



Mathematics Awareness Week 98

Department of Mathematics

University of Kansas

POSTER EXHIBITION

Kindergarten, 1st 2nd GRADES and 3rd 4th GRADES

Goals

*To explore some of the ideas of the Math Awareness Week 1998 theme **Mathematics & Imaging** through a joint math and art project. Imaging is the process and techniques of obtaining an image from some data. Very sophisticated mathematics is involved in all the new recent imaging technology. Some of the main concepts can be expressed in simple geometric terms. These posters will address one of them: the idea of the resolution of a picture. As demonstrated with the above Jayhawks changing the size of the pixels changes the definition of the picture.*

Deadline: April 20, 1998.

Exhibition

The posters will be on display during the period April 25 May 3, including KU Alumni weekend and the Mathematics Awareness Week 98.

Award Ceremony

Friday, May 1. All the schools participating will receive a certificate of participation. One school in each level will receive a special recognition award.

- [Guidelines](#)
- [Submission](#)
- [Example](#)
- [Some Related Mathematical Activities](#)
- [Forms](#) (Please print and submit these forms.)

Guidelines

Materials

Letter size white paper.

Black and white construction paper cut in squares of sides 1 inch and 1/2 inch.

Glue.

Preparation

1. On the letter size paper draw a simple object like an apple or a curve simulating a tornado, an ice-cream swirl, etc. The drawing **SHOULD** have some curves, not only straight lines.
2. Make a photocopy of the drawing.
3. Glue the 1 inch squares on one of the copies trying to reproduce the shape and covering your drawing **COMPLETELY**.
4. Glue the 1/2 inch squares on the other copy of the drawing trying to reproduce again its shape and covering it **COMPLETELY**.
5. For **3rd and 4th GRADERS ONLY**. Write an explanation on your submission form of not more than 100 words explaining the differences between the two pictures. Give special attention to the detail in both pictures. Use pencil and your best handwriting.

Special Instructions

The posters can be done in groups of up to 4 students.

Some overlapping of the squares like in Figure 1 and 2 is allowed.

The squares should be positioned with sides in horizontal and vertical position.

(Squares in a position like in Figure 3 are not allowed.)

The final picture should not have any of the original drawing visible.

Evaluating Criteria

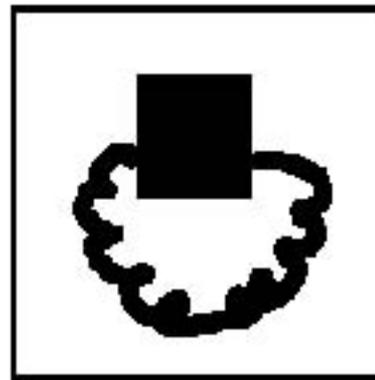
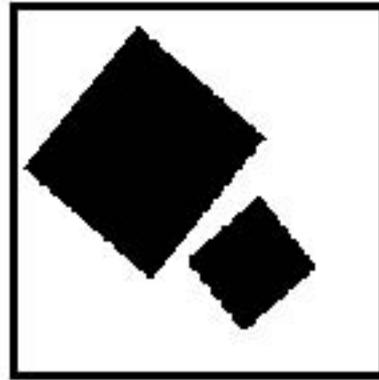
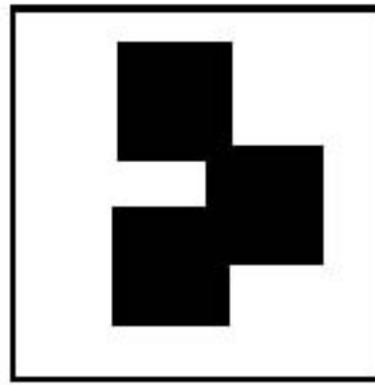
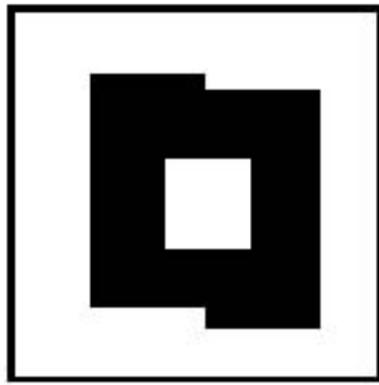
The posters will be evaluated by a panel of faculty of the Department of Mathematics and the School of Fine Arts from the University of Kansas. They will consider the following criteria.

