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INTEGRATING INDUSTRIAL ARTS AND THE ELEMENTARY SCHOOL CURRICULUM, THE REASON AND METHOD OF E.I.A.

BY- BOILY, ROBERT R.

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DESCRIPTORS- *ELEMENTARY SCHOOL TEACHERS, *GUIDELINES, *SHOP CURRICULUM, *HANDICRAFTS, *INTEGRATED CURRICULUM, MANUALS, ELEMENTARY SCHOOL STUDENTS, CREATIVE ACTIVITIES, CLASS ACTIVITIES, ART ACTIVITIES, SCIENCE ACTIVITIES, MATHEMATICS, LANGUAGE ARTS, SOCIAL STUDIES, MUSIC,

DEVELOPED FOR THE ELEMENTARY SCHOOL TEACHER, THIS MANUAL DESCRIBES THE RATIONALE AND SOME OF THE METHODS OF AN INDUSTRIAL ARTS PROGRAM WHICH FUNCTIONS AS AN INTEGRAL PART OF THE REGULAR ELEMENTARY SCHOOL CURRICULUM. GUIDELINES FOR CLASSROOM USE OF SUCH STANDARD TOOLS AS THE HAMMER AND THE HANDDRILL ARE PRESENTED, AND SUGGESTIONS ARE OFFERED FOR STUDENT HANDICRAFT ACTIVITIES IN SCIENCE, MATHEMATICS, LANGUAGE ARTS, SOCIAL STUDIES, MUSIC, AND ART. THE CONSTRUCTION OF WEATHER VANES, PUPPETS, TAMBOURINES, AND A CIGAR BOX BANJO ARE AMONG THE STUDENT PROJECTS WHICH ARE SUGGESTED. (LB)

INTEGRATING INDUSTRIAL ARTS AND THE ELEMENTARY SCHOOL CURRICULUM

ELEMENTARY INDUSTRIAL ARTS

THE REASON FOR AND METHOD OF E.I.A.

BOARD OF EDUCATION
CITY OF NEW YORK
DIVISION OF INDUSTRIAL ARTS EDUCATION
HERBERT SIEGEL - DIRECTOR
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I wish to express my sincere appreciation to the Messrs. William Hinman, Norman Martinus, Al Cavanagh, Karl Seitz and the other Elementary Industrial Arts Consultants of the Great Neck School System, Great Neck, New York, for many of the suggestion ideas which are entered in this booklet.

Appreciation is also expressed to Mr. Mike Goldberg, P.S. 3, Brooklyn, and Mr. Peter Griffin, P.S. 102, Brooklyn E.I.A. Consultants in pilot schools in New York City, and to Dr. John Hurley, Coordinator and Mr. Arthur Weener, Supervisor of the pilot program, for their suggestions towards the preparation of this booklet.

The book "Industrial Arts for Grades K-6" by Dr. Carl Gerbracht, Ph. D. and Mr. Robert J. Babcock, M.A., was used as a foundation for this booklet. As far as I know "I.A. for Grades K-6" is the only book which states the theory and practice of the elementary industrial arts program as it is being carried on in Great Neck and, on an experimental basis, in New York City.

Robert R Bailey

CONTENTS

WHAT IS EXPECTED OF THE CLASSROOM TEACHER

THE CLASSROOM TEACHER IS EXPECTED:

1. To do all in her power to insure that adequate learning takes place.

2. To recognize and make allowances for variations among students in learning capacities.

3. To provide socializing experiences for her students.

4. To be concerned about the personality characteristics of her students.

5. To be concerned with motivation.

6. To take into account a childs readiness to learn.

7. To make children like to learn.

8. To teach fundamental skills.

9. To acquaint the children with their cultural heritage

HOW E.I.A. HELPS THE TEACHER

Can the ELEMENTARY INDUSTRIAL ARTS program insure that adequate learning takes place? Def initely not - but it can make learning much more likely.

Any youngster, whether a gifted or less gifted child, whether blind, deaf or physically handicapped, can be provided with an experience that is satisfying to him thru the E.I.A. program.

Social values, such as those involved in sharing, respecting the efforts and property of others, accepting responsibility and understanding the purpose of economy in the use of materials, are practiced thru the E.I.A. program.

For every child a tangible product brings a sense of achievement which adds to his self-confidence and contributes to healthful personality adjustment.

The desire to make things is one form of motivation. This desire can be used to stimulate

effort in other areas which may not seem so interesting.

A student who wishes to make a model of a farm may be ready to study soil erosion.

What child does not get all excited when shop is mentioned? Wow!

Industrial Arts activities are mainly illustrative and motivational and exist primari as a "means" to learning the "fundamental skills".

Handcrafts, industry, manual and technological processes can not be separated from our cultural heritage.

OUR TOOLS AND WHO CAN USE THEM

CLAW HAMMER

The CLAW HAMMER is used by children on all grade levels. Those in kindergarten and first grade must hold the hammer near the head because of insufficient muscle and eye-hand coordination. They depend mostly on the weight of the hammer to drive the nail. In the second and third grade some children begin to hold the hammer near the end of the handle. This is the correct way to work with it. In grades four, five and six very few children should have trouble using the CLAW HAMMER.

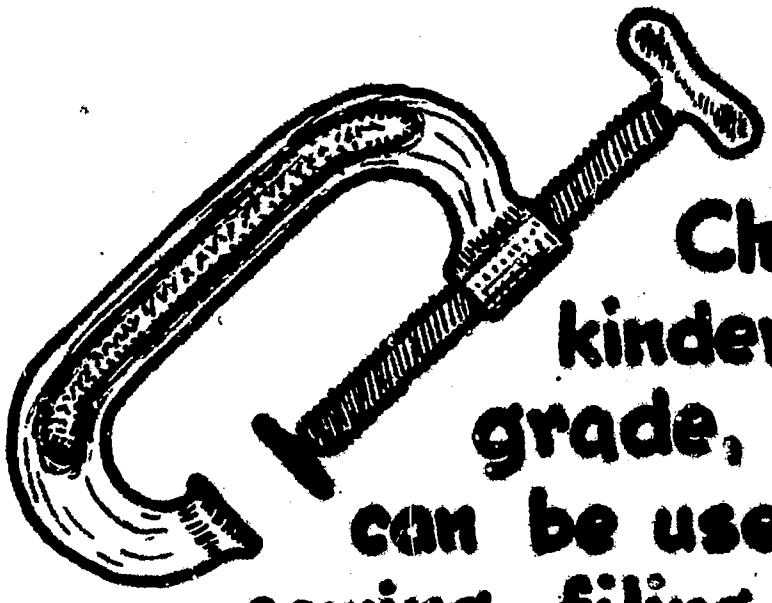
HAND SAW

The HAND SAW is used at all grade levels. In the kindergarten, first and second grades the

:hildren can start the cut by first notching
'he wood with a half-round file. The saw must
:Sually be held with two hands. In grades
hree and four the children can cut holding the
3aw in one hand and can usually start the cut
:y drawing back on the saw two or three
'imes. Grade five and six begin to use the saw
n the accepted manner and have very little
'rouble.

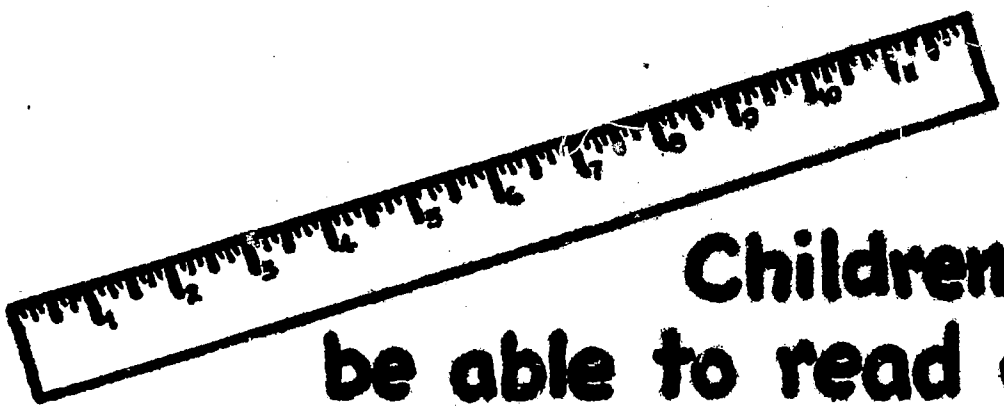
In the kinder-
garten and first
grade, most children
can use the file and
the rasp and are able to
clean them with the file
card. Muscular control
is not yet adequate for
'iling curves and irregular surfaces. Grades
wo to six have no trouble using the file.

"C" CLAMP



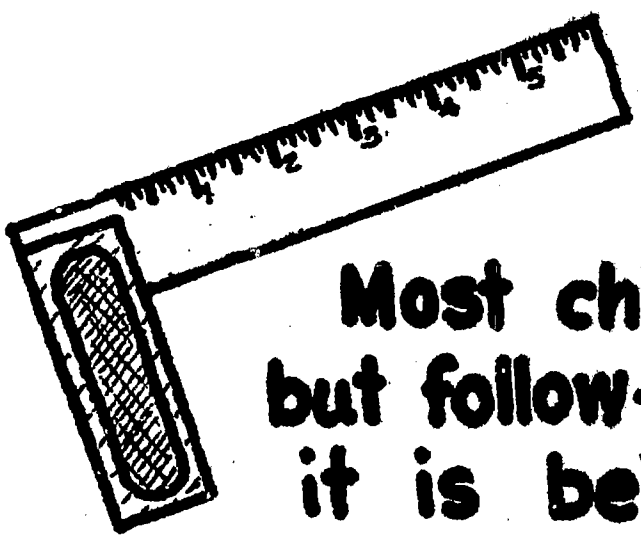
Children at all grade level kindergarten through sixth grade, can use the "C" CLAMP. It can be used to hold material while sawing, filing, nailing, etc.

RULER

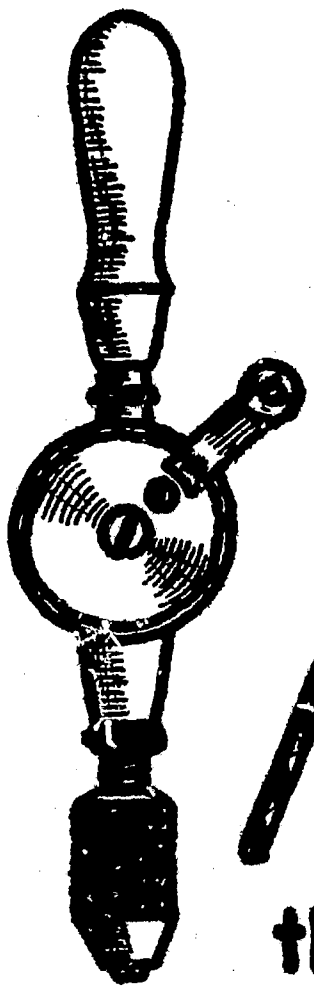


Children in first grade should be able to read and measure by full inches. In second, third and fourth grade by half and quarter inches. In fifth and sixth grade by eighth and sixteenth inches.

TRY SQUARE

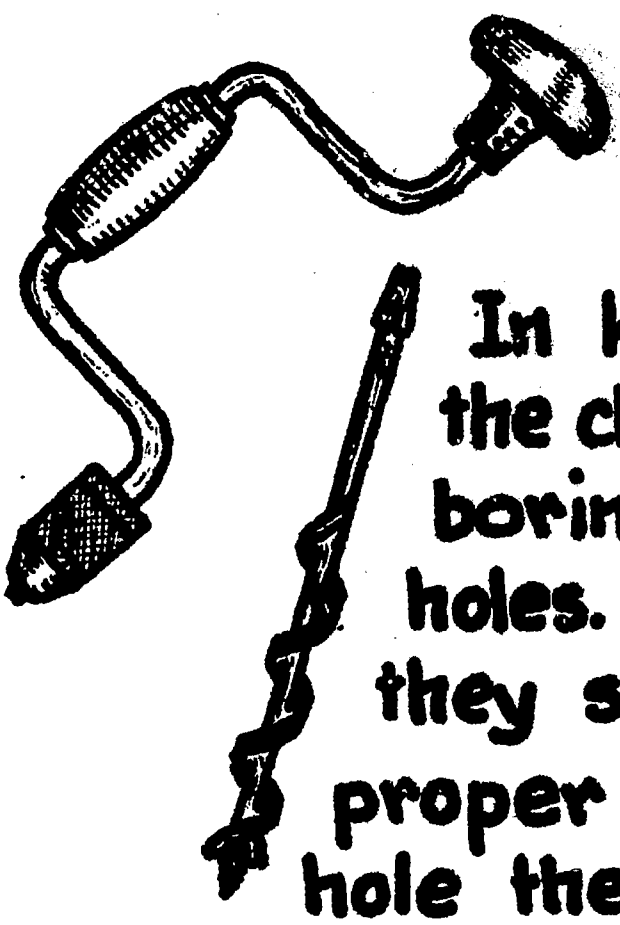


Most children can use the TRY SQUARE but follow-up is needed to make sure it is being used correctly.



