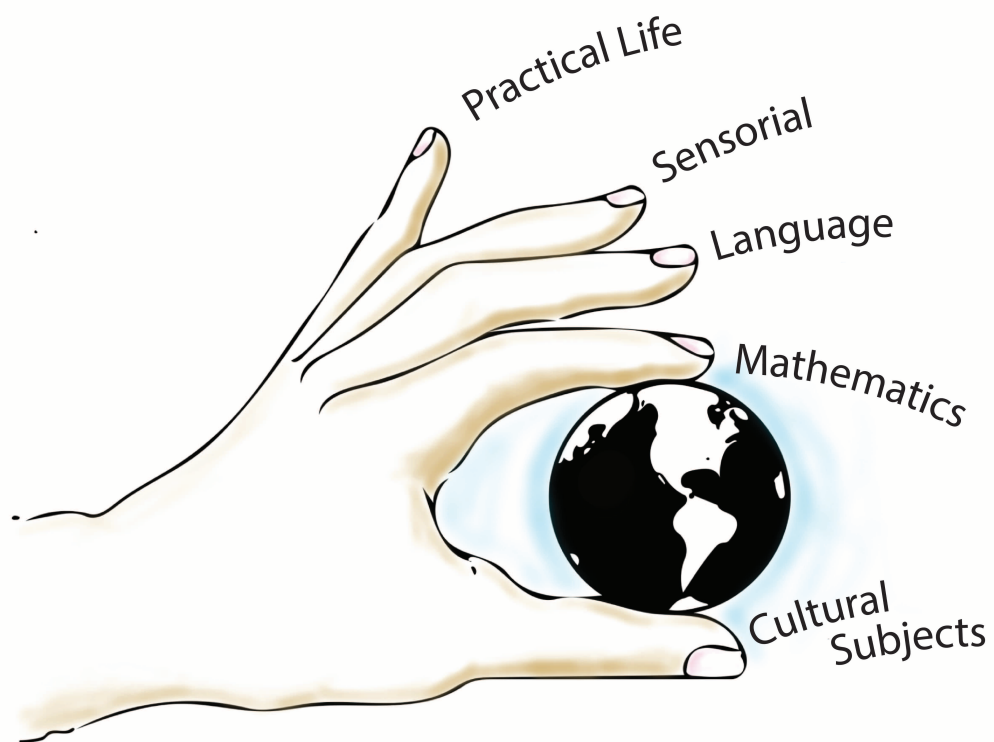


Montessori Educators International, Inc.



History

Early Childhood

Teacher Manual

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History

Purposes:

- To make the child aware of the Cosmic Plan
- To arouse interest in many aspects of history
- To relate history to geography, nature study, art, mathematics, music, literature and all other aspects of cultures of many people and places
- To develop appreciation of all that has happened in the past, establishing one's roots and place in time
- To provide opportunities to exercise the imagination, not only of the past, but also to project future happenings
- To develop appropriate vocabulary

Preliminary Exercises:

- Use of appropriate geography materials
- Practice with exercises for nature study
- Experience in basic art and music activities
- Work with mathematics materials as appropriate for time span involved
- Exercises with reading materials to be able to read the information booklets

Materials:

Note: All time lines are rolled so that the earliest time is on the left. Time lines are unrolled from left to right.

Control and mute time lines of child's day

Time line of class birthdays with photographs of each child

Time line of child's life with photographs

Time line of holidays and of birthdays of famous people, container of individual pictures, information booklet

Roman numeral cards and booklet

BC/AD time line (BCE/CE)

Time terms

Time line of non-human life relative to human life

Plate tectonics booklet and maps (See Geography)

Overview pictures for introduction of time line topics

Control and mute time lines for overview of prehistory: Hadean, Archean, Proterozoic, Phanerozoic

Control and mute time lines for Vendian through Cenozoic Eras, containers of overview pictures, containers of individual pictures, information booklets

Note: There must be three separate control time lines, one for plants, one for animals and one for geology.

Dinosaur models with controls made of outlines of each animal's footprints

Dinosaur puzzles with controls

Mute time lines for each: Palaeolithic Age, Neolithic Age, Megalithic Age, containers of overview pictures, containers of individual pictures with dates on reverse to act as control, information booklets

Note: Handwork and art activities relative to early human's culture are covered in the manual on Handwork and Art.

History of calendars

Mute time lines on early civilizations, containers of overview pictures, containers of individual pictures with dates on reverse to act as control, information booklets

Mute time lines for discoveries on Earth and in space, containers of overview pictures, containers of individual pictures with dates on reverse to act as control, information booklets

One mute time line for needs of humans: nourishment, clothing, shelter, transportation, self-defense, tools and industry, inventions, art, music, literature; containers of overview pictures, containers of individual pictures with dates on reverse to act as a control, information booklets

Booklets on work of anthropologists and archaeologists

Pencil, ruler or straight edge, carbon paper

Note: All materials relative to one topic may be kept in a container of a size to accommodate the time lines, containers of pictures and information booklets.

General Introductory Procedure for All Topics:

1. Invite several children to the lesson and have them sit around a table.
2. Get a container of pictures which give an overview of the topic. Usually no more than eight pictures are in a container. These eight are changed for eight others on the same topic once the original pictures have been examined by those children interested in the topic.
Note: Do not require that every child in the class use every container of pictures. The child's interest guides the independent choice of ALL work.
3. Remove pictures from the container and place on your non-dominant side. Show one picture and read or tell the information given on the back of the picture. Make it brief and interesting. Pass the picture around for those at the table to examine. Do not ask questions about what has been presented, but invite the children to ask questions. If a question is asked which you cannot answer, this gives a great opportunity to introduce the child to finding information in references such as the dictionary, encyclopedias and the atlas.
4. Turn the first picture face down by the container, remove another picture and repeat the procedure.
5. After all eight pictures have been shown, return them to the container. Thank the children and say that the picture container may be chosen. Stand, replace chair and return the container to the shelf.

