

Understanding the *Math on the Level* Approach

Math on the Level is a completely different approach to teaching math, one that is designed specifically for use by homeschool families.

Distinguishing Features

- **Maturation focus** — teach when children are maturationally ready to learn.
- **Continual review** — individualized so children remember what they've learned.
- **Practical** — math can be taught in unit studies or daily activities.
- **Efficient** — the math curriculum covers the math instructional needs for the entire family from pre-school through pre-algebra.
- **Flexible** — choose topics and groupings to fit your family.

Math and Maturation

Math on the Level is designed to accommodate each child's unique maturation rate. Just as children mature *physically* at different rates (sitting up, walking, or having the coordination to ride a bike at different ages), they also mature *mentally* at different rates. In most cases, the age at which these physical milestones are reached doesn't matter in the long run and does not predict future athletic ability. (Do you know — or care — the age you were when you first sat up?) In the same way, a child also matures mentally at a unique pace, which is not a reflection of intelligence.

Math is one area where maturation matters

Some concepts that are obvious to adults are beyond the understanding of a young child. Even if very well explained, and no matter how intelligent the child may be, at certain stages the child's brain cannot comprehend some math concepts. It would be like trying to force a 4 month old to walk — it cannot be done until the child's body matures more, and it would greatly frustrate both parent and child to keep trying. However, math books often attempt to force understanding upon children whose brains are not ready to comprehend the concepts. This is a setup for failure and frustration.

Teach to the child's Maturation Level — not grade level

Math on the Level approaches math with an awareness of each child's unique level of maturation. For children who mature early, parents can move quickly through the curriculum; for children who mature more slowly, *Math on the Level* allows parents to focus on concepts that the child *can* understand. With this approach, the child learns math without becoming discouraged and frustrated. And when children have matured to the point of being able to understand the concepts, teaching them will be much easier and time-efficient — concepts that earlier would take days or weeks of aggravating effort to teach to a child who isn't maturationally ready, will take only a short time once the child *is* maturationally ready to learn.

How we remember

The goals in math are for students to understand each concept and then to *retain the information in long term memory*. It is important to consider three basic ways in which information is stored.

- **Intense experience**

This may involve a story, a song, a flannel board or drama lesson, a memory hook, or some way that the learning is associated with an experience or image. This approach can be a very effective way to get information stored in long-term memory, but it may take a lot of effort to plan and prepare.

- **Intense repetition over a short period**

In math, this approach involves doing many problems of the same type each day after the topic has been taught. Repeating something over and over is an effective way to learn, and it is often used to memorize numbers, poems, memory verses, etc. This approach by itself, however, tends to store information in short-term memory, though it does have the advantage of being relatively easy to prepare.

- **Repetition over a long period of time**

Continual review will store information in long-term memory, whether or not there has been intense repetition over a short period of time.

Many math curriculums use the approach of intense repetition over a short period of time as the primary tool for learning and retaining concepts. By contrast, *Math on the Level* focuses on long-term repetition to solidify each concept in long term memory. When a topic is being taught, the parent uses practice problems as needed to help the child understand the concept. Afterward, the 5-A-Day process makes sure the child reviews each topic which has been taught at least once every three weeks, and more often if necessary, to facilitate long-term memorization.

Motivation

Many children view math in terms of pages and pages of problems to solve — which is not particularly motivating! With *Math on the Level*, the child has only five independent review problems each day. With this focused-review approach, children who once dreaded math find it much more enjoyable.

To overcome another learning barrier that occurs when children cannot see how math relates to real life, *Math on the Level* teaches math concepts using normal daily activities. For example, fractions are taught when cooking, decimals are taught when buying groceries, and math concepts are reinforced with family games or when riding in the car. Even the vocabulary a family uses can be modified to make math more familiar and relevant. These activities are included throughout the entire curriculum.

With *Math on the Level*, the student completes a 5-A-Day review paper each day. The math lesson may be a hands-on activity, a time with a parent showing how to do a math skill, or both. If the concept is beyond the child's maturation level, it can be dropped and re-taught at a later date. Children are more accepting of this approach because it separates intelligence and maturation, prevents failure and frustration, and helps them see how math relates to life.

