be similar to those of the parents you're dealing with, or quite different. But they show some things that many parents have in common.

The biggest reality of parents' lives is what researchers Hewlett and West call a "time famine." (Show and read points 1-3 on Transparency 1).
Point out that almost all parents work year-round, and work very long hours. (Statistic #3)

What are the implications of this "time famine" in terms of how teachers work with parents and caregivers?

Points that may arise in this discussion include the following, and you may want to raise one or more of them if they do not come up.

- Parents have little time to be involved in school events or volunteering at school. Teachers need to think about how to reach the majority of parents who cannot attend school events.
- School vacation is not a time when most parents can spend extra time on educational experiences for children—it may be a time when children receive less attention than usual. This has implications for the work or activities that are sent home during vacation.
- There are inequities between parents in the amount of time they can spend working with their children on school-related activities. For example, single parents and the 20% of parents with two jobs may be even more stretched than other parents.
- It appears that fathers have more available time than mothers (working only 65 hours per week compared to 85 hours for mothers.) What does this mean in terms of our expectations for educational support from fathers versus mothers?

Now show Statements 4-7.

Despite limited time and difficult circumstances, parents from every background care deeply about their children's education. They report being more involved in their children's education than their own parents were involved. But the type of involvement may be quite different than what we expect.

Point out that the truly important work parents do with children is in their own homes, in whatever moments they can spare. Research demonstrates that parental engagement in educational activities at home is far more important in terms of student outcomes than time spent at school events.

End this piece by encouraging participants to think about the "match" between the realities of parents' lives and their own expectations for parents.

Activity 2: Promoting Math Interactions at Home

(25 minutes)

Activity Synopsis:

Participants consider specific mathematics activities and how these are effective in engaging adults in math with children at home. The example activities (Handout 2) used in this session come from the *Investigations in Number, Data, and Space* © curriculum. You may want to substitute new activities that reflect the curriculum specific to participants' school or after-school program. Participants examine principles/criteria for good home math activities, then select an activity that optimally fits these criteria. These are shared with all participants at a given grade level.

Begin by saying something like the following:

Like parents, teachers also face a "time famine." It's not possible to do all the important work involved in home outreach. Given the research that shows that engagement at home is essential, a priority for us today is to identify mathematics activities that promote positive math interactions at home.

Standards-based mathematics offers many ways of encouraging parents/caregivers to do math at home. The work we're doing next will give you a focus for your work. Later, you can figure out ways of introducing the activities you have chosen, supporting parents as they use these activities over time, and making connections between the work students are doing at home and in your class.

Distribute Handout 2: Selecting Home Math Activities as well as the completed example(s) of this handout. Choose examples from appropriate grade levels.

Explain that this form is what participants will use to identify mathematics activities that they think have been particularly effective with families. They will also receive completed examples appropriate for their grade level, so that they will have a head start in thinking about which activities they might emphasize in their work with parents.

Show Transparency 2: Criteria for Selecting Home Math Activities.

This transparency provides a more detailed description of the selection criteria on the handout. Explain what is meant by each criterion.

After reviewing these criteria with the group, participants begin work on their own or with a partner, using the mathematics curriculum specific to their institution.

You will work at grade level, either on your own or with a partner to identify an activity that you have found particularly effective in promoting math

interactions at home. It could be homework, a routine or 10 minute math, a game, or an extension. Once you've selected an activity, complete the handout.

Participants spend the remaining time selecting and rating a mathematics activity. Most participants will work alone. However, if a participant has no experience with the curriculum, she should work with an experienced partner.

Participants do this work at their own grade level.

End by distributing and reviewing Handout 3, "Guidelines to Accompany Math Work at Home." This handout consists of suggestions from leader-teachers about ways to approach math activities at home. This sheet contains very good advice!

Activity 3: Math Messages

(25 minutes)

Activity Synopsis:
Participants view the Marilyn Burns' tape, "What Are You Teaching My Child?" paying particular attention to how the tape address the issues they considered in the first activity regarding parents' and families' conceptions of math education. They discuss how they would use this tape with parents.

