Site Facilitator Guide: Math Games in Grades 6-8

E-Workshop: Math Games
Grade Band: 6 - 8

Rationale/Suggestions for Use:
This set of E-Workshops and accompanying facilitator guide provide educators with a variety of mathematically rich classroom games that will keep students motivated and excited to learn. Making the most of each game requires reflection and discussion on behalf of the teacher and students. Each game will be discussed in depth with suggestions on how to encourage students to justify their own unique ways of thinking and strategizing.

Materials

- Registration for the Math Games in Grades 6-8 E-Workshop. Registration includes one site connection. The E-Workshop should be projected for a large group from one computer. Audio can be accessed through the phone. A speaker phone is recommended for large groups.
- Martinie, Sherri. "Games in the Middle School" *Mathematics Teaching in the Middle School* 11 (September 2005): 94-95.
- Maze playing board (attached)
- Nine cards labeled 1 to 9 (on PowerPoint print-out)
- Contig playing board (attached)
- Computer with internet access for all participants (optional)

Procedures/Discussion questions

1. Distribute and read the attached article: *Games in the Middle School* by Sherri Martinie. Use the questions below to facilitate a discussion about developing students' mathematical reasoning.
    - Why are reflection and discussion so important when playing games in your classroom?
    - What is the value in having students articulate their strategies out loud?
    - The author describes the Product Game. What are some guiding/reflection questions the teacher could ask students as she/he walks around the room observing the students playing?
    - The author states that "games generally increase motivation, but can have the opposite effect". Describe an example of a time when you observed a decrease

in motivation while playing a game. What can be done to ensure that games are implemented successfully?

2. Allow participants time to explore the following websites which will be referenced in the E-Workshop. Consider how these resources can be used as tools to support instruction.
   - NCTM Principles and Standards of School Mathematics: http://standards.nctm.org
   - Order of Operations Bingo: http://illuminations.nctm.org/LessonDetail.aspx?id=L730

3. Participate in the initial E-Workshop Math Games for Grades 6-8.

4. After participation in the initial E-Workshop, discuss the following questions:
   - What makes a game different from an activity?
   - Games are carefully chosen with specific learning goals in mind. What makes some class room games beneficial to students while others are not?
   - Discuss advantages and disadvantages of using games in your classroom.
   - Which games from the E-workshop do you plan to use? How will you modify them to fit the needs of your students?
   - Which games will you not use from the E-workshop and why?

5. During the next four weeks, try one your own games or one of the games described in the e-workshop with your students. Prepare to give a 5-10 minute informal presentation to your colleagues on your results. Include the following in your presentation:
   - How did you implement the game?
   - How long did it take to play and reflect?
   - What significant concepts were learned from this game?
   - How did you modify this game to fit the needs of your students?
   - What was your method for encouraging students to reflect upon what they were learning?
   - How did students respond?
   - Will you play this game again? If so what (if anything) will you do differently next time?

6. Prepare to share your results with the other participants in the follow-up E-Workshop. If possible, send in the games you have tried along with student work to e-learning@nctm.org at least one week before the date of the follow-up E-Workshop.

