

LIVING MATH THROUGH HISTORY

Primary Level Introduction

Primary Level is written for early elementary children

Parent Orientation - How to Use the Course

Welcome to Living Math! You are embarking on a new way of learning, studying and enjoying math and history.

Each lesson plan consists of multiple elements:

Synopsis - written for parents to understand background and context

Core and suggested reading and math vignettes, with comments on suitability

Language and literature tie-ins, vocabulary, quotes, discussion questions

Geography and timeline

Math and science related **activities** and **internet sites**

Downloadable activities

Primary resources focus on picture books and story-telling resources that parents can use to bring math topics to life. Many of the activities for this level are drawn from the picture books themselves, either through specifically designed activities, activities suggested in the books themselves or application of "acting out" or modeling activities in the stories.

There are many good resources for the study of math and history, and I have suggested more in these plans than you can likely use, in the knowledge you may have access only to some and therefore multiple sources provides choices. You do not need to purchase everything suggested. Pick and choose what will work best for you and your family. Selecting just those readers and activities you feel would appeal to your child is appropriate. Many will be a challenge, so *go for quality rather than quantity*. One mom likened it to a unit study buffet - that's exactly how our family has used materials like these for years.

Do I use math curriculum with this program? This seems to be THE question, doesn't it? In an article on the website, I have accumulated the experience of many families. <http://www.livingmath.net/UsingLivingMathArticle/tabid/1026/Default.aspx> The answer is, it depends on what kind of mentor/teacher you are, your educational philosophy, and if you can use curriculum as a tool rather than a taskmaster, to give you insight in how to help your child understand. Many families find curriculum unnecessary for the early elementary years, however, if a math-rich environment is provided.

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If curriculum is desired, one resource that I have found to have features that can be blended with Living Math is The Mathematics Enhancement Project (MEP), available for free download at <http://www.cimt.plymouth.ac.uk/projects/mep/default.htm>. The emphasis is on developing mathematical thinking. Ideas from the non-traditional verbal reasoning activities in the teacher's lesson plans can be done separately from the arithmetic and drill exercises, and this is where we have found the most value. "Talking" math and the discussion of math ideas is far more effective at this age than workbook math. Games and re-reading readers provides more enjoyable practice than curricula.

Pacing: The pace of the course is completely up to you. Much of the material in each lesson plan can be covered in two weeks, but families have usually spent more time than this on the material. At one time suggested schedules were included in the plans but were removed at the request of families, as it became apparent these detracted from the intent of the material and stressed families out thinking they were behind if they did not keep up with the schedule.

Manipulatives are used throughout the recommended course activities. A set of Base 10 blocks such as Math U See (www.mathusee.com) color coded blocks or Cuisenaire Rods (found at any large homeschool supplier) is very useful for early elementary. Most other manipulatives are simple items around your home or easily made, with links to instructions provided. Right Start Mathematics sells a nice set of basic manipulatives many of which can be used in the activities, and a nice game package, but it is not necessary to purchase all of these.

History Cycle Notes: The course is designed around two history cycles of four quarters each. Each quarter unit has a focus on a theme. Refer to the Living Math Lessons Plans page for outlines of the full eight quarters of lesson plans.

Living Math Lesson Plans Icon Key

- | | |
|---|---|
|  Best done with two or more people |  Writing or drawing activity |
|  Book resource in print and/or online |  Quote to think about or discuss |
|  Highly visual resource, pictures |  Discussion activity |
|  Printable handout |  Internet website |
|  Hands on activity |  Math activity, calculator |
|  Primary,  Intermediate |  Video resource |
| or  Advanced | |

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Following is a description of lesson plan elements and how they are used.


Synopsis - These are original synopses written to give you and your child a taste of the highlights of each mathematician's life and accomplishments. Each mathematician is selected for his or her place in a thread of discovery. This will also provide more background for those users of the plans who may not have access to all the recommended reading.

The synopses are written for upper elementary level reading on up. You may assist your primary child in understanding some of these ideas.

Reading and Literature

 **Joy of Mathematics**, *Discovering Mathematics All Around You*, by Theoni Pappas. This is a book of short math vignettes that are used throughout the course at every level. Once you have pre-read the indicated pages in *The Joy of Mathematics*, you can bring in the pictures that correspond and discuss them as they relate to the books, topics, geography used in each lesson.

To provide one example, in a lesson of *The Joy of Mathematics*, there are examples of Hindu (Indian) Arabic, European and computer numbers. You can identify these with people and places in the progression on a time line (see timeline activity suggestions below). Some lessons have included notes and resources on how to get more out of the *Joy of Mathematics* vignettes, as they are intended to spark interest and further exploration.

 **READING:** The readers are a core element of the course. Suggested activities revolve around the reading topics.

Use judgment and discretion in time spent reading for this age group

These are wonderful books, but be sensitive that you do not demand too much attention span for your child's maturity. Using your judgment and knowledge of your child to shorten and abbreviate based on interest is appropriate, especially if this approach is new to both of you. While the plans have you move chronological order, with this age group, keep in mind that a book that may not work for a child at one time, if put away for a while, might be perfect a few months later. Be flexible with

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resources, "recycling" books through frequent re-readings is a key factor in success with literature based math learning.