General Procedure for All Time Lines with Control:

1. Invite one or two children to the lesson, take the control and mute time lines with container of individual pictures to an open space on the floor which will accommodate the length and width of the two time lines. Give the name of the topic of the time line.
2. Have the child or children sit beside you on the floor. Unroll the control time line from left to right, then unroll the mute time line exactly under the control so that the time scale on the mute time line touches the bottom of the control. Remove the individual pictures from their container and place below the mute time line, within reach of the child or children.
3. Point to the first outline on the left end of the control and say the name. If able to read phonograms, invite a child to read the word under the outline.
4. Have a child find the individual picture that matches the outline on the control, then place it on the mute time line in the appropriate position, corresponding to the position of the outline.
5. Continue the same procedure until all of the pictures are placed.
6. Have the child or children collect the pictures and return them to the container, then roll the time lines from right to left.
7. Thank the child or children and say that this time line may be chosen. Return the materials to the shelf.

Procedure for All Mute Time Lines with Control on Reverse of Picture:

1. Invite a child to the lesson who has used control and mute time lines. Take the container holding the time line with pictures having controls on the reverse.
2. Have the child unroll the time line from left to right on the floor or on the table if the time line is small enough.
3. Tell the child to look at the date on the reverse of any picture, then to place it accordingly.
4. Leave as soon as it is apparent that the procedure is understood . Observe unobtrusively.

Control of Error:

- Control time lines
- Control on reverse of pictures
- Color of picture mounting

Observations:

- Handling of overview picture containers
- Handling of time lines
- Arrangement of individual pictures on the mute time line
- Child's reaction to error
- Length of work time and number of repetitions
- Length of period of contemplation
- Degree of interest and concentration

Variations:

- Invite the child to use the dinosaur puzzles and controls after dinosaur models have been introduced.
- Invite the child who has used the time line and can read phonograms to read the information booklets related to the time line.
- Invite the child to participate in art and handwork activities as appropriate for some time lines.
- Invite the child to participate in music and dance activities as appropriate for some time lines.
- Show the child how to relate time lines to geography, arithmetic, nature study and literature as appropriate.
- Invite the child to read the booklets on the work of archaeologists and anthropologists.
- Invite the child to prepare time lines on topics which are of individual interest.

Vocabulary:

- Cosmic Plan control time line mute time line AD BC
- Azoic Proterozoic Paleozoic Mesozoic Cenozoic
- Paleolithic Age Neolithic Age Megalithic Age words used on time lines
- archaeologist anthropologist

Time Concepts with Golden Beads

Purposes:

- To provide concrete representation of a span of time
- To enhance the concept of time
- To develop appropriate vocabulary

Preliminary Exercises:

- Use of golden bead material for concept of units, tens, hundreds, thousands
- Practice in setting up the "Grand Array"
- Work with counting the thousand chain

Materials:

- Container of golden bead units, container of golden bead tens, small mat
- Two Thousand chains, 2 tens, nine units and strips long enough to accommodate the full length of the lay-out
- Numeral arrows for counting bead chains
- Forty-five thousand cubes (or more, if available)
- Floor mat

Procedure for Illustrating Ages of Child's Family Members:

1. Prior to the introduction of this lesson, ask those children who have done the preliminary exercises to bring from home the names and ages of all family members.
2. Invite a child to the lesson. Ask that the containers of golden bead units and tens be brought to a table along with a small mat.
3. Have the child sit on your dominant side and spread the mat on the table.
4. Using the ages of family members brought from home, ask the child to lay out the appropriate number of beads to show the age of each person.
5. After completing the exercise, the child replaces the beads in their containers. Thank the child and say that any ages may be laid out with the beads.
6. Stand, replace chair and have the child return the materials.

Procedure for Illustrating the Year in Bead Material

1. Invite a child to the lesson and say that the year in which we live will be shown with golden beads. Mention the name of the year, for example, "This is the year 2021."
2. Have child place the strip for the thousand chain on the floor. Ask the child to bring additional strips to equal the thousand strip, placing them in a continuous line.
3. Tell the child to place the thousand chain on a strip, then place second thousand chain on the second strip.
4. Ask the child to place the appropriate number of ten bead bars at the end of the second thousand chain. In the example, it would be two ten bead bars. Have the child place the appropriate number of unit beads at the end of the last ten bar. In the example, it would be one unit bead.
5. Invite the child to count the entire amount of beads, using the appropriate numeral arrows that accompany the chains.
6. Leave and observe unobtrusively.. The child will return the materials to their proper places upon completion of the work.

Procedure for Illustrating the Concept of a Million

1. Invite a child to the lesson who has been involved with the two previous exercises.
2. Ask the child to place a large floor mat near the golden bead shelf, then to bring 45 thousand cubes to the mat.
3. Ask the child to place ten of the thousand cubes in a straight line down one edge of the mat, then to place nine of the thousand cubes perpendicular to one end of the first line of thousand cubes. Have the child repeat this procedure at the other end of the first line of thousand cubes. Eight more thousand cubes will be needed for the child to complete the fourth side of the square constructed with the thousand cubes.
4. Have the child stack the remaining 9 thousand cubes on any corner of the square just constructed.
Note: If more thousand cubes are available, these may be stacked on the other corners.
5. Tell the child that if we had enough thousand cubes to completely fill this space, that would be one million beads.
6. Thank the child and say that the lay-out of a million may be chosen. The teacher leaves the area as the child returns the beads to their proper places.

Control of Error:

The teacher
Numeral arrows for chain counting

Observations:

Handling of materials
Child's reaction to error
Length of work time and number of repetitions
Length of period of contemplation
Degree of interest and concentration

Variations:

Invite the child to form the year of the birth of any family member, famous person, friend or event, using the chains, bead bars and units.
Note: For some family members only one thousand chain will be needed, with nine hundred chains to equal the appropriate date, i.e. 1976 would need one thousand chain, nine hundred chains, seven tens and 6 unit beads. If nine hundred chains are not available, the second thousand chain may be used with the excess beads covered by a strip.