Comparing *Math on the Level* with Textbooks

This table gives a general idea of the differences between *Math on the Level* and the typical math grade-level textbook approach.

Table 1: Comparison of Textbooks with *Math on the Level*

Textbook Approach	<i>Math on the Level</i>
Covers all necessary topics.	Covers all necessary topics.
A Teacher's guide gives instructions on how to teach each lesson as presented in the textbook.	Suggestions and ideas for teaching any concept are found in the four teaching guides: Operations, Geometry and Measurements, Money and Decimals, and Fractions.
The order of teaching is very specific .	The order of teaching is flexible . Concepts can be taught when the child is maturationally ready for them.
Specific scripts or teaching directions may be included for each lesson.	Suggestions are given using a variety of approaches to teach challenging concepts. Parents can choose the approach that best fits their children.
Topics are reviewed once each year. New lessons first review and then build on the previous year's lessons. This can be thought of as a spiral approach .	Once a topic is taught, it is continually reviewed until a more advanced topic is taught that includes it or replaces it. This approach is more like a ladder .
Math is taught primarily in the context of books, manipulatives, and paper & pencil tasks.	Math is taught in the context of daily activities and real life (as well as manipulatives and paper & pencil tasks).
Student textbook, workbook, or practice pages are used to teach concepts and give practice problems.	The parent teaches the concept based on the Teaching Guides . After a concept is learned, the child reviews it continually to retain the information. The parent uses review problems, such as the ones found in the back of the Teaching Guides, for the child's daily 5-a-Day review.
To retain information, children do many repetitions of the same type of problem for one or more days (intense, short-term review).	Once a concept is learned, the child solves one problem with that concept each day for a time, then one every other day, then one a week, then one every two weeks, and finally one every three weeks. Children do only five math problems independently each day but they continually review every concept they have learned.

Table 1: Comparison of Textbooks with *Math on the Level* (continued)

Textbook Approach	<i>Math on the Level</i>
Review that is built into the textbook lesson tends to be too little or else overwhelming. Because the textbook aims at a “typical” child, it does not match any specific child’s need for more or less review of a concept.	The 5-A-day review process is designed specifically to meet each child’s need. A child who needs more review of a topic will have that topic on daily-review for a longer time. If the child finds the topic easy, it can be moved quickly to less frequent review (once every two or three weeks).
Children tend to forget previously learned concepts (because of the intense, short-term review approach).	Children tend to remember previously learned topics because of the continual, long-term review approach. If the child forgets a topic, the parent knows within three weeks that the child needs more frequent review.
Concepts are introduced on the schedule of the textbook. A child who is not maturationally ready to understand the concept must perform the steps anyway without knowing why he or she does them. This is often a very frustrating, discouraging, and time-consuming process.	If a child is not maturationally ready for a concept, the parent has the freedom (and is encouraged) to wait and teach it at a later time. Once the child is ready to learn a concept, the teaching goes more quickly and is less stressful.
Children who find math easy must go through pages of problems or through many steps in order to get through the textbook.	Once a child grasps a concept, the parent can move on to teach the next concept. For children who understand math concepts easily, the parent can also group several topics together and quickly move through the program.
Math instructions are given in different sequences for each grade level. Because children are put on the learning track prescribed by their specific book, it is difficult to teach children of different ages or levels together.	Children can be grouped to learn topics together, or else taught independently. This grouping can be modified at any time.
All children in the homeschool family learn different topics.	The parent can teach all children the same general topic, with each child covering concepts at his/her own level.
If the homeschool family does a unit study, math must normally be taught as a separate subject. It is difficult to incorporate a math book into the unit study.	Since the math concepts can be taught in any order, the parent can teach math in a unit study by choosing topics that fit naturally into the unit study.
Some children can work totally independently (without parental instruction or participation) by reading their math book.	This is not an independent study program. The parent teaches the math concepts and the children use the math concepts in family activities.