HAND DRILL

At the kindergarten-first grade level some of the children will be able to put the drill bit into the chuck. Most children cannot hold the drill steady when drilling. It occasionally sticks because of lack of strength in the wrists. From grade two on, all the children should be able to use the HAND DRILL with little trouble.

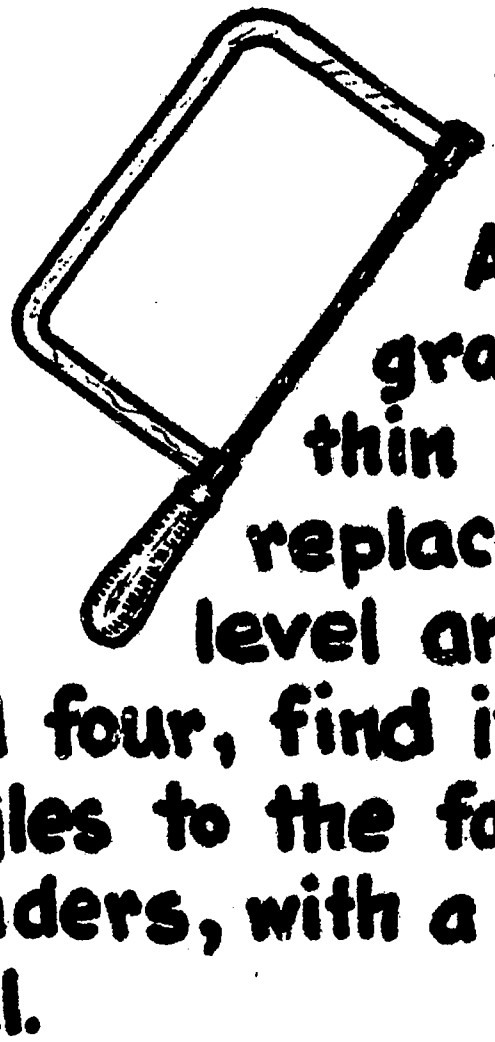


BRACE & BIT

In kindergarten thru second grade the children will have problems boring true size and perpendicular holes. From the third grade upwards they should be able to choose the proper size AUGER BIT for the hole they wish to bore. Can use counter-sink and screwdriver bits.

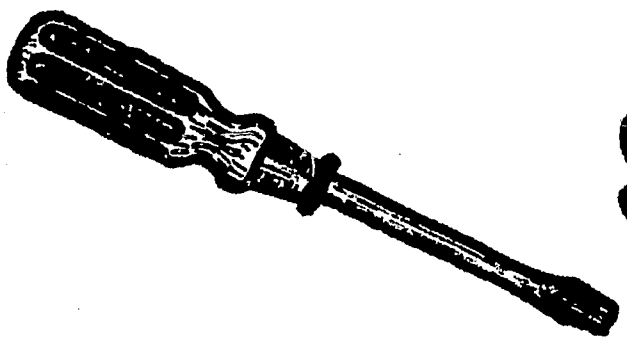
BLOCK PLANE

Most children can use the BLOCK PLANE if an adult adjusts the blade. In the fifth and sixth grade most of the children can adjust the blade and plane a chamfer.



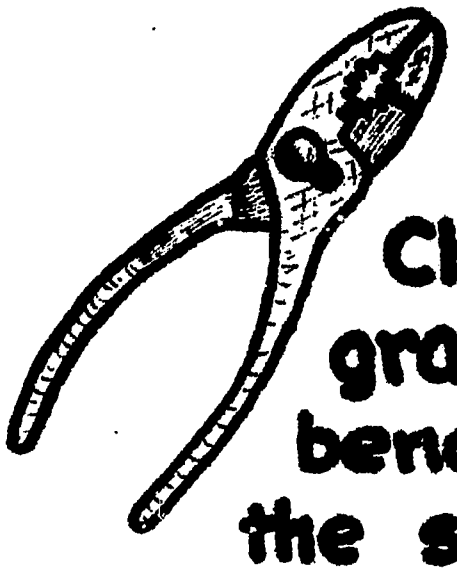
COPING SAW

At the kindergarten-first grade level the children can cut thin pieces of wood. Teacher must replace blades. Children at this level and also grades two, three and four, find it difficult to cut at right angles to the face of the wood. Fifth and sixth graders, with a little practice, can do fairly well.



SCREW DRIVER

Children in the kindergarten and first grade are not strong enough to turn many screws. They do not have the eye-muscle coordination necessary to keep pressure on the SCREW DRIVER as they twist. In grades two thru four the children can usually be taught the skills necessary for fastening with screws. Most are capable of opening cans with the screw driver. In the fifth and sixth grade most can select the proper size and use the SCREW DRIVER successfully.



COMBINATION PLIERS

Children at the kindergarten-first grade level can use the pliers to bend wire and for similar uses. In the second, third and fourth grade the children might possibly cut wire with them. Children should be aware that pliers are not used where a wrench is needed

SUPPLIES

WOOD SCREWS

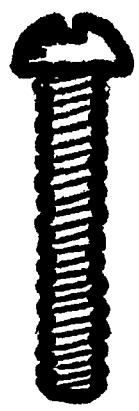
FLAT HEAD

ROUND HEAD

For all practical purposes wood screws may be described by length. Distinguish between round or flat hea

MACHINE SCREWS

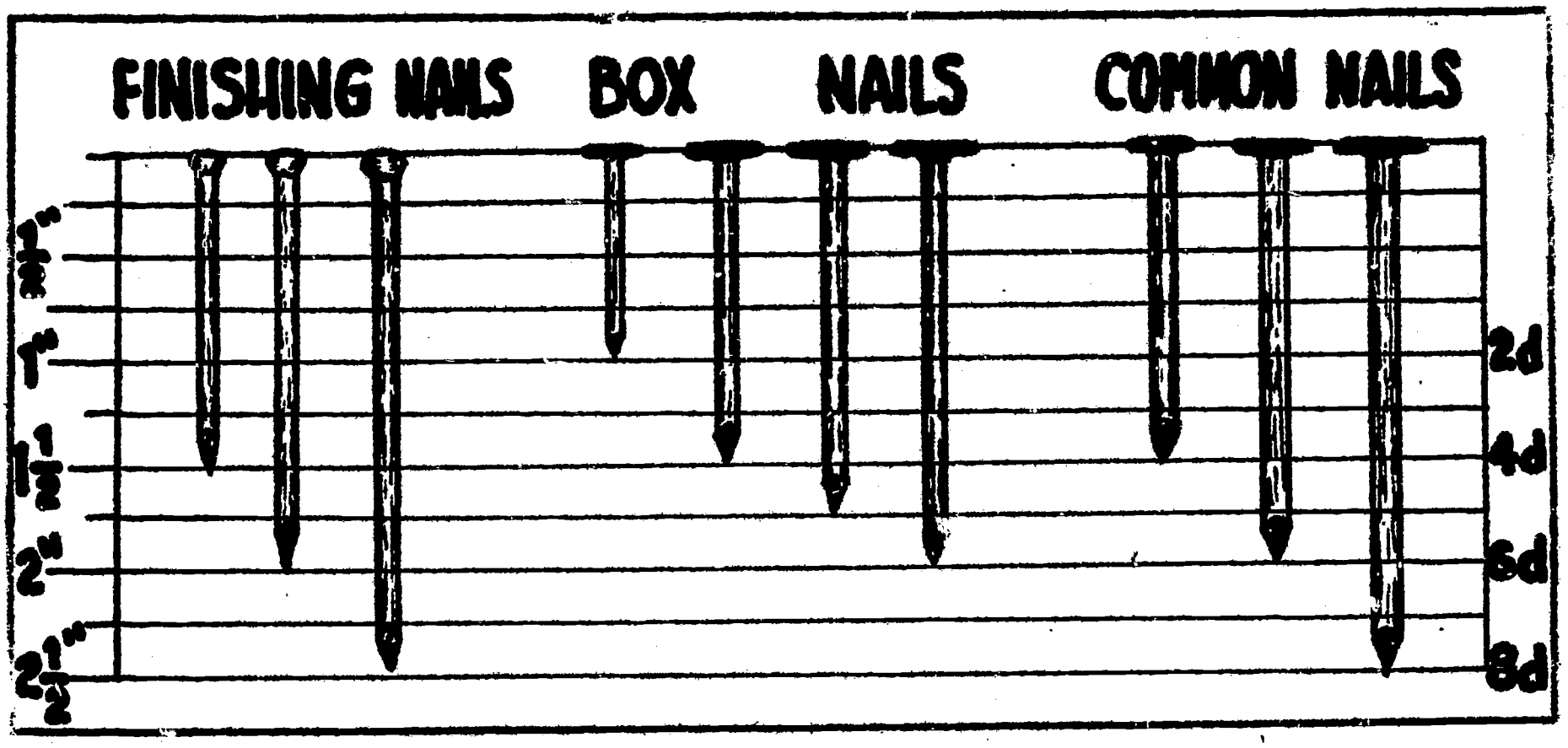
FLAT HEAD



ROUND HE
SQUARE N
HEXAGON N

WING NUT

MACHINE SCREWS are described by type of head, length and diameter. Nuts are manufactured to fit the screw. Square and hexagon nuts are made for the same size screw. Wing nuts only fit certain size machine screws.



THE THREE BASIC VARIETIES OF NAILS

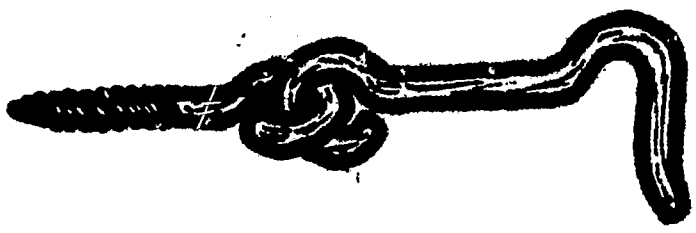
Finishing nails are used where you do not want the nail to be seen. Box nails and common nails are similar, except that box nails are somewhat thinner and are less likely to crack thin wood.

The size of nails are described by the symbol "d" which stands for "penny". A one inch nail would be a "two penny" or "2d" nail.

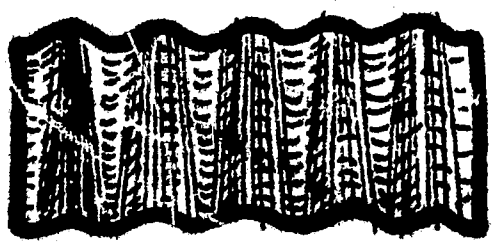
WASHERS

LOCK PLAIN

Lock washers are used when two pieces of metal are to be held together by a bolt or machine screw. The plain washer is used to prevent the bolt from biting into wood.