Vocabulary:

million

Early Humans

Purposes:

- To provide information about the history of humans
- To develop appreciation for the progress that humans have made
- To provide a means for understanding the sequence of development of human culture
- To develop appropriate vocabulary

Preliminary Exercise:

- Work with zoology materials on external parts of the human body
- Practice with prehistoric time line

Materials:

- Container of color coded pictures giving an overview of early humans in their environments
- Note: The pictures are numbered to ensure that they will be presented in the correct sequence.
- Container with control and mute time lines showing the development of humans; separate drawings and labels
- Information booklet about each picture on the time line

Procedure:

1. Invite a child to the lesson and take the container of overview pictures to a table. Have the child sit on your dominant side.
2. Place the container of pictures on your non-dominant side. Remove the first picture, give brief information about it as the child examines it.
3. Once the child indicates that the picture has been examined as long as desired, turn it face down above the container.
4. Present the second picture according to the previous procedure, and continue as long as interest is shown.
5. At the conclusion of the lesson, either after all pictures have been presented or when interest wanes, return the pictures to the container in their numbered sequence. Thank the child and say that the container of pictures may be chosen.
6. Stand, replace chair and return materials to the shelf.

Control of Error:

- Numerals on pictures
- Color coding of picture mounting

Observation:

- Handling of materials
- Child's reaction to error
- Length of work time and number of repetitions
- Length of period of contemplation
- Degree of interest and concentration

Variations:

Invite the child to lay out the control time line with the mute in front of it, then to match and place the drawings and labels appropriately.

Invite the child to place drawings on the mute time line without referring to the control until work is completed.

Invite the child to read the information booklet about the early humans depicted on the time line.

Vocabulary:

australopithecus australopithecines habilines Homo erectus Neanderthals
Homo sapiens Neanderthalensis Homo sapiens sapiens

Information on Pronunciation and Color Code for Early Humans

Australopithecus	(aws-tra-la pith-e- kus)	black
Australopithecines	(aws-tra-la pith-e-seens)	gray
Homo habilis	(Hoh-moh hab-uh luhs)	blue
Homo erectus	(Hoh-moh ih-rehk-tuhs)	orange
Homo sapiens Neanderthalensis	(Hoh-moh say-pih-enz nee-an-der-tal en sis)	pink
Homo sapiens sapiens	(Hoh-moh say-pih-enz say-pih-enz)	red

Roman Numerals

Purposes:

- To learn the value of Roman numerals
- To become acquainted with the history of Roman numerals

Preliminary Exercises:

- Practice with materials to establish number-numeral concepts
- Work with phonograms

Materials:

Container of white cards 2" by 3" with a different Roman numeral on each and its value on the reverse; horizontal white control strip with numerals 1 to 19, white control strip with numerals 20, 30, 40, etc., through 90; white control strip with numerals 100 through 1000

Note: Roll the control strips.

Information booklet on Roman numerals

Procedure:

1. Invite a child to the lesson and take the container of Roman numeral materials to a table. Have the child sit on your dominant side.
2. Remove the control strip for 1 through 19 and unfold so that 1 is at the far left and 19 is at the far right.
3. Tell the child to read the number on the reverse of the cards with Roman numerals so that they may be placed under the appropriate numerals on the control strip.
4. Leave as soon as it is apparent that the procedure is understood and observe unobtrusively.

Control of Error:

- Control strip
- Numeral on the reverse of each Roman numeral card

Observations:

- Placement of control strip and cards
- Handling of materials
- Child's reaction to error
- Length of work time and number of repetitions
- Length of period of observation
- Degree of interest and concentration

Variations:

- Invite the child to use the other control strips and their Roman numerals.
- Invite the child to read the information booklet.

Vocabulary:

- Roman numeral

Nutrition

Purposes:

- To acquaint the child with daily nutritional needs essential for growth and development
- To provide the basis for choosing a balanced diet which meets nutritional needs
- To introduce the classification of foods into the four food groups
- To develop appropriate vocabulary

Preliminary Exercises:

- Work with color tablets
- Sorting exercises
- Practice with phonogram materials

Materials:

- Container of pictures of protein foods mounted on tan cover stock
- Container of pictures of dairy foods mounted on cream cover stock
- Container of pictures of fruits mounted on orange cover stock and vegetables mounted on green cover stock
- Container of pictures of grain foods mounted on yellow cover stock
- Note: Each picture has information on the reverse. For example, a picture of a carrot would have "carrot, root vegetable, can be eaten raw or cooked, good source of fiber, vitamins A, B, B₂, C."
- Container of pictures identical to those above, but mounted on white cover stock with no information on reverse; labels for each food group, color coded as in the separate containers
- Container with three cream dairy labels; two tan protein labels; three orange fruit labels; two green vegetable labels; six yellow grain labels; white labels for breakfast, lunch and dinner
- Booklet on daily needs

Procedure:

1. Invite a child to the lesson, take any container of pictures to a table and have the child sit on your dominant side. Tell child the name of food group in container.
2. Take the pictures from the container, place them in a stack in front of you and remove the container to your non-dominant side.
3. Place one picture in front of the child, near the front edge of the table. Give information about it, then turn over and place by the container.
4. Continue the previous procedure, until all pictures have been shown.
5. Return the pictures to the container. Thank the child and say that any of the containers of food pictures may be chosen. If the child cannot read, say that you will give the name of the food group in any chosen container upon request. Stand, replace chair and return container to the shelf.

