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The Montessori Concept of Mathematics
(An Article Written For Parents)
 Etymology Research

Alan Temple

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Maureen Peifer

Austin Montessori School

Donna Pesoli

?

Geometry Commands (from training and original)

Phil Gang

X

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Steve Callender

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Jim Fitzpatrick

The Montessori Concept of Mathematics

By D. Alan Temple

For Maria Montessori, mathematics was something magic, not something that was to be taught dryly in school. It was the structure of the imagination, the human mathematical mind, and, as with the other subjects, it was to capture the interest of the child and enthuse him. It was to be an aid to the natural development of the child. This development is based on the process of the child building and creating himself in order to be better adapted to the environment.

Montessori discovered two very important human characteristics necessary for the development of the mathematical mind -- order and exactness. These she built as foundations of her pre-school program so that they would become very natural for the child.

But the present level of technology is making it increasingly difficult for children to attain the kind of adaptation to the environment that Montessori talked about. Never before have the "academic" demands been so great on children. Never has the need for successful teaching techniques been so great, yet schools all over the country are failing. Is mathematics so intricate, so difficult, so horrible to the human mind that children must be forced to learn it? Is it necessary for them to spend hour after hour working problem after problem by rote trying to memorize thousands of facts? Can mathematics be taught to children so they not only learn it but also enjoy it?

I believe it can. And the answer lies partly in the word "teach". For seventy years, children in Montessori children's houses and elementary schools have been enjoying mathematics because there has been little teaching. The teacher has spent hours and hours carefully preparing the environment so that the exercises there are complete, are ordered, and are exact. These materials are the keys for the children, but they are not taught. They are discovered. The material, which is so beautiful, so appealing, is never used as an end in itself. It is tied to the needs of the child. It allows the children to do, to experience, to relate. The emphasis is not on the result, the calculation, but on the concept. The emphasis is on the concrete rather than the rule, the abstract. By combining the expectations of orderliness and exactness with the manipulation of the material and the emphasis on the concept, the children discover the keys to mathematics. (The orderliness and exactness is the self-discipline expected in the classroom which leads to constructive activity, and the manipulation and exploration of the materials is the creativity which leads to discovery and internalization of the concept.) Each concept becomes a personal conquest of the child, and, therefore, a part of him.

In order to approach mathematics from the point of departure of key concepts, we look back in history to the path that man has taken. The origin of math was not abstract. It stemmed from a practical need. The Egyptians built the pyramids without a system of geometry, and the Romans carried on a highly civilized society without the use of a decimal system.

The need for math began with possessions. When early man settled into the agricultural life and began to own property and livestock, the need to count arose. He could count to himself by using a one-to-one correspondence, but to make his claim known to others, symbols were

needed, first verbal and later written. These symbols, far from being abstract, were stylized pictures of objects called pictographs. In early Egypt, for example, the overflowing of the Nile every year brought rich new topsoil to the farms, but wiped out all traces of boundaries. This meant that if a farmer was to re-establish his claim to a plot, a basic system of measurement was needed. A chain was used, and in time, a 100 chain link became standard. After more time, a symbol for the number one hundred evolved, and it was a link of chain. Legend has it that there were one thousand lily pads in the Nile. In time the symbol for one thousand was a lily pad. A drawing of a tadpole came to mean ten thousand. This shows the ability of man to progress, over time, from the concrete to the abstract. The symbol for one hundred was exact, tangible, yet one would doubt that the tadpoles in the river were ever counted. Everyone knew it was too many to count, and such was the number ten thousand in those days.

Different people over the world worked with numbers in different ways, each developing a different base. Base two (two hands), base five (fingers on one hand), base 12 (counting the finger joints with the thumb), and even base 60 (based by the Babylonians on observations of the stars) were used, but by far the most common was the base of ten. But all of these early number systems were inferior because they lacked one important thing. It was the discovery of this one thing that changed a number system to a foundation of mathematics. It was to the mathematical mind what the wheel was to technology (and strangely, the same shape!) It was the discovery of the zero. Until about 800 A.D., it was not known. All numbers (like Roman numerals) were limited to the numerals that were agreed upon. There was no way to keep building using the same pattern. Strangely enough, it is the zero that brings to mind infinity by allowing us to write higher and higher numbers. It is the zero in the number system, that stands for nothing, that allows the system of concrete representations to expand outside the realm of experience, into infinite imaginary structures.

The zero was discovered in India shortly after the discovery of fractions and square roots. The Indians carried their system of numeration to Bagdad while trading. The Moslems absorbed the idea, changed the symbol from a dot to a circle, and brought it, over time, to Europe. This system is now known as the Arabic numerals.

Our task as teachers in a Montessori classroom is to structure the environment for discovery, and then to present to the child the idea of Man's discoveries through the ages so that he, like the Arabs, can absorb the concept, internalize it, change and adapt it, and then spread it in his developing world. The child not only learns, but begins to appreciate the heritage of man. Think how difficult a long multiplication problem was in Roman numerals with no zero. The dreams of the past have made life better today. And it is the child's dreams now that will shape the future. This is the challenge for a child in a dynamic education.

But in our task, we must realize that the child must make the conquest himself. He must see its importance. We must resist the temptation of handing the zero or the wheel to the child so that he may sooner create a theorem of Pythagoras or a cart. A child learns at any moment, not what is most logical to us, but what is most

logical to him, based on his experiences. He will not always take the path that we, who know the end result, will take. But the child will create himself and his knowledge based on his interpretations and structure of reality. He must fit each new concept into his own mind.

And so we say, the child must walk for himself the path that all men before him have walked, through the countless ages of man, living and learning and appreciating their accomplishments.

What is this walk that Man has made in tens of thousands of years that the child will make in a short few? How has he made it? From what point did he start and where did he end up?

1. Man first experienced the world. He lived. Set on the surface of the earth as the other animals, yet with the potential to understand and to create, Man first experienced and learned what the environment had to offer. He used all of his senses to take in the impressions around him. This led to the second phase of his walk.

2. After absorbing his environment, Man used his brain to comprehend, to understand. Through his understanding he gained the ability to "make things happen", to change the world, constantly experimenting and increasing his knowledge. He began to create things solely for the purpose of "seeing what would happen" rather than simply satisfying an immediate need. This experimentation born of self-confidence led him to the final stage.

3. Man's experiments, his ability to relate phenomenon, to think new thoughts, to make new associations, led him to the discovery of rules, of abstract concepts that were basic to the Universe. These could be used and generalized to explain not only what he had seen, but also what he had never seen. Only at this point was man capable of understanding what was not before him, what was purely imaginary.

The child too must take this path, which leads from the sensorial experiences of his pre-school years to the acquisition of the culture of Man during his elementary years. It is this direction taken, coupled with the discipline, that leads to the development of the mathematical mind in the child. And it is this mathematical mind that will give him the tools to go out in today's technology and not only survive, but to understand and to create. This is what the Montessori math program is all about. It is a lot more than the memorization of the tables and the correct answer on a test. This is what we mean when we say it is an aid to the development of the child, an aid to life.

So the basic idea of the material and Montessori's contribution to education is this: that the child, furnished with a rich environment in which he is encouraged to explore, which is attractive enough so that he makes use of it, simple enough so that he can succeed with it, abstract enough so that it presents models of key mathematical structures, and structured enough so that he can correct himself when he wanders off the path -- that the child can discover these invariable mathematical principles that it took ages for men to discover. He can discover it himself in this environment. And it is this self-discovery that allows the child to adapt to the world of today; that allows him to experience the joy of creating and building through hard but rewarding, conscious effort, the race of men that will be tomorrow, and the technology that will serve them.

ETYMOLOGY RESEARCH

by

Maureen Peifer

Preliminary Notes:

1. Most of my references are from a delightful and informative book by Issac Asimov, Words of Science and the History Behind Them. I highly recommend having a copy for yourself and your classroom. It is published by The New American Library, Signet Reference Books, PO Box #2310, Grand Central Station, New York, New York 10017. Cost .95. It's a deal.
2. The following abbreviations are used:
LAT Latin Gr Greek A.S. Anglo-Saxon
Fr from FR French SP Spanish
If no foreign word is given the word is a direct translation from the language indicated.
3. The etymologies are divided as much as possible according to the subject area in which they were given in lectures. They are alphabetized within each area for convenient reference.

I BOTANY - BIOLOGY

ALGAE LAT - seaweed
AMPHIBIAN GR - Amphi, on both sides of; Bios life
ANGIOSPERM GR - Angion, vessel; Sperma, seed
ANIMAL LAT - Anima, breath
ANTHER LAT - Pollen
ANTHOCYANIN (a blue pigment in flowers) GR - Anthos, flower; Kyanos, blue
ASTEROIDEA (order) GR - aster, star; Oides, in the form of
BACTERIA GR - Bakterion, a little rod
BIOLOGY GR - Bios, life; Logos, word
BOTANY GR - Botane, pasture, herb, plant
BRYOPHYTA GR - Bryon, moss; Phyta, plant
CAPILLARITY LAT - Capillus, hair
CARNIVORE LAT - Carnis, meat; Vorare, to eat, devour
CELL LAT - Cella, a small room
CENTIPEDE LAT - Centum, one hundred; GR podes, foot
CETACEAN (order) GR - Ketos, whale
CHIROPTERA (order) GR - Cheir, hand; Pteryx, wing
CHLOROPHYLL GR - Chloros, green; Phyllon, leaf
CILIA LAT - eyelashes
COCOON FR - Cocoon, little shell
COLEOPTERA (order) GR - kolean, sheath; pteron, wing
CONIFER LAT - conus, cone; ferre, to bear or carry
COTYLEDON GR - kotyle, cup shaped or hollow
CYRPTOGAM GR - kryptos, hidden; gamos, marriage
DECIDUOUS LAT - de, down; Cadere, to fall
DICOTYLEDON GR - di, twice; kotyle, cup or hollow (most flowers)
DIPTERA (order) GR - di, twice; pteron, wing
ECHINODERMATA GR - chinos, spiny; derma, skin
ELEPHANT GR - elephas, derived from Phoenician alawwa, yellow

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Page Number Two

- FLAGELLA** LAT - Whips
- FLAVONES** (yellow pigment in flowers) LAT - flavus, yellow
- FRUGIVORES** LAT - Frux, fruit; Vorare, to eat
- FUNGUS** LAT - Mushroom
- GYMNOSPERM** GR - Gymnos, naked; Spi ma, seed
- HERBIVORE** LAT - herba, grass; vorare, to eat
- HIPPOTAMUS** GR - hippos, horse; potomas, river
- INSECTA** (class) LAT - in, into; secare, to cut
(p.p. insectum) The body is cut into 3 main regions
- INSECTIVORE** - insect, vorare, to eat or devour
- LARVA** LAT - ghost (just as a ghost originates from a human yet looks different, so does a larva originate from an insect)
- LEMUR** LAT - Lemures, spirits who prowl at night These monkeys live in Madagascar and prowl at night
- LEPIDOPTERA** (order) GR - lepis, scale; pteron, wing
- LICHEN** GR - leichein, to lick The Greeks thought lichen looked like fire licking upward along a tree trunk
- KANGAROO** - Australian native for "What are you saying?" In 1770, Capt. James Cook landed in Australia. He saw a strange leaping animal and asked natives, "What's that?". They answered, "kangaroo?".
- MAMMAL** LAT - mammae, milk forming glands
- MARSUPIAL** (order) LAT - marsupium, pouch
- MONOTREME** (order) GR - monos, solitary; tremas, opening. Egg-laying mammals which have 1 opening for both wastes and eggs.
- NOTOCHORD** GR - notos, back; chorde, string. The cartilage chord which exists in all Chordates and shows the beginnings of an internal skeleton.
- NUCLEUS** LAT - nus; nucis, nut. A little nut.
- NYMPH** GR - Mythological girls on the point of adulthood; an insect on the point of adulthood.
- OCTOPUS** LAT, GR - octo, 8; paus, foot
- OMNIVORE** LAT - omnis, all; vorare, to eat or devour
- ORGANISM** GR - organon, an instrument that does work, now any living being.
* organic, a compound containing carbon atoms.
- OVULE, OVARY** LAT - ovum, egg; ovulum, little egg
- PACKYDERM** GR - pachus thick; derma, skin
- PARAMECIUM** GR - paramekes, oblong
- PISCES** LAT - fish A.S. fisc
- PHYLUM** GR - phylon, tribe
- PLACENTA** LAT - flat cake The organ does resemble one.
- PLATYPUS** GR - platys, broad; pous, foot
- PROBOSCIS** (Proboscides) GR - pro, before; bosthekai, to graze Elephants and other animals with a proboscis graze before themselves.
- PROTOPLASM** GR - protos, first; plasmo, a molded form. The first form into which an animal is molded.

ETYMOLOGY RESEARCH

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PTERIDOPHYTA (division) GR - pteron, feather; phyton, plant. Feather-like plants e.g. fern.

PUPA (an insect stage) LAT - doll or puppet. This stage shows no life.

REPTILE LAT - reptere, to creep

RHINOCEROS GR - Rhinokeros, rhis, nose; keras, horn.

SKELTON GR - Skeletos, dried up.

SPERMATOPHYTE GR - sperma-seeds; phyte, plant

SYMMETRY GR - symi with; metron, measure

TELEOSTEI (order) GR - teleos, complete; osteon, bone

THALLOPHYTA GR - thallos, shoots; phyton, plant

UNGULATE (order) LAT - ungula, little fingernail

VERTEBRATE LAT - vertare, to turn (allowing the head to turn)

*OSSIFY LAT - os, bone; ficafe, to make

II GEOGRAPHY

ALTITUDE LAT - altus, high

ANTHRACITE (coal) GR - anthrax, coal. A very hard coal formed during the Carboniferous.

ARTIC GR - arktos, bear. This was the region of the earth over which the Greeks saw the Great Bear, or Big Dipper which appears over the northern hemisphere most prominently. Arcuturus is the brightest star in the Great Bear.

ANTARTIC GR - anti, against

ASTEROID GR - aster, star; oides, in the form of

ATMOSPHERE GR - atmos, vapor; sphairos, ball

AURORA BOREALIS LAT - aurea, the direction of dawn; boreas, the north wind. Northern dawn.

