

Celebrating Cosmic Time: The Roman Calendar

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Overview

Celebrating Cosmic Time: The Roman Calendar is a curriculum unit that incorporates history, geography, science, math literacy, and cultures. This unit also uses the pedagogy and educational philosophy of Maria Montessori's cosmic education.

The ancient Roman calendar was a lunar calendar with an extra month inserted sporadically to keep the months aligned with the seasons. The study of the Roman calendar includes the Latin derivatives of the names of our months, the mythology involved in the names, the comparison to other early calendars, and the Roman calendar as a mathematical and scientific contribution of an ancient civilization. This curriculum unit is to be used at Pittsburgh Montessori School. Maria Montessori believed in sensory education for the primary grades and cosmic education for the elementary grades. See Appendix A for an outline of Montessori philosophy and pedagogy provided by Michael Olaf.

I teach in a multi-age classroom of kindergarteners and first graders using the philosophy and pedagogy of Maria Montessori and the Pittsburgh Public School curriculum and standards. This unit was created to be introduced to the students in the three to six year old class and as a full unit of study (Ancient Roman Civilization) to the students in the six to nine year old classes.

The importance of historical knowledge of our past is not merely for the exchange of facts, but to highlight for ourselves and for the students we teach, our interdependence. Cosmic education begins with the story of the universe, through which the child sees the inter-

relationship of all things. According to Maria Montessori students learn first through their senses with many didactic materials and presentations. This information is presented first as a whole and then its parts. For example, the solar universe is first presented, then the planets, then earth, then the continents, then the countries.

A deep understanding of past civilizations provides a reference for students to compare and contrast the changing times, beliefs/rituals, contributions and errors. Using the 10 standards of social studies (Appendix B) a student is given a framework to understand people, places, culture, and political systems. Maria Montessori stated: *“Let us give the child a vision of the whole universe. . . for all things are part of the universe, and are connected with each other to form one whole unity.”*--Maria Montessori, *To Educate the Human Potential*

Understanding the needs of mankind and placing them in a timeline and cultural framework helps the student understand human endeavors and more importantly, they see similarities and differences of people and circumstances. History comes alive for primary and elementary students by connecting how these people, places and/or events personally affect the students' present lives.

At the Pittsburgh Montessori school, the Montessori teacher would have already presented to the primary and elementary students the Five Great Lessons. *“If you would understand anything, observe its beginning and its development”*—Aristotle Montessori uses its Five Great Lessons as an introduction to all topics, providing a "Big Picture" or “Big idea” to demonstrate how the sciences, art, history, language, geography are interrelated. Rather than following the traditional approach of presenting facts as belonging to individual subjects, Montessorians use the Five Great Lessons to present a holistic vision of knowledge, building the subject skills into each topic or theme. Reading, writing, geography, science and history are all studied in terms of these larger, cultural contexts. We take the children from the whole to the parts and back to the whole again.

Through these Five Great Lessons, children become aware of time. The students learn that the universe evolved over billions of years, and that it is based on the law and order through which all the plants, animals, and the rest of creation is sustained. There is order in contrast to chaos.

Just as in traditional scope and sequence, Montessori students are introduced to increasing levels of detail and complexity within these broad areas and gradually understand that they are part of this order and are participants in the ongoing fiber of the universe. The students will begin to just match nomenclature cards that explain the derivation of the names of the months. As they grow in knowledge they begin to research other calendars, make comparisons, and create timelines. As they become more familiar with their subject they will present to their peers in an oral or technological presentation.

The primary and elementary curriculum uses Montessori's Five Great Lessons as its major themes or big ideas. The Five Great Lessons move logically in sequence from the beginning of

time through modern day. These themes include: The Story of the Creation of the Universe, The Timeline of Life, The Timeline of Civilization/The Coming of Humans, The Story of Language, and The Story of Numbers,

The Story of the Creation of the Universe introduces scientific thought on the origins of the universe and our own planet. Using impressionistic charts and experiments directly related to the basic physical properties of matter, a foundation is made for the future study of physics, chemistry, astronomy and geology. Specifically, this first Great Lesson describes how minerals and chemicals formed the elements, how matter transforms to three states of solid, liquid, and gas, how particles joined together and formed the earth, how heavier particles sank to the earth's core and volcanoes erupted, and how mountains were formed and the atmosphere condensed into rain, creating oceans, lakes, and rivers. From this story, students are introduced to lessons in physics, astronomy, geology, and chemistry. For example, they learn about light, heat, convection currents, gravity, galaxies, planetary systems, the earth's crust, volcanoes, erosion, climate and physical geography

The Time Line of Life represents the beginning of life on Earth from the simplest forms through the appearance of human beings. A great variety and magnificence of life is presented, with each organism a contributor to a vast cosmic scheme. Specifically, this second Great Lesson explains how single-cell and multi-cell forms of life became embedded in the bottom of the sea and formed fossils. It traces the Paleozoic, Mesozoic, and the Cenozoic periods, beginning with the kingdom of trilobites and ending with human beings. The teacher indicates on a time line where vertebrates began, followed by fish and plants, then amphibians, reptiles, birds, and mammals. This lesson is the basis for lessons in chemistry, nutrition, categories of animals and plants, care and requirements of different animals, and their interrelationship with an ecological system. Students are introduced to formal scientific language of zoology, botany, and anthropology