GATE HOOK

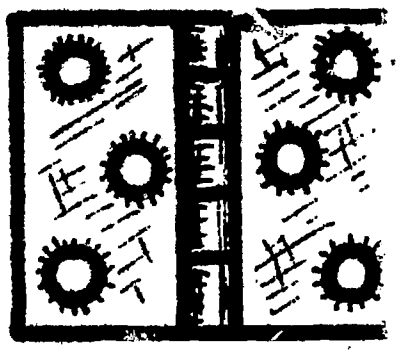


CORRUGATED FASTENER

SCREW EYE

DOUBLE-POINTED OR ELECTRICIANS TACK

CUP HOOK

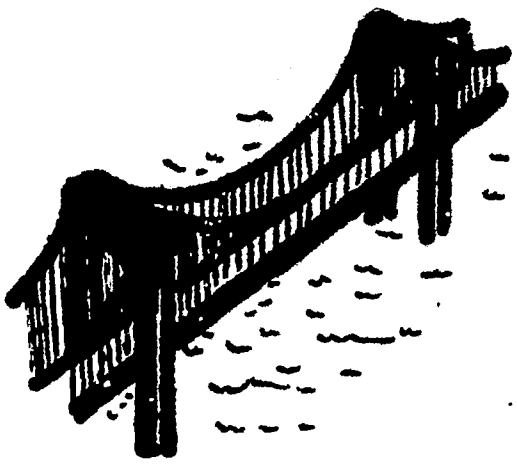


BUTT-HINGE

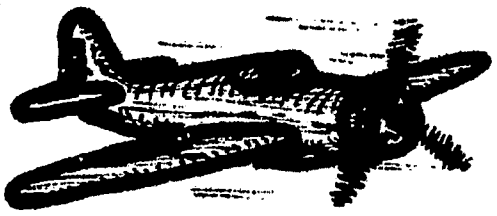
SQUARE-BENT HOOK

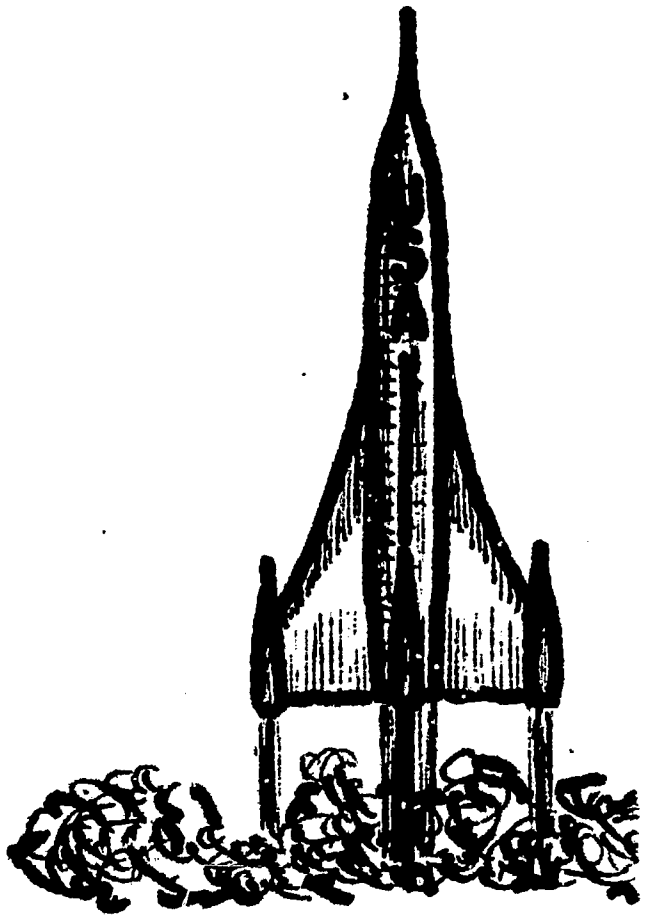
BUTTON-MOLD WOODEN WHE

Gate hooks, screw eyes, cup hooks and square-bent hooks are manufactured in various sizes. Corrugated fasteners are obtainable 3/8" wide, used for fastening the corners of frames. Double-pointed tacks come one size only. Butt-hinges are described by width and length - come in various sizes. Button-molds - 1½" in diameter. Wooden wheels -

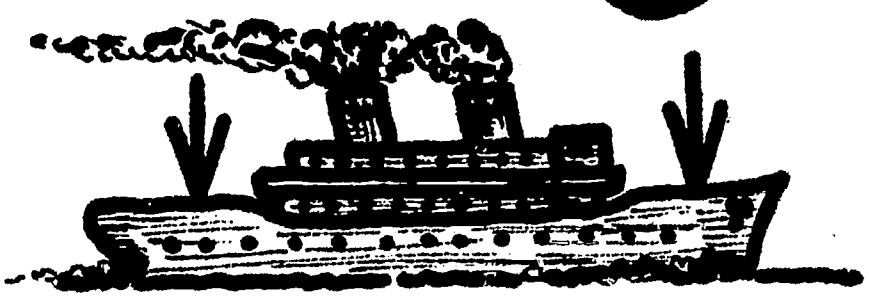


WHAT WE CAN DO



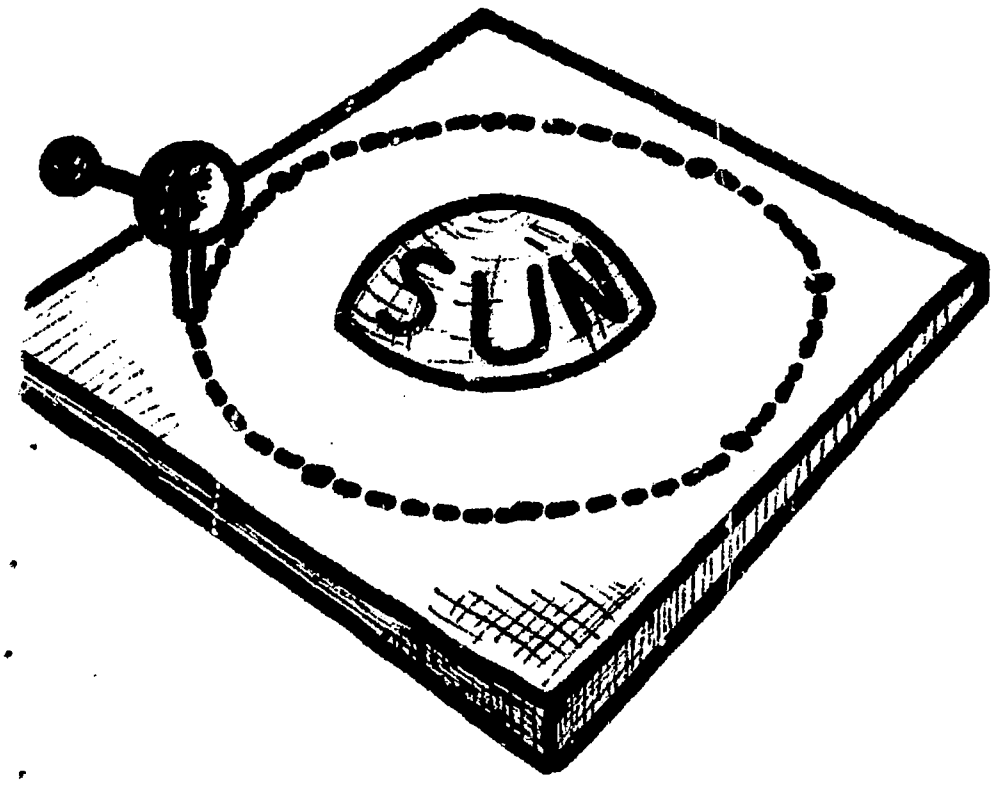


SOME E.I.A. IDEAS

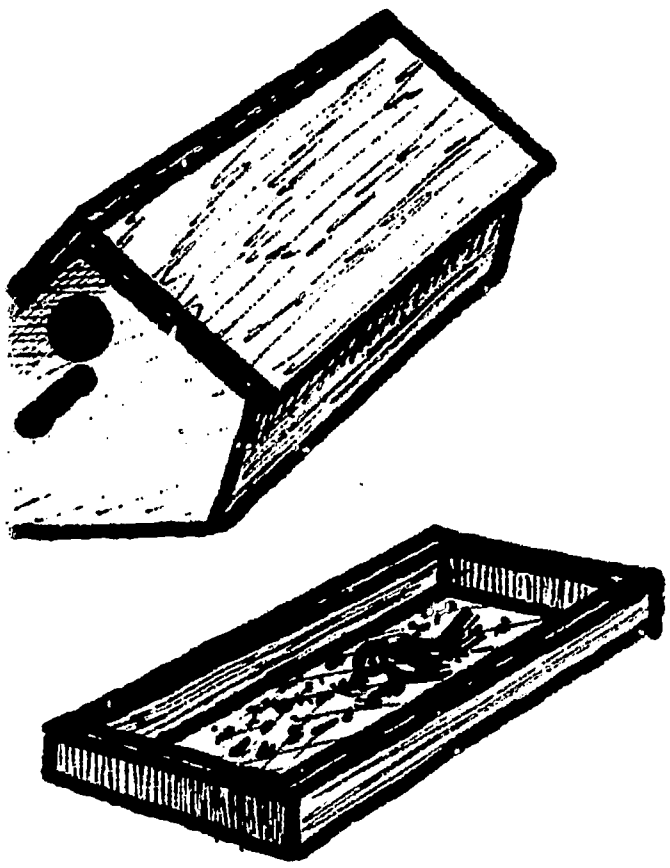


3.1.A. SCIENCE SUGGESTIONS

low about a panorama showing the relationship etween the sun, earth and moon? The earth



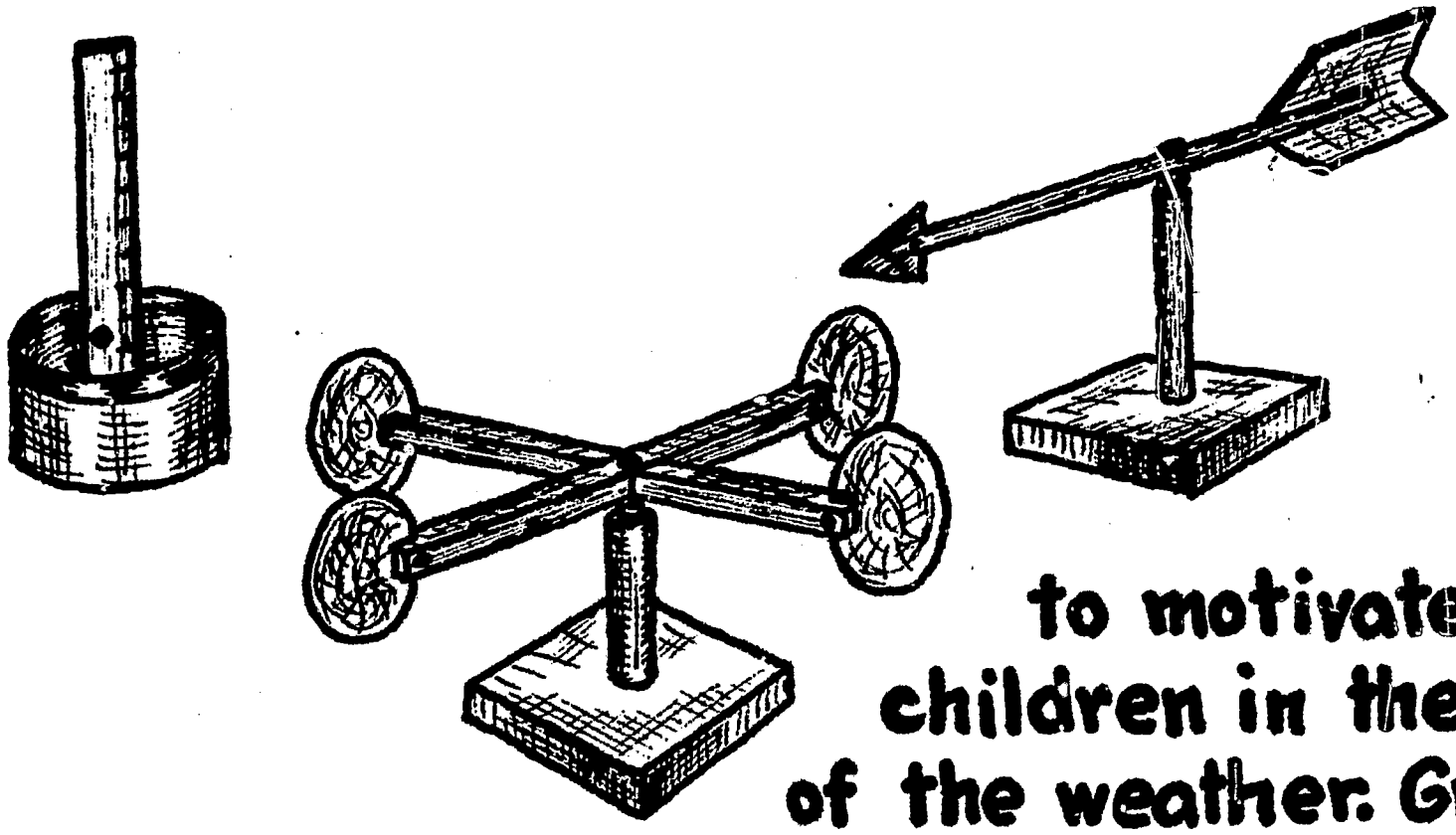
can be moved to different positions around the sun. The moon can be rotated around the earth. Suggested for a group of 3 or 4 children in grades 4, 5 or 6.



A bird house or feeding station on your window sill or in your school garden helps to motivate children to find out about living things. Suggested for a group of 2 or 3 children in grades 2 or 3.

