mixing in MATH

Food Fights, Puzzles, and Hideouts

Games, projects, and activities that mix in MATH

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Food Fights, Puzzles, and Hideouts

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Do you like playing games? building models? eating? talking with friends? running and jumping? exploring and discovering?

If you answered "yes" to any of these, this book is for you. It contains:

Games Galore

All kinds of games: coin, dice, and board; quiet and active; partner and whole group. Play to win or play so everyone wins!

Projects and Crafts

Build, design, create, and grow with projects and crafts that use everyday materials like paper towel tubes and cardboard boxes.

Play with Your Food

Ideas to investigate and games to play when you're eating, cooking, or party planning.

Good for Groups

Icebreakers, party games, challenges, and contests designed for a crowd.

Anytime, Anywhere

Activities to do and games to play wherever you are: in the car, on the bus, in a waiting room, or at the dinner table.

Any Year Calendars

Things to do on familiar holidays (like July 4), less common holidays (like Backward Day) and any day. Includes a bonus set of ideas for celebrating 100 days.

With all the games, projects, and activities in this book, where's the math? It's everywhere: in the strategies you develop when you play the *Name Game* (p. 3), the shapes in the paper tube structures you create with *Build a Hideout* (p. 16), the portion sizes when you play *Food Fight* (p. 31), the distance you go when you participate in *Animal Olympics* (p. 38), the rating you give today's weather when you *Rate It* (p. 52), and the patterns you create with the April calendar (p. 61).

Whether or not you've liked math in the past, once you've dipped into this book, you'll see that it can be part of the things you love to do. So find a game, project, or activity in this book and get started!

Why did we write Food Fights, Puzzles, and Hideouts?

We believe that creativity, play, and socializing are important ingredients in learning just about anything. This book is designed to put those ingredients into learning math.

We started with activities, games, and projects that children do for fun at after-school programs, at public libraries, at school, and at home. We highlighted the inherent math with things to talk about, and sometimes we added a mathematical twist. To ensure that our materials were engaging and enriching, we piloted them in a wide range of "informal" settings (after-school, home, public library) and "formal" programs (academic support, tutoring, school). Independent research showed that children and adults gained math skills, confidence in their math abilities, understanding of the role of math in everyday life, and positive attitudes toward math. To find out more about this research, see http://mixinginmath.terc.edu/aboutMiM/index.php.

Food Fights, Puzzles, and Hideouts is based on nearly 15 years of development and research funded in part by The National Science Foundation.

Who is this book for?

Everyone! It's for children and adults, mathophobes and mathophiles, and parents, teachers, after-school providers, and childcare providers. The games, projects, and activities are geared toward children in the elementary grades, but older children and adults will also enjoy and find challenge in them. Some are perfect for children alone or in small groups; others work well with a larger group at home, at a party, at an after-school program, at school, or just about anywhere!

What math is in the book?

The activities, games, and projects in this book span the key topics in the elementary grades Common Core State Standards for Mathematics. See pages 71-77 for more detail. Many of the ideas in this book are interdisciplinary, including topics in engineering, science, social studies, and literacy.

Thank you!

The authors of the book, Marlene Kliman, Valerie Martin, and Nuria Jaumot-Pascual, are very grateful to Martha Merson and Lily Ko at TERC for their contributions, to our external evaluators who have provided us with evidence-based insights (Char Associates, Miller-Midzik Research Associates, and Program Evaluation Research Group), to Laura DeSantis for amazing images, and to the many after-school providers, librarians, parents, and children who have collaborated with us over the years. We extend our appreciation to TERC for providing a home for our Mixing in Math projects. Marlene would like to thank her daughters Clara and Chloe for helping her mix in math from the start and for providing a reality check on math at home.

Making the most of Food Fights, Puzzles, and Hideouts

This book contains hundreds of games, activities, and projects, including variations and calendar ideas. You can do them in any order.

Look for the information below in each game, project, and activity.

Level. Each is marked with one or more of "Easy," "Medium," and "Hard." Some people use these levels as a starting point: Kindergarteners and first graders might start with "Easy;" fourth and fifth graders with "Hard." Other people prefer to start with "Easy" for almost any age and then move up as needed, since abilities at different ages vary widely.

Note: Levels that only appear in Variations are in parentheses.

Estimation Station Challenge

How do you estimate? Use what you know about one cup to find how many in the other.

Level: Hard

Group size: 2 or more (to make and trade cups)

Materials (per two cups):

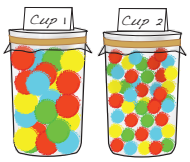
- two clear plastic cups the same size
- two rubber bands
- two sheets of plastic wrap
- objects that come in two sizes (pompoms, pasta shells): larger so that about 20-40 fill the cup, and smaller so that at least 100 fill the cup

Group size. Some projects and activities can be done alone; others are best done with a group. Games require more than one player.

Materials. Some involve no materials; others rely on common household materials.

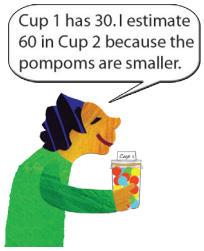
1 Make two mystery cups

Follow steps 1 and 2 from Estimation Station. Put the larger objects in Cup 1 and the smaller in Cup 2.



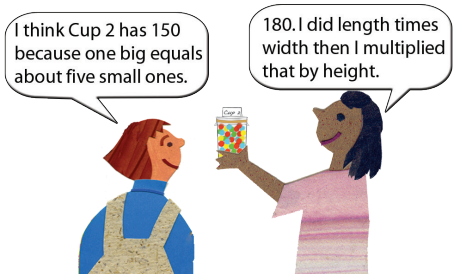
2 Trade cups

Say how many are in Cup 1. The other person estimates how many are in Cup 2.



Talk About

Does Cup 2 have about twice as many as Cup 1? about 10 times as many?



Talk About. Offers ideas on things to talk over or think about.

About the Authors

Marlene Kliman, Senior Scientist and Director of the MIXING IN MATH group at TERC, brings 30 years experience developing research-based resources for children's math learning in and out of school. A Principal Investigator of out-of-school math projects funded by The National Science Foundation, she has collaborated with a wide range of educational organizations including after-school programs, public libraries, and family literacy centers. She formerly taught math to pre-service elementary grades teachers at Lesley University. Marlene completed her undergraduate studies in mathematics at Harvard and her graduate studies in learning and epistemology at MIT.

Valerie Martin, Senior Web and Graphic Designer at TERC, specializes in conveying math and science concepts in a clear and visually appealing manner. She designs web- and print-based curricula, games, and educational resources for a wide range of audiences, including children, parents, preschool teachers, adult education teachers, and museum educators. Valerie holds degrees in French and German literature, with further studies in graphic design and website design and development.

Nuria Jaumot-Pascual, Senior Research Associate at TERC, has 20 years experience as a bilingual (Spanish/English) preschool and after-school teacher, staff developer, and educational researcher in Spain, Central America, and the United States. Nuria holds degrees in out of school education (Universitat de Barcelona), anthropology (University of Texas, Austin), educational psychology (Universitat Oberta de Catalunya), and organizational behavior (Harvard). She holds a PhD in education from the University of Georgia.