The Timeline of Civilization/ The Coming of Humans continue the exploration of life on Earth, providing a time line that stresses the development of humans from the earliest beings and introduces their unique endowments of intellect and will. The aim is for the children to imagine what life was like for early humans. This lesson is the basis for lessons in prehistory and ancient civilizations. Students are introduced to an analytical tool to compare cultures. They learn how climate and topography influence culture and political geography.

The Story of Language A theme area rather than a specific time line (although time lines may be developed), the Story of Language follows the development of writing from its appearance in primitive cultures to its role in modern society, covering the origin, structure, and types of writing and speaking. It begins with a discussion of the Egyptians, who had two kinds of symbols, one for ideas and one for sounds. The story goes on to describe the Phoenicians, who used the Egyptian's sound pictures but not their idea pictures. Next, it describes contributions of the Hebrews, Greeks, and Romans. From this lesson, students use grammar materials, which help them examine how language is put together, and refine capitalization and punctuation. Students are introduced to the study of the origin of English words from other languages, the

meanings of prefixes and suffixes and different forms of writing such as poetry, prose, and plays. Older children may study Egyptian hieroglyphics or Native Indian picture writing.

The Story of Numbers Also a theme area, this lesson involves the use of mathematics as an expression of the refinement of the human mind and as a response to the specific needs as well as the shared needs of human groups. Specifically, this Great Lesson emphasizes how human beings needed a language for their inventions to convey measurement and how things were made. The story describes how the Sumerians and Babylonians had a number system based on sixty, which is the reason for our sixty-second minute and sixty-minute hour. Greek, Roman and Chinese numbers are introduced. The story explains that our Arabic numerals are similar to numbers found in a cave in India from two thousand years ago. These Indian numerals used something that no other number system had used: the zero. This story is the basis for the children's learning of mathematics, which is integrated into all studies. For example, large numbers are needed in measuring time and space in astronomy, negative numbers are needed when measuring temperature changes; triangulation is needed to re-establish property boundaries after the Nile flooded ancient Egypt.¹

1 <http://www.missbarbara.net/greatlessons.html>

The unit, *Celebrating Cosmic Time: The Roman Calendar* could be a part of all of the Five Great lessons.

What is the meaning of time? How time was first calculated? What influence does astronomy have in the creation of calendars? What resources did ancient people use to calculate time? How did ancient civilizations begin the record time? What were their misconceptions? What is the history of our current calendar? What important dates, events, people, and political powers influence the creation of the Roman calendar? How does the Roman calendar compare to other calendars. What are the ancient Roman origins of the months of the years? What folklore surrounds the name and attributes of each month? What were the fundamental needs of man during those times? What was the source of the Roman and Norse mythology used for the names at that time? What parallels can be drawn to illustrate similarities and differences with other nations/cultures calendar.

Rationale

This deep understanding of our history as human beings, is not only necessary but of utmost importance for the evolution and survival of the human race. As a Montessori educator and observer of both humanity and inhumanity, I believe our survival as civil and humane inhabitants of the world is contingent upon our understanding and appreciation of the past and how it connects all of us.

1 <http://www.missbarbara.net/greatlessons.html>

“Whoever wishes to foresee the future must consult the past; for human events ever resemble those of preceding times? This arises from the fact that they are produced by men who ever have been, and ever shall be, animated by the same passions, and thus they necessarily have the same results”--. Machiavelli

In David Ewing’s Book, *Calendars* he stated, “The calendar is humanity’s epic struggle to determine a true and accurate year” The Pittsburgh Public School curriculum in math requires the students fill in the daily calendar. A class calendar is part of every classroom. Providing the students with the history and chronology of the calendar goes above and beyond the minimum requirements and provides multiple learning opportunities. “The calendar in Rome was in a jumble. It was supposed to be a lunisolar calendar, but had lost touch with both the seasons and the phases of the Moon. It had March as the first month and September as 7th, October as 8th, November as the 9th, and December as the 10th” (<http://www.nso.edu/Pr/answerbook/calendar>.) Emperor Julius Caesar had to reform the calendar, but because of errors with leap year, it still had problems. .

A pre-requisite for students to learn how to think clearly, to choose values, and how to act on those values, he/she must have an understanding of the nature of man. To teach students history is the best introduction to this understanding. It shows what man has tried in the past, what has succeeded, and what has failed. Students at Pittsburgh Montessori School are required to learn about the Prehistoric man, primitive ancient civilizations,--Sumerians, Babylonians, Mayans, Incas, Egyptian, Native Americans, Ancient Greece and Ancient Rome.