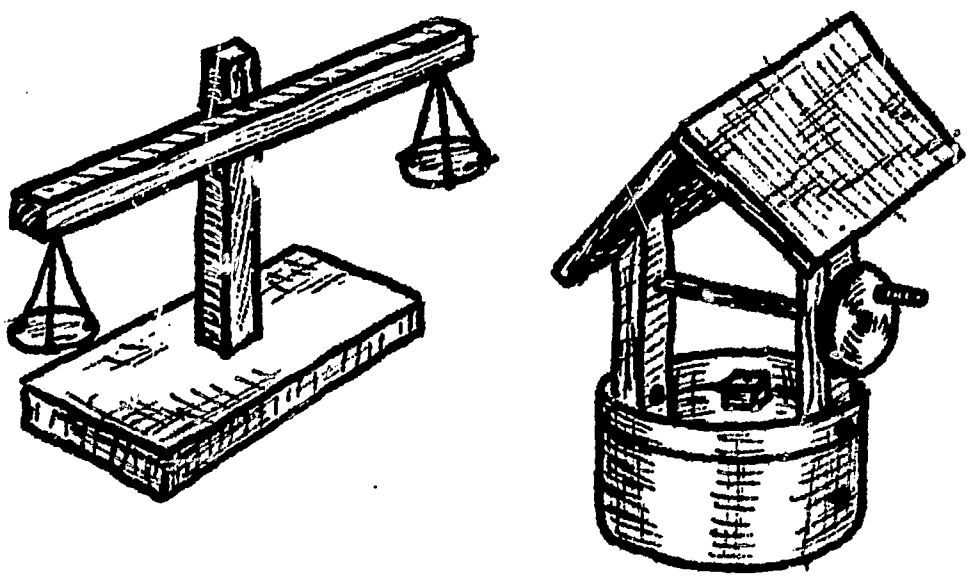
E.l.A. SCIENCE SUGGESTIONS

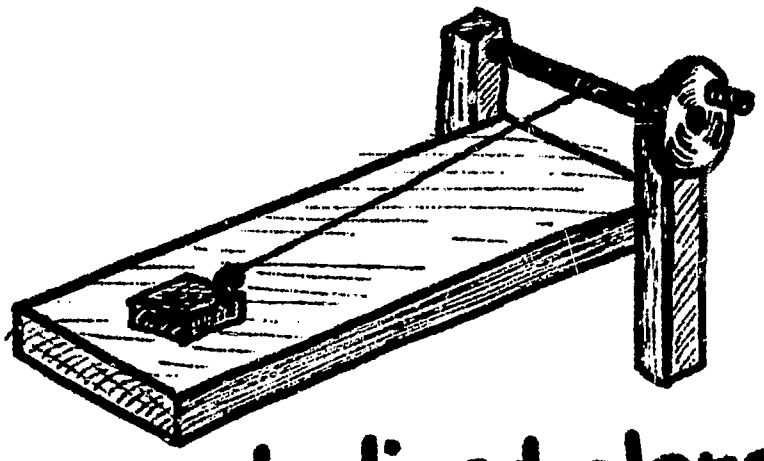
Weather instruments such as the windvane, annemometer, raingage can be made and use



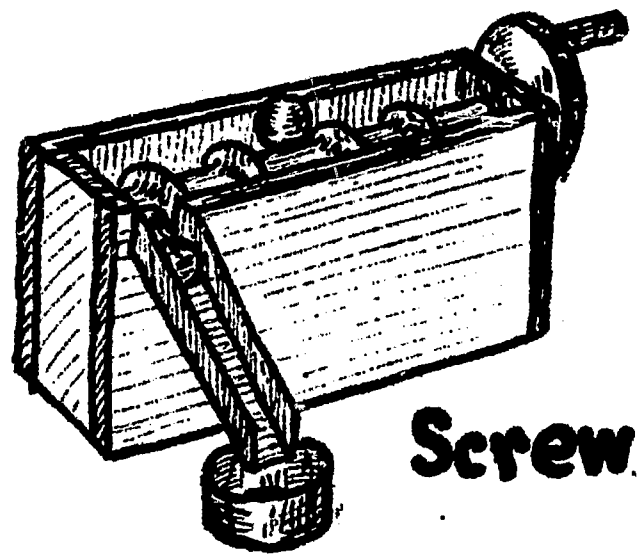
to motivate the children in their study of the weather. Groups of 1 to 3 children. Grades 5 or 6.

Simple machines such as the models shown help the children to understand the lever, the wheel and axle, the inclined plane, the wedge, the pulley and the screw. Children can work on models individually or in pairs. Grades 4



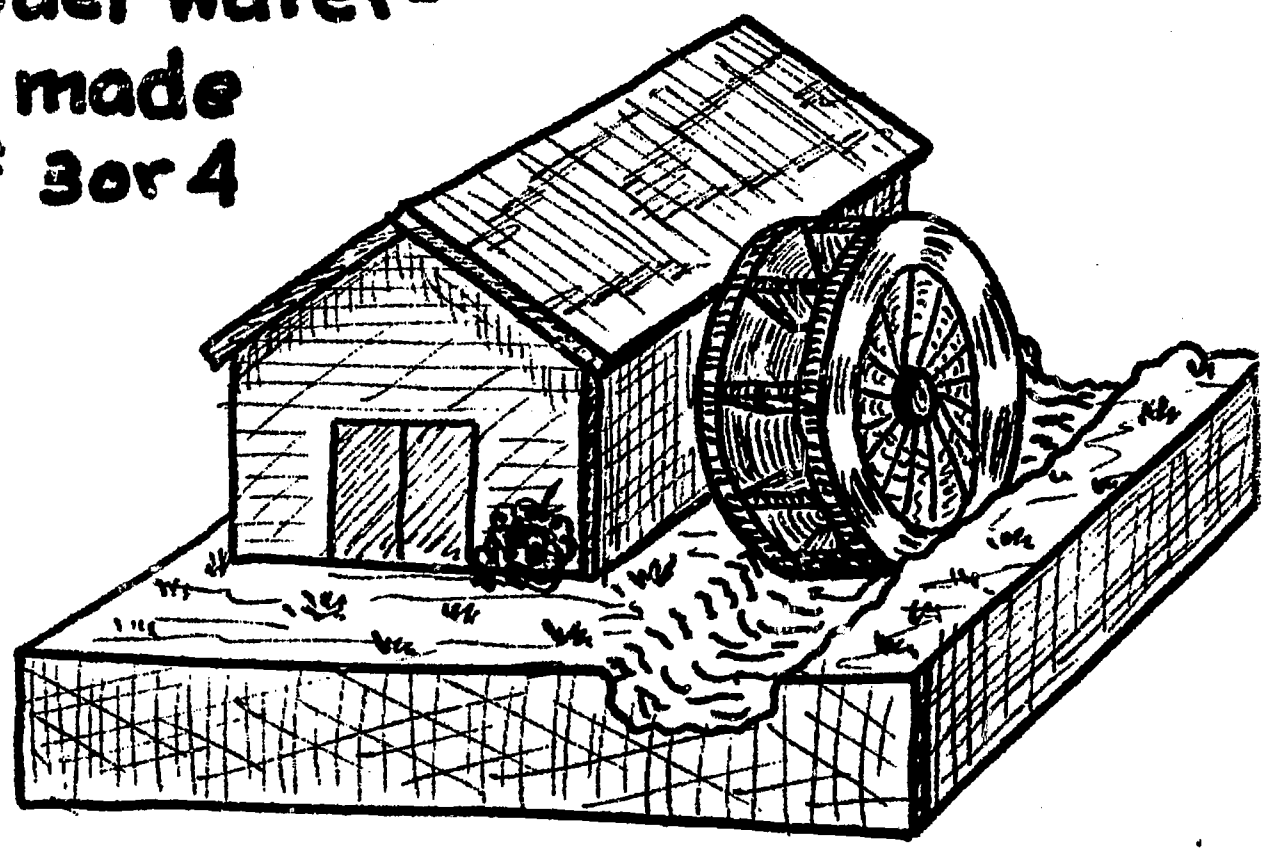


Inclined plane.



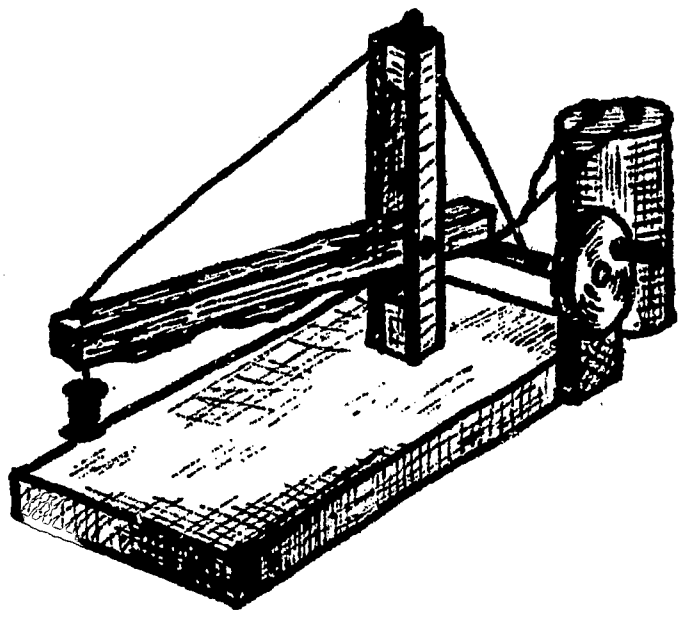
Screw

How nature helps man. Flowing water moves heavy loads. It can turn wheels, and power machines. Model water-wheel can be made by a group of 3 or 4 children. Fifth grade.



E.L.A. SCIENCE SUGGESTIONS

An electromagnetic crane will help to show how the electro-magnet works. 1, 2 pupils in the fifth or sixth grade.



A diorama showing the different types of cloud

might motivate the children to want to learn more about climate, the weather and how geographical barriers suchasdeserts, mountains and oceans effect weather conditions. Group of 5 or 6 children. Grades four, five or six.

ON THE FOLLOWING PAGE IS A LIST OF OTHER "SCIENCE SUGGESTIONS" THAT COULD BE MADE.

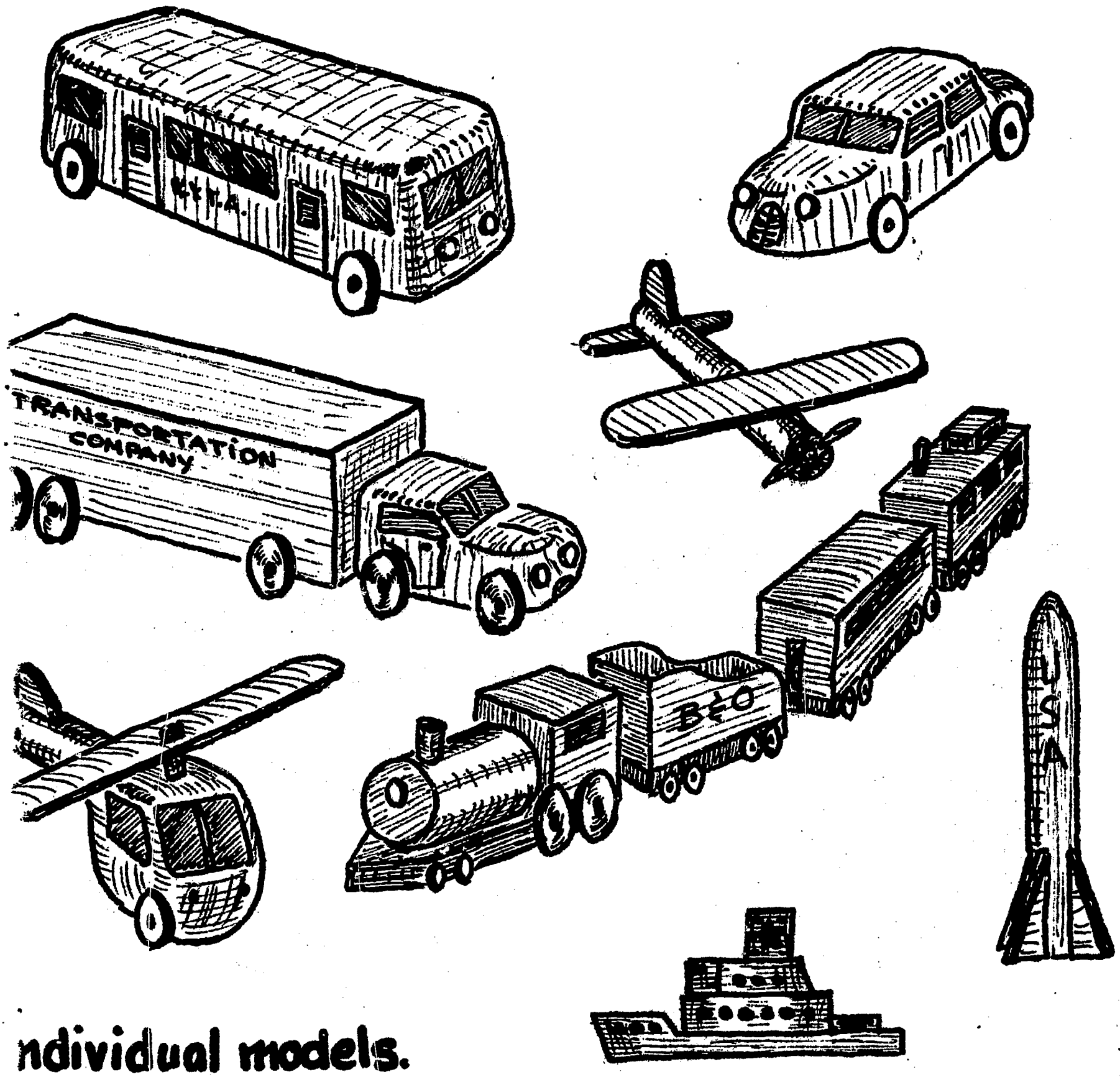
E.I.A. SCIENCE SUGGESTIONS LIST

1. PANORAMA or DIORAMA of a typical dam to show production of ELECTRIC POWER.
2. PANORAMA or DIORAMA of an oil well showing depth of the well in a cross-section of the EARTH
3. MODEL of cross-section of ROCKETS.
4. MODEL TELEGRAPH SETS.
5. KITES
6. MODEL AQUARIUM
7. SUN DIALS
8. MODEL FARMS
9. DISPLAY BOXES for ROCKS, SEEDS, PLANTS, etc
10. RELIEF MAPS of CONTINENTS, COUNTRIES, etc.
11. PAPER MAKING
12. EXPERIMENTS with STRENGTH, WEIGHT, etc. of different MATERIALS.
13. MODEL GLIDERS.
14. PERISCOPES
15. ANT OBSERVATORY
16. ELECTRICAL QUIZ BOARDS
17. FIELD TRIPS.
18. ANIMAL CAGES

These are only a few of the possibilities. Maybe they give you an idea. Why not talk to your E.I.A. Consultant. He will be more than happy to help.

