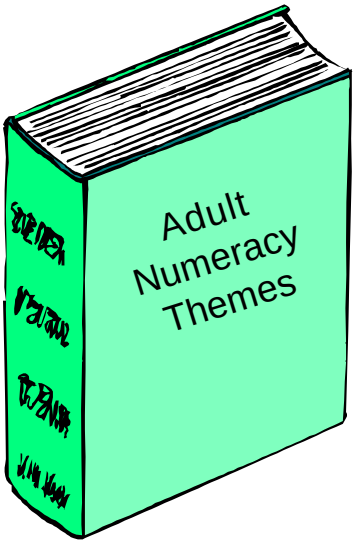
Math Literacy News

Volume 5 A math newsletter of the Ohio Literacy Resource Center Winter 1997

During the past year, many math educators in Ohio have been part of several exciting projects. Eight team leaders spent the past year working on a National Institute for Literacy (NIFL) System Reform Planning Project which looked at several documents. These included: the *SCANS Report,* the *Massachusetts ABE Math Standards,* the *NCTM Standards, Equipped for the Future,* the *1994 Adult Numeracy Conference Proceedings,* and *Reconstructing Mathematics Education.* The team leaders also participated in learner and stakeholder groups to help gather data for the NIFL project. Patti Bilyeu, Lois Borisch, Sonja Brown, Susan Cann, Charley Flaig, Delores Jones, Paula Mullet, and Diane Ninke worked on this project during the entire year to increase mathematical awareness and knowledge in Ohio.



In addition to their work on the NIFL grant, the individuals listed above served as team leaders for focus groups of teachers to look at specific parts of the adult mathematics curriculum. These focus groups worked hard throughout the year, and many of them presented during the Regional Math Kick-Off Days in August. Many instructional ideas developed during these focus group meetings were included in an Ohio Literacy Resource Center publication, *Adult Numeracy Themes* compiled by the *Ohio Mathematical Planning Committee*. This 200-page notebook was distributed at the Regional Math Kick-Off Days to all participants. Copies are available at each Regional Resource Center and through each ABLE program director. These notebooks include sections on Competence and Self-Confidence; *the process themes of* 1) Problem Solving/Reasoning/Decision Making, 2) Communication, and 3) Relevance and Connections; *and the content themes of* 1) Number and Number Sense, 2)Data: Data Analysis, Probability and Statistics, and Graphing; 3) Algebra: Patterns and Functions, and 4)Geometry: Spatial Sense and Measurement.

I want to thank all the members of the focus groups who worked tirelessly for the entire project. These innovative math educators include: Roberta Altic, Dee Bell, Beatrice Benton, Minnie Brown, Becky Brunotte, Jennifer Cutler, Maureen Daly, Megan Dixon, Leslie Enoch, Betty Finney, Susan Galandiuk, Cynthia Grantz, Carolyn Gross, Karen Howell, Kathryn Jackson, Michelle Kearns, Diane Kemer, Brenda Lehman, Joan Lindhurst, Catherine Lippert, Sharon McConnell, Kathleen McDonnell, Joann Minnick, Melody Robinson, Geri Ryan, Linda Sullivan, Patricia Talbot, Tamara Wagner, and Paula Weed.

Many of the instructional materials developed by these professionals were included in the notebook. Other materials and activities are included in this newsletter. We hope that you will find them beneficial to your students!

Nancy L. Markus, Editor

ON-LINE RESOURCES

LISTSERV

■ The ANPN (Adult Numeracy Practitioners Network) sponsors a wonderful listserv for adult math teachers. There have been many great ideas as well as interesting discussions on the list recently on such topics as algebra resources and useful mathematics websites. If you wish to subscribe to the numeracy list, send an e-mail message to:

majordomo@world.std.com

The message should read:
Subscribe NUMERACY (your e-mail address here)

■ Another fun listserv is BEATCALC *(Beat the Calculator).* Every Monday morning you receive a mental math method that can be shared with your students. These mental math ideas are fun and easy to learn! More advanced students (or teachers) can try to figure out algebraically *why* the method works! Send your message to:

BEATCALC@aol.com

Message should read:
SUBSCRIBE BEATCALC (your e-mail address here)