The rationale for this lesson is to present to the whole classroom the opportunity for student inquiry and research on a selected topic. Students would have a work plan and a rubric that would help prioritize the planning, requirements, and expectations.

This experience of spending a month on a theme driven unit provides the Montessori student opportunities to investigate far more than just the Roman calendar. Instead the Montessori student researches ancient Rome, the history and fundamental needs of the people, policies, and power that influenced the culture and its contributions. The art teacher, music, gym, and foreign language teacher would be aware of the unit of study. This would provide rich learning experiences in the students’ elective classes as well.

- The Roman world and its first settlers.
- The work of Ancient Romans.
- Transportation.
- Art, Architecture and engineering.
- Government/Society and Class
- The famous people of Ancient Rome.
- Daily life, clothing, food, housing etc.

- Religion.
- Recreation.
- Roman Arms and Armor.
- The Contributions and Errors from Ancient Rome

The large unit of ancient Roman history, geography, and cultural studies, in conjunction with the curriculum unit of the Roman calendar would include explorations into mythology, astrology, and astronomy. Opportunities for math and science extended lesson would be necessary to fully understand what was necessary for the creation of calendars, the understanding of the similarities and differences of other calendars, and the connections of the past to the present. This unit incorporates the teaching standards in 4 curriculum areas: social studies, (science, literacy, and math (Appendix C)

Objectives

“The human child’s intelligence has to take in the present of an evolving life which goes back hundreds of thousands of years in its civilization, and which has stretching before it a future of hundreds of thousands of millions of years; a present that has no limit either in the past or the future, and that is never for a moment the same.”

--Dr. Maria Montessori – Education for a New World, p. 31

This unit is a part of Montessori education because it requires the student to be knowledgeable of the past and see the connection to his/her own life. The Roman calendar along with ancient Roman history allows the student to see how earlier generations have struggled and survived and they will do the same. The student begins to see how ancient civilization contributed to the evolution of the human race and those lessons connects them to their place and responsibility. The student that learns about the past civilizations and contributions becomes familiar with different cultures and understands diversity. This understanding can build an appropriation and foster positive qualities of empathy and gratitude, teamwork, cooperation, and self-reliance.

These objectives are aligned with Pennsylvania Early learning Standards, math, literacy, social studies, and science. Appendices B and Appendix C provides these standards.

Strategies:

- A. Communicate with parents the course of study will be ancient Rome as a large unit of study. Request for support and opportunities for parents to volunteer to research

- extensions and provide information through grandparents etc. Ideas of Latin teachers, Italian heritage, astronomy, time pieces clock makers
- B. Research internet sites for online information, resources, and assessments.
 - C. Establish a partnership with Carnegie Library to send resource materials to our library
 - D. Establish a partnership with the Pittsburgh Observatory for field trips and/ or speakers
 - E. Participate in the school's curriculum units to provide clarification to students and parents about the course of study. Plan ahead for the availability of resources and artifacts to provide optimal presentations for the students.
 - F. Research and ascertain movies, videos or speakers that would complement the Ancient Roman unit.
 - G. Research and select appropriate internet sites for online creation of calendars.
 - H. Follow the Montessori pedagogy of teaching history and culture.
 - I. Create Montessori materials to reinforce the core knowledge: nomenclature cards, maps, biographies, stories, and artifacts.

Approaches to Teaching History:

1. Timelines
2. The fundamental needs of humans.
3. Independent research and projects.
4. Group research and projects.
5. Oral reports
6. Incorporating current events and tying them into history.
7. Interaction with "real life:" museums, artifacts, pictures, books, videos, drama, interactive software, and internet.
8. Nomenclature fact cards for matching and tracing.

Classroom Activities

#1: Our calendar, our language, and the connection to Ancient Rome

This lesson provides background information through videos, pictures, stories, and direct instruction. Day 1 and Day 2 will be viewing a movie, video that contains facts about the calendar. A graphic organizer will be provided so the students will be able to proficiently match the Roman Gods and Norse Gods correctly to their English name of the months or days of the week. The students will create their own nomenclature cards to match factual core knowledge about the gods or facts about history of calendars. Note cards with Roman calendar facts will be provided. The children will use the internet to research Roman calendars on provided internet sites. They will work with a partner to create a match for these pre-printed cards by drawing or printing an illustrated picture. They will be proficient in matching Roman gods to the names of the months (Appendix D) from the template. Teacher's resources for core knowledge of Roman calendars through internet sites listed in the bibliography.

This is a knowledge based lesson of disseminating facts to give students background information. The student would have a rubric and pre-written cards with calendar information. Each group would be responsible for creating assigned nomenclature cards would be "shelf work" for students. The students will be divided into 5 groups and create Timeline nomenclature cards that reflect the history of the calendar.

#2 Roman Days: In Rome Do Like the Romans Do

How the Romans counted special days The students will watch a video that illustrates the Roman calendar. The students will receive a template and create a Roman calendar as an assessment for understanding Kalends, nones, and ides.