Begin by referring back to Handout 1, Question 4, which asks the following:

How do parents feel about their own mathematical abilities? How did they learn math? How accepting are families of new approaches to teaching math?

Ask a few participants to share their responses to this question with the group, paying particular attention to the final question about parents' acceptance of different ways of teaching/learning math.

Remind participants that most adults have experienced math class in a very different way than "Investigations" students experience it. It takes time to understand what math is and why it is being taught differently.

As you are watching the tape, think about how the parents you work with have learned math and about their concerns with learning math a different way. How would the tape address parents' concerns?

Play the videotape, which is 17 minutes long.

When the video is done, discuss any of the following with the entire group:

What pieces of the tape would help parents see the need for a different kind of math program?

How might you use this tape with parents?

Optional: What does "the horse problem" do to help parents redefine math?
Most participants will want to figure out the horse problem for themselves. Doing and discussing this problem can take 20 minutes, but it is well worth it if you have time. It helps teachers as well as parents see that seemingly simple math problems have considerable depth.

End the session by reminding participants that while parents will benefit from seeing the videotape, they will need several experiences over time in order to understand how and why math education is changing.

Transparency 1

Reality Check: Characteristics of Parents

Who are the parents of the children we teach, and how do they perceive their roles in educating their children?

1) Approximately 79% of parents work in the paid labor force. *A full 20% of parents hold two or more jobs in order to earn enough money to support their families.* (Hewlett & West, 1998)

2) Only one in six mothers is a stay-at-home parent. (Hewlett & West, 1998)

3) Mothers spend an average of 85 hours a week working in and outside the home on essential tasks, while fathers spend 65 hours per week (Sidel, 1990).

4) Despite the pressures in their lives, 74% of today's parents report being more involved in their children's education than their own parents were involved. (Public Agenda, 1999).

5) Two-thirds of teachers say they have academically successful students whose parents they have never met. (Public Agenda, 1999, p. 19)

6) Researchers have found little relationship between students' achievement and their parents involvement at school (e.g., attendance at school events, school visits, volunteer work) (Finn, 1998).

7) Researchers have found a consistent relationship between students' achievement and parents' engagement in educational activities at home (helping with homework, discussing school, reading) (Finn, 1998).

Transparency 2

Criteria for Selecting Home Math Activities

- Is the activity based on math content that parents find familiar and worthwhile? (To what extent will you need to "pull out" and identify the relevant math for parents?)

- Is it practical, requiring few tools or supplies (or supplies that you can easily send home?)

- Is it possible to do in a very short period of time (10 minutes or less, including preparation/assembling time?)

- Is it interesting to repeat the activity or are there variations that hold parents' and children's interest?

- Is it easy to teach this activity to parents, both in writing, and by having children show/explain it? (How might you need to support parents in doing this activity?)

Handout 1

Who Are the Parents of Your Students?

Think about the parents of students whom you most recently taught. Jot down a few notes in response to each of the following.

1) Hopes and dreams: What are the educational hopes and dreams these parents have for their children?

2) Backgrounds: Where are the families of your students from? Are they long-time residents? How many are immigrants? How many move a lot? What languages are spoken in their homes?

3) Education issues: How many parents graduated from high school? From college/graduate school? In what countries were they educated? What professions or occupations are they in?

4) How do parents feel about their own mathematical abilities? How did they learn math? How accepting are families of new approaches to teaching math?

5) Work/Time issues: How many parents can be home at the end of the school day or have caregivers providing support for their children? How many stay home with children during school vacations?

Handout 2 pg.1

Selecting Home Math Activities

Activity:_____

Math Emphasis in Activity_____

Curriculum Unit _____ Grade Level_____

On a scale from 1 to 5, rate this activity (1= superior, 5 = poor). Add comments.

_____ Math content seen as familiar and worthwhile by parents.

_____ Practicality (requires few tools/supplies)

_____ Possible to do in short time period

_____ Repeatable or has variations

_____ Easy to teach to parents

If you have used this activity and received feedback, please summarize:

- What did you do to support or explain this activity to parents?