AURORA AUSTRALIS LAT - aurora; auster, the south wind. Southern dawn.

AXIS LAT - hub or axle, that about which a wheel turns.

BARYSPHERE GR - baros, heavy; sphairos, ball

BITUMINOUS (soft coal) LAT - bitumen, a tarry substance.

CANYON Pr, Lat - canna, a reed. A canyon is long and hollow like a reed.

CENTRIFUGAL force LAT - centrum, center; fugere, to flee

CENTRIPETAL force LAT - centrum, center; petere, to move toward

CHALK LAT - calx, calcis, stone

CIRRUS LAT - a curl of hair

CLOUD AS - clud, any round mass

COMET GR - kometes, long hair. The greeks saw these stars as distraught women fleeing with long hair streaming out behind. The Romans called them "stellae cometae" hairy stars.

CONTINENT LAT - continens, continuous (land)

CONSTELLATION LAT - con, together; stella, star

CRATER GR - krater, a mixing bowl for water and wine

CUMULUS LAT - heap

CYCLONE GR - kyklos, circle

EAST - Sanskrit-usos meaning shining adapted by GR to eos, dawn.

- LAT - oriens, rising (orient)

EQUATOR LAT -aequator, one who equalizes

EQUINOX LAT -aequus, equal; nox, night

ETYMOLOGY RESEARCH

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EROSION LAT - e, away; roder, to eat or gnaw
FOG - DANISH - Spray or driving snow
GALAXY GR - galaxins FR - gala, milk. The Greeks thought it looked like a belt of milk, in the sky. The Romans called it Via Lactea, Road of Milk.
GEOGRAPHY GR - geos, earth; graphein, to write
GRANITE LAT - gramum, grain. Granite is a grained rock formed of visible grains of mica, feldspar and quartz.
GRAVITY LAT - gravis, heavy
HURRICANE, CARRIBEAN INDIAN - hurukan, an evil spirit
HYDROSPHERE GR - hydor, water; sphairos, ball
HYDROGEN GR - hydor, water; genes, born of
IGNEOUS LAT - ignis, fire
ISLAND LAT - insula, island, FR - in, in; salo, salt
ISTHMUS GR - isthmos, a narrow passage
LATITUDE LAT - latus, side. Lines which lie on either side of the equator
LAVA ITALIAN - lavare, to wash. The people of Naples felt that the lava washed the streets with fire.
LITHOSPHERE GR - lithos, stone; sphairos, ball
MAGMA GR - dough FR - massein, to knead. Rock softened by heat.
MARBLE GR - marmaros, sparkling stone
MICA LAT - micare, to shine. A stone which splits into shiny sheets.
MIST AS - darkness
NEBULA LAT - clouds FR, GR - nephele, clouds
NIMBUS LAT - rain clouds
OXYGEN GR - oxys, sharp; genes, born of. Originally thought to be the element in acids which produced a sharp taste.
PLANET GR - Planates, wander
SEDIMENT LAT - sedere, (pp) to sit
STRATOSPHERE LAT - stratum (pp) to spread GR - sphairos, ball
SEA LAT - salo, salt
TIDE AS - time, So regular you could tell time by them.
TORNADO SP - return (the funnel returns to the same spot)
TROPIC GR - tropikas, to turn (where the sun seemed to turn and reverse)
TROPOSPHERE GR - tropos, change; sphere, ball
TYPHOON Arabic, Tufan; GR - Typhon, the evil giant who battles Zeus
URSA MAJOR LAT - urus, bear; major, larger
VOLCANO LAT - Vulcan, god of fire
ZEPHYR GR - zephyros, west wind

GEOMETRY AND MATHEMATICS

ABACUS LAT - abax, aboard on which one solves problems
ACUTE LAT - acuere, to sharpen
ANGLE LAT - angulus, corner
ARITHMETIC GR - arithmus, number
BARYCENTER GR - baros, weight; kentron, center
CHORD GR - chorde, the innards of an animal, used as string on an instrument
CIRCLE LAT - circulus, a little ring
CIRCUMFERENCE LAT - circum-around; fene, to carry

ETYMOLOGY RESEARCH

Page Number Five

COMPLEMENT LAT - complere, to fill up

COMPOSITE NUMBER LAT - com, together; ponere, position, place, put all the numbers which can be factored by putting together small numbers

DIAGONAL GR - dia, through; gonia, angle

DIAMETER GR - dia, through; meter, to measure

ELLIPSE GR - ellipses, deficient An ellipse is a deficient circle.

EPICYCLOID GR - epi, upon; kulikos, circular

FACTOR LAT - facere, to make

FRACTION LAT - fractus, broken

GEOMETRY GR - ge-earth; metron, measure

HORIZONTAL GR - horizo, bound; (binds earth/sea or earth/sky)

HYPOTENEUSE GR - hypo, under; teinen, to stretch

LINE LAT - linea, flax (flax was stretched to make a straight line)

MATHEMATICS GR - mathein, to learn

OBTUSE LAT - ob, against; tundere, to strike (PP obtusus) If you strike against a sharp edge, you blunt or dull it and make it obtuse.

OBLIQUE LAT - ob, before; liquis, crooked

PARALLEL GR - para, beside; allelon, of one another.

PARALLELOGRAM GR - gramme, line

PERIMETER GR - peri, around; metron, measure

PERPENDICULAR LAT - per, through; pendere, to hang

PLANE LAT - planus, flat

POLYGON GR - poly, many; gonia, angles

PRIME NUMBER LAT - primus, first; humerus, number

QUADRILATERAL LAT - quattour, 4; latus, side

RADIUS LAT - spoke of a wheel, ray

RATIONAL (number) LAT - ratio, reason

*REFLEX LAT - re, back; flectere, to bend. One arm of the angle bends back to (meet the other)

RIGHT LAT - rectus, upright.

SQUARE LAT - out of quattour, 4 changed to; FR - esquarre and thus to square.

SECTION, SECANT LAT - secare, to cut

SOLID LAT - solidus, dense

STRAIGHT AS - streccan, stretch

TANGENT LAT - tangere, to touch

TRIANGLE LAT - tri, three; gonia, angle

VERTEX, VERTICAL LAT - vertere, to turn; vertex, crown of the head. Origin Center of a whirlpool, came to mean the place on top of the head about which the hair turned or the top. Now top of anything.

*RELATIVE LAT - re, back; latus, carried

V HISTORY

ERAS

ARCHAIZOIC GR - archaios, ancient; zoon, animal

CENOZOIC GR - kainos, new; zoon, animal

MESOZOIC GR - mesos, mikkle; zoon, animal

PALEOZOIC GR - palaios, old; zoon, animal

PROTARZOIC GR - proteros, earlier; zoon, animal

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ERAS continued

Eocene GR - eos, dawn; Kainos, new
Holocene GR - holos, whole; Kainos, new
Miocene GR - melon, less; Kainos, new
Oligocene GR - oligos, few; Kainos, new
Pleistocene GR - pleistos, most; Kainos, new
Pliocene GR - pleion, more; Kainos, new
Carboniferous LAT - carbos, coal; ferre, to carry or bear

ANIMALS AND FOSSILS

Dinosaur GR - deinos, terrible; sauros, lizard
Fossil LAT - fossilis from, fodere, to dig
Homo Neanderthalensis (Neanderthal man) LAT - homo, man; The bones were found
in the Thaal valley of the Neander River in Germany.
Homo Sapien LAT - homo, man; sapien, wise
Pitheca Nthropus (Java Man) GR - pithekas, ape; anthropos, man
Pterodactyl GR - pteron, wing; dactylos, finger
Pteranodon GR - pteron, wing; anodon, without teeth
Pterosaur GR - pteron, wing; sauros, lizard
Stegosaurus GR - stegos, roof; sauros, lizard
Triceratops GR - trikeratos, 3 horned (tri, three keratein, horn)

MISCELLANEOUS

Canendar LAT - calends, to proclaim. The priests in Rome proclaimed the
beginning of the new month on the first appearance of the new
moon's crescent.
Evolution LAT - e, out; volvere, to roll
Week AS - change. (In the stages of the moon)

IV LANGUAGE

Adjective LAT - ad, to; jacere, to throw. The noun and adjective are thrown
together.
Adverb LAT - ad, to; verbum, word
Cuneiform LAT - cuneus, wedge; forma, form
Grammar GR - gramma, letter or graphein, to write
Hieroglyphic GR - hieroglyphika from hieros, sacred; glyphein, to carve
Ideograph GR - idea, form shape or resemblance to reality; graphein, to write.
e.g. the Chinese alphabet is based on ideographs
Interjection LAT - inter, between; jacere, to throw
Noun LAT - nomen, name
Pronoun LAT - pro, for; the noun.
Verb LAT - verbum, the word

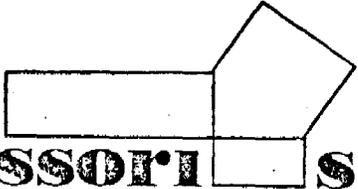
HOW TO MAKE A CANVAS TIME LINE

By: Dan Stead

Materials: Black water base acrylic paint (one trade name is Accent Craft Color #564 soft black); pen with nib; nine yards of 1/2 in. red ribbon; a strip of gold cloth; off white polyester thread; small paint brushes (cheap red sable brushes are good); enough off-white canvas material to form one long piece eight yards long and seven inches wide before hemming; one roll of wide masking tape.

Presentation:

1. Pre-shrink both the canvas and the ribbon. Iron them as smooth as possible. This is not an easy task.
2. Cutting the canvas: make a deep cut with scissors and then tear abruptly. The tear will be precise.
3. When joining the desired sections lengthwise, put the right sides together so that the seams won't show. A real problem with joining the sections is that the ends may not be perfectly square cut. To insure straightness, match the sides rather than the ends.
4. Now sew a 1/4 in. hem the length of the Time Line on both sides. In order to guarantee a constant width, measure at close interval with a ruler. When you have finished with this first hemming, do another second hem that will completely enclose the frayed edge. This is time consuming but very necessary.
5. Pin the length of red ribbon to the center of the Time Line. Use a ruler to keep it in the center. After pinning, sew close stitches on both sides of the ribbon.
6. Mark centuries and decades, drawing the vertical lines with a soft lead pencil. Now place tape on either side of the century lines. Paint the enclosed area black. The paint dries quickly. Now do the decade lines using the pen a nib and the paint as ink.
7. Use soft lead pencil to make number markings as well as the BC and AD designations. With the nib just trace over with black paint.
8. Sew gold strip at juncture of BC and AD markings. FINISHED.



**austin
montessori school**

DONNA PESOLI
DIRECTOR

400 WEST ALPINE ROAD / AUSTIN, TEXAS 78704 / 512-442-3152
OFFICE AND ELEMENTARY LEVEL
4108 AVENUE H AND 2904 JONES ROAD
PRIMARY LEVELS

The Administration

The school is directed by an experienced Montessori teacher who enjoys both supporting the development of a new teacher and learning from one who has experience. Three advantages are offered the new Montessori teacher by the strong direction of the school's administration: contact with other teachers who have worked through many problems successfully, the security of receiving direction and support in a truly Montessori situation, and a certain freedom from parental pressure of a non-Montessori nature. Of course, an experienced teacher, or one who needed little directing or help, would certainly have the freedom to direct his or her class in a way consistent with the philosophy of AMI without interference from the administration. We have not experienced tensions in this area.

The Teachers

Our preschool teachers this year studied in Toronto, Palo Alto, Philadelphia, and Washington, D.C. Our elementary teachers were both trained in Bergamo. One was the teacher of the demonstration class at the Institute in Mexico City. Each teacher has an aide contracted for 9 months who has read books by and about the work of Maria Montessori and who attends regular staff development days and staff meetings to increase her understanding of the Montessori classroom. Many of our aides go on to AMI training centers to become certified.

Our school has annual AMI supervision: our supervisor comes for at least a week each year to observe every class in the school and to hold a Saturday workshop with the teachers. There is a real atmosphere of mutual support and help among the teachers who want to develop a school which reflects the high standards of AMI and who continue their own self-development so that, drawing from their own inner resources, they may be able to offer the children an increasingly richer environment and an atmosphere in the classroom that is more and more sensitive to the needs of each child for growth.

There are some other good AMI schools in Texas. Our teachers attend workshops each summer. They also have time off during the year to attend NAMTA regional workshops and two days off each semester to observe at different schools.

Other Staff and Parents

We feel that it is important for the teacher to be able to devote herself as much as possible to teaching and not to work that is extraneous to her involvement with the children. We have a secretary who orders supplies, does the school shopping, and sees that it is distributed. She also takes care of typing and duplicating letters and notices to parents. Through our Parental Help program, parents who have the time help with materials (by cutting paper and laminated items and repairing broken equipment), collecting objects and pictures for classroom use, doing the school laundry, editing the monthly newsletter, helping with the library, and other activities. The parents are presently working on a project to provide the school with a scholarship fund. We have a roller-type laminator and a material-maker who laminates for all the teachers. Janitors clean the classrooms daily.

The Parental Help program has the pleasant side-effect of serving as a counteractive force to the great disparities and the fragmenting between different people which our community, too, feels as a part of the world of today. It seems good that parents of such different ways of life can draw together to work for their children.

The Children and their Parents

As recommended by AMI, we do no day care, nor do we hold double sessions either in the same room or with the same teacher. We provide an extended day (until 2:00) in the primary classes for those children from 4-6 who the teacher feels are ready for a longer day. The children in the elementary classes stay at school until 2:30. At the same time, we try to help working parents find suitable after-school care for their children by giving information on family day care and in some cases helping with transportation, and by our Early Arrival program, which allows parents to leave their children at 7:45 a.m. in the care of an aide so that they can arrive at work on time. We don't want to be a school in which only children of parents with a great deal of leisure time can be enrolled.

Our three elementary classes consist of 25 children each who come from varied social and economic backgrounds. The parents' professions range from the military officers, to carpenters, street vendors, U.T. professors, to rock musicians, educational consultants to high state officials. The children are 8-10 years old, and most of them have progressed through our primary classes. The class has been under the direction of an experienced Bergamo-trained teacher who has also had primary training and experience.