Compliance with the guidelines.

Overall artistic value.

Written explanation about the pictures (**ONLY** for 3rd and 4th GRADERS).

(Figures 1 and 2 on top are allowed. Figures 3 and 4 on bottom not)



Submission of the Material

Send the two pictures (please, staple or clip them together), the description (only for 3rd4th graders) and the completed submission form to:

MAW'98 Poster Exhibition
Department of Mathematics
University of Kansas
Lawrence, KS 66047

For more information contact:

Prof. Estela Gavosto, e-mail: gavosto@math.ku.edu
or Prof. Bozenna Pasik Duncan, e-mail: bozenna@kuhub.ku.edu

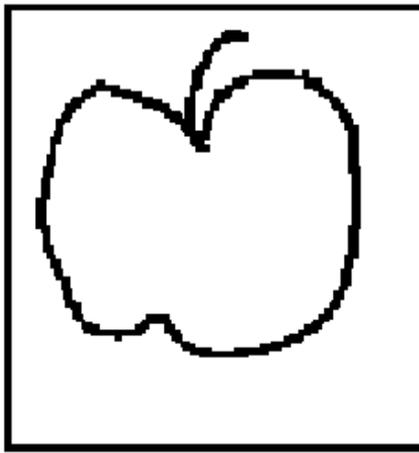
IMPORTANT: Submit only letter-size pictures, we will glue them on poster boards for an exhibition during MAW'98.

EXAMPLE

Step 1. Draw on letter size paper a simple object.

Step 2. Figure A: Make a photocopy of the drawing.

Figure A



Step 3. Figure B: Glue the 1-inch squares on one of the copies trying to reproduce the shape and covering your drawing completely.

Step 4. Figure C: Glue the 1/2-inch squares on the other drawing trying to reproduce again its shape and covering it completely.