E.L.A. SOCIAL STUDIES SUGGESTIONS

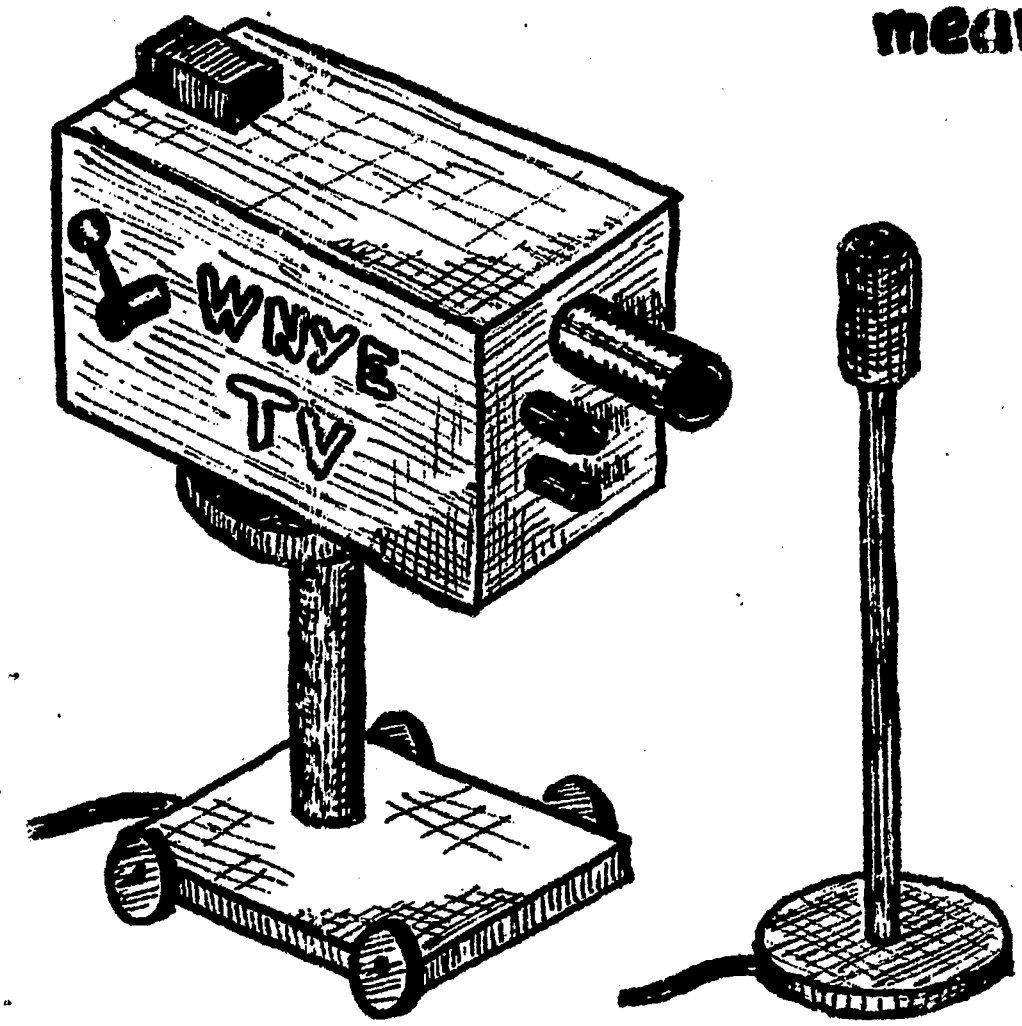
Transportation is an important part of the curriculum. Where do buses and trains go? What other means of travel are there?



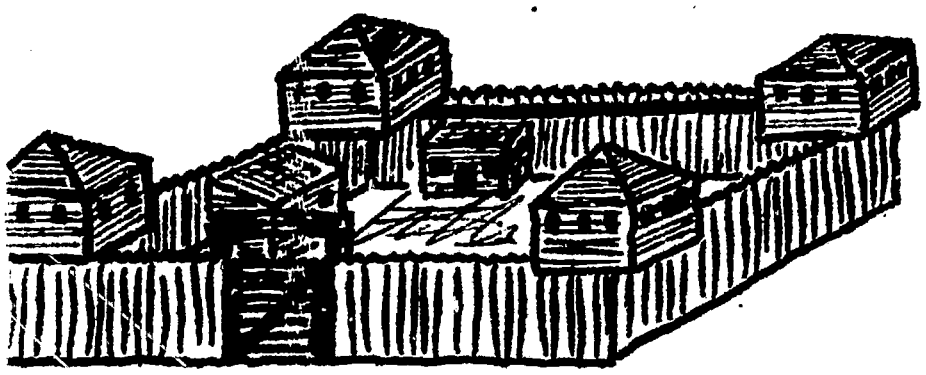
ndividual models.

rades 3,4. Grade 2 also.

E.I.A. SOCIAL STUDIES SUGGESTIONS



TV and RADIO are two of our most important means of communicating with others. A field trip to a TV show followed up by having the children write and act out their own program will aid in giving them insight into modern communication. Language Arts would also play a very important part of such a unit. TV camera and microphone to be made by groups of 3 or 4 children. Others in the class might work on a TV monitoring set, earphones, etc. Suggested for grades 3, 4, 5, 6.

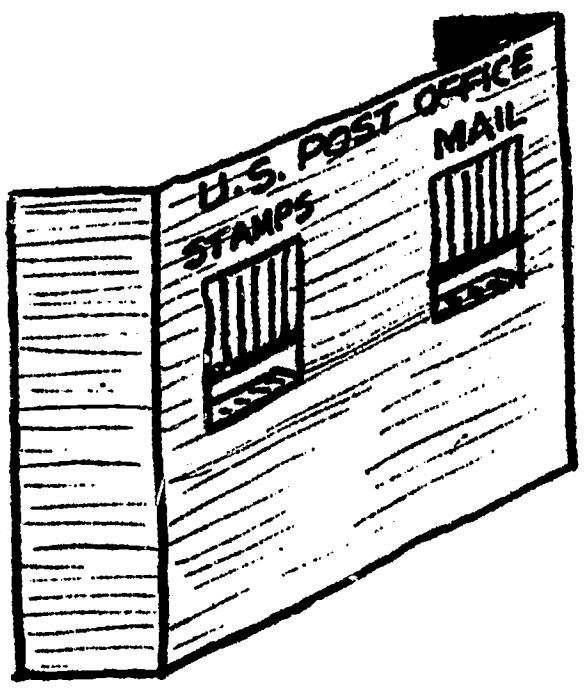


Models of frontier forts, indian villages, old towns. Groups of 5 or 6. Grades 2, 3, 4, 5, 6.

E.I.A. SOCIAL STUDIES SUGGESTIONS

Models of homes in other lands. Show how different homes are needed in different environments.

Groups of 2,3,4,5,6, depending on model chosen. Grades 3,4,5,6.



The Post Office is one of our helpers. Grocery stores, banks, etc. are all neighborhood helpers and child size models can be made of each. Groups of 4,5,6. Grades 1, 2,3.

E.I.A. SOCIAL STUDIES SUGGESTIONS LIST

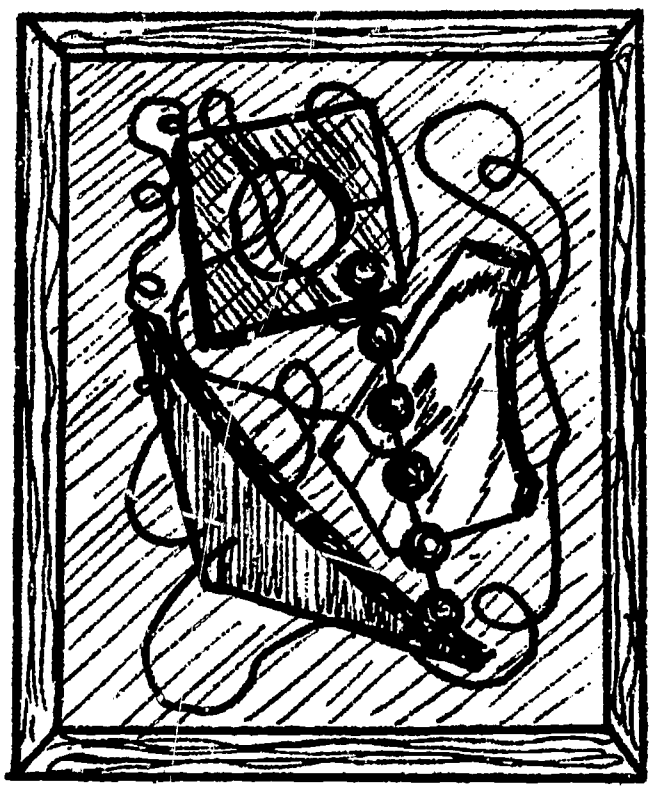
. DISPLAYS of kinds of wood and their uses.
2. MODELS of AIRPORTS-TRAIN STATIONS.
3. Construction of MODEL BRIDGES, ROADS, CANALS.
4. MASS PRODUCE SIMPLE PRODUCTS.
5. RELIEF MAPS
6. PANORAMA of a FARM, showing farm house, barn, silo, fields, etc.
7. TRUCKS: Laundry, Armoured, Tow, Gas, Trailer.
8. PLANES: Jet, Transport, Helicopter.
9. BOATS and SHIPS: Tug, Passenger, Ferry, Barge, Freight, Tanker, Man-o-War, Sailing ship, Aircraft Carrier, Battle Ship, Sail Boat, etc.
0. PARACHUTES
1. Model OIL FIELDS, COAL MINES, LUMBER CAMPS.
2. MODELS of significant inventions such as: The COTTON GIN, STEAM ENGINE, PRINTING PRESS.
3. MODELS of CANAL LOCKS.
4. Make COMMUNITY MAPS.
5. CAST BRICKS of PLASTER, CLAY, CEMENT.

These are only a few of the possibilities.
Have you an idea of your own?
Just drop a note in your consultants mail box.

E.I.A. ART SUGGESTIONS

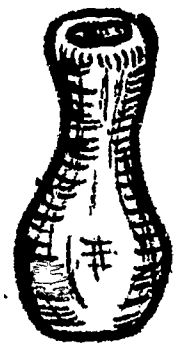
Puppets, marionettes, and simple stages can be designed by the children. Plays can be shown to other classes. Stick puppets - first and second grade. Hand puppets - grades two to six. Marionettes - grade three to six.

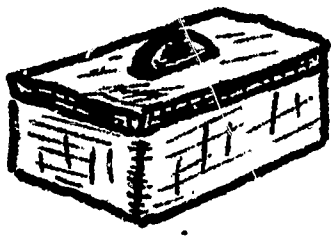
Scrap wood and many other materials can be used to make "3D" pictures. (Collage) Grades 2,3,4,5,6.