Another means of assessing this learning goal is to have the students divided into 5 groups and each group will sing a song or mnemonic gimmick to memorize these difficult facts.

The mathematical calculations of the Roman calendar are complicated and beyond the operational development of the targeted age group for this lesson. This lesson will be scaffolded to include pre-printed cards.

There were three fixed times in the Roman month. The first day of the month was always called the Kalends. For most months of the year, the fifth day was called the Nones and the

thirteenth day was called the Ides. But in March, May, July, and October the Nones and Ides were the seventh and fifteenth days. (Hence, the assassination of Julius Caesar on the “Ides of March.”) The Romans described the date by looking forward to the next fixed point. Therefore, July 31st was the “day before the Kalends of August” and was written as pridie Kal.Aug.

The Romans always included the days on which they started and finished counting, so their calendar system was inclusive. Therefore July 28th was “five days before the Kalends of August” (you count the 28th, 29th, 30th, 31st, and 1st) or antediem tertium Kal.Aug., which was written as a.d. V Kal.Aug.

The students will work with assigned partners to fill in a Roman calendar. There will be a control chart to help students fill in the correct Kalends, Nones, and Ides. The students will use the internet site to convert their birthday to the Roman calendar.

The student will use the internet site Calendar Converter and calculate his/her birthday to the Roman calendar. They then would record the date on a Chart Titled “In Rome do like the Romans Do” The children will go to google and search for the calendar converter.

2 <http://www.fourmilab.ch/documents/calendar/>

| Century | Year | Month | Day |
|---|--------------------------------|----------------------|---|
| Gregorian Date: | | | |
| <input type="text" value="1998"/> | <input type="text" value="1"/> | <input type="text"/> | <input type="text"/> |
| | | Time: | <input type="text" value="00"/> : <input type="text" value="00"/> : <input type="text" value="00"/> |
| Weekday: | | | |
| <input type="text"/> | | | |
| Julian Date: | | | |
| <input type="text"/> | <input type="text"/> | <input type="text"/> | <input type="text"/> |
| Julian day: <input type="text"/> / Modified Julian Day: <input type="text"/> | | | |
| Hebrew Date: <input type="text"/> / <input type="text"/> Hebrew month: | | | |
| סיון | | | |
| Islamic Date: <input type="text"/> / <input type="text"/> Weekday: <input type="text"/> | | | |
| Persian Date: <input type="text"/> / <input type="text"/> Weekday: <input type="text"/> | | | |

6. Group #6 will present the historical facts of the Roman law and create a mock court. They will create a Venn Diagram of our classroom meetings and a Roman Forum.

#4 Knowing the planets and the constellations and the science of astronomy

The class will be divided into 11 partner groups:

1. Each group will present 1 planet or constellation and basis of astronomy that was used to create the Roman calendar. Included would be a factual list of scientist that contributed to creation of the calendar
2. Each group will create a power point research chart on the planet or constellation and create an assessment tool. A fill in the blank or a coloring, or tracing activity of a planet and/or constellation will be the assessment.
3. Each child will print and complete both the rubric and graphic organizer for researching a planet for The Enchanted Learning web site.
4. Each individual child will work at home with a school/home connection by filling out a graphic organizer that charts the movement of the sun, moon, planets, and stars.

#5 Roman mythologies: the gods and goddesses

The student will use the internet for images and information about a Roman mythological figure. Each student will then create a power point presentation on a mythological figure of their choice. The months of the year and the days of week derivative will be required and choices of others figures will be for extra credit. The following images are available:

3 http://web.uvic.ca/grs/department_files/classical_myth/gods.html

1. [Aeneas](#)
The legendary Roman hero. [Illustration; 5kb]
2. [Amor](#)
The god of love. [Illustration; 9kb]
3. [Aurora](#)
The Roman personification of the dawn. [Illustration; 14kb]
4. [Bacchus](#)
The god of wine. [Illustration; 21kb]
5. [Bacchus](#)
The Roman god of wine and intoxication. [Illustration; 7kb]
6. [Ceres](#)
The goddess of agriculture. [Illustration; 16kb]