Physical Plant

Our school has three locations in Austin. Two of our buildings-- about 10 miles apart across town-- house two classes each. One is an old home in a residential neighborhood with hardwood floors, high ceilings, and large rooms. The other is a fairly new ranch-style house with large windows and sliding glass doors. The building where our elementary classes are held was designed and built for the school about three years ago. It stands on a 2/3 acre lot and is surrounded by old live oaks and lots of ivy and flowering bushes, with very little concrete on the school grounds. Each of the two 6-9 year old's classrooms has 1000 square feet; the supply rooms, restrooms, and coat closets are 500 square feet. Behind the school is a two-story house which has been remodelled for use as a library, material-making room, office, and a science lab. Behind that house is the present office and storage room, which houses the 9-12 yr. old group, athletic, gym carpentry and garden equipment.

The elementary children play outside in our large yard; they pull out gym mats for tumbling and wrestling, and we are building a set of balance beams for them right now. Elementary children also go to the south Austin Recreation Center several times a week to use their gyms and fields. We are fortunate, on summer mornings, to be able to use a natural spring-fed public pool where we are almost alone with the lifeguards.

We have a library of 1000 books, a record collection, and many art prints and posters which are rotated in plexiglass covers and hung in each classroom. Our library grows each year with our annual Book Fair. A great deal of time is spent deciding on new books to buy and new pictures and records to have in the classrooms, and the result is nice; each book, we feel, is truly worthy of being in a Montessori classroom.

Materials and Supplies

From what we've gathered from talking with people in other schools, it seems our environment, supplies, and materials are especially fine. Our budget in this area is quite generous in comparison with most schools, as far as we can tell. This is probably because our director-teacher-owner has worked without salary or profit for 10 years. Hopefully we can remedy this gradually without raising the tuition too much or too often. Parental involvement in the area of fund raising, contribution seeking, purchasing, volunteer organizing is being developed.

As the parent of a child in this school and a Montessori teacher (Washington D.C. '73-'74) I would highly recommend the Austin Montessori School to anyone looking for employment.

To me the environment (quality of life, cost of living, friendliness of the people, emphasis and dedication of the community) both in the school and town offers the highest possibility of not only teaching the way AMI recommends but also offers a wide range of outside opportunities for enrichment. This is provided by the University, the state government, arts, excellent climate and recreation possibilities.

Under the direction of very dedicated people this school has grown slowly and is committed to keeping the ideals of the Montessori Method intact. Several good preschool classes support the three elementary classes. Unless very high standards are maintained for the preschool the junior work can be mainly remedial.

The parents in both the preschools and elementary class are encouraged and have many opportunities to become more involved and familiar with Montessori through conferences, welcomes observations, volunteer work days and parent meetings. Informed and educated parents provide a real asset which can be seen through the great amount and variety of extras they have been able to supply for their children's school.

As a good place to live and work, Austin and the Austin Montessori School offer an exceptional opportunity for teachers who want the rewards of a true Montessori experience.

Sincerely,

Donna Mitchell

Donna Mitchell

AUSTIN MONTESSORI SCHOOL
PRIMARY AND ELEMENTARY LEVELS

Donna Pesoli, Director

Supervised by Association Montessori Internationale

I. OBJECTIVES

1. To help each child develop and educate his own individuality toward his unknown potential.
2. To help the group of children develop a social structure among themselves which originates from the contrasting needs of the individual and the group and makes them complementary.
3. To help the child develop and educate himself in a way natural to him, so that he may remain in touch with his own nature and develop a reverence for the organic order of the universe. The result: a whole, integrated human being vitally involved in his own development and sensitive to the needs of others.

II. THE MONTESSORI MOVEMENT

Montessori is not a method of teaching but a philosophy of life. It is faith in each child as a potential new beginning for humanity. We see the child as creator of the man he will become. Each child has an inner force for his own development which can be observed in his spontaneous activities. We respect his natural interest which makes learning one of his basic needs. We appreciate his relentless explorations through all his senses and movements which makes his environment his natural school.

It is our purpose to observe the child's natural interests and activities and provide for him an environment in which he can develop and learn.

Within the structured order of the Montessori class the child is free to choose his own projects through the hours of each day. Dr. Montessori believed that self-motivation is the only valid impulse to learning. As each child follows his own inner direction, he works out for himself a personal pattern of learning which fits his needs and abilities. This results in a joy of learning and satisfaction in work.

In the Montessori classroom it is the child who is active rather than the teacher. He is active in his own self-development rather than being trained by an adult. The children are directed toward independence in social adjustments. They are encouraged to work out their own social problems and come to their own moral conclusions. Responsibility to one another is emphasized and adult authority is only a background for free development. Understanding and personal feelings are the vital forces we encourage the children to develop for self-discipline.

III. CURRICULUM

In this atmosphere of faith and respect for the life force of each child, the children are presented with work which is worthy of their attention. They are brought into an environment which reflects their innate dignity, their active interest, their urge to further their development.

Practical Life is the area of development provided for by materials with which the child creates, controls, changes or cares for his physical environment and his own physical being. There are three goals of practical life which make it a foundation of the child's future life as a whole and make practical life the most basic and essential area of Montessori development: (a) Through these activities the child grows to respect and love the physical world around him both natural and man-made. (b) He develops techniques and skills which are basic to other areas of development. (c) He unites his growing body, his developing intelligence and his own will. The resulting condition of human integrity is what we call freedom. The success of our work depends upon this foundation.

The child chooses what he will do. He acts upon his decision with intelligence, using his body and his environment in an act of work. The process of this work, freely chosen, done with self-discipline, using physical skills in an intelligent way, is the child's daily product. The result is a free child who is creating through his work a free adult.

Sensorial Exercises are done with an extensive set of materials, each of which isolates one sensorial property and expands upon it: shape, weight, texture, pitch, etc., are matched, graded or contrasted. The sensorial work allows the child to develop his sensory awareness and organize what he perceives to form concepts and abstractions. The purpose of the work is three-fold: (a) the satisfaction of the work with the materials, (b) the ability to perceive one's environment with sensitivity and intelligence, (c) the appreciation of the natural order that intelligent awareness cultivates in one's life.

Intellectual Work in math and language develops from concrete sensorial materials which the child manipulates in practical processes to form the foundation for the use of symbols to represent the concrete and the process. We want the child to first have the experience before he uses the symbols that represent it. With the symbols finally the child begins to communicate what he knows and does. This way a child's "school life" is not divorced from reality and does not become something apart from life, but is rather a natural development of his personal being.

Arithmetic, geography, reading and writing, grammar and syntax, music, art, science, algebra, and geometry are developed in gradual stages from the concrete sensorial to the abstract conceptual through sequential materials and exercises.

AUSTIN MONTESSORI SCHOOL

GENERAL INFORMATION: ELEMENTARY

1. School starts at 8:30. A teacher will be at school at 8:15 to begin receiving the children. You may pick up your child at 2:30.
2. You should already have received your child's health form. Please have it in as soon as possible because your child cannot start school without it.
3. Medicine of any kind, even baby aspirin, may not be given by the teacher except on written instruction from the child's parent to the school stating how much, when, for how long and under what conditions the teacher should give the medicine at school. The prescription label on the bottle is not acceptable as a parent's instruction. When this is necessary, the child's parent should put the medicine in the hand of a teacher or assistant and not let the child carry it himself.
4. On his birthday the child may bring cookies or cupcakes to serve to the children at lunch-time.
5. The children bring their own lunches. They should be limited to sandwich, soup, meat, fruit, vegetable, etc. Please keep fritos, candy, gum, cake, pies, cookies, etc., for the child to enjoy at home. Send milk or real fruit juice for the child to drink at school. Save Koolaid, drinks, pop, and tea for home.
6. The child should be dressed comfortably for school. We wear aprons for messy jobs but this is by no means foolproof. Clothes which are too good to risk stains should not be worn to school. Soft-soled shoes are more practical for climbing outdoors, mopping indoors and other activities calling for sure footing. No boots for school, please.
7. If you are in a carpool, please leave a list of those in your carpool at the school. Children will be allowed to leave school only with their parents or designated carpool drivers, unless the school is notified otherwise by the child's parents. As carpools are formed, those parents involved should meet to establish rules for conduct in cars. It may be better for each parent to drive his own child to school for the first few days of school, especially if the child is a new student.
8. If any person other than the parents is to pick up a child, please notify us in writing in advance, designating the person's name. The notice can be for the day, week or year.
9. At school we have pocket-sized items from money to rocks and shells to imported didactic materials. If on some occasion your child's pockets contain a few such items, please see that they get back to us promptly as it can take six weeks or more to reorder and replace them.
10. Toys, gum, money and candy should be enjoyed at home. When the child wants to bring something with him to school we welcome books, records, pictures, items the child has made himself or objects related to foreign culture, science or nature. If they are to be returned, please label.

11. If you have a message for the directress, please jot it down on paper as sometimes it is hard to remember verbal messages, especially if there are several coming in at the same time.
12. The particular way in which we begin each morning and the particular lesson with which we begin have an effect on the rest of the day. It is quite important that your child arrive promptly and begin his morning with the rest of the children. A good and leisurely breakfast after a good night's sleep with plenty of time to dress at his own pace do much for a child's attitude the rest of the day.
13. The school is interested in any information providing insight into the child's behavior, such as an inability to sleep well for several consecutive nights, the birth of a sibling, stress occurring at home or in school, etc. Parents are requested not to hesitate to inform the school on such matters, either by telephone or in writing. Any unobserved incident occurring at school which has disturbed your child should be reported in the same manner.
14. When you come to pick up your child, let him feel through your greeting that you are interested in him, not only in his school progress. Questions such as, "What did you do today?" imply expectations of an evaluative nature. When a child brings work home with him, give him your true interest and reflect his pleasure without excessive praise or negative criticism. Questions and remarks regarding the child's progress or the meaning of his work can be addressed to the teacher. She will welcome the opportunity to talk with you.
15. Your child's teacher is happy to talk to you. Call the school office and ask the secretary to have the teacher call you back after school.
16. Please send with your child on or before the first day of school:
 1. A permanent-pressed napkin about 14" x 14" and a napkin ring marked with his name.
 2. A terry cloth washcloth about 10" x 10" labeled with his name or initials and having a loop for hanging on a hook.
 3. A comb and brush labeled with the child's name.
17. Please send with your child on the second day of school:

A potted house plant in a 4"-6" clay pot with a hole in the bottom and a clay saucer to set it in. Please choose one which is easy to care for and very hardy.

January -
February, 1976

BOX LUNCH AT SCHOOL

In our school the teachers have lunch with the children. Lunch is a social experience and an opportunity to refine manners. It is a time to enjoy pleasant conversation and good food.

We help the children become consciously aware of the flavors and textures of their food. This expands their vocabularies as well as their eating pleasure. We may discuss the sources of the foods we eat. If it comes from a plant, we discuss the part of the plant we are eating: stem, leaf, fruit, or root. Other discussion may cover the way the food product is made, where or how it grows, its nutritional value or group, etc.

Although we bring our lunches, we do not eat out of our bags. Lunch is set up pleasantly with placemats, plates and cloth napkins. Wrappings are put into the bags or boxes and removed from the tables. The children enjoy learning to prepare for, serve, and clearing away after a meal. They learn to wait for everyone to be ready to begin together. The children are helped to peel and pour for themselves. Also, they learn to offer help to one another and to request, accept and decline help as needed.

Each child is encouraged to eat as much as his hunger requires only, although generous time is provided. When a child is through eating, he wraps uneaten food and returns it to his bag or box. Cores, pits and peelings are put in the compost bucket; empty wrappings are put in the wastebasket. If you find empty wrappings, old peelings, or unwrapped leftovers in your child's lunch box, it would be a helpful reinforcement if you would make an appropriate comment reflecting your understanding of the lunchtime procedure.

We send home all leftover food so that you and your child can determine from it the amount he might be able to finish the following day. Continue decreasing portions of any food left over each day. When no food comes home, you will know for that present time that you have determined the proper amount. Of course, there will always be fluctuations. If for days your child continues to bring home an empty lunchbox, ask if he would be hungry for a slightly larger lunch, or try sending a little something extra. Continue to increase his lunch until he brings something left over home; then cut back just a bit.

Hopefully, these suggestions will help us to be sure each child has enough, but not too much for his own individual needs. The more we do, taking our guide from the needs he shows us, and the less we say about the size of his appetite, the better we will be able to help him to eat what he really needs, free of hidden desires to reward or punish us with his appetite.

Emma Howell

APPLICATION FOR ADMISSION
to
AUSTIN MONTESSORI SCHOOL: ELEMENTARY AND ADVANCED PRIMARY LEVELS
400 West Alpine Rd.

Date _____

Application is hereby made for admission of _____

(Child's Name)

As a student in the Austin Montessori School, for the academic term beginning _____, 19 _____
(Month)
and ending _____, 19 _____
(Month)

The following information is submitted as part of this application:

Date of Birth _____ Sex _____
(Month) (Day) (Year)

Home Address _____ Telephone _____
(Street) (City) (zip)

Father's (or Guardian's) Name _____

Business or Profession _____

Name of Firm _____

Business Address _____ Business Telephone _____

Mother's Name _____

Business or Profession _____

Name of Firm _____

Business Address _____ Business Telephone _____

Child's Doctor _____ Address _____

Telephone _____

Child's Dentist _____ Address _____

Telephone _____

In case of illness, whom do we contact if unable to reach the family? _____

Name _____ Telephone _____

Do we have permission to contact your doctor if necessary? _____

Signature of Parent or Guardian

I understand that this document is nothing more than an application for admission, and that acceptance of the application by the School in no way binds or obligates the School to accept the child for whom the application is made. I further understand that the selection of applicants (and continuation of any student) shall be in the sole and absolute discretion of the Austin Montessori School.

Tuition for the Montessori Elementary Program is as follows: \$765.00 for the school year (payable in monthly payments \$85.00).

Each month's tuition payment is due the first of the month. In case of prolonged absence, a child's enrollment in the class will be reserved only as long as tuition payments are made. Due to the financial obligations of the Austin Montessori School, no tuition payments or parts thereof will be refunded because of absences or withdrawals.

The following May's tuition is due by May 1. This is not refundable in case of withdrawal before the end of the school year.

A \$20.00 application fee is due with this form (applicable to new students only). It is refundable only if there is not an opening for your child.

(Signature of Parent or Guardian)

Do not write in this space.