Control of Error:

- Color coding of materials
- Labels designating required number of foods in each food group

Observations:

- Handling of materials
- Placement of pictures
- Child's reaction to error
- Length of work time and number of repetitions
- Length of period of contemplation
- Degree of interest and concentration

Variations:

- Invite the child to sort the food pictures mounted on white, using a color-coded label for each food group.
- Invite the child to plan breakfast, lunch and dinner by laying out those labels, then to use the food group labels to indicate the number of foods from each group. Tell the child that the number of labels for each food group represents the required number of daily servings from each group.
- Invite the child who can write to keep a record of the foods eaten for one day, then to evaluate it, using the control labels.
- Invite the child who can read to read the booklet on daily needs.

Vocabulary:

- nutrition balanced diet names of foods in pictures protein dairy fruit
- vegetable grain food group

Example of daily menus:

Breakfast:

- fruit or juice: 1/2 cup
- grain: bread, cornbread, muffins, waffles, pancakes, biscuits or 3/4 cup cereal
- protein: egg, meat, fish, cheese, poultry, peanut butter,
- milk: 3/4 cup

Lunch:

- protein: 1 ounce meat, poultry, fish, cheese, peanut butter, dried peas or beans or 1 egg
- vegetable: 1/2 cup
- fruit: 1/2 cup
- grain: bread
- milk: 3/4 cup

Dinner:

- protein: 3 ounces meat, poultry, fish, cheese, peanut butter, dried peas or beans or 1 egg
- vegetable: 1/2 cup
- fruit: 1/2 cup
- grain: bread
- milk: 3/4 cup

Preparation of Materials Related to Time Lines

1. Choose a topic which will interest the children. Collect pictures for overview and individual pictures for the time lines.
2. Determine the time period to be covered.
3. Calculate a scale which will allow room for each item to be placed on the time line. Usually the scale is stated as one inch equals the determined number of years.
4. Choose material from which to make the time line. Fabric-backed vinyl, plastic or fabric can be used. Shelf paper is used for time lines to be made by children.
5. Choose a color or several colors if appropriate.
6. Cut time line material to the calculated width and length, one for the control and an identical one for the mute, if required. Be sure to allow enough material for seams if it is not possible to cut the time line in a continuous strip.
7. Test various kinds of markers to be sure there will be no bleeding, smearing or color changes.
8. Draw the time scale at the top of the mute time line in pencil, check for accuracy and then carefully mark the scale with the previously tested marker, using a straight-edge. Be sure all lines are straight and perpendicular to the top edge.
9. Determine the placement of each picture to be outlined on the control time line. Using carbon paper, outline the picture with pencil, check for accuracy, then go over the traced line with marker. Letter the appropriate label under each outline on the control time line.
10. Mount overview pictures on appropriate color of cover stock, index, etc., either on 8 1/2" by 11" or 5 1/2" by 8 1/2". Follow procedure given in previous directions for picture preparation. Carefully type or letter pertinent information on the reverse, then laminate. Place in container of appropriate color and label as to contents.
11. Mount individual pictures on appropriate colors. Cut around each in the general shape, leaving a 1/4" border of color. If no control time line is to be used, write the date on the reverse of the mounted picture. Prepare a label in the appropriate color for each picture, 1" by 4 1/4". Laminate pictures and labels. Place the individual pictures and labels in a container of appropriate color and label as to contents.
12. Make information booklet according to previous instructions for the individual pictures on the time line. Place pictures identical to the individual pictures on the left page and brief information on the right page. Prepare a cover of appropriate color. Title it on the front. Sew booklet as previously instructed.

Preparation of Materials for Calendar

Materials:

- Pictures or drawings of ancient means of reckoning time such as calendar stones of the Aztec, Stonehenge, etc. with dates and information on the reverse
- Container for pictures labeled Ancient Calendars

Procedure:

1. Mount pictures or drawings on a color according to the continent in which located. Letter information and the date on the reverse. Laminate and place in container.

Preparation of Materials for Time Terms

Materials:

- Ten inches of 1 inch wide white Velcro and 10 one inch pieces of white Velcro
OR ten inch plastic ruler or strip with 10 peel-off plastic strips 1 inch wide
- One hundred inches of either of the above one inch wide materials
- Ten 10 inch pieces of the same material as above
- White labels 1" by 4 1/4" for decade, century and millennium
- Container

Note: Days and months are in the white pages of the Language manual. A calendar is in the white pages of the Mathematics manual.

Procedure:

1. On the reverse of a 10 inch Velcro or plastic strip, mount the word century.
2. On the reverse of each of the ten 1 inch pieces of Velcro or plastic strips, mount the word decade.
3. On the reverse of the 100 inch strip, mount the word millennium.
4. On the reverse of each of the ten 10 inch strips, mount the word century.
5. Copy the labels and years for century, decade, and millennium.
6. Cut decade and ten years to make labels 1" by 1 1/2". Mount on white cover stock 1 1/2" by 2". Laminate.
7. Cut century and 100 years to make labels 1" by 2 1/2". Mount on white cover stock 1 1/2" by 3". Laminate.
8. Cut millennium and 1000 years to make labels 1" by 4 1/2". Mount on white cover stock 1 1/2" by 5". Laminate.
9. Place materials and labels in the container.

Preparation of Roman Numeral Material

1. Prepare booklet according to instructions previously given. Copy the information and place in the booklet on the right pages with appropriate drawings mounted on the left pages. Sew pages together within a white cover.
2. Copy the Roman numerals and number words on white paper and cut to 1" by 2" size. Mount the Roman numeral on one side of a 2" by 3" white card with the appropriate number word on the reverse. Laminate and place in a container.
3. To make the control, copy the Roman numerals one through nineteen and place on a white strip 40" long.
4. Copy the Roman numerals twenty through ninety and place on a white strip 16" long.
5. Copy the Roman numerals one hundred to one thousand and place on a white strip 20" long.
6. Laminate all the control strips, fanfold and place in container.