7. [Ceres](#)
The goddess of agriculture. [Illustration; 33kb]
8. [Ceres](#)
The goddess of agriculture. [Illustration; 31kb]
9. [Cupid](#)
The god of love and his mortal lover Psyche. [Illustration; 32kb]
10. [Diana](#)
The goddess of the hunt. [Illustration; 17kb]
11. [Diana](#)
The goddess of the hunt. [Illustration; 33kb]
12. [Diana](#)
The goddess of the hunt. [Illustration; 16kb]
13. [Diana](#)
The goddess of the hunt. [Illustration; 55kb]
14. [Diana](#)
Diana's dogs attacking Actaeon. [Painting; 74kb]
15. [Fauns](#)
Wild forest deities. [Illustration; 8kb]
16. [Flora](#)
The goddess of blossoming flowers of spring. [Illustration; 21kb]
17. [Fortuna](#)
The personification of good fortune. [Illustration; 14kb]
18. [Janus](#)
The god of gates and doors, beginnings and endings. [Illustration; 4kb]
19. [Juno](#)
The queen of the gods. [Illustration; 19kb]
20. [Juno](#)
The queen of the gods (head; frontal view) [Illustration; 8kb]
21. [Jupiter](#)
The chief god of the Roman pantheon. [Illustration; 29kb]
22. [Mars](#)
The god of war. [Illustration; 16kb]
23. [Mars](#)
The god of war. [Illustration; 16kb]
24. [Mercury](#)
The god of trade and profit, merchants and travelers. [Illustration; 8kb]
25. [Minerva](#)
The goddess of wisdom, medicine, the arts, science and trade, and war. [Illustration; 17kb]
26. [Minerva](#)
The goddess of wisdom, medicine, the arts, science and trade, and war [2]. [Illustration; 10kb]
27. [Penates](#)
The patron deities of the household. [Carving; 20kb]

28. [Priapus](#)
The Roman patron god of gardens, viniculture, sailors and fishermen. [Statue; 98kb]
29. [Roma](#)
The personification of the city of Rome. [Illustration; 5kb]
30. [Romulus](#)
The legendary founders of Rome. [Statuette; 33kb]
31. [Saturn](#)
The god of agriculture. [Illustration; 27kb]
32. [Venus](#)
The goddess of love and beauty. [Illustration; 22kb]
33. [Vesta](#)
The goddess of the hearth. [Illustration; 15kb]
34. [Victoria](#)
The goddess of victory. [Illustration; 18kb]
35. [Vulcan](#)
The Roman god of fire and craftsmanship. [Statuette; 15kb]
36. [Vulcan](#)
The Roman god of fire and craftsmanship [2]. [Illustration; 40kb]

Number of images in this area: **36**.

#6 Comparing the Roman Calendar to other calendars.

The students will be divided into 6 groups. The students will use the library and internet for research. Each group will recreate on large poster paper a different calendar. Each group will present a research lesson following a rubric and creating a Venn Diagram as an assessment. A graphic illustration of various calendars appears in the book, *Calendar Art*. The students would trace or draw free hand the different calendars.

This diagram is from the internet and provides the students with information for their comparisons.

4

<http://www.friesian.com/calendar.htm>

| | Start date | No. of days | No. of | Correction |
|--|------------|-------------|--------|------------|
|--|------------|-------------|--------|------------|

| | (in Gregorian) <u>Explain</u> | per year <u>Explain</u> | months per year <u>Explain</u> | applied <u>Explain</u> |
|-------------------------|-------------------------------------|-----------------------------------|--|--|
| <u>Astronomical</u> | | <u>365.24219</u> <u>approx</u> | | |
| <u>Aztec Sacred</u> | | 260 | 20 of 13 days | |
| <u>Aztec Solar</u> | | 365 | 18 of 20 days + 5 days | |
| <u>Babylonian</u> | | 365.2467463 | 12 each of 29 or 30 days | Intercalary month added every 19 years |
| <u>Bahai</u> | 21 Mar 1844 AD | 365.2425 | 19 of 19 days and 4 or 5 feast days | If year is divisible by 4 then it is a leap year. If year is divisible by 100 then it is not a leap year. If year is divisible by 400 then it is a leap year. |
| <u>Balinese</u> | | 210 | 6 of 35 days | No correction applied. |
| <u>Chinese</u> | 2637 BC | 353 to 385 | 12 or 13 of 29 or 30 days | Intercalary month added according to complicated rules. |
| <u>Egyptian</u> | | 365 | 12 of 30 days + 5 days | No correction applied. |
| <u>English</u> | | Unknown | 12 | |
| <u>Ethiopian</u> | 11 Sept 7 AD | 365.2425 | 12 of 30 days + 1 of 5 or 6 days | A leap year occurs when the Gregorian calendar has one. |
| <u>French</u> | 22 Sept 1792 | 365.24225 | 12 of 30 | Years 3, 7 & 11 were leap years. |

| | | | | |
|---------------------------------|--|---------------|---|---|
| Revolutionary | AD | | days + 5 or 6 days | Calendar abolished in year 14. |
| Greek Orthodox | | 365.24222 | 12 in total. 7 x 31, 4 x 30, 1 x 28 or 29 | If year is divisible by 4 then it is a leap year. If year is divisible by 100 then it is not a leap year. If year divided by 900 leaves a remainder of 200 or 600 then it is a leap year. |
| Gregorian | In theory - 1 Jan 1 AD. In practice. | 365.2425 | 12 in total. 7 x 31, 4 x 30, 1 x 28 or 29 | If year is divisible by 4 then it is a leap year. If year is divisible by 100 then it is not a leap year. If year is divisible by 400 then it is a leap year. |
| Hebrew | 3761 BC | 354 approx | 12 or 13 each of 29 or 30 days. | If year divided by 19 leaves a remainder of 0, 3, 6, 8, 11, 14 or 17 then it is a leap year and has 13 months. |
| Hebrew Jubilee | | 364 | 12 of 30 days + 1 extra day in each quarter. | No correction applied. |
| Indian | 22 Mar 79 AD | 365.2425 | 12 in total 5 x 31 7 x 30 | If year is divisible by 4 then it is a leap year. If year is divisible by 100 then it is not a leap year. If year is divisible by 400 then it is a leap year. |
| Islamic (Hijri) | 16 July 622 AD | 354.36 | 12 length variable. | The calendar is based on the first sighting of the moon each month and therefore difficult to predict. |
| Julian | 45 BC | 365.25 | 12 in total. 7 x 31, 4 x 30, | If year is divisible by 4 then it is a leap year. |