Crispen's Roadmap

It is difficult to know where to begin on the World Wide Web. Teachers and students often wander aimlessly through site after site. Crispen's Roadmap is a site appropriate for both teachers and students when beginning to navigate the World WideWeb. The Roadmap is an Internet training workshop designed to teach new "Net Travelers" how to travel around the rapidly expanding and often confusing "Information Superhighway" without getting lost. All you need to participate is e-mail. The workshop sessions teach you about how to use the tools of the Internet directly and also how to use these same tools using nothing but e-mail. The workshop is self-paced and can be experienced in as little or as much time as needed. The workshop is copyrighted, but users have permission to share the lessons (but not to sell them on the street corners!). To access this great, free Internet training go to:

http://www.brandonu.ca/~ennsnr/Resources/Roadmap/welcome.html

ANPN Homepage

Once you are comfortable navigating the World Wide Web, you will be able to find many good websites for mathematics. The Adult Numeracy Practitioners Network's homepage is a good place to start. Included is information about adult numeracy, including the entire System Reform Planning Project funded by NIFL this past year. The document produced from this project, *A Framework for Adult Numeracy Standards: The Mathematical Skills and Abilities Adults Need to Be Equipped for the Future* by Donna Curry, Mary Jane Schmitt, and Sally Waldron contains learner and stakeholder voices as well as practitioner viewpoints. Once in this homepage, there are links to many other groups and resources for adult numeracy education. Be sure to visit the Adult Numeracy Practitioners Network at:

http://www.std.com/anpn

The Math Forum

The Math Forum at Swarthmore:

http://forum.swarthmore.edu/

is another good start for numeracy information. There are links to *math resources by subject*, *math education,* and *key issues in math.* Dr. Math can be accessed through this website. Dr. Math is a site appropriate for people, both students and teachers, who love math and want to know more about *why* math works. All levels of questions about math can be asked at this site.

Lesson Plans

Lesson plans are available through the following math gopher. While this site, like many resources, is designed for K-12 it has lots of activities that can be used with adults as well. There are pages and pages of actual lesson plans which can be adapted for your adult classroom. The address is:

gopher://bvsd.K12.co.us/11/Educational_Resources/Lesson_Plans/big%20Sky/math

ON-LINE RESOURCES (cont'd)

Mega-Math

Mega-Math includes fun and challenging material for all levels of math students. Much of the material deals with logic problems, a necessary component of math instruction. If you are having trouble finding relevant, applications of math easily used by your students while working cooperatively, this is the place to look.

http://www.c3.lanl.gov/mega-math/welcome.html

Logic Puzzle

Other logic puzzles are available at:

http://einstein.et.tudelft.nl/~arlet/puzzles/index.html

These puzzles are updated often. Many of these puzzles may be too difficult for the adult education classroom, although some can be adapted. Each puzzle in this archive is categorized by subject area and includes a solution. This archive is still under construction; new puzzles and links are continuously being added to the archive.

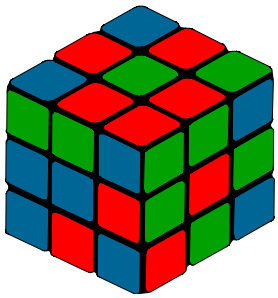
1996 MATH KICK-OFF DAYS

Almost 200 math educators in Ohio participated in the 1996 Regional Math Kick-Off Days held in Xenia, Lancaster, Euclid, and Lima this past August. Participants received problem solving books, a notebook of ideas related to the numeracy themes, and pattern blocks. Plans are underway for next year's Regional Math Kick-Off Days. If you are interested in presenting a carousel of ideas that have worked for you, please contact Nancy Markus at the Ohio Literacy Resource Center.

The following pattern block activity came from the 1996 Kick-Off Days:

Activity: PATTERN BLOCKS

Pattern block activities help promote problem solving as well as understanding of geometry concepts, measurement concepts, etc. Pattern blocks are manipulatives with standard shapes and colors. Each set includes yellow hexagons, orange squares, green triangles, red trapezoids, blue rhombuses, and tan rhombuses.