Child accepted _____

Application received _____

Admission fee received _____

Check No. _____ Receipt No. _____

Child entered _____
Day Month Year

PARENTAL QUESTIONNAIRE

Why do you wish to send your child to a Montessori School? _____

Have any of your friends had children in the Montessori School? _____

What have you read about or by Montessori? _____

In what way did you learn about this Montessori School? _____

What is the position of this child in the family? _____

Only child _____ Oldest _____ Youngest _____ Other _____

Names and ages of brothers and sisters: _____

Do you have any special problems with this child at present? _____ If so, describe. _____

Has the child experienced any special problems or circumstances in the past? If so, describe. _____

Has the family experienced any special problems or circumstances in the past? If so, describe. _____

General comments: _____

Use reverse if necessary.

RECORD OF PREVIOUS SCHOOLING

Age	Years Att'd	School and City	Level

GENERAL INFORMATION

The Austin Montessori School does not discriminate in enrollment on the basis of race, national origin, or religion. Our children come from a broad cross section of backgrounds, lifestyles, and economic levels. We do not screen children through I.Q. scores. We are interested in serving a normal range of children whose parents support our goals.

Staff Development Days, vacations, and holidays will coincide with A.I.S.D. calendar with rare exceptions.

The maximum enrollment in any Austin Montessori School class will be 30 children with one Montessori teacher and one assistant, or 35 children with one teacher and two assistants. The minimum in a new group will be eight, and in an established group will be 25. The maximum number of children in a primary group staying until 2:00 will be 18. The minimum will be six. Ages of children in the classes are two through six, six through nine, and nine through twelve.

Observation of classes can be arranged through individual teachers. Conferences will be arranged twice a year and at other times whenever necessary. Ask to have the child's teacher call to set up an appointment.

When a primary child is brought to school, he or she must be left in the presence of a staff member.

Designate those persons by whom the child may be picked up other than the parent.

1. _____
2. _____
3. _____

Signature

I. PLANE INSETS

- A. Take the square inset and frame from the geometry cabinet.
- B. One at a time, try to fit all the other insets inside the square frame.
- C. Make a list of all the shapes that fit inside the square.

2. PLANE INSETS

- A. Take each figure from the geometry cabinet. See how many sides each one has.
- B. Make a list of all the shapes which have:
 - 1 side
 - 2 sides
 - 3 sides
 - 4 sides
 - more than 4 sides
 - the sides are not possible to count

3. PLANE INSETS

- A. Take these insets: circle, square, decagon, equilateral triangle, heptagon, pentagon, nonagon, hexagon and octagon.
- B. Rotate each inset like the wheel of a bicycle.
- C. Begin drawing these insets with the ones that rotate easily and finish with the ones that do not rotate at all.
- D. Answer this question: Which roll better - those with many sides or those with only a few sides?

4. CONSTRUCTIVE TRIANGLES

- A. Get the box of blue constructive triangles.
- B. Take the 2 equilateral triangles and join them together on a piece of paper. Trace the quadrilateral you have made.
- C. Do the same with the scalene triangles.
- D. Do the same with the isosceles triangles.

5. CONSTRUCTIVE TRIANGLES

- A. Take the box of blue constructive triangles.
- B. How many different shapes can you make with the 2 isosceles triangles?
- C. How many different shapes can you make with the 2 scalene triangles?
- D. How many different shapes can you make with the 2 equilateral triangles?

6. CONSTRUCTIVE TRIANGLES

- A. Make a copy of the dots and numbers below on your own paper.
- B. Using a ruler and pencil connect points 1 and 2. Now connect 2 and 3; then 3 and 4; and last, 4 and 1.
- C. Now connect points 1 and 3.
- D. What 2 new shapes have you formed?

1.

2.

3

4.

7. CONSTRUCTIVE TRIANGLES

- A. Construct a pinwheel with 12 triangles.
- B. Open it up and make a diaphragm.
- C. Draw the pinwheel or the diaphragm.

8. CONSTRUCTIVE TRIANGLES

- A. Construct a pinwheel with 6 triangles.
- B. Open it up and make a diaphragm.
- C. Draw the pinwheel or the diaphragm.

9. CONSTRUCTIVE TRIANGLES

- A. Construct a pinwheel with 4 triangles.
- B. Open it up and make a diaphragm.
- C. Draw the pinwheel or the diaphragm.

10. FUNDAMENTAL CONCEPTS

- A. In your notebook make a list of some solids.
- B. In your notebook make a list of some things that remind you of surface.
- C. In your notebook make a list of some things that remind you of a line.
- D. In your notebook make a list of some things that make you think of a point.

11. FUNDAMENTAL CONCEPTS

- A. Get a box of golden beads. Each bead is a "point".
- B. Place many of these points in a long row.
- C. What have you constructed?

12. FUNDAMENTAL CONCEPTS

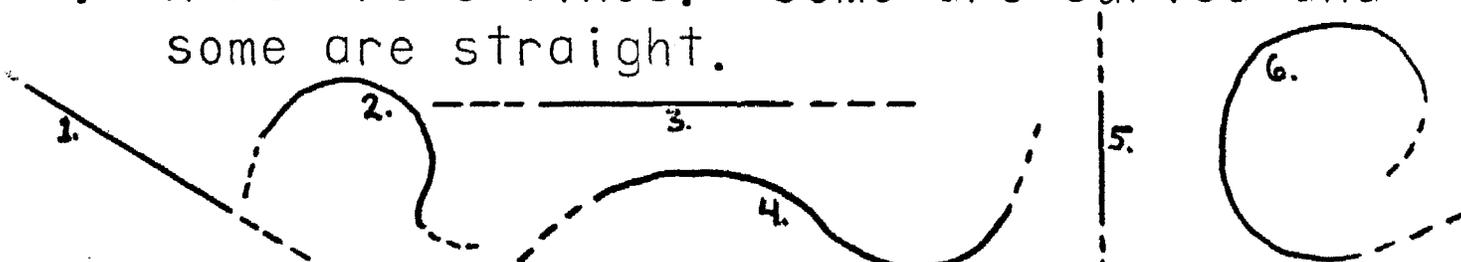
- A. Take a box of golden bead ten bars. Each bar is a line.
- B. Place many of these lines next to each other.
- C. What have you constructed?

13. FUNDAMENTAL CONCEPTS

- A. Get a stack of metal inset paper. Each sheet is a "surface".
- B. Place lots of these "surfaces" on top of each other.
- C. What have you constructed?

14. STRAIGHT AND CURVED LINES

- A. Here are 6 lines. Some are curved and some are straight.



- B. On your own paper complete the following:

- Line #1 is a ----- line.
- Line #2 is a ----- line.
- Line #3 is a ----- line.
- Line #4 is a ----- line.
- Line #5 is a ----- line.
- Line #6 is a ----- line.

15. STRAIGHT AND CURVED LINES

Write the following phrases on your paper and place or draw the proper grammar symbols above each word:

the straight line

the curved line

the line

16. STRAIGHT AND CURVED LINES

- A. Make a list of the objects in the room limited by straight lines.
- B. Make a list of the objects in the room limited by curved lines.
- C. Make a list of the objects in the room limited by both straight and curved lines.

17. STRAIGHT AND CURVED LINES

- A. Take the geometry cabinet insets and feel the sides of each one. Decide if each is made up of curved or straight lines.
- B. Make a list of the figures made up of straight lines.
- C. Make a list of the figures made up of curved lines.

18. BROKEN LINES

- A. Form a broken line with the sticks. Draw it on a piece of paper with a red pencil.
- B. Form a curved line with the sticks. Draw it with a blue pencil.
- C. Form a mixed line with the sticks. Draw it using the red and blue pencils.

19. THE STRAIGHT LINE AND ITS PARTS

- A. Draw a straight line.
- B. Draw a ray.
- C. Draw a line segment.
- D. What is the difference between a ray and a line segment?

20. POSITIONS OF A LINE

- A. On your own paper draw the following:
 - a vertical blue line
 - a horizontal red line
 - an oblique green line
- B. In your own words write a definition for an oblique line.

21. POSITIONS OF A LINE

Write the following phrases on your paper and place or draw the proper grammar symbols above each word:

a curve

a straight line

a horizontal straight line

a vertical straight line

an oblique straight line

22. TWO LINES

- A. Get sharpened blue and red pencils.
- B. Place a rubberband tightly around both.
- C. Place the red pencil along the edge of a ruler and trace the lines.
- D. Measure the distance between the lines and see if it is always the same.
- E. What are these lines called?

23. TWO LINES

- A. Draw 2 parallel oblique lines.
- B. Draw 2 parallel horizontal lines.
- C. Draw 2 parallel vertical lines.
- D. When are 2 straight lines parallel?

24. TWO LINES

- A. Draw 2 convergent lines.
- B. Draw 2 divergent lines.
- C. When are 2 lines convergent?
- D. When are 2 lines divergent?

25. TWO LINES

- A. Draw 4 right angles using the measuring angle.
- B. Cut out each angle and place them together.
- C. Look at the sides of the angles. When are 2 straight lines perpendicular?

26. ANGLES

- A. Draw a whole angle and color it red.
- B. Fold it in half. What kind of angle did you form?
- C. Fold it in half again. What kind of angle did you form?

27. ANGLES

- A. Trace the inset of the square on a piece of paper.
- B. Use the measuring angle and classify each angle of the square.

28. ANGLES

- A. Draw each triangle in the geometry cabinet.
- B. Use the measuring angle and classify each angle of every triangle.

29. ANGLES

- A. Draw each shape in the sixth drawer of the geometry cabinet.
- B. Use the measuring angle and classify each angle in each shape.

30. ANGLES

- A. Draw an angle in your notebook. Color the sides red. Color the vertex blue. Color the size of the angle yellow.
- B. In your own words write a definition for these three parts of an angle.

31. ANGLES

- A. Draw 2 oblique lines that cross each other.
- B. Identify one set of vertical angles and color them red.
- C. Cut out the angles and match them.
- D. What can you write about vertical angles?

32. MEASURING ANGLES

- A. Take the tray with the fraction insets of the circle.
- B. Using the Montessori protractor measure the number of degrees in the $\frac{1}{3}$, $\frac{1}{6}$ and $\frac{1}{9}$.
- C. Trace the $\frac{1}{3}$, $\frac{1}{6}$ and $\frac{1}{9}$ in your notebook.
- D. Write the number of degrees in the angle on your tracing.
- E. Do the same with the $\frac{1}{4}$, $\frac{1}{5}$, $\frac{1}{8}$, and $\frac{1}{10}$.
- F. Do the same with the $\frac{1}{2}$, whole and $\frac{1}{7}$.

33. MEASURING ANGLES

- A. Draw 2 adjacent complementary angles. Write the number of degrees in each angle.
- B. Draw 2 adjacent supplementary angles. Write the number of degrees in each angle.

34. BISECTOR OF AN ANGLE

- A. Draw an angle in your notebook.
- B. Use your compass and construct the angle bisector.

35. REGIONS

- A. Take a string that is 20 cm. long and tie the ends together.
- B. Lay the string on a piece of paper and trace around it.
- C. What kind of region did you make?

36. REGIONS

- A. Choose any four (4) line segments from the box of sticks and unite them.
- B. What is the general name for all shapes with 3 or more sides?

37. TRIANGLES

- A. With only your ruler and a pencil draw an isosceles triangle and a scalene triangle on a sheet of paper.
- B. Now try to do the same for an equilateral triangle. If you wish to use a protractor you may do so.

38. TRIANGLES

- A. Using ruler, pencil and protractor construct the following triangles on a sheet of paper:
 - right angled triangle
 - obtuse angled triangle
 - acute angled triangle
- B. Measure each angle in all 3 triangles and write the number of degrees in each angle.

39. TRIANGLES

- A. Draw the 7 triangles of reality in your notebook, each on a different page.
- B. Write the whole name of each triangle at the bottom of the proper page.

40. PARTS OF A TRIANGLE

- A. With a red pencil underline one base in each of the 7 triangles of reality.
- B. For each one of the bases construct an altitude with a blue pencil. You may use the measuring angle or the protractor.

41. PARTS OF A TRIANGLE

- A. Select any triangle from the geometry cabinet. Draw it in your notebook.
- B. Construct the 3 altitudes for this triangle.
- C. Draw a red circle around the point at which all 3 altitudes meet.
- D. This point is called orthocenter. Write "orthocenter" under your drawing.

42. PARTS OF A TRIANGLE

- A. Select any triangle from the geometry cabinet. Draw it in your notebook.
- B. Construct all 3 medians for this triangle.
- D. Draw a red circle around the point at which all 3 medians meet.
- D. This point is called the centroid. Write "centroid" under your drawing.

43. PARTS OF A TRIANGLE

- A. Select any triangle from the geometry cabinet. Draw it in your notebook.
- B. Construct the 3 axes for the sides of this triangle.
- C. Draw a red circle around the point at which all 3 axes meet.
- D. This point is called circumcenter. Write "circumcenter" under your drawing.

44. PARTS OF A TRIANGLE

- A. Select any triangle from the geometry cabinet. Draw it in your notebook.
- B. Locate the orthocenter, centroid and circumcenter.
- C. Connect the 3 points with a red line.
- D. This line is called Aeuler's Line. Write "Aeuler's Line" under your drawing.

45. PARTS OF A TRIANGLE

- A. Select one of the drawings you made of the 7 triangles of reality.
- B. Measure each angle and write down the size of the angles.
- C. Add the number of degrees in all the angles together. What is your answer.
- D. Try the same for another triangle.

46. QUADRILATERALS

- A. Draw the 6 quadrilaterals of reality in your notebook, each on a different page.
- B. Write the names of each quadrilateral at the bottom of the proper page.

47. PARTS OF A QUADRILATERAL

- A. Answer this question: Does the common quadrilateral have a base?
- B. With a red pencil underline one base in each of the other 5 quadrilaterals of reality.
- C. With a blue pencil draw one altitude for each base. You may use a protractor or the measuring angle.
- D. With the green pencil draw one diagonal in each of these 5 quadrilaterals.

48. PARTS OF A QUADRILATERAL

- A. Select one of the quadrilaterals you have drawn and measure each angle with a protractor.
- B. Write down the size of each angle.
- C. Add the number of degrees in all 4 angles together. What is your answer?
- D. Try the same for another quadrilateral.