Preparation of Time Line of Child's Day

Materials:

Twenty-four light yellow cover stock cards 4" by 4", twenty-four dark blue cover stock cards 4" by 4"

Twelve light yellow labels 2" by 4"; twelve dark blue labels 2" by 4"

White strip 2" wide and 49" long marked AM

Tan strip 2" wide and 49" long marked PM

Note: The strip may be made from cover stock, belting or bulletin board border

Clock pictures with hours or clock stamp

Pencil, carbon paper

Black marker that will not "bleed"

Laminating material

Container to hold cards, labels and time lines

Procedure for preparation:

1. Make 2 copies of each drawing except child in bed which requires 20 copies.
2. Using 12 yellow cards, mount a picture for each hour of the child's day, starting with awakening at 7 AM, breakfast at 8, going to school at 9, working at school at 10, other work at school at 11, lunch at noon, school work at 1 PM, different school work at 2 PM, going home at 3 PM, playing outside at 4 PM, helping get dinner at 5, eating dinner at 6. On 12 blue cards, mount the remaining pictures: bath at 7, being read to in bed at 8, asleep for the remaining hours. Repeat the same picture on blue of a child asleep in bed at each hour during the night.
3. Make 4 copies of each clock with time indicated. Mount on the yellow labels clocks showing hours from 7 to 6. On blue labels, mount clocks with hours from 7 to 6.
4. To make the control, trace just outline of principle figure in each picture on appropriate yellow and blue cards. Go over the traced lines with black marker. Mount the appropriate clock labels at the bottom center under each picture. Arrange control cards in sequence, starting with midnight at the left. Laminate in a continuous strip on both sides of the control, leaving 1" of laminating material at one end.
5. Glue the hook side of a 2" piece of Velcro to the top and bottom of one end of the control so that it cannot be seen from the front. Glue the loop side of the Velcro on the other end on the extension of the laminating material, placing so that the loop side will attach to the hook side. This will allow the control to be fastened together so that it can be placed upright on its bottom edge, forming a cylindrical arrangement. Roll for storage with the drawings to the outside.
6. Sew or glue white and tan strips together by overlapping white strip 1" over the tan. Apply Velcro at the other ends so that a continuous strip can be made with 48" of each color. In the center of the white strip, letter AM in large letters. In the center of the tan strip, letter PM in large letters. Mount or stamp a clock face at the center of the joining of the white and tan strips. If using stamped clock face, draw the hands of the clock to indicate 12 o'clock. Letter the word "noon" under the clock. Place the two ends of the strip together and stamp or mount a clock face at the center of the joining of the tan and white strips. Draw the hands of the clock to indicate 12 o'clock. The right half the clock will be on the white end and the left half on the tan end. Letter the word "midnight" under the clock face so that the entire word is seen when the ends are connected. Roll the strip for storage.

Preparation of Time Line of Birthdays of Class Members

Materials:

Small photograph of each child and teacher in the class, one by two inches

Note: Bring a Polaroid to take photos of those who do not bring one from home and trim to size above.

Twelve pieces of white cover stock 8 1/2" by 11"

Black marker that does not bleed or smudge

Pencil

Ruler

Container for photographs

Note: The time line is kept separately because it will be used for other topics.

Procedure for preparation:

1. On the 12 pieces of white cover stock, copy the calendar page (found in math manual white pages). In the 1" space at the top, letter the names of the months.

2. For each month, number appropriate spaces according to the calendar for the current year.

Note: If a printed calendar with 1" by 2" or larger spaces is available, separate each month and mount on white cover stock.

3. Arrange the calendar pages in sequence, starting with January on the left. Laminate both front and back, leaving enough space between each page to allow for fan-folding.

4. On the back of each photograph, letter the month and day of the birthday for each individual so that the pictures can be placed appropriately on the time line. Place in a container.

Note: There is no control time line for this topic. The control is the date on the reverse of each picture.

Preparation of Materials for Holidays and Birthdays of Famous People

Materials:

Time line used for class members' birthdays

Containers for each category of drawings or pictures

Drawings 1" by 2" or the size of your calendar grid for each holiday other than those celebrating birthdays of famous persons

Booklet with information about each holiday

Pictures of famous people 1" by 2" or to match the size of your calendar grid

Booklet with information about each famous person

Note: These can be divided into several categories such as presidents, educators, scientists, inventors, etc., each in a separate container.

Procedure for preparation:

1. On the back of each drawing representing holidays, letter name of the holiday, the day and month. Place in a container with the booklet about holidays prepared according to instructions given previously.

Note: Be sure to include the holidays of other cultures such as Chinese New Year, Yom Kippur, etc.

2. On the back of each drawing representing famous persons, letter the name, day and month of birth. Place in container with the booklet about the persons prepared according to instructions given previously.

Note: There is no control time line for these topics. The control is the date on the reverse of each picture.

Preparation of Materials for Earth's Age

Materials:

Twenty-one yards and 4" of black ribbon or vinyl 1" wide

Red ribbon or vinyl 1" wide and 1" long

Labels: Humans' Time on Earth, 3 million years; Before Humans Appeared on Earth, 4.6 billion years

Black cover stock 2" by 5 1/4", red cover stock the same size

Container

Procedure for preparation:

1. Sew red material under one end of the black so that 1/2" of red shows.
2. Mount the label, Humans' Time on Earth, on red; mount the other label on black. Laminate both labels.
3. Place the materials in a container.