- What did parents like about it or learn from it?

- How did it address the needs of particular parents (e.g., parents with limited math background, parents with no time)?

Handout 2 pg. 2

Selecting Home Math Activities

Activity: Counting Jar

Math Emphasis in Activity Counting

Curriculum Unit Routines Grade Level K

On a scale from 1 to 5, rate this activity (1= superior, 5 = poor). Add comments.

1 Math content seen as familiar and worthwhile by parents.
1:1 correspondence; connections from things counted to numeric quantities; counting groups with like amounts.

1 Practicality (requires few tools/supplies)
Whatever is in or around home.

1 Possible to do in short time period

1 Repeatable or has variations

1 Easy to teach to parents

If you have used this activity and received feedback, please summarize:

• What did you do to support or explain this activity to parents?
Parent may need suggestions and questions to extend the experience.
- just count groups
- count and compare two groups
- make connections (counting groups and numeral)

• What did parents like about it or learn from it?

Made them aware of counting opportunities

• How did it address the needs of particular parents (e.g., parents with limited math background, parents with no time)?

Can be done anywhere

Handout 2 pg. 3

Selecting Home Math Activities

Activity: Compare and Double Compare

Math Emphasis in Activity number combinations, counting and beginning addition strategies

Curriculum Unit Math Thinking Grade Level 1

On a scale from 1 to 5, rate this activity (1= superior, 5 = poor). Add comments.

1 Math content seen as familiar and worthwhile by parents.

3 Practicality (requires few tools/supplies)

1 Possible to do in short time period

2 Repeatable or has variations

2 Easy to teach to parents

If you have used this activity and received feedback, please summarize:

• What did you do to support or explain this activity to parents?
Send home directions as well as sample strategies. Also, questions parents can ask.
• What did parents like about it or learn from it?

- their concept that students are learning number pairs
- variety of strategies that kids use

• How did it address the needs of particular parents (e.g., parents with limited math background, parents with no time)?

- entry for most people child would play with (sibling, parent, after-s counselor, etc.)
- pictures on cards lead to more concrete conversations.

Handout 2 pg. 4

Selecting Home Math Activities

Activity: Get to 100

Math Emphasis in Activity Addition using multiples of 5

Curriculum Unit Putting Together Taking Apart Grade Level 2

On a scale from 1 to 5, rate this activity (1= superior, 5 = poor). Add comments.

1 Math content seen as familiar and worthwhile by parents.

2 Practicality (requires few tools/supplies)
100 chart, multiples of 5 cards or cubes, markers

1 Possible to do in short time period

1 Repeatable or has variations

1 Easy to teach to parents

If you have used this activity and received feedback, please summarize:
Parents saw children combining numbers mentally

- What did you do to support or explain this activity to parents?

Showed during conference of Family Math Night
Send directions (written) with materials
Child already knows how to explain and play the games

- What did parents like about it or learn from it?

Flexibility moving on the 100 chart by 5s and 10s; not relying on counti

- How did it address the needs of particular parents (e.g., parents with limited math background, parents with no time)?

- Children can play the game with an older sibling, caretaker
- Quality time with child helping with school in a non-threatening way

Guidelines:
Child needs to be familiar with game
Responsible for materials
Child needs to know why they are playing the game – where s the mat

Handout 2 pg. 5

Selecting Home Math Activities

Activity: Fraction Card Games

Math Emphasis in Activity combine fractions to make wholes; equivalent fractions; exploring relationships between fractions.

Curriculum Unit Fair Shares Grade Level 3

On a scale from 1 to 5, rate this activity (1= superior, 5 = poor). Add comments.

1* Math content seen as familiar and worthwhile by parents.
*Game can be difficult – fractions can be combined incorrectly (overlaps, etc.) misconceptions/confusions can be reinforced.

2 Practicality (requires few tools/supplies)
once pieces are cut out, it s fine.

1 Possible to do in short time period

1 Repeatable or has variations

1 Easy to teach to parents

If you have used this activity and received feedback, please summarize:

• What did you do to support or explain this activity to parents?
Goes home with directions immediately after students have played it.