Get It Together: Problem Solving for Groups (Editor: Tim Erickson; Developed by: Lawrence Hall of Science (1989), University of California, Berkeley, CA 94720; cost $18.00) has cooperative learning activities for use with pattern blocks. Pattern blocks can be ordered from many educational supply stores including Tricon Publishing (517-772-2811). In the activities, each member of a group of six learners receives a card with a clue on it. By working together, the group must solve the problem. Each person reads his or her clue to the entire group, and the group must decide the best way to solve the problem. Communication skills, which are important to all areas of life, are enhanced and practiced. Susan Cann's class in Lancaster, Ohio developed the following six clues for use with pattern blocks:

1.) No two sides of any same color shape touch a block of the same shape or color.

2.) It takes seven pattern blocks to make one complete design.

3.) A yellow hexagon is the center of my pattern block design.

4.) The outside of my "unit cell" has six points.

5.) Each yellow hexagon is surrounded by six identical shapes, one per side.

6.) Only two different shapes are used in my pattern.

PROCESS THEMES

These three numeracy themes, 1) problem solving/reasoning/decision making, 2)communication, and 3) relevance and connections, are the ultimate goals of math education. They are often interconnected and can be incorporated into many interdisciplinary activities.

■ Problem Solving/Reasoning/ Decision Making

Adults engage in these three processes continuously. Math skills are integrated in the problem-solving and decision-making processes. Problem solving includes seeking to understand the problem and figuring out what information and math skills are important to use in solving it. Adults need a repertoire of strategies and skills to solve problems. Problem solving and decision making often involve teamwork. Parents, workers, and community members use problem solving and reasoning to reach decisions. Math content skills must be embedded in processes like problem solving, reasoning, and decision making. Reasoning and problem solving should be integrated in all teaching areas. Students must be provided with opportunities to work in groups.

Activity: Ice Cream Sales is an activity which was presented during a math teleconference sponsored by National Center for Adult Literacy (NCAL). This problem was presented as an example of an open-ended problem that is beneficial, interesting, and doable in an adult education classroom. Sharon McConnell of Warren, Ohio has adapted it for her adult education students. This open-ended question is to be worked on by students in small groups. This activity was also expanded upon during the December 7 workshop presented by Susan Cowles of Corvallis, Oregon for over 70 Ohio adult educators on Visualizing Mathematics: A Concrete Approach to Abstract Mathematics.

The basic problem is as follows:
The students are ordering ice cream for a store. They must order 40 gallons of ice cream. They must decide on 10 flavors that will be displayed in the front of the store.

Using information from charts and graphs, students must propose a solution as well as a rationale for their choices. This is an excellent way to begin open-ended problem solving in your classroom.

If you are interested in a copy of the complete problem, please leave your name, address, and phone number with a message for Nancy Markus at the Ohio Literacy Resource Center.

Activity: Crossing the River, submitted by Susan Cowles of Oregon, is a problem-solving activity that she has used with her JOBS students. Materials needed are counters or a class set of very small rowboats, along with a "river" and some spare adults.

1.) On the bank of a river are one adult, two children, and one very small rowboat. We want to get all of the people across the river by rowing. The boat will hold

- ☐ 2 children
- ☐ a single child or
- ☐ a single adult

The boat is too small to hold an adult and a child. All of the people can row. "One trip" means rowing the boat across the river in either direction. How many trips does it take to get all of the people across the river? Explain how you did it.

2.) On the bank of a river are 2 adults, 2 children and 1 very small rowboat. We want to get all of the people across the river by rowing. How many trips does it take to get all of the people across the river? Explain how you did it.

3.) What is the answer for 3 adults and 2 children?

4.) Is there a pattern to your answers? Explain.

5.) Complete the following table:

Number of Adults	Number of Children	Number of Trips
1		
2		
3		
4		
5		
50		
100		

6.) What is the rule for any number of adults with 2 children?

7.) Explain why the rule works.

8.) How many adults are there if it takes 17 trips?

9.) How many adults are there if it takes 61 trips?

10.) Explain how you figured out your answers.

Students can be asked to graph the results on a number plane.