Preparation of Prehistoric Time Line

Materials for Eons and Eras

Two pieces of black vinyl 25" by 5" (Hadean Eon)

Two pieces of dark gray vinyl 53" by 5" (Archean Eon)

Two pieces of medium gray vinyl 33" by 5" (Proterozoic Eon, Aphebian Era)

Two pieces of light gray vinyl 45" by 5" (Proterozoic Eon, Riphean Era)

Two pieces of light blue vinyl 5 4/5" by 5" (Proterozoic Eon, Vendian Era)

Two pieces of yellow vinyl 14 2/5" by 5" (Phanerozoic Eon, Paleozoic Era)

Two pieces of orange vinyl 8 1/5" by 5" (Phanerozoic Eon, Mesozoic Era)

Two pieces of red vinyl 2 2/3" by 5" (Phanerozoic Eon, Cenozoic Era)

Labels for each Eon and Era

Materials for Prehistoric Time Line Vendian Era through Cenozoic Era (expanded scale)

Four pieces of light blue vinyl 30 4/5" by 10" (Proterozoic Eon, Vendian Era)

Four pieces of yellow vinyl 81 2/5" by 10" (Phanerozoic Eon, Paleozoic Era)

Four pieces of orange vinyl 44 1/5" by 10" (Phanerozoic Eon, Mesozoic Era)

Four pieces of red vinyl 16" by 10" (Phanerozoic Eon, Cenozoic Era)

Note: All dimensions except for Cenozoic include one extra inch for space on which to overlap the next piece of vinyl.

narrow point permanent marking pen

pencil

ruler

rectangular measuring guide (corners must be exactly perpendicular) with 1/4" and 1/2" accurately measured from one corner and marked clearly

Procedure for Eons and Eras:

1. Overlap one inch of the left 5" edge of the dark gray vinyl on top of the right 5" edge of the black vinyl. Glue or sew into place so that 24" of the black vinyl remain showing.
2. Overlap one inch of the left 5" edge of the medium gray vinyl on top of the right 5" edge of the dark gray vinyl. Glue or sew into place so that 52" of the dark gray remain showing.
3. Overlap one inch of the left 5" edge of the light gray vinyl on top of the right 5" edge of the medium gray vinyl. Glue or sew into place so that 32" of the medium gray remain showing.
4. Overlap one inch of the left 5" edge of the light blue vinyl on top of the right 5" edge of the light gray vinyl. Glue or sew into place so that 44" of the light gray remain showing.
5. Overlap one inch of the left 5" edge of the yellow vinyl on top of the right 5" edge of the light blue vinyl. Glue or sew into place so that $4\frac{4}{5}$ " of the light blue remain showing.
6. Overlap one inch of the left 5" edge of the orange vinyl on top of the right 5" edge of the yellow vinyl. Glue or sew into place so that $13\frac{2}{5}$ " of the yellow remain showing.
7. Overlap one inch of the left 5" edge of the red vinyl on top of the right 5" edge of the orange vinyl. Glue or sew into place so that $7\frac{1}{5}$ " of the orange remains showing. All of the red will remain showing.
8. Repeat steps 2 through 7 to make another time line with the black vinyl on the left and the red vinyl on the right.
Note: One of the time lines will become the mute time line with the time scale on it. One will become the control time line labeled for Eons and Eras.
9. Along the top edge of one time line (which will be the mute time line with time scale) measure and make light pencil dots at every inch. Using the cardboard perpendicular template as a guide, draw vertical lines $\frac{1}{4}$ " long at the first three pencil dots with a thin black permanent marker. Make the fourth line $\frac{1}{2}$ " long and a little darker. Continue drawing three lines $\frac{1}{4}$ " long and the fourth line $\frac{1}{2}$ " long and a little darker for the entire length of the time line. The last $\frac{1}{2}$ " long, heavy line should be four inches from the right edge of the time line with three $\frac{1}{4}$ " lines following it.
Note: The divisions of colored vinyl may NOT correspond to the perpendicular lines.
10. Starting at the left, label the fourth line (the first heavy $\frac{1}{2}$ " line) **4400 million years ago**. Label the next heavy $\frac{1}{2}$ " line **4300 million years ago**. Label the next heavy $\frac{1}{2}$ " line **4200 million years ago**. Continue in this manner to the last heavy $\frac{1}{2}$ " line which should be labeled **100 million years ago**.
Example of lettering: **4200 million
years ago**
11. Make copy of labels for Eons and Eras and cut to 1" by $4\frac{1}{4}$ ". Mount on appropriately colored card or index stock cut 2" by $5\frac{1}{4}$ ". Laminate according to directions for materials preparation given in the Art manual. Trim the laminating film.
12. Label control appropriately for Eons and Eras according to information which follows.

Procedure for Preparation of Prehistoric Time Line Vendian Era through Cenozoic Era
(expanded scale)

1. Overlap one inch of the left 10" edge of the yellow vinyl on top of the right 10" edge of the light blue vinyl. Glue or sew into place so that 29 $\frac{4}{5}$ " of the light blue remain showing.
2. Overlap one inch of the left 10" edge of the orange vinyl on top of the right 10" edge of the yellow vinyl. Glue or sew into place so that 80 $\frac{2}{5}$ " of the yellow remain showing.
3. Overlap one inch of the left 10" edge of the red vinyl on top of the right 10" edge of the orange vinyl. Glue or sew into place so that 43 $\frac{1}{5}$ " of the orange remains showing. All of the red will remain showing.
4. Repeat steps 1 through 3 to make a total of four time lines with the blue vinyl on the left and the red vinyl on the right.

Note: One of the time lines will become the mute time line with the time scale on it. One will become the control time line for animals. One will become the control time line for plants. The fourth time line will become the control time line for geology.

5. Along the top edge of one time line (which will be the mute time line with time scale) measure and make light pencil dots every 6 inches. Using the cardboard perpendicular template as a guide, draw vertical lines $\frac{1}{4}$ " long at the first three pencil dots with a thin black permanent marker. Make the fourth line $\frac{1}{2}$ " long and a little darker. Continue drawing three lines $\frac{1}{4}$ " long and the fourth line $\frac{1}{2}$ " long and a little darker for the entire length of the time line. The last $\frac{1}{2}$ " long, heavy line should be 24 inches from the right edge of the time line with three $\frac{1}{4}$ " lines following it.

Note: The divisions of colored vinyl may NOT correspond to the perpendicular lines.

6. Starting at the left, label the fourth line (the first heavy $\frac{1}{2}$ " line) **600 million years ago**. Label the next heavy $\frac{1}{2}$ " line **500 million years ago**. Label the next heavy $\frac{1}{2}$ " line **400 million years ago**. Continue in this manner to the last heavy $\frac{1}{2}$ " line which should be labeled **100 million years ago**.