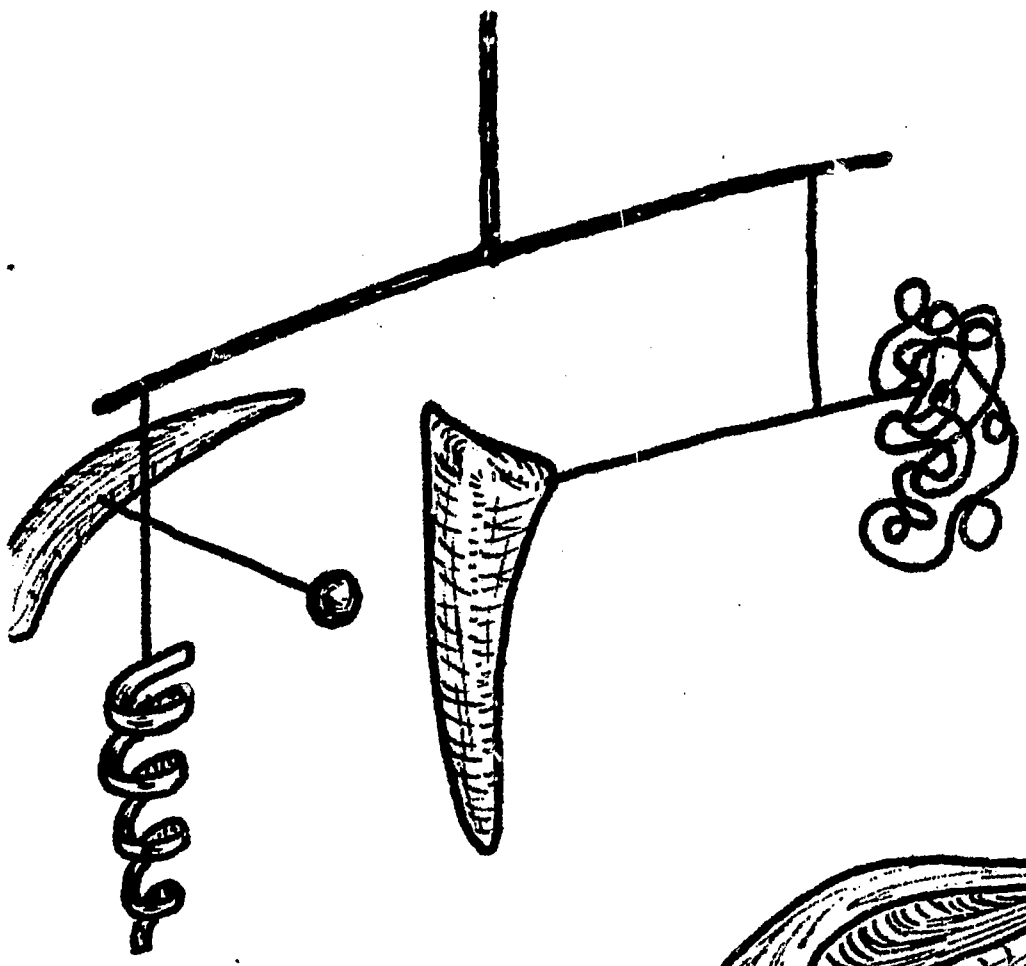


E.I.A. ART SUGGESTIONS

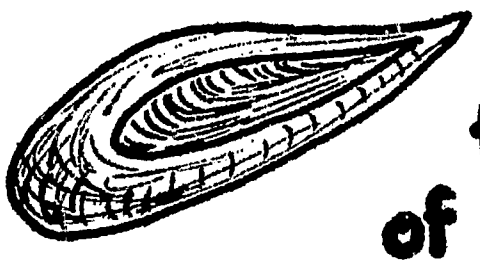
Working with clay; experimenting; free forms making shapes, animals; learning the pinch, coil and slab method of construction; using simple instruments to help shape clay. Grades K through 6.







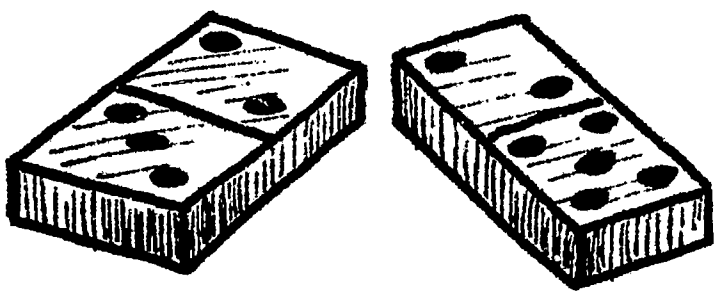
Mobiles made with wire, scrap wood, paper, metal. Grades 5or6.



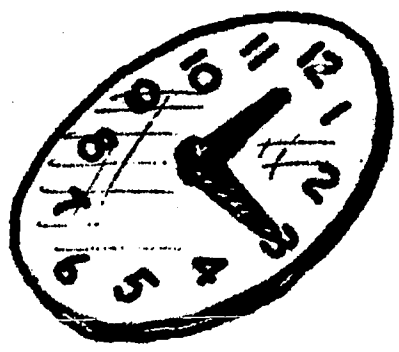
Wooden shapes filed from pieces of scrap wood. Fourth to sixth grade.

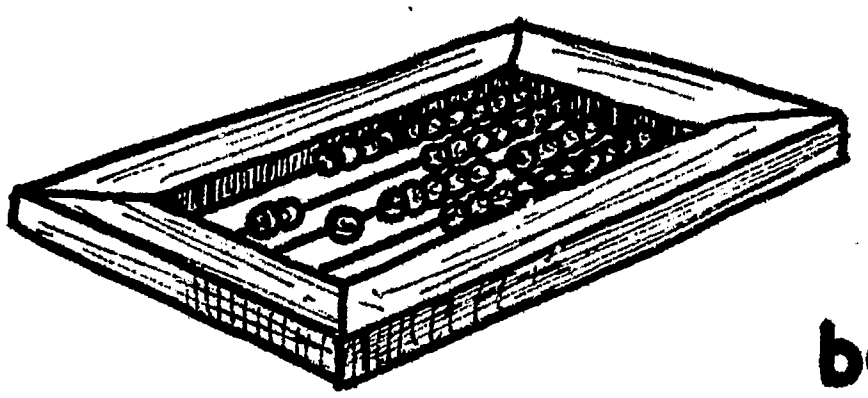
E.I.A. MATHEMATICS SUGGESTIONS

Large size dominoes will help the children learn numbers in groups. Each child can make his own domino. Grades K-1.

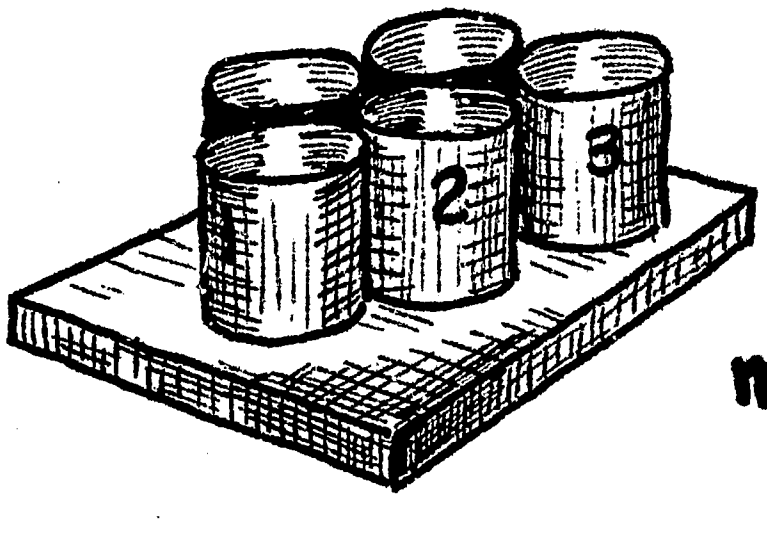


A large clock face with movable hands will help. 2 children. Grades K-3.





A child who has constructed his own abacus might be more interested in how to use it. Individual children. Grades 1-6.



Arithmetic games such as this bean bag toss make adding much more fun. Groups of 2. K-3.

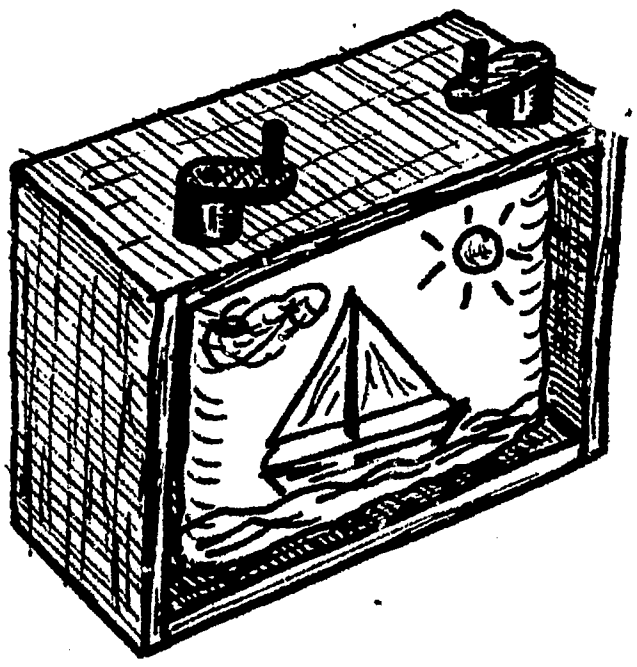
E.I.A. MATHEMATICS SUGGESTIONS LIST

1. Construct CLASSROOM STORE.
2. Build early clocks.
3. Design and use play money printed in shop.
4. Record daily temperatures.
5. Make height measuring devices.
6. Construct BANK WINDOW.
7. Make devices to show: square, circle, triangle, rectangle, cube, etc.
8. Make SCALE drawings of homes, models, etc
9. Prepare Bill of Materials for construction.
10. Make liquid, dry and square measure devices.
11. Construct balance scale and weigh material

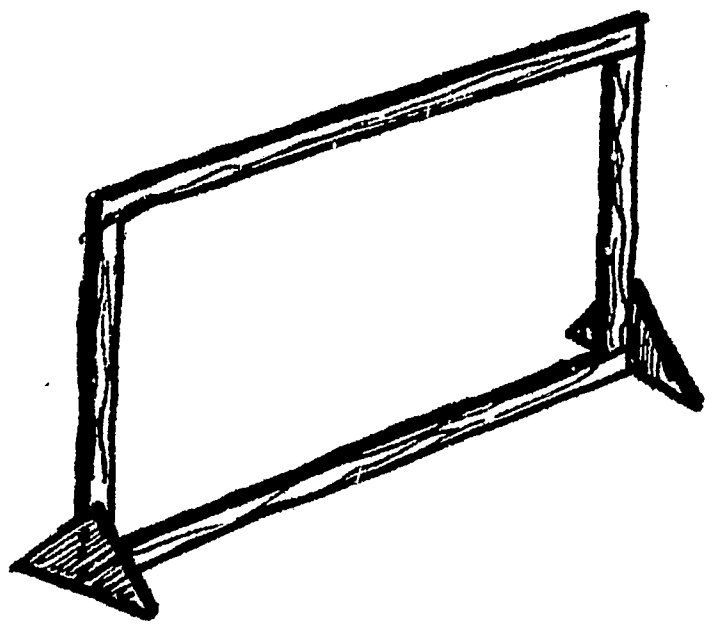
Many of the suggestions on other lists will overlap with mathematics. On any construction work the boys and girls must measure. Use of the ruler is a must. Addition, subtraction, division, multiplication take place. On some work (model homes) scale comes into play. MATH is an integral part of E.I.A.

E.I.A. LANGUAGE ARTS SUGGESTIONS

A "movie" or "television" box makes story telling much more interesting. 2 children. Grades Kindergarten through three.



A child size shadow frame for pantomime. 3 or 4 children. Grades K-6.



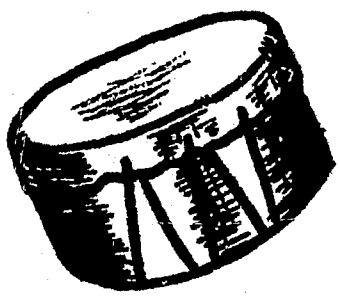
anguage Arts, like math, is part of any ctivity which takes place in the shop. hildren must talk about and describe their deas. They must plan to know what materials ey will use. A completely new vocabulary is arned; hack saw, wood screw, screw eye, etc.