■ Communication

Math is language. Communication is essential for understanding. Communication provides the foundation for learning in school and in life. Communication includes knowing when and being able to ask for help both in the classroom and in life. Communication in math, as in other aspects of life, is the bridge to finding and exchanging ideas, to identifying problems, and to seeking and finding solutions to these problems. Communication is essential to working collaboratively at home, at work, and in the community. Communication is the link that makes other math skills effective. The focus on mathematical communication should be increased. Good mathematical communication for work, home, and community situations through group discussions should be encouraged.

Activity: Kids Have Died By Doing Conversions Metrically *or* Kill Him Dead But Don't Call Me are sayings that Paula Weed of Springfield, Ohio uses to help students remember the prefixes for the basic units of metric measurement. Kill Him Dead But Don't Call Me correlates to the prefixes Kilo, Hecto, Deca, Base unit, Deci, Centi, and Milli. "Kids Have Died By Doing Conversions Metrically" is another sentence that provides a saying to remember the prefixes. The metric system combines prefixes and the basic units to form other units. For example, kilogram has the prefix "kilo" in front of the basic unit "gram." "Kilo" means 1000, so a kilogram is 1000 grams. Often students are given charts to help them remember these prefixes. By attaching liters, meters, and grams to the prefixes, different units can be formed.

Students can write their own sayings for different charts and lists. Remember, understanding is the goal, but this is a good way to help students make a memory connection.

Other lists for which sayings can be written are the planets, rainbow colors, and continents.

Activity: Writing problems is a good way to help students understand mathematics. While it would be wonderful if we could just reject texts, often we must use what is available. Several math text authors are trying hard to use more relevant problems; however, many are unrealistic and unmotivating. One suggestion is to ask students: "How would this problem make better sense to you?" Perhaps students could rewrite the problems to help facilitate understanding!

■ Relevance and Connections

Adults need to see connections in math--connections within the domain of math itself, connections to other disciplines, and connections to real life and work situations. Math takes on greater meaning and understanding when it is directly applied in the workplace or in real-life situations. Adults see little relevance or connections between math and their everyday living and working conditions. Adults feel they are more successful when they are able to link any new learning to something they already know. Textbook math, and particularly word problems, may have little relevance to what adults perceive as math in everyday life. Math must be taught in the context of real-life and workplace situations. Learner-centered approaches to teaching ensure that learners see the relevance of what they are learning. Interdisciplinary approaches to teaching are essential. New math learning should be linked to previous learning. We must help adults see the relevance of learning by seeing the "big picture."

Activity: Calendars offer a wealth of opportunities to enhance math skills. Minnie Brown of Cincinnati uses calendar math with her students. Many activities can be generated around the various holidays; dates can provide drill in addition and opportunities to write figures. Calendars are readily available and can be made on computers. The history of calendars and various holidays offers other possibilities. Interest in the zodiac and horoscopes can also blend in this.

Students can figure probabilities of specific birthdays. Or they can explore many other questions. How many weeks are there between leap years? Is 2000 a leap year? How many leap years are there from 1900 to 2000? What are different ways to figure the answer?

Editor's note: A favorite question of mine concerns patterns. If my birthday is on a Tuesday this year, what day will it be on next year and the next five years? What is the pattern? Why does it work?

CONTENT THEMES

The descriptions of these four themes reflect the words of adult learners, teachers, and stakeholders from the ANPN Planning grant.

■ Number and Number Sense

Number sense is a content skill that encompasses many areas in our adult education classrooms. Computation skills are necessary but not sufficient. To demand individual paper-and-pencil computation from all students at all times does a disservice to our students and society. Estimation and mental math are essential to sense making with numbers. Fractions, decimals, percents and ratios and their relationships with each other are basic skills. Knowledge of numbers is useful to adults in making decisions about issues that relate to their families, communities, and workplaces. Numbers must be taught and learned in context right from the beginning. We must build on an adult's personal number sense.

Activity: Family Math (Authors: Jean Stenmark, Virginia Thompson, and Ruth Cossey; Developed by: Lawrence Hall of Science (1986), University of California, Berkeley, CA 94720; Cost: $18.00) is a wonderful book full of many reproducible ideas that are applicable for all levels of learners. Number line rectangles is an activity that helps develop understanding of the qualities of numbers such as factors, products, prime numbers, composite numbers, and square numbers. This understanding of numbers is essential for successful work with fractions, ratio and proportion, geometry, and other parts of advanced mathematics. Understanding is often ignored, which causes problems when students try to master the above concepts.