Example of lettering: **100 million
years ago**

7. Make three copies of the drawings for animals of each era. One copy will be used to trace the drawing onto the control time line for animals. Cut around the general shape of the second drawing, mount colored card or index stock which matches the color of the vinyl on which it will be placed and trim to give a $\frac{1}{4}$ " border around the previously cut drawing. Laminate according to directions for materials preparation given in the Art manual. Trim the laminating film. Note: If the drawing is so small that it might be lost, make the border of card or index stock larger.
8. Make a copy of the labels and cut to 1" by 4 $\frac{1}{4}$ ". Mount on appropriately colored card or index stock cut 2" by 5 $\frac{1}{4}$ ". Laminate.

9. Using another time line which will be the control time line for animals, place the second set of drawings according to the scale of 1" = 25 million years, leaving enough room below the drawing for a label. After verifying the placement according to the scale, trace over the outline of the drawing using carbon paper to transfer the picture onto the time line. Go over the outline with a permanent marker. Carefully label the name of the animal under each outline drawing.
10. Use the third set of drawings to make an information booklet according to previous instructions, with the drawings and labels on the left pages and the information on the right pages.
11. Repeat steps 7 through 10 for making a time line for plants and a time line for geology.

Information on eons and eras:

Hadean Eon	4500-3900 million years ago	black
Archean Eon	3900-2600 million years ago	dark gray
Proterozoic Eon, Archean Era	2600-1880 million years ago	medium gray
Proterozoic Eon, Riphean Era	1800- 700 million years ago	light gray
Proterozoic Eon, Vendian Era	700 - 580 million years ago	light blue
Phanerozoic Eon, Paleozoic Era	580 - 245 million years ago	yellow
Phanerozoic Eon, Mesozoic Era	245 - 66 million years ago	orange
Phanerozoic Eon, Cenozoic Era	66 million years ago to present	red

Note: One of the time lines will become the mute time line with the time scale on it. One will become the control time line for animals. One will become the control time line for plants. The fourth time line will become the control time line for geology.

Preparation of BC-AD (BCE/CE) Time Line

Materials:

- Twenty-two inches of green vinyl or ribbon, any of which should be 1" wide
- Thirty-seven inches of red 1" wide material the same as that used for the green section
- Small picture of a nativity scene, about 2" by 3", such as a reproduction of a famous painting or the little cards sold in religious bookstores
- Neutral colored cover stock or index the same size as the picture
- Glue
- Clear Contact adhesive laminating material
- Two copies each of the labels Before Christ B.C., Anno Domini A.D., Before Common Era BCE, Common Era CE
- Four pieces of red cover stock 3 1/2" by 5 1/4"
- Four pieces of green cover stock 3 1/2" by 5 1/4"
- Container for materials

Procedure for preparation:

1. Glue 1" of the green strip at the center on the back of the right side of the nativity picture, and 1" of the red strip at the center on the back of the left side. Turn the picture with attached strips over and glue the neutral cover stock to the reverse. Cut a point on the end of the red and of the green strips from the last inch of the strip.
2. Mount 1 copy of the label Before Christ B.C. on red 3 1/2" by 5 1/4" and 1 copy of the label Anno Domini A.D. on green the same dimension.
3. Mount 1 copy of the label Before Common Era BCE on red 3 1/2" by 5 1/4" and 1 copy of the label Common Era CE on green the same dimension.
4. Mount 1 copy of the label Before Christ on red 3 1/2" by 5 1/4" and 1 copy of the label Anno Domini on green the same dimension.
5. Mount 1 copy of the label Before Common Era on red 3 1/2" by 5 1/4" and 1 copy of the label Common Era on green the same dimension.
6. Mount 1 copy of each abbreviation cut 1" by 4 1/4" and mount on appropriate color 2" by 5 1/4". Laminate the cards and labels.
7. Place materials in a container.

Preparation of Materials for Fundamental Needs of Humans

Note: Please refer to the list of Fundamental Needs of Man in the white pages for suggested topics.

Materials:

- Overview drawings or pictures showing as many needs as possible in each, mounted on tan cover stock and dated as to BC or AD century
- Container for overview drawings
- Drawings of uniform size, dated on reverse, which cover individually the following topics from early man to present: nourishment, shelter, clothing, transportation, self-protection, spiritual needs, tools and industry, inventions
- Information card for each drawing, mounted on the appropriate color
- Eight colors of cover stock on which to mount drawings and information cards, for example, yellow for nourishment, blue for shelter, pink for clothing, light green for transportation, orange for self-protection, white for spiritual needs, gray for tools and industry, light blue for communication
- Laminating material
- Container for each category of drawings
- Green BC time line dated by thousands of years and scaled to suit size of drawings
- Red AD time line dated by hundreds of years and scaled to suit size of drawings
- Container for BC time line and container for AD time line
- White label 1" by 4 1/4" for spiritual needs, black label 1" by 4 1/4" for material needs, heading card labeled Fundamental Needs of Humans
- Control chart with main heading, Fundamental Needs of Humans, sub-headings spiritual and material with appropriate topics listed under those
- Container for labels and control chart

Procedure for preparation:

Note: These directions will need to be adjusted to allow for the passage of time into the twenty-first century. When measuring times, it is wise to measure back from the most recent time to the earlier time.