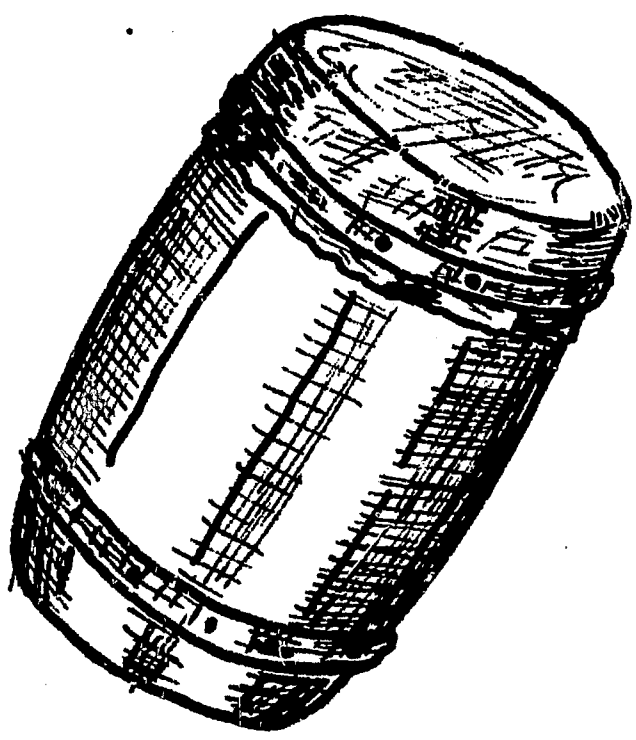
E.I.A. LANGUAGE ARTS SUGGESTION LIST

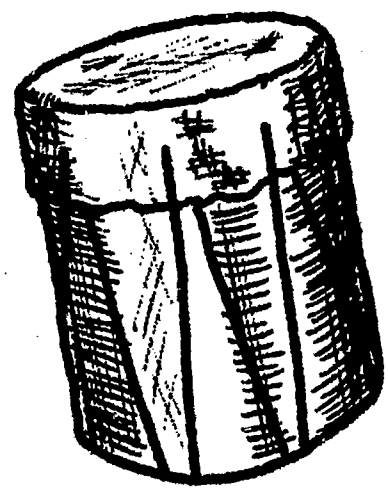
1. Construct reading chart stand.
2. Draw plans of school building and the surrounding area.
3. Introduce research method for project ideas.
4. Construct felt boards or flannelgrams.
5. Make book holders.
6. Make lettered blocks.
7. Bind books.
8. Make furniture for library corner.
9. Make book rests and book marks.
10. Design and make puppets.
11. Make scenery and props for plays.
12. Compile school newspaper.

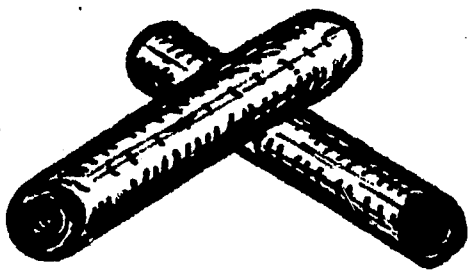
E.I.A. MUSIC SUGGESTIONS

Drums of different shapes and sizes produce varied sounds. Each child constructs his own drum. From grade one to grade six.







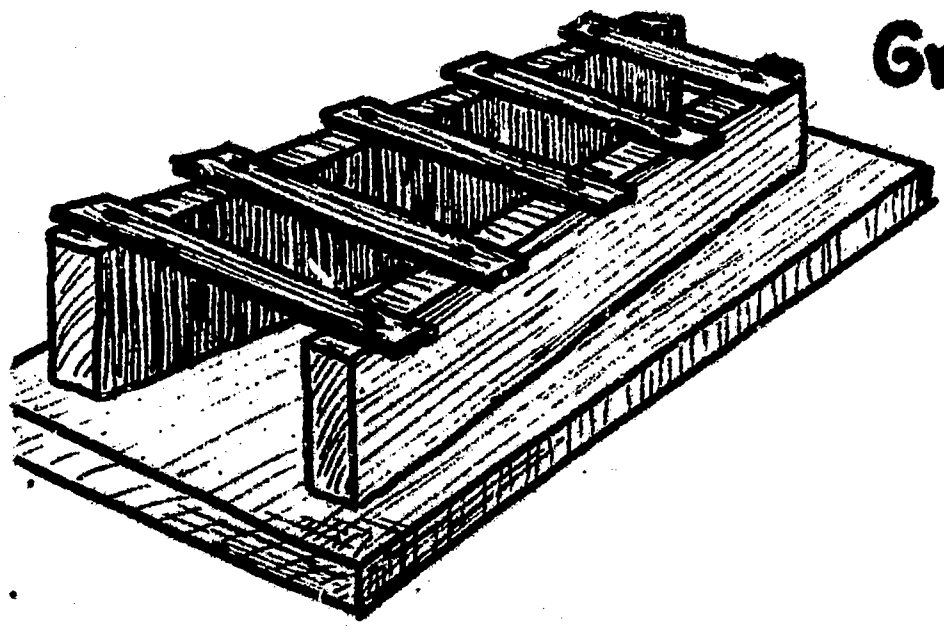


Rhythm sticks are simple to make. One child can make a pair in almost no time. Kindergarten through sixth grade.

E.I.A. MUSIC SUGGESTIONS

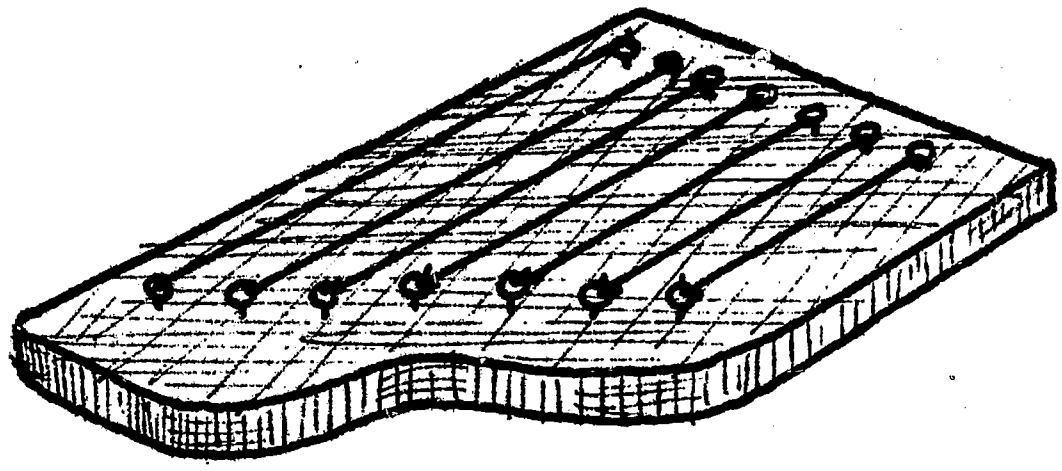
Xylophones made from wood produce sounds different from those constructed of metal.

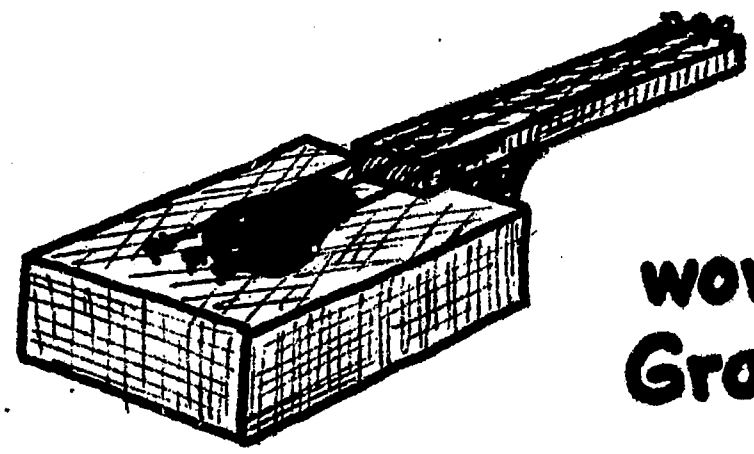
Groups of 2 or 3 children.
Grades 2 through 6.



Bars can be constructed of either wood or metal.

A zither strung with rubber bands makes interesting sounds. One Child. Grades 1 to 6.

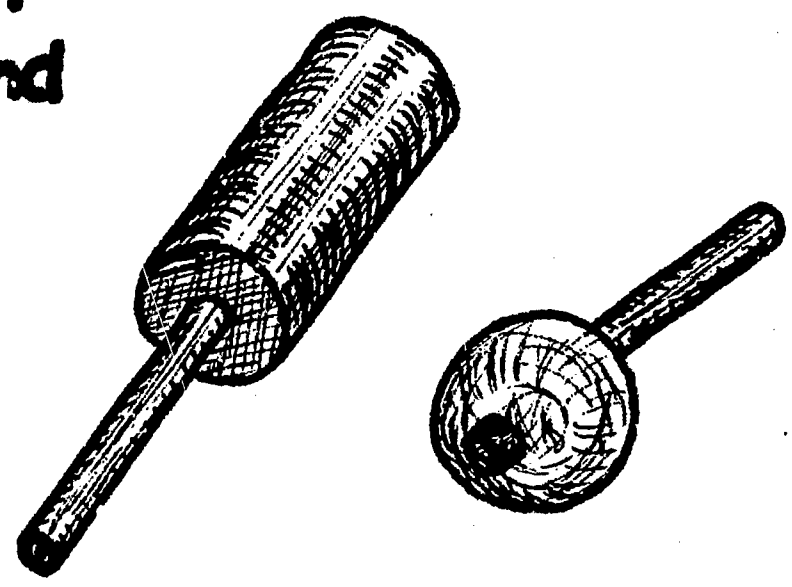


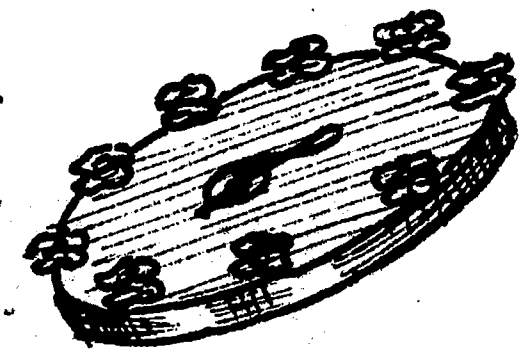


Cigar box banjos really work. One or two children. Grades 2 to 6.

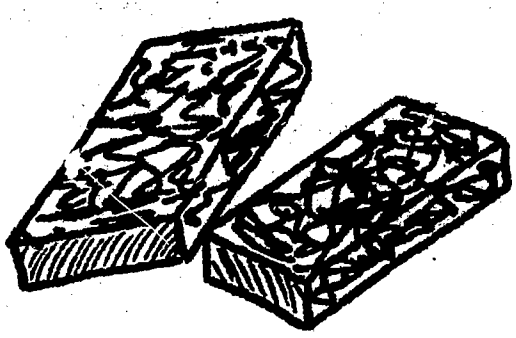
E.I.A. MUSIC SUGGESTIONS

Rattles can be constructed from tin cans or rubber balls. One of each for a hard sound or a soft sound. One child. Grades K to 6.





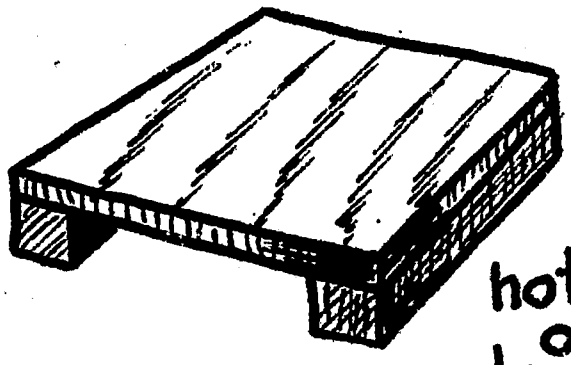
The tambourine makes an interesting instrument. One child. Grades kindergarten through six.



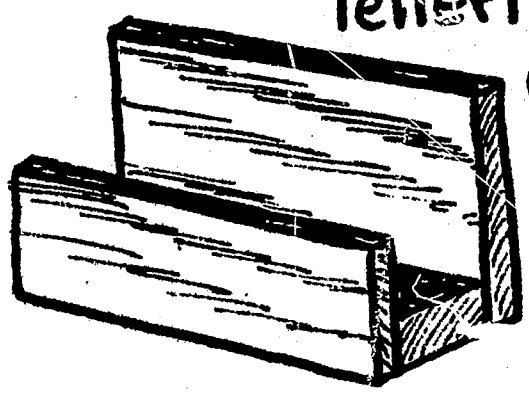
Sandpaper wrapped around a piece of wood will add a swish-swish to your orchestra. 1 child. Grades K to 6.

DON'T KEEP THOSE IDEAS TO YOURSELF. TALK TO YOUR E.I.A. CONSULTANT ABOUT THEM.