Students are asked to make rectangles of different sizes using tiles or graph paper. A discussion about what a rectangle is may be beneficial for all students. A classroom working definition of a rectangle can be developed using examples and non-examples.

Students are then asked to determine how many small squares are in each rectangle. How many squares are there in the smallest rectangle? (Note: The smallest rectangle has an area of just one square. Many people think that squares are not rectangles, but in truth, a square is a special kind of rectangle. All squares are rectangles. Not all rectangles are squares.) What is the next smallest rectangle? Since a rectangle can be drawn horizontally or vertically they are congruent mathematically. If rectangles are the same size and shape, orientation doesn't matter. Too often students see rectangles, triangles, etc. always drawn in the same orientation.

What is the largest rectangle that can be put together using all the square tiles? How can you decide how large a rectangle is? One way is to count all the little squares. Most students may discover for themselves how to look at length times width and why that actually works.

Rectangles can be cut out for each number until number 15 or 20. Some will have more than one rectangle, such as the number 12 which can have 2 x 6, 3 x 4, and 1 x 12. Others have only one rectangle, such as 17.

By examining all the rectangles, students can see the factors in a number, which are the lengths and widths of each rectangle. These same numbers are also called divisors of a number.

Square numbers can be explored. Most students will be surprised that they actually have a square shape when using a square number.

Prime numbers are those numbers that only have themselves and one as a factor. Their rectangles will be only one long strip.

Students might want to make posters of their factors to put around the room.

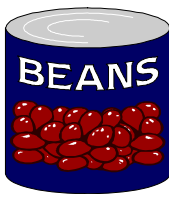
■ Data: Data Analysis, Probability and Statistics, and Graphing

Adults make decisions based on data in their daily lives and in the workplace. Reading charts and graphs, interpreting data, and making decisions based on information are key skills to being a successful worker and an informed citizen. Data collection, analysis, and graphing are essential in the workplace. Statistical knowledge is important in problem solving and decision making. Graphs, tables, and statistics make data easier to understand and adults use them in their roles as workers, parents, and citizens. We must use more work-related charts and graphs and other statistical information in our programs to better prepare adults for the world of work. We must provide hands-on experiences collecting, organizing, and interpreting data.

Activity: Graphing Bean Soup is an activity presented by Mildred Kuth of Hamilton, Ohio during Southwest Regional Math Kick-Off Day.

Materials:

15 bean soup mixes (mixtures of dry beans)
graph paper
lined paper
colored pencils (optional)
calculators
rulers



Students work in groups of two or three. Each group is given a handful of mixed dry beans. Information on each package is used to sort and identify the beans. Fold a piece of lined paper into sixths (fold in half and then the half into thirds or fold the paper into thirds and then that in half..... what is being modeled here?). The six columns are labeled as follows:

(Blank) / Type of Beans / Number of Beans / Fraction / Decimal / Percent

Beans are listed in each sample, using the package as a guide. Using a calculator, students find the number of beans in the total sample. For each type of bean, students find the fraction of that type of bean, then using the calculator, find the decimal and percent of each bean. Discussion as to how to do these conversions may be necessary. Students should be allowed to work this out for themselves if possible.

On the graph paper, students draw a horizontal axis about two inches from the bottom of the paper. Under the axis, they list the types of beans in the sample.

Then they draw a vertical axis on the left side of the graph paper. Using the largest number of beans as a guide, they make a scale to record the number of each type of bean.

Students then title the graph. They can decide on an appropriate title. What should a title say? What information do you want to convey with the title?

They use the table to make a bar graph.

The class can discuss the differences among the groups. Why are there the variations? What percentages of beans would each group put in each bag if they were in charge of production? Why?

Variations and Extensions:

Use four or five types of beans to make a pie or circle graph.

Measure the beans in millimeters and graph the sizes of the beans.

Place beans (ten is a good number) on a wet paper towel in a baggie. Predict the number of beans you would expect to germinate. Make a table and each day record the number of beans that actually germinate. Calculate the fraction, decimal or percent of beans germinated.