Figure B

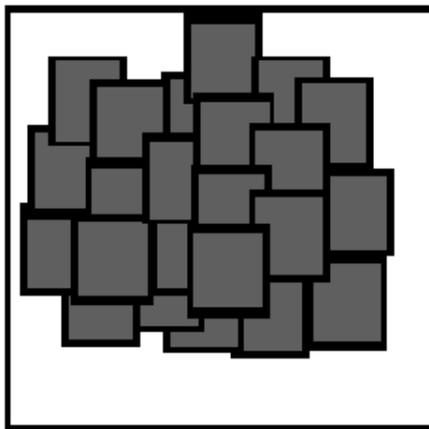
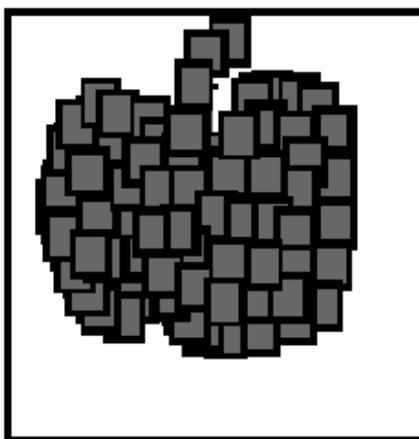
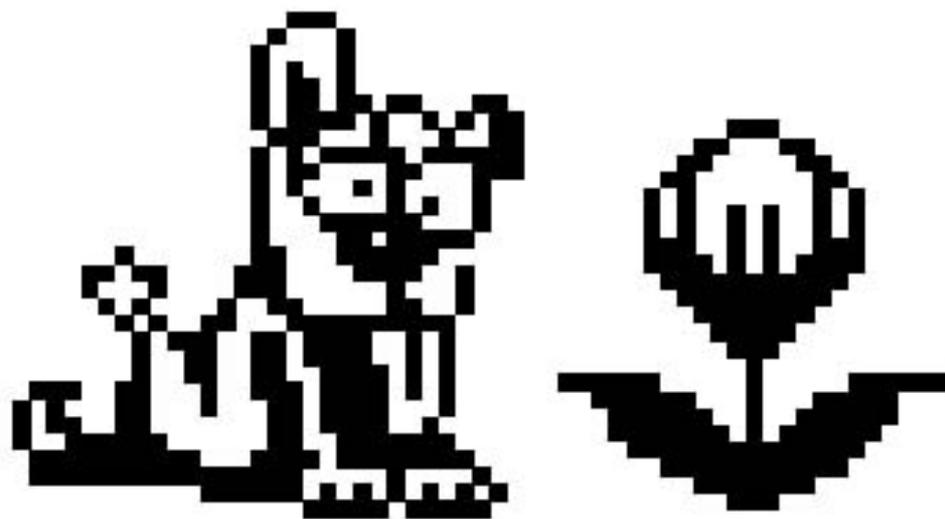
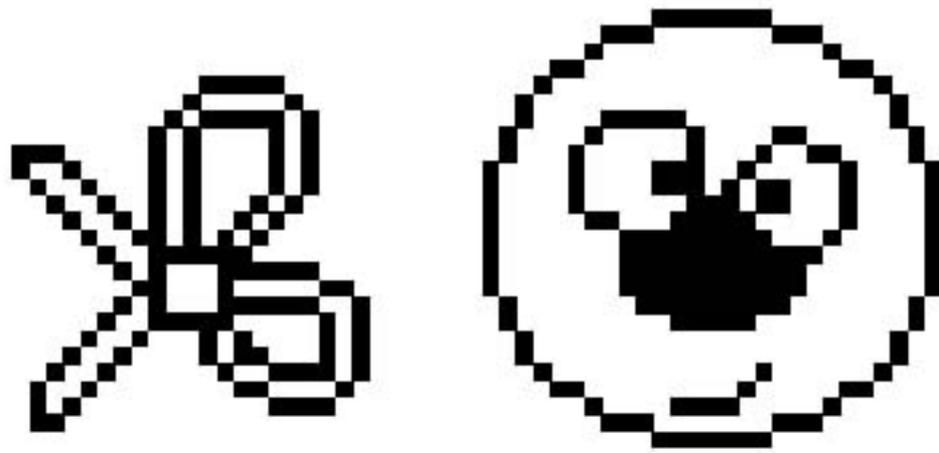


Figure C



Hint: If you have a computer with a graphic program like KidPix®, Flying Colors®, Print Shop®, etc., pick a stamp and blow it up until you see very big squares to get some ideas!



Some Related Mathematical Activities

GEOMETRY

Area: How many squares are needed to fill a circular region? First consider only squares inside the circular region. What happens if we consider squares partially outside the circular region? (See Figures 5, 6, 7, & 8.)

The turning of a curve: If a curve turns a lot, do we need bigger or smaller squares to be able to see the turn? (See Figures 9, 10, 11, & 12 where the same curve is covered by different sizes of squares.)

Lines with different orientation: Are there any differences between covering a horizontal or vertical line with squares or a line with another orientation?

ARITHMETIC

Counting and grouping: If we have three one-inch squares, how many 1/2-inch squares do we need to cover them?

Multiplication: Powers of two and four using the 1- and 1/2-inch squares. Use the squares to represent one

and group them like in the following illustration.

Division: Dividing by 2 and 4 using the 1- and 1/2-inch squares.