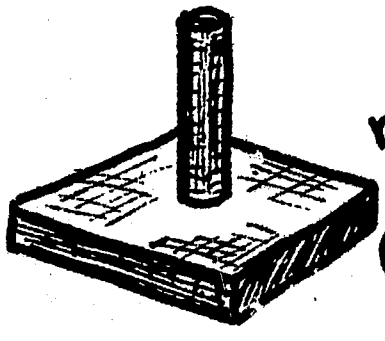
E.I.A. GIFT SUGGESTIONS



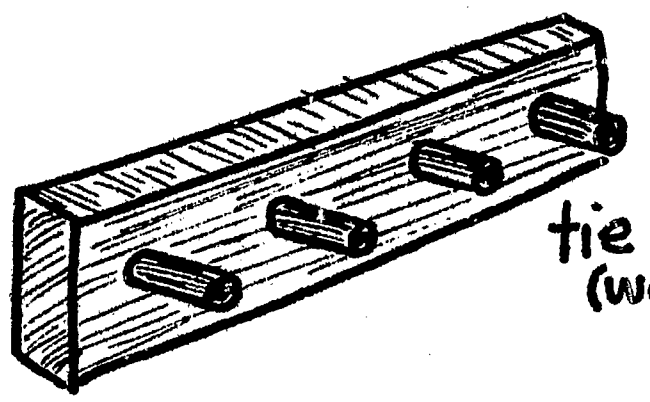
hot plate
or
plant stand
(wood)



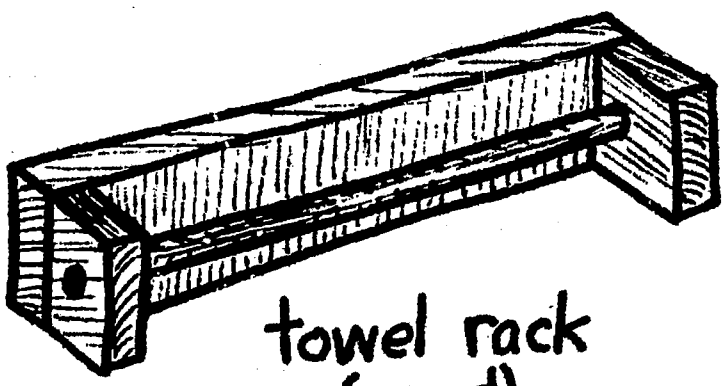
letterholder
(wood)



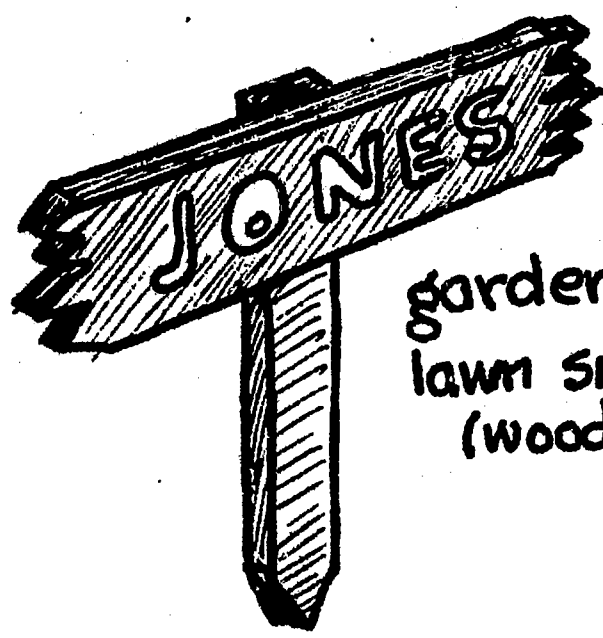
ring
stand
(wood)



tie rack
(wood)



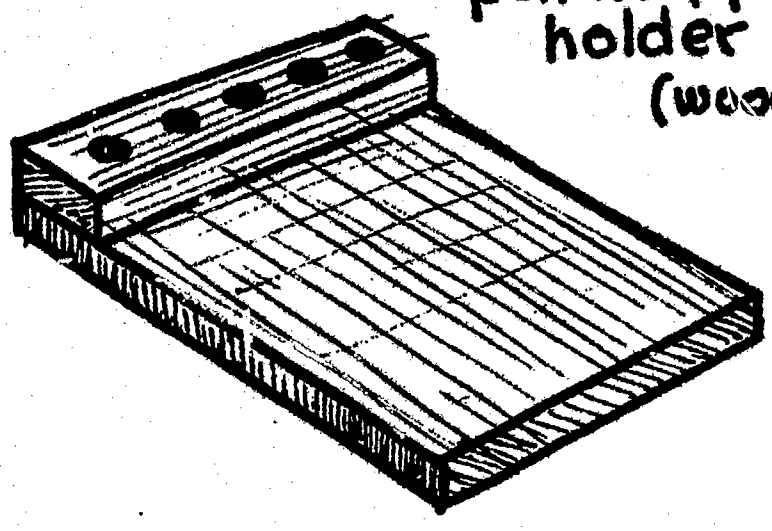
towel rack
(wood)



garden or
lawn sign
(wood)

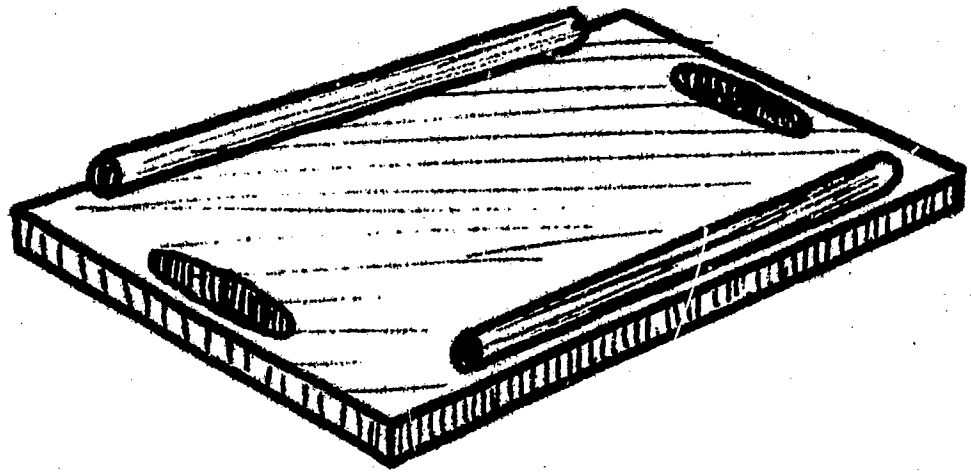
E.I.A. GIFT SUGGESTIONS

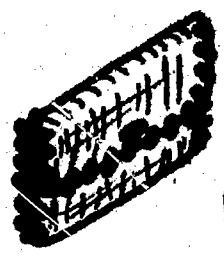
pencil & pad holder (wood)



comb case (leather)

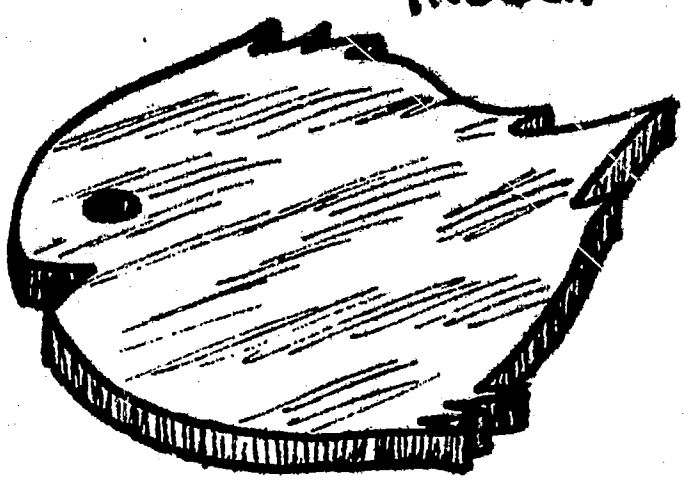
serving tray (wood)





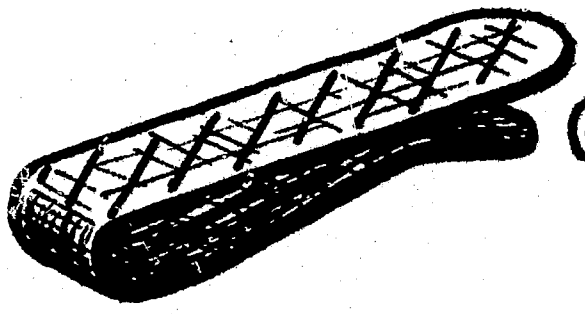
key cases or change purse (leather)

cutting board (wood)

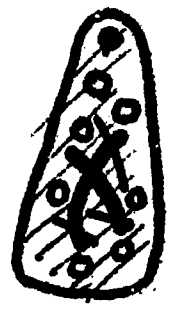


WE WORK WITH MANY KINDS OF MATERIALS.

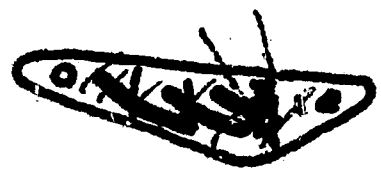
E.I.A. GIFT SUGGESTIONS



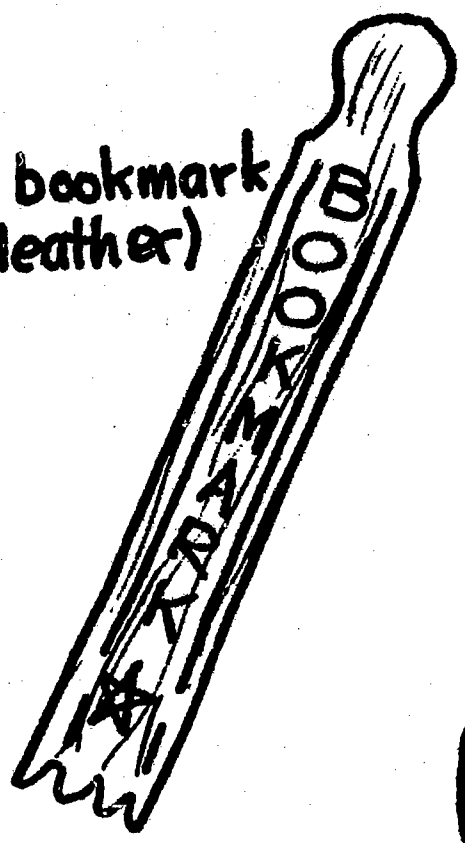
tie clip (copper)



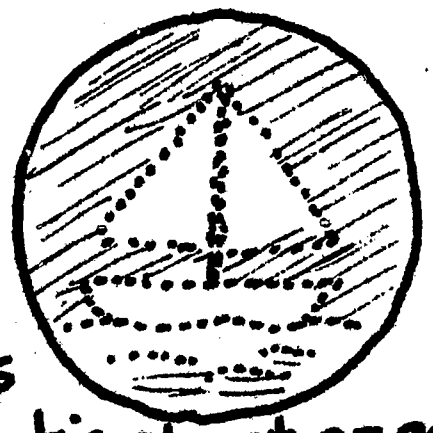
pins, tie clips, ear rings, pendants. (copper enamel)



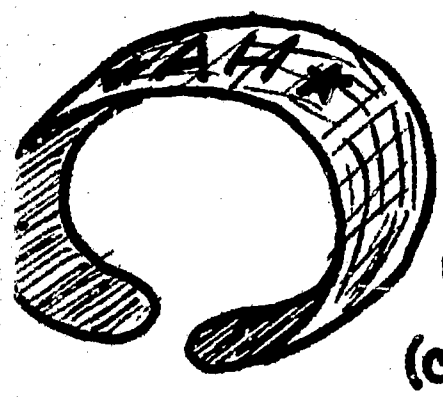
copper enameling is a process of melting and fusing different colored glass onto a copper piece or shape. very attractive.



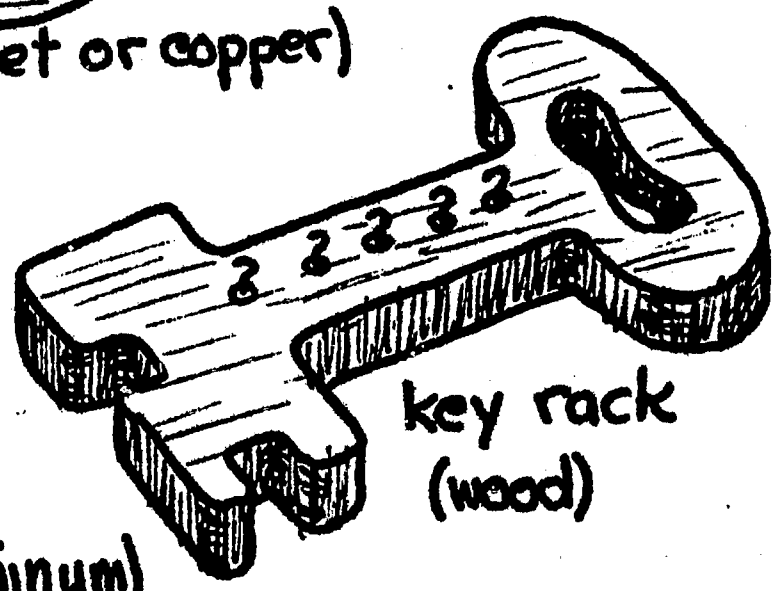
bookmark (leather)



coasters (leather, tin sheet or copper)



bracelet (copper or aluminum)



key rack (wood)