• What did parents like about it or learn from it?
Visual images of fractions

• How did it address the needs of particular parents (e.g., parents with limited math background, parents with no time)?
Directions – lots of reading.
Not as good for parents with limited reading skills.

Handout 2 pg. 6

Selecting Home Math Activities

Activity: Collecting Dollars

Math Emphasis in Activity recognizing values of U.S. coins.; figuring totals combinations of coins.

Curriculum Unit Math Thinking at Grade 4 Grade Level 4

On a scale from 1 to 5, rate this activity (1= superior, 5 = poor). Add comments.

1 Math content seen as familiar and worthwhile by parents.

1 Practicality (requires few tools/supplies)
school should supply game cards and directions

1 Possible to do in short time period

1 Repeatable or has variations

1 Easy to teach to parents

If you have used this activity and received feedback, please summarize:

• What did you do to support or explain this activity to parents?
Make sure students know the game thoroughly before it goes home. Include the directions.

• What did parents like about it or learn from it?
Straight forward activity that deals with real life skills.

• How did it address the needs of particular parents (e.g., parents with limited math background, parents with no time)?
All parents deal with money in their lives, so the materials and activit familiar.
Scoring variation is available when parents (and/or kids) find it too ea

Handout 2 pg. 7

Selecting Home Math Activities

Activity: Close to 1000

Math Emphasis in Activity using knowledge of landmarks up to 1000; mental and /or written strategies for finding sums and differences.

Curriculum Unit Math Thinking at Grade 5 Grade Level 5

On a scale from 1 to 5, rate this activity (1= superior, 5 = poor). Add comments.

2 Math content seen as familiar and worthwhile by parents.
Practice in strategies of sums and differences (they can get t know addition and subtraction)

2 Practicality (requires few tools/supplies)
After cutting of numeral cards or laminating them, score sheet on their own.

1 Possible to do in short time period
They can play a round, a couple of rounds, a whole game – it s to stop and come back.

1+ Repeatable or has variations/modifications
Close to 20 (SPED with 1st Buddies), Close to 100, 0 or 10,000

1 Easy to teach to parents
Kids play it enough in class – teach the Close to most comfortable (written directions are available in student bookl

If you have used this activity and received feedback, please summarize:

• What did you do to support or explain this activity to parents?
Game nights, classroom visit, sending home most comfortable Close to

• What did parents like about it or learn from it?
Short; really appreciate seeing the sums and differences.

• How did it address the needs of particular parents (e.g., parents with limited math background, parents with no time)?
Short; user friendly – seeing numbers left to right; their children ARE math.

Handout 3

Guidelines for Math Work at Home

Sending math work home can be very beneficial in connecting families with math, but it needs to be done with care. Here are some suggestions from teacher-leaders about home activities and the curriculum.

1) Encourage children to do interactive home activities with any grown-up (it doesn't have to be a parent or even a family member.

2) Give enough time—more than one day—for homework to be completed. Many families have busy schedules, and they may not have time on any particular night to finish an activity.

3) Show the activity before asking students to bring it home. It is also useful to show it at a parent night, if possible, before sending it home.

4) Adults' ways of starting problems are a good starting place: Ask students to find out how an adult would do a computation;. This engages family members in a way that starts with what they know.

5) Choose activities that don't involve much equipment or busywork (parents don't like to cut out cards, and it's not productive math time.)

6) Families like activities that relate to their everyday lives, such as teaching children to deal with money.

7) Always talk about "home-math connections", rather than referring to moms and dads. Not everyone has a mom or dad at home.

8) Data collection activities are engaging but can be sensitive. Students want to know about their own and each others' families. But don't collect data about families if this will raise sensitive issues that you aren't prepared to deal with.

Be sensitive to individual circumstances. In some situations, it is not reasonable to expect children to interact at home with an adult. For example, if you know that a child is living with an abusive adult, think twice about asking the child to do math with that person.

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