| | | | | |
|----------------------------------|-------------------|--------------------------------|---|---|
| | | | 1 x 28 or 29 | |
| Lunar | | 354 | 12 in total. 6 x 29, 6 x 30 | No correction applied. |
| Mayan Sacred | 12 Aug 3113 BC | 260 | 20 of 13 days | No correction applied |
| Mayan Solar | 12 Aug 3113 BC | 365 | 18 of 20 days + 5 extra days | No correction applied |
| Persian | 21 Mar 622 AD | 365.2422 | 12 in total 5 x 30, 6 x 31 1 x 29 or 30 | One extra day inserted according to a complicated cycle which lasts 2820 years. |
| Roman | Approx 750 BC | Standard 355 Ave. 366.25 | 12 in total. 1 x 28, 7 x 29, 4 x 31 | An additional month of either 28 or 29 days in alternate years. |

1. O'Neil, William. *Time and the Calendars*, Sydney University Press, 1975
2. Duncan, David Ewing, *Calendar*, Avon Books Inc. 1998
3. Richards, E. G. *Mapping Time The Calendar and its History*, Oxford Press, New York, 1998
4. Maestro, Betsy, *The Story of Clock and Calendars*:Lothrop, Shepard Books,New York,1999
5. James S. *See Through History Ancient Rome*, New York: Penguin Group, 1992
6. Usher, K. *Heroes, Gods & Emperors from Roman Mythology*, New York: Bedrick 1983.

Internet Sites:

1. <http://www.roman-empire.net/republic/ceasar>
2. <http://www.cap.nsw.edu/places/roman>
3. <http://www.School-History.co.uk>
4. <http://www.Members.enchantedlearning.com>
5. http://www.library.thinkquest.korg/CR0210200/ancient_rome/cities.htm
6. <http://www.timelessmyth.com/classical/allthings.html>.
7. http://www.exovedate.com/a_history_of_the_calendar.html
8. <http://www.michaelolaf.com>
9. <http://www.missbarbara.net/greatlessons.html>
10. <http://www.fourmilab.ch/documents/calendar/>
11. http://web.uvic.ca/grs/department_files/classical_myth/gods.html

Appendix A

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Author: Susan Stephenson bio

Return to the Michael Olaf home pages:

<http://www.michaelolaf.net> (Montessori Overviews 0-12+)

<http://www.michaelolaf.com> (products)

SPECIFIC ELEMENTS OF MONTESSORI PHILOSOPHY ON WHICH THE EDUCATIONAL METHOD IS BASED

- **Multi-aged Grouping, based on Periods of Development**
- **The Human Tendencies**
- **The Process of Learning**
- **Indirect Preparation**
- **The Prepared Environment**
- **Observation**
- **Work Centers**
- **Teaching Method**
- **Class Size**
- **Basic Lessons**
- **Areas of Study Linked**
- **The Schedule**
- **Assessment**
- **Requirements for Age 3-6**
- **Requirements for Ages 6-18**
- **Learning Styles**
- **Character Education**
- **The Results**

Multi-aged Grouping, based on Periods of Development: Children are grouped in three or six-year spans and have the same teacher for this period

The 3-Hour Work Period: After every age, a minimum of one 3-hour work period per day, uninterrupted by required attendance at group activities of any kind is required for the Montessori method of education to produce the results for which it is famous.

The Human Tendencies: The practical application of the Montessori method is based on human tendencies— to explore, move, share with a group, to be independent and make decisions, create order, develop self-control, abstract ideas from experience, use the creative imagination, work hard, repeat, concentrate, and perfect one's efforts.

The Process of Learning: There are three stages of learning:

(Stage 1) introduction to a concept by means of a lecture, lesson, something read in a book, etc.

(Stage 2) processing the information, developing an understanding of the concept through work, experimentation, creation.

(Stage 3) "knowing", to possessing an understanding of, demonstrated by the ability to pass a test with confidence, to teach another, or to express with ease.

Indirect Preparation: The steps of learning any concept are analyzed by the adult and are systematically offered to the child. A child is always learning something that is indirectly preparing him to learn something else, making education a joyful discovery instead of drudgery.