49. POLYGONS

- A. Using the box of sticks construct a non-equilateral, non-equiangular hexagon.
- B. Now construct a non-equilateral, but equiangular hexagon.
- C. Now construct an equilateral, but non-equiangular hexagon.
- D. What is the name given to these polygons?

50. POLYGONS

- A. Using the box of sticks construct an equilateral and equiangular hexagon.
- B. What is the name given to this polygon?
- C. Make a list of some other regular polygons.

51. POLYGONS

- A. Using plastic straws, a needle and yarn, construct several regular polygons.
- B. Write a statement explaining why these are called regular polygons.

52. POLYGONS

Copy the following form and complete it.

How many sides in your polygon?	How many diagonals from one vertex?	How many triangles did the diagonals make?	How many straight angles?	How many total interior angles?	How many degrees in each angle?
3					
4					
5					
6					
7					
8					
9					
10					
n					

53. PARTS OF A CIRCLE

- A. Using a compass construct a circle with a radius equal to 5 cm.
- B. Now construct a circle with a radius of 2.5 cm.
- C. Now construct a circle with a radius of 2 inches.
- D. Draw each of the above radii in red.

54. PARTS OF A CIRCLE

- A. Using a compass construct a circle with a diameter equal to 8 cm.
- B. Now construct a circle with a diameter equal to 7 cm.
- C. Draw each diameter in red.

55. PARTS OF A CIRCLE

- A. Draw a sector of a circle.
- B. Draw a segment of a circle.
- C. Draw a semicircle.
- D. Is a semicircle a sector?
- E. Is a semicircle a segment?

56. PARTS OF A CIRCLE

- A. Select any circle from the geometry cabinet.
- B. Roll the circle so that it completes one revolution. Make a dot on a line where you begin and where you end.
- C. Now see how many diameters fit into the circumference line you have constructed.

57. PARTS OF A CIRCLE

- A. Select any circular object in the classroom and trace its circumference on a sheet of paper.
- B. Draw any 2 chords inside the circle.
- C. Draw the perpendicular bisector of each chord.
- D. Color in red the intersection of the bisectors. Write: "center of the circle".

58. PARTS OF A CIRCLE

- A. Select any circle from the geometry cabinet.
- B. Inscribe an equilateral triangle.
- C. Select another circle and circumscribe a square.
- D. What part of the circle are the sides of:
the equilateral triangle?
the square?

100. CONGRUENCY

- A. Draw 2 congruent shapes in your notebook.
- B. In your own words write why the 2 shapes are congruent.

101. SIMILARITY

- A. Draw 2 similar shapes in your notebook.
- B. In your own words write why the 2 shapes are similar.

102. EQUIVALENCE

- A. Draw 2 equivalent shapes in your notebook.
- B. In your own words write why the 2 shapes are equivalent.

103. CONGRUENCY, SIMILARITY AND EQUIVALENCE

Copy the following form and complete it:

Concept	Do shapes have same value?	Are shapes same size?	What is the symbol?
Congruency			
Similarity			
Equivalence			

104. TRIANGULAR BOX

- A. Put the green triangles together; the yellow triangles together; and finally the red triangles.
- B. Write a statement in your notebook that explains why each of the shapes you formed are equivalent to the large gray triangle.

105. TRIANGULAR BOX

- A. Take the 2 green halves and form a rectangle; then a parallelogram; then a different parallelogram; then a triangle; and last a deltoid.
- B. Draw each of these shapes on one large sheet of paper.
- C. On the paper write in your own words why all 5 shapes are equivalent.

106. TRIANGULAR BOX

- A. With a red pencil underline a base in each of the 5 shapes from command #105.
- B. With a blue pencil draw the altitudes.
- C. Compare the base and altitude in each shape to the base and altitude in every other shape.

107. LARGE HEXAGONAL BOX

- A. Combine the red triangles. Now join the gray triangles.
- B. With 3 yellow triangles form a large triangle; with the last 3 form a trapezoid.
- C. If the large yellow triangle represents one whole what fractional part of the whole is:
 - the red rhombus?
 - the gray parallelogram?
 - the yellow trapezoid?
 - the yellow triangle?

108. LARGE HEXAGONAL BOX

- A. On one piece of paper draw the red rhombus, the gray parallelogram and a yellow arrowhead.
- B. On the paper write in your own words why these 3 shapes are equivalent to each other.

109. LARGE HEXAGONAL BOX

- A. Compare the long diagonal of the rhombus to the side of the large yellow triangle.
- B. Compare the long side of the parallelogram to the side of the large yellow triangle.
- C. What do you discover?

110. LARGE HEXAGONAL BOX

- A. Form a hexagon with the 6 small yellow triangles.
- B. Spread it apart and form 3 rhombi.
- C. True or false? The diagonal of the hexagon is equal to the longer diagonal of the rhombus.
- D. True or false? The side of the rhombus is equal to the side of the hexagon.

112. SMALL HEXAGONAL BOX

- A. Take the large gray triangle from the triangular box. Compare it to the large yellow triangle from the small hexagonal box.
- B. Prove that the yellow triangle is $\frac{3}{4}$ of the gray triangle; or prove that the gray triangle is $\frac{4}{3}$ of the yellow triangle.

111. SMALL HEXAGONAL BOX

- A. Join the 6 gray triangles; then the 2 red triangles; then the 3 green triangles.
- B. Name the shapes you have formed.
- C. If the hexagon is a whole (or $6/6$), what fractional part is the trapezoid?
- D. What fractional part is the rhombus?
- E. Compare the major base of the trapezoid to the diagonal of the hexagon. What did you find?

over

113. INSCRIBED SQUARES

- A. Take the square inset of the whole along with the one-fourths and one-eighths (by diagonals).
- B. Remove 2 of the one-fourths from the inset of one-fourths. With the remaining 2 pieces form a square so that the diagonals of the new square extend to the sides of the old square.
- C. Fill in the uncovered part with one-eighth pieces.

over

- F. Compare the minor base of the trapezoid to the side of the hexagon. What did you find?
- G. Compare the short diagonal of the rhombus to the minor base of the trapezoid. What did you find?
- H. Compare the long diagonal of the rhombus to the altitude of the trapezoid. What did you find?
- D. How many one-eighths did you use?
- E. What fractional part of the whole square is the new square that you formed?

SEEING THROUGH COMMERCIALS

A report from Steve Callender, Jr.

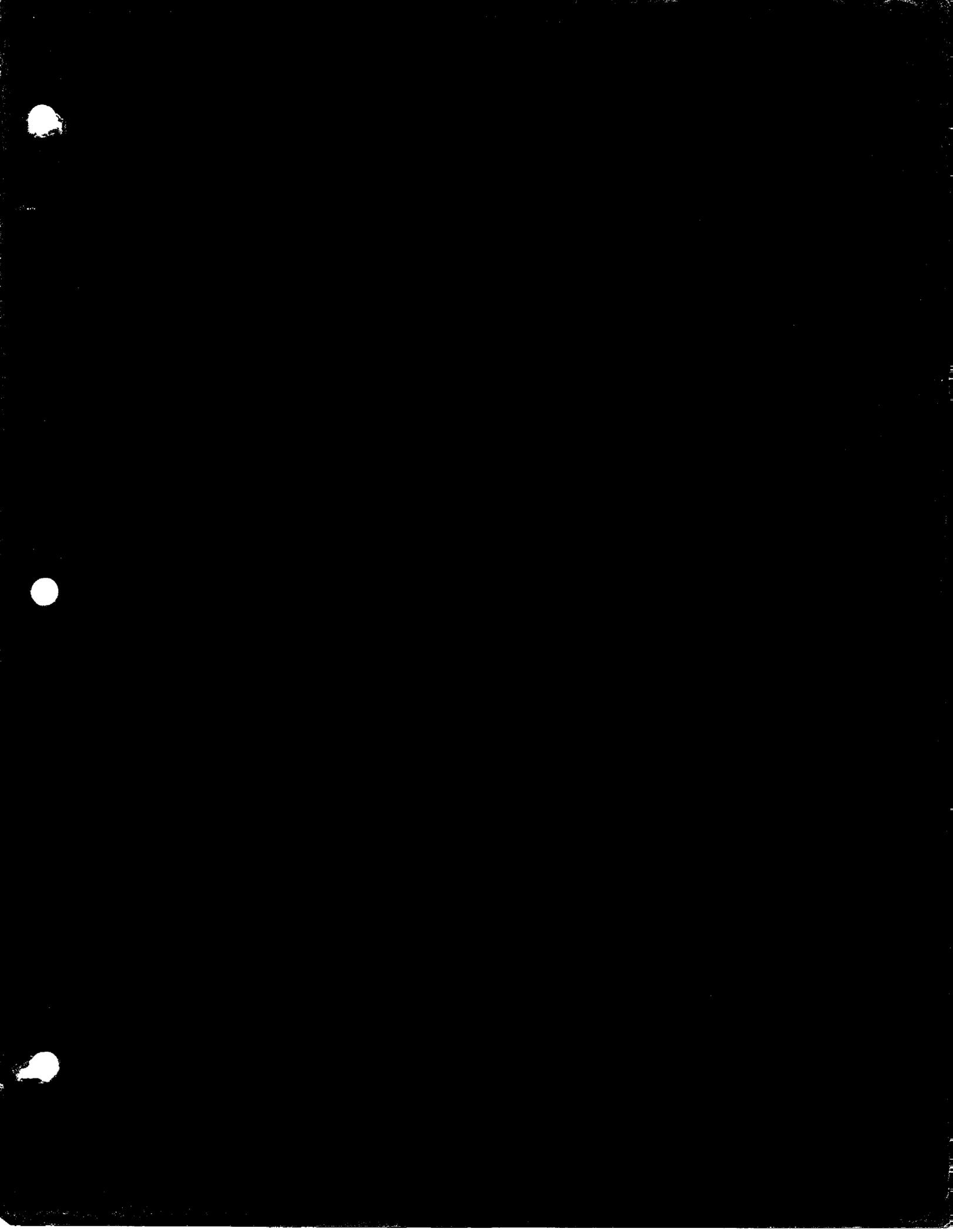
A neighboring Montessori School recently sponsored an evening presentation by a representative from ACT (Action for Children's Television). Other than being totally dismayed by the national averages (20 + viewing hours/week for the average child aged 3 to 12), I was intrigued and enlightened by seeing a film there.

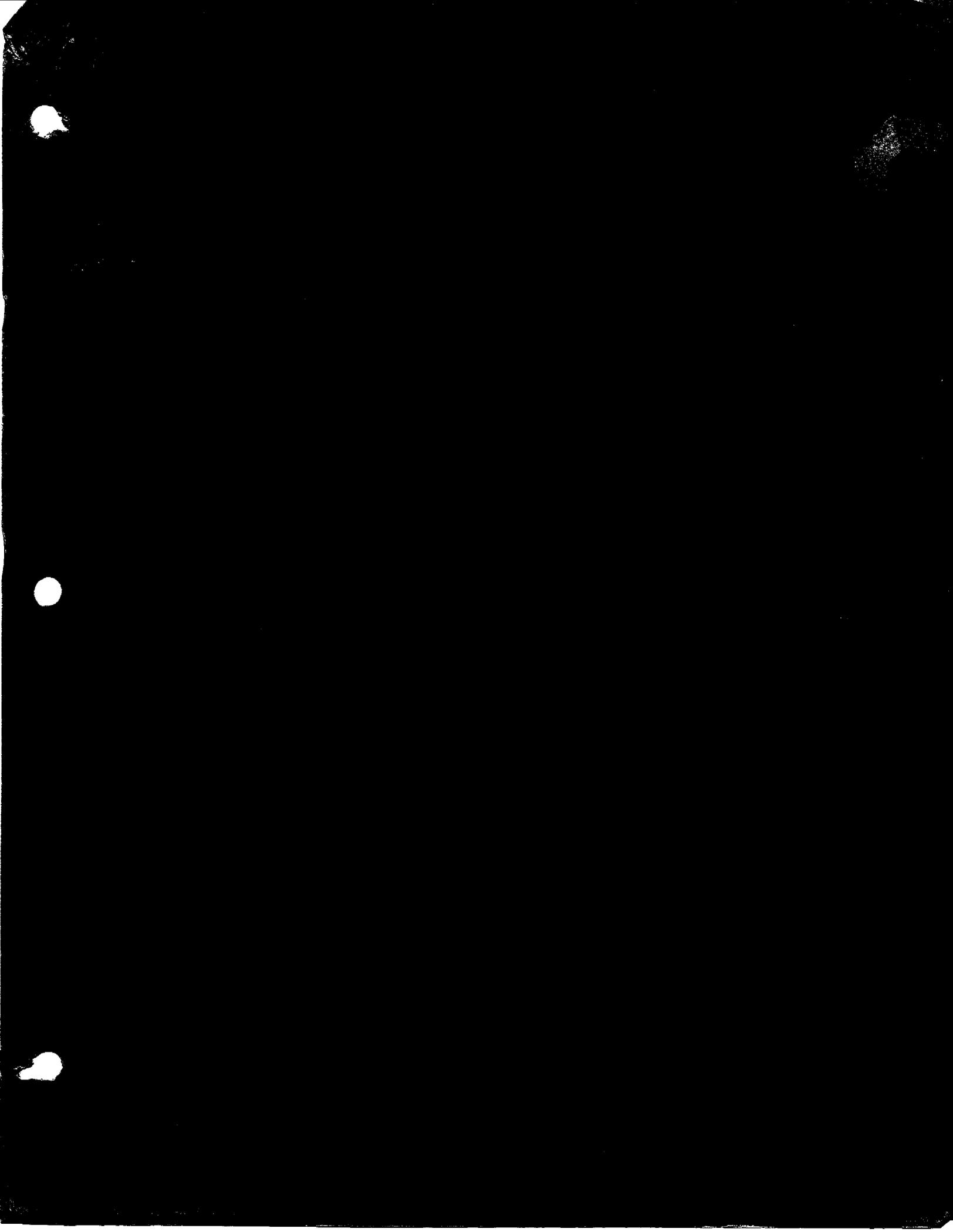
The film was 20 minutes of entertaining and very well dramatized pointers on how TV advertisers trick kid viewers. Highlighted were the uses of sound effects, excited spectators, super closeups, lack of size comparitives, misleading cuts, fine print disclaimers and more.