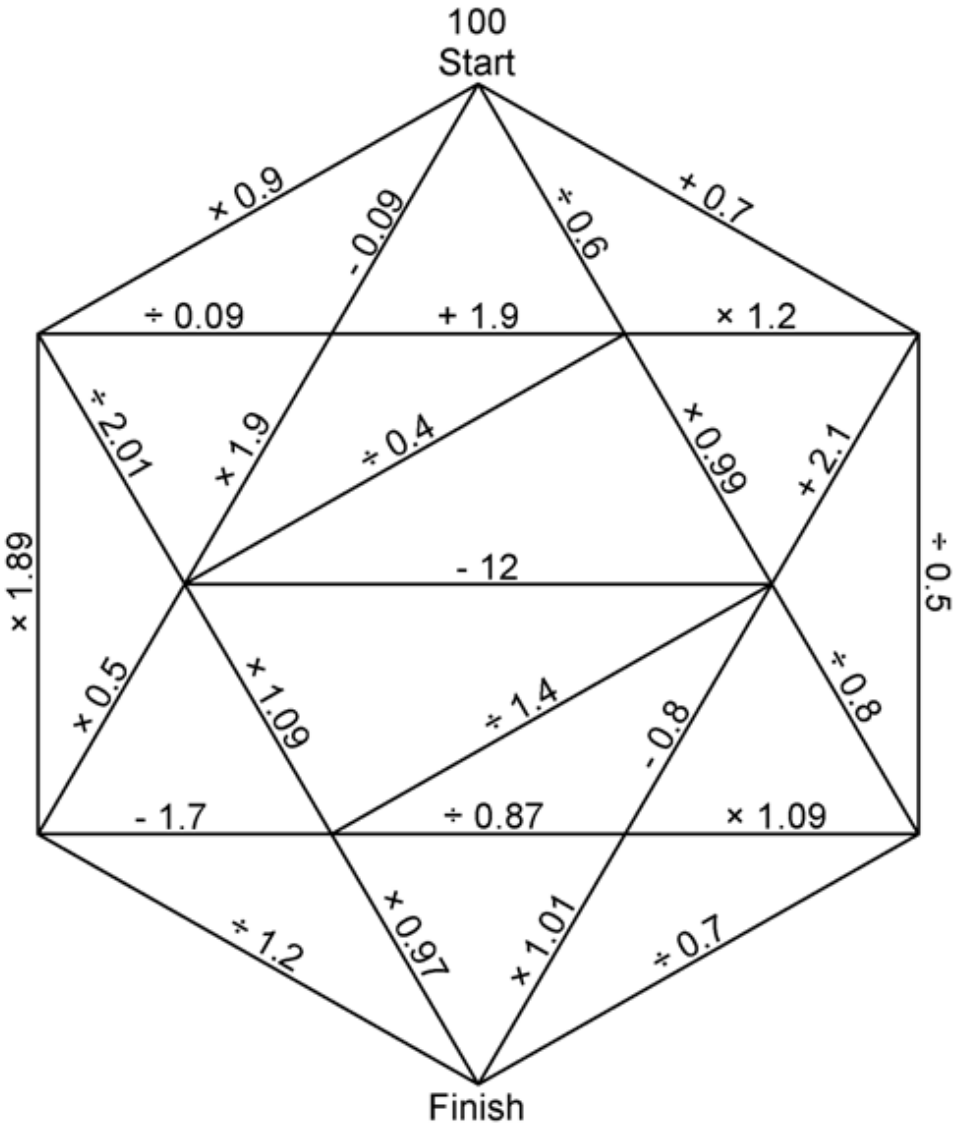
7. Before the follow-up E-Workshop participants should meet and discuss the following questions about problem solving in small groups:
    - What is problem solving?
    - How do you currently incorporate problem solving into your curriculum?
    - What is the difference between an exercise and a problem-solving problem?
    - How can we measure students' progress in their abilities to problem solve?

8. Allow participants time to explore the following websites which will be referenced in the follow-up E-Workshop. Consider how these resources can be used as tools to support instruction.
    - Mastermind: http://www.nlvm.usu.edu/en/nav/frames_asid_179_g_3_t_1.html?open=instructions&from=grade_g_3.html
    - Peg Puzzle: http://nlvm.usu.edu/en/nav/frames_asid_182_g_3_t_1.html
    - Nim: http://education.jlab.org/nim/index.html
    - Coin Problem: http://www.nlvm.usu.edu/en/nav/frames_asid_139_g_3_t_2.html?from=grade_g_3.html
    - Tower of Hanoi: http://illuminations.nctm.org/ActivityDetail.aspx?ID=40
    - Arithmetic Four: http://www.shodor.org/interactivate/activities/ArithmeticFour/?version=1.6.0_03&browser=MSIE&vendor=Sun_Microsystems_Inc
    - NCTM Middle School Resources: http://www.nctm.org/resources/archive.aspx?id=3604&journalid=4

9. Attend the follow-up E-Workshop: Math Games in Grades 6-8.

Connections to Other NCTM Publications

- Lach, Tisa M., and Lynae E. Sakshaug, "Let's Do Math: Wanna Play?" *Mathematics Teaching in the Middle School.* 11 (November 2005): 172-76.
- Mahoney, John. "What is the Name of This Game?"*Mathematics Teaching in the Middle School.* 11 (October 2005): 150-154.
- Olson, Jo C., "Developing Students' Mathematical Reasoning through Games", *Teaching Children Mathematics.* 13 (May 2007): 464-471.


100
Start
× 0.9
- 0.09
÷ 0.6
+ 0.7
÷ 0.09
+ 1.9
× 1.2
÷ 2.01
× 1.9
÷ 0.4
× 0.99
+ 2.1
× 1.89
- 12
÷ 0.5
× 0.5
× 1.09
÷ 1.4
- 0.8
÷ 0.8
- 1.7
÷ 0.87
× 1.09
÷ 1.2
× 0.97
× 1.01
÷ 0.7
Finish

C O N T I G

1	2	3	4	5	6	7	8
9	10	11	12	13	14	15	16
17	18	19	20	21	22	23	24
25	26	27	28	29	30	31	32
33	34	35	36	37	38	39	40
41	42	44	45	48	50	54	55
60	64	66	72	75	80	90	96
100	108	120	125	144	150	180	216