The Prepared Environment: The Prepared Environment: Since the child learns to glean information from many sources, instead of being handed it by the teacher, it is the role of the teacher to prepare and continue to adapt the environment, to link the child to it through well-thought-out lessons, and to facilitate the child's exploration and creativity.

Observation: Scientific observations of the child's development are constantly carried out and recorded by the teacher. These observations are made on the level of concentration of each child, the introduction to and mastery of each piece of material, the social development, physical health, etc. on.

Work Centers: The environment is arranged according to subject area, and children are always free to move around the room, and to continue to work on a piece of material with no time limit.

Teaching Method: There are no text books, and seldom will two or more children be studying the same thing at the same time. Children learn directly from the environment, and from other children—rather than from the teacher. The teacher is trained to teach one child at a time, with a few small groups and almost no lessons given to the whole class. She is facile in the basic lessons of math, language, the arts and sciences, and in guiding a child's research and exploration, capitalizing on interests and excitement about a subject. Large groups occur only in the beginning of a new class, or in the beginning of the school year, and are phased out as the children gain independence. The child is scientifically observed, observations recorded and studied by the teacher. Children learn from what they are studying individually, but also from the amazing variety of work that is going on around them during the day.

Class Size: The most successful 3-6 or 6-12 classes are of 30-35 children to one teacher, with one non teaching assistant, this number reached gradually over 1-3 years. This provides the most variety of personalities, learning styles, and work being done at one time. This class size is possible because the children learn from each other and stay with the same teacher for three to six years. .

Basic Lessons: A well-trained Montessori teacher spends a lot of time during training practicing the many basic lessons with materials in all areas. She/he must pass difficult written and oral exams on these lessons in order to be certified. She is trained to recognize a child's readiness—according to age, ability, and interest—for a specific lesson, and is prepared to guide individual progress. Although the teacher plans lessons for each child for each day, she will bow to the interests of a child following a passion.

Areas of Study Linked: All subjects are interwoven; history, art, music, math, astronomy, biology, geology, physics, and chemistry are not isolated from each other and a child studies them in any order he chooses, moving through all in a unique way for each child. At any one time in a day all subjects—math, language, science, history, geography, art, music, etc.—are being studied, at all levels.

The Schedule: There is at least one 3-hour period of uninterrupted, work time each day, not broken up by required group lessons or lessons by specialists. Adults and children respect concentration and do not interrupt someone who is busy at a task. Groups form spontaneously but not on a predictable schedule. Specialists are available at times but no child is asked to interrupt a self-initiated project to attend these lessons.

Assessment: There are no grades, or other forms of reward or punishment, subtle or overt. Assessment is by portfolio and the teacher's observation and record keeping. The real test of whether or not the system is working lies in the accomplishment and behavior of the children, their happiness, maturity, kindness, and love of learning, concentration, and work.

Requirements for Age 3-6: There are no academic requirements for this age, but children are exposed to amazing amounts of knowledge and often learn to read, write and calculate beyond what is often thought usual for a child of this age.

Requirements for Ages 6-18: Requirements for ages 6-18: There are no curriculum requirements except those set by the state, or college entrance requirements, for specific grades and these take a minimum amount of time. Students of K-12+ age design 1-2 week contracts with the teacher to balance their work, and learn time management skills. The work of the 6-12 class includes subjects usually not introduced until high school.

Learning Styles: All intelligences and styles of learning—musical, bodily-kinesthetic, spatial, interpersonal, intrapersonal, intuitive, natural, and the traditional linguistic and logical-mathematical—are nurtured and respected.

Character Education: Opportunities for the valorization of the personality is considered at least as important as academic education. Children are given the opportunity to take care of themselves, each other, and the environment—gardening, cooking, building, moving gracefully, speaking politely, doing social work in the community, etc.

Appendix B: Social Studies Standards

I CULTURE

Social studies programs should include experiences that provide for the study of culture and cultural diversity..

II TIME, CONTINUITY, AND CHANGE

Social studies programs should include experiences that provide for the study of the ways human beings view themselves in and over time.

III PEOPLE, PLACES, AND ENVIRONMENTS

Social studies programs should include experiences that provide for the study of people, places, and environments.

IV INDIVIDUAL DEVELOPMENT AND IDENTITY

Social studies programs should include experiences that provide for the study of individual development and identity.

V INDIVIDUALS, GROUPS, AND INSTITUTIONS

Social studies programs should include experiences that provide for the study of interactions among individuals, groups, and institutions.

VI POWER, AUTHORITY, AND GOVERNANCE

Social studies programs should include experiences that provide for the study of how people create and change structures of power, authority, and governance.

VII PRODUCTION, DISTRIBUTION, AND CONSUMPTION

Social studies programs should include experiences that provide for the study of how people organize for the production, distribution, and consumption of goods and services.

VIII SCIENCE, TECHNOLOGY, AND SOCIETY

Social studies programs should include experiences that provide for the study of relationships among science, technology, and society.

IX GLOBAL CONNECTIONS

Social studies programs should include experiences that provide for the study of global connections and interdependence.