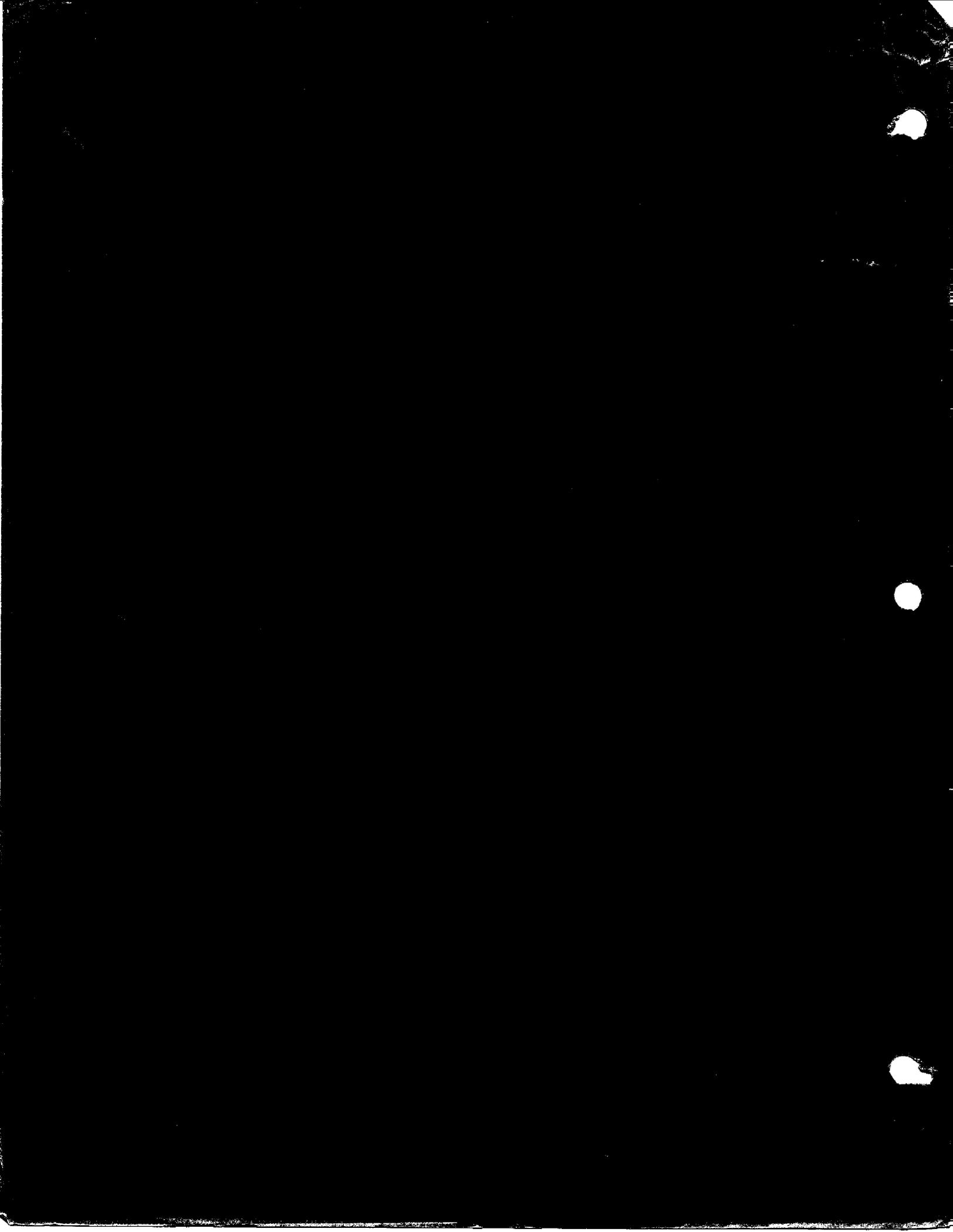
It's the kind of film you'll want to show a couple of times for maximum effect. Our elementary kids loved it and subsequent discussion indicated a really heightened awareness of what was really going on. Watch their sense of morality really come on!!

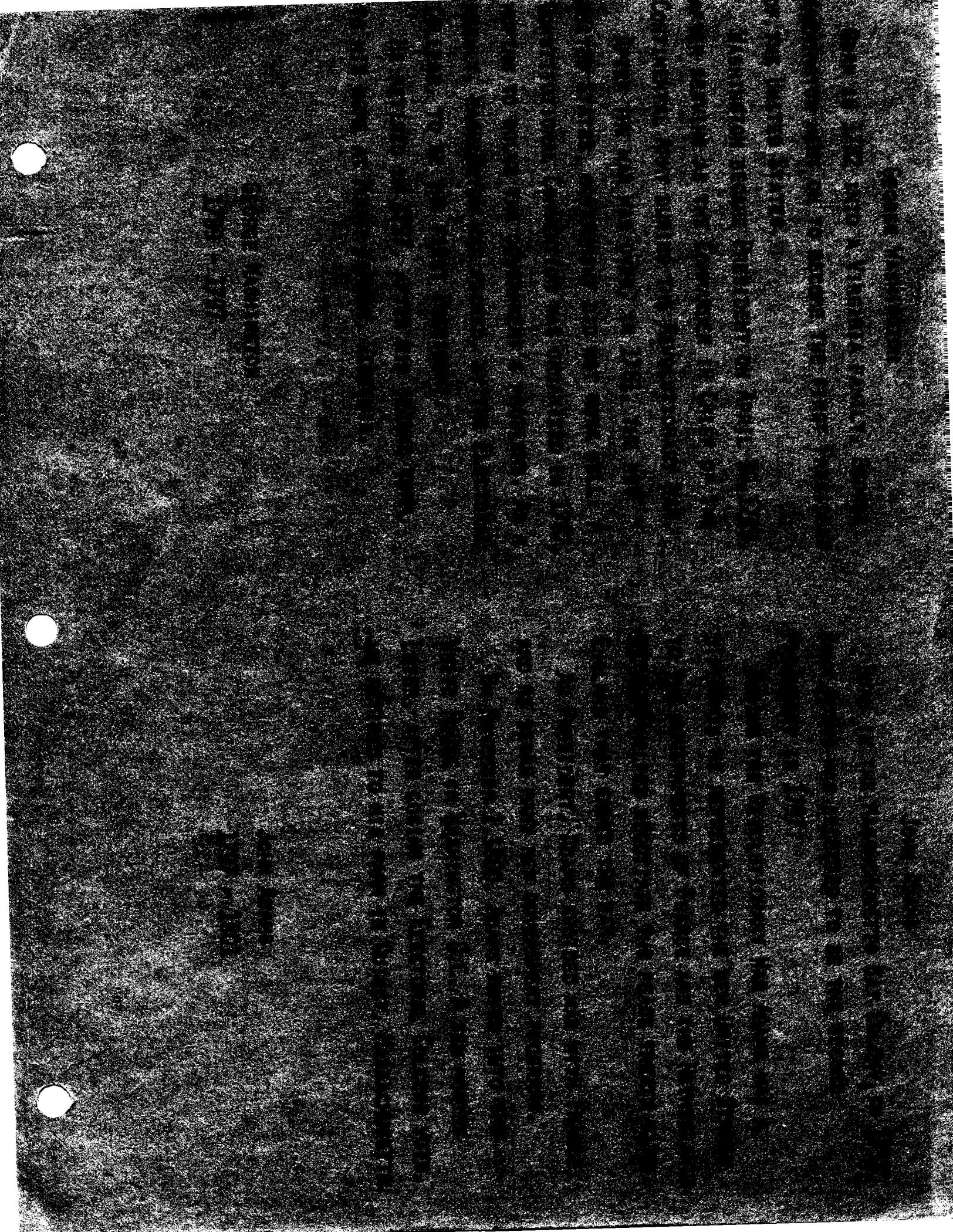
It is 16mm color and sound. It is available for rental from Vision Films, P.O. Box 48896, Los Angeles, California 90048. The fee is \$20.00

My suggestion is that the fee is a bit steep, and several schools may well be able to share it in the three day rental period.









JAMES MONROE

BORN IN WESTMORELAND COUNTY, VIRGINIA, IN 1758. MONROE ATTENDED THE COLLEGE OF WILLIAM AND MARY, FOUGHT WITH THE CONTINENTAL ARMY IN THE REVOLUTIONARY WAR, AND WAS A LAWYER IN VIRGINIA. HE BECAME A UNITED STATES SENATOR AND MINISTER TO FRANCE BEFORE HE WAS SELECTED PRESIDENT IN 1816.

HE WAS A "NATIONAL" PRESIDENT, BUT DIFFERENT SECTIONS OF THE NATION HAD DIFFERENT BELIEFS, AND PROBLEMS LIKE SLAVERY COULD NOT BE SOLVED. HE WANTED TO MAKE SURE THAT OTHER COUNTRIES IN THE AMERICAS WOULD REMAIN FREE. IN THE MONROE DOCTRINE PREVENTS OTHER COUNTRIES FROM STARTING NEW COLONIES IN NORTH OR SOUTH AMERICA.

JAMES MONROE

1817 - 1825

JOHN QUINCY ADAMS

BORN IN BRIMFIELD, MASSACHUSETTS, IN 1767. JOHN QUINCY BECAME THE ONLY PRESIDENT WHO WAS THE SON OF A PRESIDENT. HE SERVED AS SECRETARY TO HIS FATHER AND WAS MINISTER TO THE NETHERLANDS. HE WAS A UNITED STATES SENATOR AND LATER THE MINISTER TO RUSSIA.

THE ELECTION PROCESS WAS BECOMING TOO COMPLICATED AND THE HOUSE OF REPRESENTATIVES HAD TO COME UP WITH A PRESIDENT WHEN NO ONE WON THE ELECTORS. IN 1825 HE BECAME THE FIRST PRESIDENT WHO WAS A MEMBER OF THE HOUSE OF REPRESENTATIVES. HE WAS A MEMBER OF THE HOUSE OF REPRESENTATIVES AND THE HOUSE OF SENATORS, INCLUDING WITHIN THE HOUSE OF SENATORS. IN 1825, HE LOST THE ELECTION TO ANDREW JACKSON, BUT CONTINUED IN SERVICE AS A MEMBER OF THE HOUSE OF REPRESENTATIVES.

JOHN QUINCY ADAMS

1825 - 1829

MARTIN VAN BUREN
1837 - 1841

MARTIN VAN BUREN
THE SON OF A TAYLORKEEPER AND FARMER, VAN
BUREN WAS BORN IN KINDERHOOK, NEW YORK, IN 1781.
HE WAS ELECTED TO THE UNITED STATES SENATE
IN 1821 AND BECAME SECRETARY OF STATE UNDER
PRESIDENT JACKSON, AND IN 1832 HE WAS ELECTED AS
JACKSON'S VICE PRESIDENT. MANY OF THE PROBLEMS
OF JACKSON'S ADMINISTRATION WERE PASSED ON TO
VAN BUREN WHEN HE WAS ELECTED PRESIDENT IN 1837.
AS PRESIDENT HE HOPED TO SOLVE THE ECONOMIC
"BOOM AND BUST" PATTERNS, BUT HIS IDEAS FOR
SOLUTIONS ONLY MADE THINGS WORSE. HE OPPOSED THE
IDEA OF SLAVERY, AND REJECTED THE ANNEXATION OF
TEXAS BECAUSE IT WOULD HAVE ADDED TO SLAVE
TERRITORY.

ANDREW JACKSON
1829 - 1837

ANDREW JACKSON
BORN IN THE CAROLINAS IN 1767, ANDREW JACKSON
NEVER FINISHED SCHOOL, BUT HE STUDIED LAW AND
BECAME AN OUTSTANDING LAWYER IN TENNESSEE. HE
SERVED IN THE HOUSE OF REPRESENTATIVES AND THE
UNITED STATES SENATE, AND WAS A MAJOR GENERAL
IN THE WAR OF 1812. HE BECAME A NATIONAL HERO
WHEN HE DEFEATED THE BRITISH AT NEW ORLEANS.
MORE THAN ANY OF HIS PREDECESSORS, JACKSON
WAS ELECTED BY POPULAR VOTE. HE RECOMMENDED
ELIMINATING THE ELECTORAL COLLEGE, AS PRESIDENT
THERE WERE MANY PEOPLE THAT DISAGREED WITH HIM,
AND THE REPUBLICAN PARTY SPLIT INTO TWO SECTIONS,
THE DEMOCRATS AND THE WHIGS. HE ALSO TRIED TO
MAKE GOVERNMENT APPOINTMENTS MORE DEMOCRATIC.

WILLIAM HENRY HARRISON

BORN AT BERKELEY, VIRGINIA, IN 1773, HARRISON WAS PART OF AN ARISTOCRATIC PLANTER FAMILY. AS A YOUNG MAN HE STUDIED MEDICINE, BUT CHANGED HIS PLANS AND JOINED THE ARMY. HE HEADED TO THE NORTHWEST AND BECAME THE SECRETARY OF THE NORTHWEST TERRITORY IN 1798. DURING THE WAR OF 1812, HE WAS GIVEN COMMAND OF THE NORTHWEST ARMY AND AT THE BATTLE OF THE THAMES HE DEFEATED THE COMBINED ARMIES OF THE ENGLISH AND INDIANS, AND KILLED THE INDIAN CHIEF TEGAWAGA. THE WHIG PARTY MADE HIM A HERO AND NOMINATED HIM FOR PRESIDENT, AND HE WON THE ELECTION. A MONTH AFTER BECOMING THE PRESIDENT, HE CAUGHT A COLD THAT DEVELOPED INTO PNEUMONIA. ON APRIL 4, 1841, HE DIED.