Repeat with two sets of beans. Wrap one set in newspaper to keep them in the dark. Put one set in the light. What happens? After the beans have germinated, measure the stem and root of each plant. Calculate the stem: root ratio. Compare lengths of seedlings from light and dark seeds.

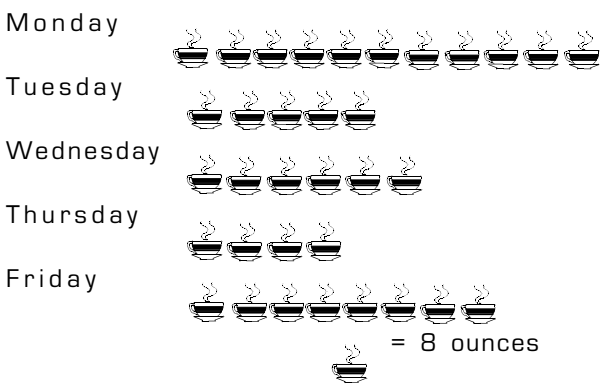
Share bean soup or other recipes. How could the recipe be used for a given number of people?

Write an essay such as:
It's a soup day when.....
One of my favorite home-cooked meals is...
Here's a dish that's my specialty.

Plan a balanced menu for a day using the food pyramid. Calculate the calories.

Activity: Coffee shop sales is a conversion measurement activity. This activity gives students practice with data analysis as well as problem solving. Materials needed are: the coffee shop pictograph, pencil, paper, liquid measurement chart (optional), and 3 x 5 cards.

Coffee Shop Sales:



The students look over the pictograph. (Make sure they understand how to read the graph.) Students are asked to answer questions from the 3 x 5 cards.

Sample questions include:

1.) Ralph brought in a quart thermos on his way to work. How many cups of coffee will Ralph have to buy in order to fill his thermos?

2.) How many ounces of coffee did Ralph buy on Tuesday? How many pint containers can Ralph fill with the coffee bought on Tuesday?

3.) How many quarts of coffee were sold on Thursday?

4.) The workers in the water department bought the coffee sold on Friday. What size container would be the best container to take the coffee to work? How much coffee did they buy?

5.) How much coffee was sold during the week? How many quart containers could be filled? How many pint containers could be filled? Was there enough coffee sold to fill a two-gallon container?

The activity can be modified by changing to a larger or smaller unit.

Activity: There are books written about M & M math and these are some of the activities that can be done with small bags of multi-colored candies. Lois Borisch of Cincinnati uses this activity with ABE, pre-GED and GED students.

Each student receives a small bag of candies. The bags are opened and individual colors are counted. Fractional parts and percentages of each color can be determined using a calculator if necessary. Percentages are recorded on a table.

If the bags each have the same amount of candies, then the percentages can be averaged for each color in the class. Averaged percentages can be recorded also.

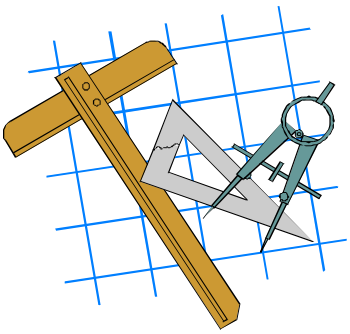
Predictions using information from the small bags can be used for an opened bag of candies. Percentages can be compared with the company's official percentage of each color. As of May, 1996 the percentages for plain M & M's are: red - 20%, blue - 10%, yellow - 20%,

green - 10%, orange - 10%, brown - 30%. (There is a toll free number on each package that you may call for information.)

Extensions could include having the students decide how to display their data. Many different kinds of graphs could be used.

■ Geometry: Spatial Sense and Measurement

For some adults, geometry immediately makes sense to them and gives them confidence in their ability to learn. Measurement is a foundation skill for geometry. Measurement is essential to our sense of ourselves and our orientation to the world. Measurement skills can be critically important. We must use exact and estimated measurements to describe and compare phenomena to increase understanding of the structure, concepts and process of measurement. We must address the impact of measurement skills on the self-efficacy and self-reliance of our students. Measurement skills should be extended to concepts, and areas such as volume, proportion, and problem solving. We must increase the awareness of acceptable tolerances and the consequences of being within and outside of these tolerances. The place to start is with the learner's strengths; instruction must be practical and useful for learners to overcome their fear regarding geometry. Finally, hands-on problem solving and special attention to developing spatial sense helps learners develop an understanding of geometric principles.