X CIVIC IDEALS AND PRACTICES

Social studies programs should include experiences that provide for the study of the ideals, principles, and practices of citizenship in a democratic republic

Appendix C

Standards in Science education

OBJECTS IN THE SKY

- The sun, moon, stars, clouds, birds, and airplanes all have properties, locations, and movements that can be observed and described.
- The sun provides the light and heat necessary to maintain the temperature of the earth.

CHANGES IN THE EARTH AND SKY

- The surface of the earth changes. Some changes are due to slow processes, such as erosion and weathering, and some changes are due to rapid processes, such as landslides, volcanic eruptions, and earthquakes.
- Weather changes from day to day and over the seasons. Weather can be described by measurable quantities, such as temperature, wind direction and speed, and precipitation.
- Objects in the sky have patterns of movement. The sun, for example, appears to move across the sky in the same way every day, but its path changes slowly over the seasons. The moon moves across the sky on a daily basis much like the sun. The observable shape of the moon changes from day to day in a cycle that lasts about a month.

Science and Technology

As a result of activities in grades K-4, all students should develop

- Abilities of technological design
- Understanding about science and technology
- Abilities to distinguish between natural objects and objects made by humans

Standards in Communication/Literacy

2.0 Reading Comprehension

Students read and understand grade-level-appropriate material. They draw upon a variety of comprehension strategies as needed (e.g., generating and responding to essential questions, making predictions, comparing information from several sources). The selections in Recommended Literature, Kindergarten Through Grade Twelve illustrate the quality and complexity of the materials to be read by students. In addition to their regular school reading, by grade four, students read one-half million words annually, including a good representation of grade-level-appropriate narrative and expository text (e.g., classic and contemporary literature, magazines, newspapers, online information). In grade one; students begin to make progress toward this goal.

Structural Features of Informational Materials

2.1 Identify text that uses sequence or other logical order.

Comprehension and Analysis of Grade-Level-Appropriate Text

2.2 Respond to who, what, when, where, and how questions.

2.3 Follow one-step written instructions.

2.4 Use context to resolve ambiguities about word and sentence meanings.

2.5 Confirm predictions about what will happen next in a text by identifying key words (i.e., signpost words).

2.6 Relate prior knowledge to textual information.

2.7 Retell the central ideas of simple expository or narrative passages.

3.0 Literary Response and Analysis

Students write clear and coherent sentences and paragraphs that develop a central idea. Their writing shows they consider the audience and purpose. Students progress through the stages of the writing process (e.g., prewriting, drafting, and revising, editing successive versions).

Students write compositions that describe and explain familiar objects, events, and experiences. Student writing demonstrates a command of standard American English and the drafting, research, and organizational strategies outlined in Writing Standard 1.0.

Using the writing strategies of grade one outlined in Writing Standard 1.0, students:

2.1 Write brief narratives (e.g., fictional, autobiographical) describing an experience.

2.2 Write brief expository descriptions of a real object, person, place, or event, using sensory details.

Math Standards:

1.0 Students understand and use numbers up to 100:

Statistics, Data Analysis, and Probability

1.0 Students organize, represent, and compare data by category on simple graphs and charts:

1.1 Sort objects and data by common attributes and describe the categories.

1.2 Represent and compare data (e.g., largest, smallest, most often, least often) by using pictures, bar graphs, tally charts, and picture graphs.

2.0 Students sort objects and create and describe patterns by numbers, shapes, sizes, rhythms, or colors:

2.1 Describe, extend, and explain ways to get to a next element in simple repeating patterns (e.g., rhythmic, numeric, color, and shape). Mathematical Reasoning

1.0 Students make decisions about how to set up a problem:

1.1 Determine the approach, materials, and strategies to be used.

1.2 Use tools, such as manipulative or sketches, to model problems.

2.0 Students solve problems and justify their reasoning:

2.1 Explain the reasoning used and justify the procedures selected.

2.2 Make precise calculations and check the validity of the results from the context of the problem.

Appendix D Roman Gods and the names of our months.

| Name | Comes from | Who or what? | Why? |
|-----------|------------------------------|-------------------|---|
| January | <u>Janus</u> | God of Doors | This month opens the year. |
| February | februo | purify | This was a Roman month of sacrifices and purification. |
| March | <u>Mars</u> | God of War | Start of year for soldiers (no fighting during winter) |
| April | aperire | open | This is the month when trees open their leaves. |
| May | <u>Maia</u> | Goddess of Growth | This is the month when plants really start to grow. |
| June | <u>Juno</u> | Queen of the Gods | |
| July | Julius Caesar | Ruler of Rome | He reorganized the calendar. |
| August | Augustus | Ruler of Rome | He thought he was at least as important as Julius Caesar! |
| September | septem | seven | Seventh month (counting from March) |
| October | octo | eight | Eighth month (counting from March) |
| November | novem | nine | Ninth month (counting from March) |
| December | decem | ten | Tenth month (counting from March) |