Figures 5 and 6

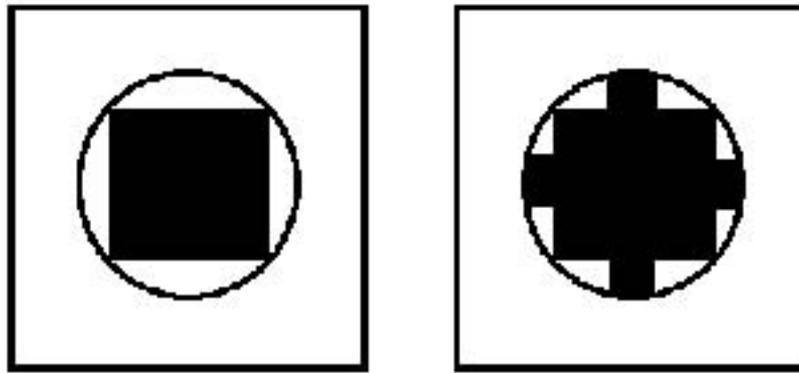


Figure 7 and 8

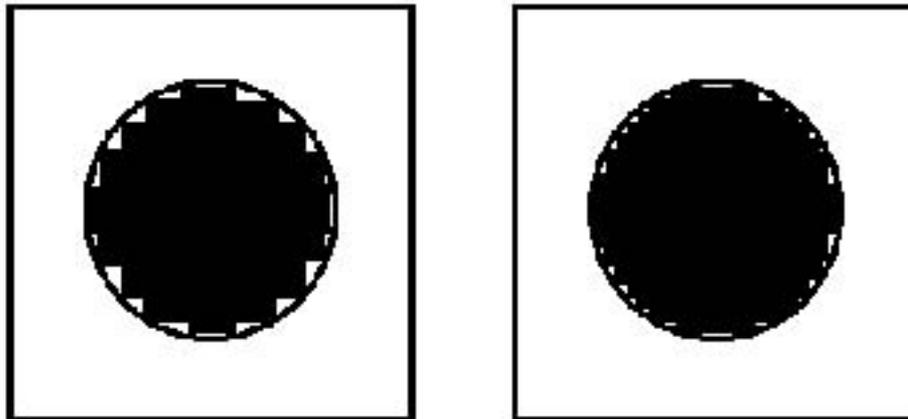
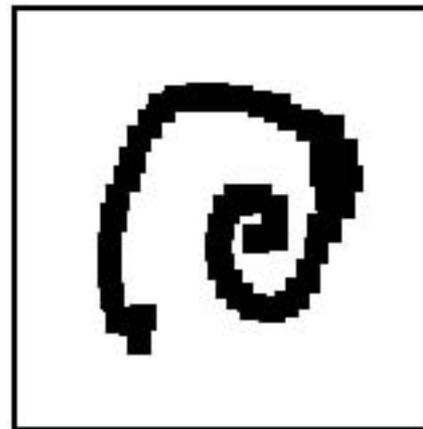
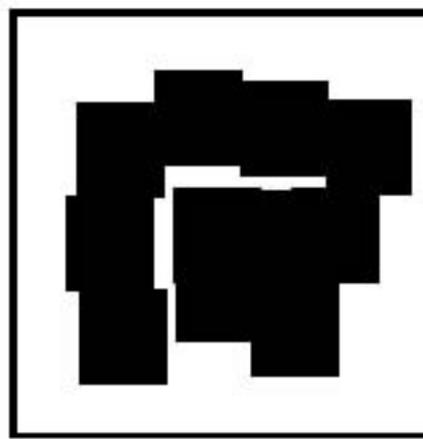


Figure 9, 10, 11, and 12



Pre-Entry Form

Poster Exhibition

Entry deadline: April 20, 1998

School:

Grade (please circle one): K 1st-2nd 3rd-4th

Math Teacher(s):

Art Teacher(s):

Contact person: phone:

Mail to:

MAW'98 Poster Exhibition
Department of Mathematics
405 Snow Hall
University of Kansas
Lawrence, KS 66045

or fax to: (785) 864-5255

Submission Form

Poster Exhibition