Activity: Square tile problem solving is a good way to explore perimeters and areas. While square tiles can be purchased in colored plastic, they can also be obtained at carpet and tile stores quite inexpensively. Color tiles can be used to build *rectangles* that satisfy all the conditions stated in each of the problems below. Answers can be recorded on graph paper.

1.) Three of my tiles are blue.
3/4 of my tiles are red.
My perimeter is 14 units.

2.) Two of my tiles are blue.
My perimeter is 16 units.
5/6 of my tiles are red.

3.) One fourth of my tiles are red.
One third of my tiles are blue.
One sixth of my tiles are yellow.
My perimeter is 20 units.

4.) One fifth of my tiles are blue.
One half of my tiles are yellow.
One tenth of my tiles are red.
Five of my tiles are green.

5.) One half of my tiles are blue.
One fifth of my tiles are yellow.
One tenth of my tiles are green.
All other tiles are red.
My perimeter is 26 units.

■ Algebra: Patterns and Functions

Algebra, both formal and informal, presents a challenging dilemma, because although educators want this included, learners often react negatively. Many frustrations are connected to past experiences with algebra. However, algebra is relevant, practical, and useful. Many life experiences can be expressed in algebraic terms. Algebraic thinking skills are crucial if adults are to compete in the global economy; therefore all adult learners should have the opportunity to improve in that area. Introduce all learners to algebraic concepts by making links to the learner's experiences. We must pay attention to instructional pace, vary teaching strategies, and strengthen the development of concepts to improve algebra instruction. Stressing logic puzzles, "function machines," tables and graphs, as well as the concept of what an equation really means are all strategies to help build algebraic thinking.

Activity: Ron Kindig (RonKin@aol.com) of California has this idea for using fraction patterns to help students make sense of a fraction problem:

As for division of fractions, for some time I thought it probably had little application in real life, although I use it myself in situations such as cabinet work (spacing shelves evenly over an 18 3/4 inch space). After talking with our vocational teachers, I was firmly informed of its importance in printing (cutting up paper stock); apparel (figuring darts along a waistline); commercial art (placing drawings accurately on paste-ups); and many other occupations.

One of the problems we have is overcoming the concept students get from teaching multiplication only as repeated addition is that "multiplication makes bigger" and "division makes smaller". Providing real examples with fractions helps overcome this, as with other ways of showing multiplication. One example I found somewhere and adapted is this:

You manage a store that sells packaged fruit and nuts. You have 6 lbs. of raisins and several sizes of packages you sell them in. How many of each of the following sizes could your six pounds fill?

1. 3 lb. size
2. 2 lb. size
3. 1 lb. size
4. 1/2 lb. size
5. 1/3 lb. size
6. 2/3 lb. size

This pattern can be shown either by drawing a picture or making a table.

ADULT NUMERACY PRACTITIONERS NETWORK MEETING

The annual Adult Numeracy Practitioners Network meeting will be held in conjunction with the National Council of Teachers of Mathematics meeting in Minneapolis/St. Paul this coming April. On Wednesday, April 16 the annual ANPN meeting will be held followed by three days of NCTM sessions. You may attend only the ANPN meeting, but the NCTM conference is unbelievable! For more information call the Ohio Literacy Resource Center at 1-800-765-2897. The application form for the ANPN meeting is included in this newsletter.

ANPN is a national group devoted to adult mathematics reform. Members receive The Math Practitioner, a quarterly newsletter dedicated to math reform and full of ideas useful for the adult education classroom. The annual meeting is devoted to teacher inservice.