1. Collect overview drawings or pictures showing as many needs as possible in each. Begin with early man and continue to the present day. For example, a drawing of cave dwellers would show their shelter, clothing, food, self- protection. Mount on tan cover stock either 8 1/2" by 11" or 5 1/2" by 8 1/2". Laminate and place in a container.
2. Mount on appropriate color the individual drawings or pictures showing each category of needs individually. For example, under shelter, drawings of cave, skin tent, mammoth bone hut, stone and mud huts, reed shelter, each mounted on blue. On the reverse, put the name of the item and the approximate date it appeared in civilization. Laminate and place in a separate container for each category.
Note: Drawings 2" by 2" will keep the time line a reasonable length.
3. Make red BC time line to the scale of your drawings, starting at 35,000 BC on the far left and marking it in 1000 year intervals.
4. Make green AD time line to the scale of your drawings, starting at the first century AD and marking it from the left in 100 year intervals to the end of the 20th century.
5. Cut cards 3 1/2" by 5 1/4" in appropriate colors of cover stock. Mount on appropriate colors the information which has been printed on white paper 2 1/2" by 4 1/4". Letter on the reverse of the colored card the date corresponding to its matching picture. Laminate and place in container with the appropriate individual drawings.
- 6 Copy and cut white label 1" by 4 1/4" for spiritual needs and cream label 1" by 4 1/4" for material needs. Copy and cut tan label 1" by 4 1/4" for Fundamental Needs of Humans.
7. Prepare the control chart with main heading, Fundamental Needs of Humans, sub-headings spiritual and material with appropriate topics listed under those. Place control chart and labels in container.

Note: A good source for drawings is The Atlas of Early Man, by Jacquetta Hawks, St Martins Press, New York, 1976.

Preparation of Materials for Nutrition

1. Cut cover stock 4 1/4" by 4 1/4" in appropriate color for each food group as given below. Type information on the reverse before mounting picture and laminating.

tan: protein foods

meat: beef, veal, pork, lamb

game: rabbit, venison, squirrel

poultry: chicken, turkey, duck, goose, squab, eggs

game birds: duck, goose, pheasant, quail, dove

seafood: fish, clams, oysters, crab, lobster, scallops, shrimp

freshwater foods: fish, mussels, clams, eels, turtles, crayfish

legumes: dried beans, peas, lima beans, kidney, black-eyed peas, soybeans, peanuts

nuts: almonds, cashews, pistachios, pecans, macadamias, Brazil, hazel, chestnuts, coconuts

seeds: sunflower, pumpkin, sesame, anise, poppy, caraway

cream: dairy products

milk, cheese, yogurt, butter, cottage cheese, cream, ice cream

orange: fruit

citrus: oranges, grapefruit, tangerines, limes, lemons, tangelos

from trees: apples, peaches, pears, apricots, nectarines, plums, cherries

from bushes: blueberries, raspberries, blackberries, currants, gooseberries

from vines: strawberries, grapes, pumpkins, watermelons, cantaloupes, honeydews, kiwis

from other plants: pineapple, bananas

green: vegetables

fruits considered vegetables: eggplant, peppers, squash, okra, cucumbers, tomatoes, olives

roots: potatoes, sweet potatoes, beets, turnips, radishes, carrots

stems: asparagus, celery, rhubarb

leaves: cabbage, lettuce, spinach, turnip greens, mustard greens, kale, collards, parsley, Brussel sprouts

flowers: broccoli, cauliflower

seeds: peas, corn, string beans, mung beans, soybeans

bulbs: onions, garlic

yellow: grains

wheat, oats, rice, rye, millet, barley, buckwheat made into cereal or

flour for bread, pasta, cookies, cake

light orange: fats

vegetable: olive oil, corn oil, soybean oil, safflower oil, coconut oil, sunflower oil, sesame oil, cotton seed oil, canola oil, peanut oil

animal: lard, butter, tallow

lavender: sugar

refined sugar, brown sugar, honey, maple syrup, sorghum

2. Cut cover stock 2" by 5 1/4" as follows: 3 cream color, 2 tan, 3 orange, 2 green, 6 yellow, and 3 white.
3. On white paper make labels "1 by 4 1/4" by copying and cutting as follows: 3 copies dairy products, 2 copies protein, 3 copies fruit, 2 copies vegetable, 6 copies grain.
4. Make copies of labels for breakfast, lunch, and dinner.
5. Mount labels on appropriate color as given previously and place labels in a container.

Suggested Topics for Time Lines

Botany, Zoology, Geology
Child's Life and Child's Day

Seasons of Year

Holidays

Class Birthdays

Number Systems through the Ages

Instruments for Telling Time

Calenders through the Ages

Forms of Written Language through the Ages

Non-human and Human Time Periods

Continental Drift

Prehistory by Eons (Precambrian Time's Archeon and Proterozoic , Phanerozoic)

Prehistory by Eras within the Phanerozoic Eon (Paleozoic, Mesozoic, Cenozoic)

Note:Periods within the eras will be presented in the Level 2 course.

Dinosaurs

Early Man

Needs of Man:

- Procurement of Food (gathering, hunting, animal domestication, cultivation)

- Inventions Relating to Agriculture

- Clothing

- Dwellings

- Heating of Dwellings

- Lighting of Dwellings

- Religion

- Water Transportation

- Land Transportation

- Air Transportation

- Weapons

- Inventions

Civilizations such as Egyptian, Sumerian, Indus, Minoan, Chinese, Cretan, Greek, Assyrian, Etruscan, Babylonian, Roman, etc.

BC-AD

Explorations on Earth and in Space

Art of Successive Periods such as Early Humans, Egyptian, Sumerian, Indus, Minoan, Chinese, Cretan, Greek, Assyrian, Etruscan, Babylonian, Roman, etc.

Art or Artists within a School or Style such as Impressionism

Artists of a Specific Country or Continent

Music of Successive Periods

Composers within a particular style or period

Music of a Specific Country or Continent

Evolution of Particular Groups of Musical Instruments

Lives of Famous Individuals

Individuals Contributing to the Development of a Particular Field

History of a Particular Country, City, State, Ethnic Group

Development of a Specific Item such as Computers, Automobiles, Planes

Construction of Items such as Types of Buildings, Boats, etc.

Manufacture of Products such as Automobile, Baseball, Clothing, etc.

Note: Many of the suggested topics are covered in the course manuals.