For younger children, it is suggested you set aside time for reading aloud in your family schedule. One idea is to put a stack of the books you plan to read over the course of the week along with an atlas in a central place like a coffee table, or a basket handy throughout the week.

Have an idea of what you want to read, but I don't force the attention span, and I allow "bunny paths" when a strong interest leads down tangents. Also, if your child is into the topic, go ahead and read ahead. Use the plans as guidelines. Don't be overwhelmed and feel like you have to do it all, either. Selecting those activities you feel would appeal to your child is appropriate, many will be a challenge, so go for quality rather than quantity.

For children using resources that are above their reading and maturity level, try reading parts, pointing out pictures, and then reading in another sitting, pointing out pictures. Some situations work better if you narrate what you have preread.

Especially from the early ages make it a point to encourage them to look for PATTERNS as you read. Patterns can be found in words as well as pictures. Ask your child to identify the patterns, rather than suggesting them. For kids that enjoy writing, copying symbols or otherwise drawing math stories is very effective. Kids that have a harder time can use tracing paper.

 **Math Talk Poetry in Two Voices** by Theoni Pappas: You will need to read in "two voices" for this to come off the way it should, so make sure you have someone around that knows how to do this. It takes just a minute or two, but is very effective, especially in groups (in fact, it can be hard to get people to stop!)

 **MathFocus** These are readers with a *significant math teaching focus* and often have suggested math extension activities in the books. MathStart, Hello Math Readers and Amy Axelrod Pig Math readers are examples. Comments are included to judge whether a book is more appropriate for younger or older children in this group, but do not be afraid to expose your younger child to more advanced concepts if they enjoy the stories and exploration, there's no quiz at the end. Older children often still enjoy easier readers which are a form of painless review.

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Mr. Base Ten Invents Mathematics by Bethany Tucker is scheduled in this Unit. This is a single volume story working through mathematics concepts from place value to simple fractions and decimals. Black and white illustrations.



For MathStart readers, **Hands-on Math and Literature with MathStart** by Don Balka includes additional math activities for every reader in the series.

THEME Readers are listed in a section all on their own, along with teaching resources for families relying on literature primarily for math teaching to minimize workbook use. You can decide which readers to use based on comments in the section.

Mathematical Focus Units

 **Mathematical Ideas:** These sections highlight ideas mathematicians are known for. With younger children, these are primarily for parents to learn and find openings to discuss.

Language activities

 **Quotes, Discussion and**  **Vocabulary** are for verbal exploration and tying math in with language. Again, as the parent, you would take the lead, but discuss these with your child with open ended questions, such as, what do you think this means?

For a child that does copywork, weekly copying of the definition and/or quotes would be a way of reinforcing this. Some kids really enjoy doing this, and some hate it, use the technique if it works.


Have a good dictionary available, and a math terms glossary is available at your download site to help you distinguish word usages from everyday. **Math Dictionary for Kids** by Theresa R. Fitzgerald is recommended if you would like a print version.

Symbols cross borders: The origination and history of our math symbols are in this section, beginning with Unit 2.

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Geography and Timeline

 **Geography Activities:** I suggest you use a mark-it map and a blank timeline. One of many sites you can use for free templates is this one:


<http://www.enchantedlearning.com/geography/label/latlong/>

For the very young, just using the atlas to identify the continents of North America, South America, Africa, Asia and Europe will get them grounded for the reading. This semester does not cover Australia or Antarctica.


Older kids in this group that already understand continents can add longitude / latitude activities. Have your atlas along with you and take short breaks while reading the history to identify the places discussed. Many families use an atlas, a globe, and mark-it map resources year long.

You may wish to keep a timeline. As you are reading the history books, drawing or using a timeline would reinforce this. A wall timeline is very effective, where you can add each character and event as you go along. If wall space is limited, timeline books are fine, these can be made or purchased. Instructions on how to make one are here:

<http://donnayoung.org/history/timeline-cw.htm>

 **What Was Happening When . . .** This section identifies contemporary people to the mathematician studied. Many of these sections have a question to research. Some will be very obvious, but for some, enough key words have been provided to do an internet search and find the answer, if it cannot be found in your own research materials.


Activities

 **Mathematical Activities:** Suggestions in these sections may be posted as separate worksheets, handouts, or be recommended from within book and internet resources.


P(Primary) **I**(Intermediate) **A**(Advanced) indicate the level the activity is appropriate for. Some activities can be more easily adapted to multi-level use than others, and these are indicated with more than one level. A + indicates the activity is stretching the top end of the level.

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 **IMPORTANT:** Parents should be involved in screening internet material. While all attempts have been made to ensure links do not contain objectionable material, it is not possible to read everything that is linked from links, nor can content changes be controlled after a site has been linked.

Living Math Handouts

 **Handouts** consist of activity files created for the Living Math lesson plans. You have permission to make copies for members within a family.

See the Living Math website, Lesson Plan Information pages for sharing arrangements with co-op or other group use settings.

Other

 **Video or Audio Resources** Most of these are HS/ college level, recommended as parent resources. A few are appropriate for younger children, and these will be indicated in the plans.

Activity Book Resources

There are several activity and vignette resources that have content correlating with all eight Living Math units. Each has pros and cons to consider, depending on what levels you are using. The information on the following pages is provide to assist you in deciding which resources you may want to purchase to supplement the activities in the lesson plans. Again, you do not have to purchase all of these.