WILLIAM HENRY HARRISON

1841

JOHN TYLER

TYLER WAS THE FIRST VICE PRESIDENT TO BECOME PRESIDENT BY THE DEATH OF HIS PREDECESSOR. BORN IN VIRGINIA IN 1790, HE STUDIED LAW AND SERVED IN THE HOUSE OF REPRESENTATIVES, AND BECAME GOVERNOR OF VIRGINIA. WITH THE WHIG CAMPAIGN AGAINST TIPPECANOE AND TYLER '00' THERE WAS HARRISON'S WAR HEROICS MIXED WITH TYLER'S STATE'S RIGHTS SOUTHERNISM. AS PRESIDENT HE LOST THE SUPPORT OF THE WHIG PARTY AND IMPEACHMENT PROCEEDINGS WERE BEGUN. THIS FIRST RESOLUTION OF IMPEACHMENT OF THE PRESIDENT FAILED. THE ACCUMULATIONS OF TYLER'S ADMINISTRATION LED TO THE "SECTIONALISM" BETWEEN THE NORTHERN AND SOUTHERN STATES, WHICH LED TO THE CIVIL WAR.

JOHN TYLER

1841 - 1845

James K. Polk

Called the first "dark horse" President, he was born in North Carolina in 1795. He entered politics after working as a lawyer, and he became a friend of Andrew Jackson. As President Jackson supported Polk's policies, which led to his Democratic nomination for President.

Polk promised to annex Texas, California and Oregon. The British settled on Oregon's border, but a war developed with Mexico. In 1848, Mexico ceded New Mexico and California in return for \$15,000,000.

Polk added a vast area to the United States, all his health prevented his re-election and he died in June 1849.

James K. Polk
1845 - 1849

Zachary Taylor

Born in Virginia in 1784, Taylor began his career as an officer, spending 25 years in the Indian and leading the war against Mexico, and Taylor a war hero.

As President he threatened war with southern slave states, and proposed that New Mexico and California decide if they wanted slavery. He became disliked for these policies, and they threatened to lead the army himself against the slave states. But after a July 1 assassination he became ill, and 5 days later he died.

Zachary Taylor
1849 - 1850

FRANKLIN PIERCE
1853 - 1857

FRANKLIN PIERCE
BORN IN HILLSBOROUGH, NEW HAMPSHIRE, IN
1804, PIERCE STUDIED LAW AND SERVED IN HIS STATE
AND THE FEDERAL CONGRESS. THE DEMOCRATS AND TO
VOTE 49 TIMES BEFORE PIERCE WAS NOMINATED FOR
PRESIDENT IN 1852. HE DEFEATED THE WHIG OPONENT
AND BEGAN TO INITIATE POLICIES OF EXPANSION,
OBTAINING MORELAND FOR THE SAFETY OF THE UNITED
STATES. THE GADSDEN PURCHASE OF NEW MEXICO AND
ARIZONA, FOR \$10,000,000, OPENED THE WAY FOR A
RAILROAD ROUTE TO CALIFORNIA. OTHER BOOTS,
DESIGNED BY DOUGLAS, KANSAS - NEBRASKA ACT, HE
OPENED THE SLAVERY ISSUE IN THE WEST. SOON, THERE
WAS FIGHTING OVER THE SLAVERY ISSUE, IN KANSAS,

HILLARD FILLMORE
1850 - 1853

HILLARD FILLMORE
BORN IN THE FINGER LAKES COUNTRY OF NEW
YORK IN 1800, FILLMORE LIVED A FRONTIER LIFE. BY
1823 HE HAD BECOME A LAWYER AND BEFORE BEING
ELECTED VICE-PRESIDENT HE SERVED IN CONGRESS FOR
THE WHIG PARTY. WITH TAYLOR'S DEATH, FILLMORE
BECAME PRESIDENT AND IMMEDIATELY CHANGED TAYLOR'S
POLICIES. WITH STEVEN DOUGLAS' AID, HE PASSED
INTO LAW COMPROMISE BILLS AIMED AT SOLVING THE
SLAVERY ISSUE. THESE BILLS ANGERED MANY PEOPLE
AND THE WHIGS NOMINATED SOMEONE ELSE FOR PRES-
IDENT IN 1852. HE THEN BECAME A MEMBER OF THE
KNOW NOTHING PARTY AND OPPOSED LINCOLN IN THE
1860 PRESIDENTIAL ELECTION.

JAMES BUCHANAN

BORN TO HEALTHY PENNSYLVANIA IN 1791.

BUCHANAN WAS THE ONLY BACHELOR PRESIDENT. HE STUDIED LAW AND SERVED IN CONGRESS AND AS THE MINISTER TO RUSSIA AND MINISTER TO ENGLAND.

EARLY IN HIS PRESIDENCY THE SUPREME COURT ISSUED THE DRED SCOTT DECISION WHICH SAID THE GOVERNMENT HAD NO CONTROL OVER SLAVES IN TERRITORIES LIKE KANSAS. NORTHWESTERS WERE FURIOUS, BUCHANAN TRIED TO ANNEX KANSAS, BUT FAILED. THE REPUBLICANS,

BEING ANTI-SLAVERY, TRIED TO PASS LAWS, BUT BUCHANAN VOTED THEM DOWN. SO, IN 1854, BUCHANAN'S DEMOCRAT PARTY SPLIT UP, AND THE REPUBLICANS

NOMINATED ABRAHAM LINCOLN.

JAMES BUCHANAN

1857 - 1861

ABRAHAM LINCOLN

BORN IN HARDIN COUNTY, KENTUCKY, IN 1809.

LINCOLN GREW UP IN HUMBOLDT. HIS FATHER LIVED A FRONTIER LIFE AND BY 1836 HE HAD WORKED AS A LAWYER AND STATE LEGISLATOR. HE WAS AGAINST

STRONG DEMANDS FOR SEPARATION AND LEFT THE ELECTION. BUT THE ATTENTION HE RECEIVED HELD HIM TO BE ELECTED PRESIDENT TWO YEARS LATER. SOUTHERN STATES

WERE SCARED FROM THE UNION AND THE CIVIL WAR HAD BEGUN. IN 1863, LINCOLN ISSUED THE EMANCIPATION PROCLAMATION THAT FREED SLAVES FROM ANY

THE LINE OF HIS RE-ELECTION THE WAR WAS NEARLY OVER. ON APRIL 12, 1865, LINCOLN WAS ASSASSINATED BY JESSIE AND THOUGHT HE WAS HELPING THE SOUTH.

ABRAHAM LINCOLN

1861 - 1865

ANDREW JOHNSON

BORN IN RALEIGH, NORTH CAROLINA, IN 1808, JOHNSON GREW UP IN POVERTY. HE WORKED AS A TAYLOR IN TENNESSEE, AND BECAME AN ADEPT DEBATOR. HE SERVED IN THE CONGRESS AND BECAME A HERO IN THE NORTH WHEN HE REMAINED IN THE SENATE AFTER TENNESSEE HAD SECEDED. AFTER LINCOLN'S DEATH, JOHNSON BEGAN TO RECONSTRUCT THE CONFEDERATE STATES, BUT RADICAL REPUBLICANS OPPOSED MANY OF HIS IDEAS AND CONGRESS PASSED ITS OWN RECONSTRUCTION. THEY PASSED THE CIVIL RIGHTS ACT OF 1865 WHICH CAUSED BLOOD BATHS IN THE SOUTH. HIS POPULARITY GREATLY DECLINED, IN 1868 JOHNSON WAS ACQUITTED FROM IMPEACHMENT BY ONE VOTE.

ANDREW JOHNSON

1865 - 1868

ULYSSES GRANT

BORN IN OHIO, IN 1822, GRANT WENT TO WEST POINT AND SERVED UNDER GEN. ZACHARY TAYLOR IN THE MEXICAN WAR. WHILE WORKING WITH HIS FATHER AT THE BEGINNING OF THE CIVIL WAR, HE WAS GIVEN COMMAND OF A VOLUNTEER REGIMENT. BY WINNING THE BATTLE HE WAS APPOINTED GEN. IN CHIEF IN 1862, AND ON APRIL 3, 1865, AT APPOMATTOX CONFEDERATE HE ACCEPTED THE SURRENDER OF THE SOUTH'S GEN. ROBERT E. LEE. AS PRESIDENT, GRANT RAN THE GOVERNMENT MUCH LIKE AN ARMY BUT HIS POLICY OF LENIENCY AND SELF INTEREST GAVE BATTERED FALLEN TAYLOR HIS ADMINISTRATION WITH NO VOTE.

ULYSSES GRANT

1862 - 1877

JAMES GARFIELD
1871

JAMES GARFIELD WAS BORN IN OHIO IN 1831. GARFIELD WAS THE
LAST OF THE 'LOG CABIN' PRESIDENTS. FAIRNESS
AT TWO, HE WENT ON TO COLLEGE AND THEN SERVED
AS SENATOR. DURING THE CIVIL WAR HE WAS MADE
MAJOR GENERAL BEFORE RETURNING TO THE SENATE.
AT THE 1880 REPUBLICAN CONVENTION HE BECAME THE
'DARK HORSE' NOMINEE ON THE 36TH BALLOT. AS
PRESIDENT HE STRENGTHENED FEDERAL AUTHORITY
OVER THE NEW YORK CUSTOMS HOUSE, AND ADVOCATED
NEW POLICIES IN FOREIGN AFFAIRS, BUT ON JULY
2, 1881, HE WAS SHOT BY A MAN WHO HAD WANTED
A CONSULAR POST. TWO MONTHS LATER, GARFIELD
DIED.

RUTHERFORD HAYES
1877 - 1881

LIKE GRANT, HAYES WAS BORN IN OHIO IN
1822, BUT HE WENT ON TO HARVARD LAW SCHOOL AND
FLOURISHED IN CINCINNATI AS A YOUNG WHIG LAWYER.
HE SERVED AS A CONGRESSMAN, GOVERNOR OF OHIO AND
WAS THE REPUBLICAN PRESIDENTIAL CANDIDATE IN
1876. HAYES TOOK THE POPULAR VOTE ELECTION, BUT
WON THE ELECTORAL BALLOT BY ONE VOTE. AS PRES-
IDENT, HAYES CHOSE MEN OF MERIT FOR HIS CABINET,
RATHER THAN PARTY FAVORITES. HE ADVOCATED THE
RIGHTS OF NEGROES WHILE WITHDRAWING U.S. TROOPS
FROM THE SOUTH. HIS GREATEST HOPE WAS TO BUILD
A 'NEW REPUBLICAN PARTY' IN THE SOUTH. HE RE-
TINED AFTER ONE TERM.

RUTHERFORD HAYES

1861 - 1865 - 1869 - 1877

GROVER CLEVELAND

BORN IN NEW JERSEY, IN 1837, CLEVELAND GROW UP IN ORANGE NEW YORK. HE WORKED AS A LAWYER IN BUFFALO, BECAME THE MAYOR AND THEN WAS ELECTED GOVERNOR OF NEW YORK. HE THEN WENT ON TO BE THE ONLY PRESIDENT ELECTED TO TWO NONCONSECUTIVE TERMS. DURING HIS FIRST TERM HE BECAME THE ONLY PRESIDENT TO BE HARRIED IN THE WHITE HOUSE. HIS POLICIES FOCUSED ON LIMITING FEDERAL SPENDING AND REGULATING THE RAILROADS. IN 1888, CLEVELAND WON THE POPULAR VOTE BUT LOST THE ELECTORAL COLLEGE VOTE. HIS SECOND TERM FACED A SEVERE DEPRESSION AND HIS POLICIES WERE REJECTED BY MANY PEOPLE.

GROVER CLEVELAND

1881 - 1885

CHESTER ARTHUR

THE SON OF AN IRISH IMMIGRANT, ARTHUR WAS BORN IN VERMONT. IN 1829, AFTER COLLEGE HE BECAME A LAWYER IN NEW YORK CITY, AND SERVED AS THE COLLECTOR OF THE PORT OF NEW YORK. ARTHUR WAS A FIRM BELIEVER OF THE "SPOILS SYSTEM" AND WAS OOTED FROM HIS POSITION IN PRESIDENT GAYNE'S REFORM OF GOVERNMENT. AS VICE-PRESIDENT, ARTHUR STRUGGLED AGAINST GARFIELD'S REFORMS) BUT WHEN HE SUCCEEDED TO PRESIDENT, HE WANTED TO PROVE HIMSELF ABOVE "MACHINE" POLITICS. IT WAS SAID OF ARTHUR, "HE WAS CALLED THE PRESIDENT BY DISAPPOINTED, AND HE ONE COLLIER MORE GENERALLY REJECTED."

CHESTER ARTHUR

BENJAMIN HARRISON

GRANDSON OF THE NINTH PRESIDENT, HARRISON WAS BORN IN 1833, ON A FARM BY THE OHIO RIVER. HE PRACTICED LAW IN INDIANAPOLIS, CAMPAIGNED FOR THE REPUBLICANS AND SERVED AS COLONEL IN THE CIVIL WAR. LATER, HE SERVED IN THE U.S. SENATE. IN THE 1888 ELECTION HE WAS NOMINATED ON THE STIM BALLOT AT THE REPUBLICAN CONVENTION, AND ALTHOUGH HE LOST THE POPULAR VOTE HE WON THE ELECTORAL COLLEGE VOTE TO BECOME THE PRESIDENT. HE ESTABLISHED THE FIRST PAN AMERICAN CONGRESS, TRIED TO ANNEX HAWAII AND TRIED TO SOLVE A PROBLEM OF HIGH TARIFFS ON AMERICAN GOODS. BY REMOVING THE HIGH TARIFFS THE GOVERNMENT'S BODIES WERE USED BY A AND A DEPRESSION BEGAN.

BENJAMIN HARRISON

1833 - 1893

WILLIAM McKinley

OHIO BORN, IN 1843, MCKINLEY WENT TO ALLEGHENY COLLEGE AND TAUGHT IN A COUNTY SCHOOL UNTIL THE CIVIL WAR BEGAN. AFTER THE WAR HE STUDIED LAW AND PRACTICED IN CANTON, OHIO. HE SERVED IN THE ARMY FOR 24 YEARS, BECAME THE GOVERNOR OF OHIO AND THEN WAS ELECTED TO THE PRESIDENCY. HE SET OUT TO MAKE AMERICA PROUD BUT A CONFLICT IN CUBA WITH SPAIN BROUGHT WAR. AFTER A 100 DAY WAR, THE U.S. ANNEXED SPANISH TERRITORIES: THE PHILIPPINES, GUAM AND PERTO RICO. AFTER BEGINNING HIS SECOND TERM, MCKINLEY WAS SHOT AT THE BUFFALO PAN AMERICAN EXPOSITION, AND HE DIED EIGHT DAYS LATER.