Note: We would love to include ideas that work in your classroom. Send your ideas to the Ohio Math Literacy Newsletter c/o OLRC (See address below). Don't worry about being the first to submit an idea, or even sending one that is original. We want ideas that work for you! As added incentive, we will hold a drawing for a book or math manipulative (of our choice) from all who submit information for the newsletter whether we use the idea or not. This month's winner of a classroom set of pattern blocks is Minnie Brown of Cincinnati. We hope that her students appreciate the wonderful teacher they have and that they benefit from the pattern blocks.

MATH LITERACY NEWS IS A PUBLICATION OF THE OHIO LITERACY RESOURCE CENTER AND IS EDITED BY NANCY L. MARKUS
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1-800-765-2897 OR 330-672-2007 E-MAIL ADDRESS: OLRC@KENTVM.KENT.EDU

ADULT NUMERACY PRACTITIONERS NETWORK THIRD ANNUAL MEETING REGISTRATION FORM
WEDNESDAY, APRIL 16, 1997. MINNEAPOLIS, MN. (Deadline: March 20, 1997)

Please make checks payable to ANPN and mail with application to Jan Phillips, William Rainey Harper College, 1200 W. Algonquin Road, Palatine, IL 60067-7398.

Name: _____

Home Address: _____

Work Address: _____

Home Phone: _____ Work Phone: _____ Email: _____

Your role/interest in adult education: _____

Check all that apply:

___ Please register me for the ANPN meeting on April 16, 1997 in Minneapolis. Enclosed is a check for $25 for membership and meeting costs.

___ I am interested in sharing at a 40-minute round table Sharing Session on a topic of interest to my colleagues. (We will contact you directly about your offering by March 25.) **Please provide a brief description** and indicate which of the seven numeracy themes will be focused upon: Relevance/Connections, Problem-Solving/Reasoning/Decision Making; Communication; Number and Number Sense; Data; Geometry: Spatial Sense and Measurement; Algebra: Patterns and Functions.

___ I will be unable to attend the Minneapolis meeting. I enclose $10.00 for annual membership (includes quarterly newsletter).

ADULT NUMERACY PRACTITIONERS NETWORK MEETING - Registration Information

WHO: The *Adult Numeracy Practitioners Network* (ANPN) is a self-supporting group of teachers, curriculum developers, and researchers interested in mathematical literacy for adults. Many of us work in ABE, GED, ESOL, workplace education, and developmental mathematics programs in the U.S. and Canada. Membership is open to all interested parties. Since March, 1994, we have communicated through a quarterly newsletter, "The Math Practitioner," an electronic listserv NUMERACY, and now we have our own website: http//www.std.com/anpn/

WHAT: We are planning our third annual all-day meeting to continue our network, share ideas, and improve our practice.

WHEN: Wednesday, April 16, 1997, from 8:30 a.m. to 4:30 p.m. We have scheduled the ANPN meeting to coincide with the Annual Meeting of the National Council of Teachers of Mathematics (NCTM) on April 17-20. For information about how to register for the NCTM Conference, call (703) 476-2970 or go to their web site (http://www.nctm.org).

WHERE: The Marriott Hotel in Minneapolis. Room location will be posted on our web site and on the hotel sign board.

LODGING: Anyone interested in accommodations should contact the NCTM provider, ROGAL America, at (800) 775-0505.

HOW TO REGISTER: Complete ANPN meeting and registration form and mail or fax by March 20. Please enclose a check for $25 to cover one-year membership dues and meeting costs. Make check payable to: ANPN. Unless you are planning to run a Sharing Session, we do not plan on mailing a confirmation; your cancelled check is your receipt. However, if you have any concerns, call Jan Phillips at (847) 925-6473. Fax (847) 925-6048.

ANPN Meeting Agenda

8:30-9:00	Registration and breakfast
9:00-9:30	Welcome, introductions, business meeting
9:30-10:15	Putting Math Into Context for Adults, Thomas Romberg, University of Wisconsin
10:30-11:10	Roundtable Sharing Sessions
11:20-12:00	Roundtable Sharing Sessions
12:00-1:00	Lunch and Networking
1:00-4:00	Visual Mathematics: A Concrete Approach to Abstract Mathematics in the Adult Ed Classroom. Susan Cowles and Patty Quan, Oregon
4:00-4:30	Next Steps for Individuals, teams, and the network

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Enhancing adult literacy in the State of Ohio

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