WILLIAM MCKINLEY

1843 - 1901

1901 - 1909
WILLIAM TAFT

BORN IN 1857, TAFT PRACTICED LAW IN HIS HOMETOWN OF CINCINNATI AFTER GRADUATING FROM YALE. HE SERVED AS A FEDERAL JUDGE, WAS CHIEF CIVIL ADMINISTRATOR TO THE PHILIPPINES UNDER PRESIDENT MCKINLEY AND SECRETARY OF WAR FOR ROOSEVELT. AS PRESIDENT, HE DIFFERED GREATLY FROM ROOSEVELT BUT FOLLOWED MANY OF THE SAME POLICIES. LIBERAL REPUBLICANS WERE ANSWERED BY HIS WORK AND THEY FORMED THE PROGRESSIVE PARTY, WHICH SMILT THE ELECTION, GUARANTEEING THE ELECTION OF TAFT IN 1912. TAFT WAS THEN PERSON OF LAW AT YALE AND THEN CHIEF JUSTICE OF THE SUPREME COURT.

WILLIAM TAFT

1901 - 1909
THEODORE ROOSEVELT

ROOSEVELT BECAME THE YOUNGEST PRESIDENT IN U.S. HISTORY. BORN IN NEW YORK CITY, IN 1858, HE BECAME A HERO DURING THE SPANISH AMERICAN WAR. HE WAS ELECTED GOVERNOR OF NEW YORK IN 1898. AS PRESIDENT HE WORKED TO SOLVE DISPUTES FOR LABOR, AND ENSURED THE CONSTRUCTION OF THE PANAMA CANAL. HE WON THE NOBEL PEACE PRIZE FOR MEDIATING THE RUSSO-JAPANESE WAR AND SENT THE GREAT WHITE FLEET ON A WORLD TOUR. IN 1912 HE RAN FOR PRESIDENT FOR THE "BULL ROOSE PARTY", AND WHILE CAMPAIGNING WAS SHOT IN THE CHEST. HE RECOVERED, BUT LOST THE ELECTION.

THEODORE ROOSEVELT

1921 - 1923
WARREN HARDING

WARREN HARDING
BORN NEAR TOLON, OHIO, IN 1865, HARDING
BECAME A NEWSPAPER PUBLISHER, AN ATTORNEY
REPUBLICAN POLITICAL MACHINE BOSS TO DIRECT
HIM, HE SERVED IN THE OHIO SENATE AND AS OHIO
LIEUTENANT GOVERNOR BEFORE BEING ELECTED TO THE
U.S. SENATE IN 1910, ELECTED PRESIDENT AS A
REPUBLICAN HIS ADMINISTRATION WAS EXPOSED AS
BEING CORRUPT DURING THE TEAPOT DOME SCANDAL,
HE MAY HAVE BEEN UNAWARE THAT HIS FRIENDS WERE
USING FEDERAL LAND TO MAKE THEMSELVES RICH,
WROTE ON A SPEAKING TOUR, HARDING DIED OF A HEART
ATTACK IN AUGUST 1923.

1913 - 1921
WOODROW WILSON

WOODROW WILSON
BORN IN VIRGINIA IN 1856, WILSON EARNED
A DOCTORATE AT JOHN HOPKINS UNIVERSITY AFTER
GRADUATING FROM VIRGINIA LAW SCHOOL, FIRST A
PROFESSOR AND THEN PRESIDENT AT PRINCETON
UNIVERSITY, HE WAS ELECTED GOVERNOR OF NEW
JERSEY IN 1910, WHEN ELECTED PRESIDENT HE
PRODUCED NEW LEGISLATION FOR TAXES, TARIFFS,
THE FEDERAL RESERVE, AND DURING HIS SECOND
TERM THE UNITED STATES JOINED THE WORLD WAR BY
DECLARING WAR ON GERMANY, WILSON TRIED TO
ESTABLISH THE LEAGUE OF NATIONS AFTER THE 1918
ARMISTICE, BUT CONGRESS WOULDN'T APPROVE THE
NECESSARY VERMILLES TREATY.

HERBERT HOOVER
1929 - 1933

BORN IN IOWA IN 1874, HOOVER GREW UP IN OREGON. HE GRADUATED FROM STANFORD UNIVERSITY AND HIS WORK TOOK HIM TO CHINA, WHERE IN 1900 THE BOXER REBELLION TRAPPED HE AND HIS WIFE IN TIENTSIN. DURING AND AFTER WORLD WAR I HE SERVED AS HEAD OF A FOOD PROGRAM THAT KEPT EUROPEANS FROM STARVING. HE THEN SERVED AS SECRETARY OF COMMERCE AND WAS ELECTED PRESIDENT IN 1929. WITHIN MONTHS THE ECONOMY OF THE U.S. COLLAPSED, BANKS CLOSED, MILLIONS OF PEOPLE WERE WITHOUT JOBS. HOOVER TRIED TO START PROGRAMS TO SAVE THE COUNTRY, BUT HIS OPINIONS PLEASED HIM FOR THE DEPRESSION AND HE LOST THE ELECTION OF 1933. HE SERVED THE U.S. IN DIFFERENT POSITIONS UNTIL HIS DEATH IN 1964.

CALVIN COOLIDGE
1923 - 1929

CALVIN COOLIDGE WAS BORN AT FLYMOUTH, VERMONT, ON JULY 4, 1872. HE GRADUATED FROM AMHERST COLLEGE AND ENTERED LAW AND POLITICS IN MASSACHUSETTS. HE WAS ELECTED GOVERNOR, AS A REPUBLICAN, AND AS VICE PRESIDENT WAS ADMINISTERED THE PRESIDENTIAL OATH BY HIS FATHER AFTER THE DEATH OF HARDING. COOLIDGE RESTORED DIGNITY TO THE PRESIDENTIAL OFFICE, CALLED FOR TAX CUTS, ISOLATIONISM AND LIMITED AID TO FARMERS. "COOLIDGE PROSPERITY" SHEPT THE NATION, BUT HE CHOSE NOT TO RUN FOR RE-ELECTION IN 1928.

HARRY TRUMAN
1945 - 1953

BORN IN MISSOURI IN 1884, TRUMAN PRACTICED AS
A FARMER. AS A DEMOCRAT HE WAS ELECTED A SENATOR
IN 1934. HE ONLY SERVED AS ROOSEVELT'S VICE PRES-
IDENT FOR A FEW WEEKS BEFORE HE HAD TO MAKE TUGH
DECISIONS AS THE NEW PRESIDENT. AFTER PLEADING
WITH JAPAN TO SURRENDER HE ORDERED ATOMIC BOMBS
DROPPED ON TWO JAPANESE CITIES. SURRENDER QUICKLY
FOLLOWED. AFTER THE SIGNED OF THE UNITED NATIONS
CHARTER, HE PROPOSED NEW PROGRAMS KNOWN AS THE
"FAIR DEAL". AFTER THE WAR HE HELPED DIRECT THE
REBUILDING OF EUROPE AND THE NORTH ATLANTIC TREATY
ORGANIZATION WAS FORMED IN 1949. BY 1950 U.S.
TROOPS WERE FIGHTING AGAIN WHEN WAS ELECTED IN
KOREA. HE DECIDED NOT TO RUN FOR ELECTION IN 1952.

HARRY TRUMAN

FRANKLIN ROOSEVELT
1933 - 1945

BORN IN 1882, AT HYDE PARK, NEW YORK. HE
STUDIED AT HARVARD AND COLUMBIA LAW SCHOOL. AS
A DEMOCRAT HE WON THE ELECTION TO THE NEW YORK
SENATE IN 1910 AND SERVED AS ASSISTANT SECRETARY
OF THE NAVY. IN 1921 HE WAS STRICKEN WITH POLIO-
MYELITIS; PARALYZED, HE CONTINUED HIS CAREER AND
WAS ELECTED GOVERNOR OF NEW YORK. ELECTED AS
PRESIDENT IN 1932 TO THE FIRST OF FOUR TERMS, HE
IMMEDIATELY BEGAN PROGRAMS TO SAVE THE COUNTRY
FROM THE "GREAT DEPRESSION". THE U.S. ENTERED
WORLD WAR II AFTER A JAPANESE ATTACK AT PEARL
HARBOR. TRUMAN IN 1941 ROOSEVELT SOUGHT THE
FORMATION OF THE UNITED NATIONS, BUT HE DIED
IN APRIL, 1945, BEFORE THE CHARTER WAS SIGNED.

FRANKLIN ROOSEVELT

DWIGHT EISENHOWER

BORN IN TEXAS IN 1890, EISENHOWER GREW UP IN KANSAS. HE ATTENDED WEST POINT ACADEMY AND SERVED IN THE ARMY UNDER GENERALS PERSHING, MACARTHUR AND KRUEGER. AFTER PEARL HARBOR HE BECAME SUPREME COMMANDER OF TROOPS INVADING FRANCE. HE RETURNED TO THE U.S. AS A HERO, BECAME PRESIDENT OF COLUMBIA UNIVERSITY AND SUPREME COMMANDER OF NATO FORCES IN 1951. AS A REPUBLICAN HE WON THE PRESIDENTIAL ELECTION OF 1952. 1953 BROUGHT A TRUCE IN KOREA AND HE HOPED A PEACE WITH RUSSIA. HE CONTINUED MANY FAIR DEAL PROGRAMS AND BEGAN DESEGREGATING SCHOOLS IN THE SOUTH. HE ALSO BEGAN AN "ATOMS FOR PEACE" PROGRAM.

DWIGHT EISENHOWER

1953 - 1961

JOHN KENNEDY

OF IRISH DESCENT, KENNEDY WAS BORN IN 1917, MASSACHUSETTS. HE GRADUATED FROM HARVARD IN 1940, COMMANDED A PT BOAT IN WORLD WAR II. AFTER THE WAR HE BECAME A DEMOCRATIC CONGRESSMAN, AND THEN U.S. SENATOR. ELECTED PRESIDENT IN 1960, HE PROPOSED NEW CIVIL RIGHTS LAWS, ENACTED NEW ECONOMIC PROGRAMS, AND SECURED A TEST BAN TREATY ON NUCLEAR WEAPONS AFTER A CONFRONTATION WITH HERBIA OVER RUSSIAN MISSILES SHIPPED INTO CUBA. HE ESTABLISHED THE ALLIANCE OF PROGRESS AND THE PEACE CORPS WHICH BROUGHT U.S. AID TO OTHER COUNTRIES. THE YOUNGEST ELECTED PRESIDENT, HE WAS THE YOUNGEST TO DIE WHEN HE WAS ASSASSINATED IN 1963, IN DALLAS, TEXAS.

JOHN KENNEDY

1961 - 1963

1969 - 1974
RICHARD NIXON

RICHARD NIXON
BORN IN CALIFORNIA IN 1913, NIXON BECAME A
LAWYER AFTER GRADUATING FROM DUKE UNIVERSITY LAW
SCHOOL. DURING WORLD WAR II HE SERVED AS A NAVAL
LIEUTENANT, AND WAS THEN ELECTED TO THE CONGRESS
AND THEN THE SENATE IN 1950. HE WAS ELECTED AS
EISENHOWER'S VICE PRESIDENT IN 1952 AND LOST THE
PRESIDENTIAL ELECTION TO KENNEDY IN 1960, BUT IN
1968 HE WON THE ELECTION OVER HUBERT HUMPHRY. HE
PROPOSED MANY REFORMS, REMOVED TROOPS FROM VIETNAM,
AND REDUCED TENSIONS WITH RUSSIA AND CHINA. DURING
THE 1972 PRESIDENTIAL ELECTION THE "WATERGATE"
SCANDAL BEGAN; ADMINISTRATION OFFICIALS WERE CON-
VICTED OR RESIGNED, AND FACED WITH CERTAIN IM-
PEACHMENT, NIXON RESIGNED IN 1974.

1963 - 1969
LYNDON JOHNSON

LYNDON JOHNSON
BORN IN TEXAS IN 1908, JOHNSON WORKED HIS
WAY THROUGH SOUTHWEST TEXAS STATE TEACHER'S
COLLEGE. IN 1937 HE WAS ELECTED TO THE HOUSE OF
REPRESENTATIVES, THEN SERVED IN WORLD WAR II.
HE WAS ELECTED TO THE SENATE IN 1948, AND THEN
ELECTED VICE-PRESIDENT AS KENNEDY'S RUNNING MATE.
AS PRESIDENT HE ENACTED MANY OF KENNEDY'S PRO-
GRAMS, AND AFTER HIS RE-ELECTION IN 1964 HE IN-
ITIATED THE GREAT SOCIETY PROGRAMS, FEDERAL AID
FOR EDUCATION, MEDICARE, CONSERVATION, CRIME
CONTROL, CIVIL RIGHTS INITIATIVES AND AID TO
THE POOR. BUT WAR IN VIETNAM HAD BECOME A NATION-
AL CRISIS, AND JOHNSON DEVOTED HIS EFFORTS TO
GAINING PEACE RATHER THAN RUN FOR ELECTION IN '68.

1974 - 1977

GERALD FORD

BORN IN NEBRASKA IN 1913, FORD GREW UP IN
 MICHIGAN, ATTENDED THE UNIVERSITY OF MICHIGAN AND
 YALE LAW SCHOOL. HE SERVED IN THE NAVY DURING
 WORLD WAR II, AND AFTERWARDS ENTERED REPUBLICAN
 POLITICS. IN 1958 HE WAS ELECTED TO CONGRESS AND
 SERVED AS HOUSE MINORITY LEADER FROM 1965 UNTIL
 1973 WHEN HE WAS SELECTED AS VICE PRESIDENT BY
 PRESIDENT RICHARD NIXON. NIXON'S VICE PRESIDENT, SPIRO
 AGNEW, RESIGNED OFFICE IN 1973 DUE TO A TAX-EVASION
 SCANDAL SURROUNDING HIM. AS PRESIDENT, FORD RE-
 STORED HONESTY AND INTEGRITY TO THE PRESIDENCY,
 LEADING THE COUNTRY OUT OF THE "WATERGATE" SCANDAL.
 HE NARROWLY LOST THE PRESIDENTIAL ELECTION OF 1976
 TO JIMMY CARTER.

GERALD FORD