

# Counting to Calculus



## Questions? Just Ask...

Our friendly consultant team is here to answer your questions FREE, M-F, 8:30-5 CT.



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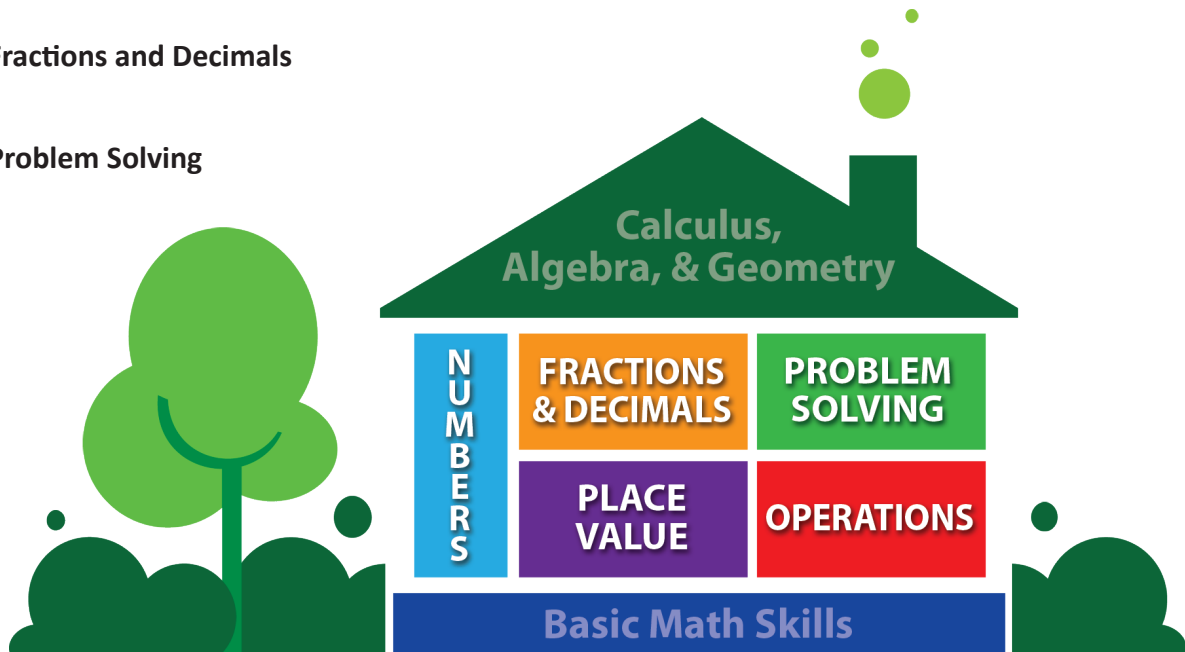
$f(x)$

# Counting to Calculus

## Math Building Blocks:

Basic math skills provide the floor of your math house, and the advanced math courses (Algebra, Geometry, Calculus) provide the ceiling in your house. In between your floor joists and the roof, lie five building blocks, which provide the cornerstones of your math house.

1. Numbers
2. Place Value System
3. Operations of Whole Numbers
4. Fractions and Decimals
5. Problem Solving



Notes: \_\_\_\_\_

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# Counting to Calculus

## 1. NUMBERS with Activities\* by Developmental Stages:

### Infant to 3 Years:

- Sing and Recite numbers to your child.
- Introduce counting and sorting.

### Two to Three Years:

- Child will begin to associate a number with the quantity.
- Teach children to count and sort.
- Introduce basic math language in relationship to objects: under, over, behind, fast, heavy.
- Teach child their age with fingers.

### Three to Five Years:

- Will develop the ability to count to 5 items (possibly 10 items).
- Will begin to recognize written numbers.
- Will develop the ability to count the next number in sequence.
- Build upon the Count and Sort Activity.
- Around 3 years, teach address and phone number.
- Between 5-6 years, will be able to count 1-100. May be able to skip count by 10s to 100.

### Six Years and Up:

- May be able to count to 200.
- Sorting and Classifying will become more complex.
- Will begin to understand number representation on a number line.
- Will begin to associate less with counting (ie: 7 is less than 8).
- Perfect time to introduce skip counting by 2s, 5s, 10s.
- Understands ordinal terms like first, second, third.

\*Please note: these are for reference only and not indicative of developmental delays or giftedness.

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## 2. PLACE VALUE SYSTEM Activities\*:

### Infant to 3 Years:

- Counting.

### Three to Five Years:

- Master counting to 100.
- Teach child to build numbers concretely with snap cubes or connecting cubes (or items found at home).
- Teach sets of 10 after proficient with building numbers concretely.

### Six Years and Up:

- Still operates in concrete thinking, so manipulatives or visual representations are critical to success. Use manipulatives to teach math concepts esp. place value.
- Will begin to understand place value at 7-8 years.

## 3. OPERATIONS OF WHOLE NUMBERS Activities\*:

### Infant to 3 Years:

- Between 2-3 years, will begin to understand simple addition using objects.

### Three to Five Years:

- Children continue to develop understanding of simple addition-by age 6, may be able to add up to 6 objects.
- Around 5, will be able to solve simple story problems.

### Six Years and Up:

- From 5-6 years, children experience an exponential growth in their ability to understand more complex math operations.
- May be able to add small numbers in their head.
- From 7 years and up, children will be able to add/subtract multiple digit numbers (using concrete objects) without borrowing or carrying.
- Teach more complex story problems with manipulatives.
- Build on previous teachings on sets.

\*Please note: these are for reference only and not indicative of developmental delays or giftedness.

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## 4. FRACTIONS AND DECIMALS Activities\*:

*Familiarize children with process of parts to whole — this is a more abstract concept.*

### Infant to 3 Years:

- Teaching and understanding shapes is foundational.

### Three to Five Years:

- Beginning around 3 years, children can be introduced to the parts to whole concept.
  - Share a chocolate bar.
  - Serve an uneven number of cookies.
  - Help cut foods.
  - Coloring activities (Paper plates color  $\frac{1}{2}$ , then  $\frac{1}{2}$  of  $\frac{1}{2}$  — or  $\frac{1}{4}$ ).

### Six Years and Up:

- Show fractional size differences with food.
- Introduce fraction manipulatives

## 5. PROBLEM SOLVING Activities\*:

*Make a part of everyday.*

### Infant to 3 Years:

- Explain patterns — usually between 12-18 months will be able to recognize simple patterns in daily routine.
- String beads or use pegboard together and follow a pattern.

### Three to Five Years:

- Begin to understand single step problems and develop multistep problem solving in later preschool years (and beyond).
- Build on pattern activities and enlist their help sorting laundry. Make it a game!
- Allow free play with LEGO® and DUPLO® bricks.
- Introduce puzzles.
- Cook together.
- Around 4- 5 years, more deductive reasoning.

### Six Years and Up:

- Deductive reasoning blossoms between 6-7 years.
- Recognizes the idea of equal or same as.
- Develops algebra sense.
- Great time to introduce estimating.

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## ADDITIONAL SUPPORTS in our Math House:

### Infant to 3 Years:

- GEOMETRY AND SPATIAL SENSE
  - Most 1-year olds, will understand that a hidden object still exists. Play Peek A Boo to reinforce this concept.
  - Introduce shapes, use Shape Sorters.
  - Knob Puzzles.
  - 3-5-piece puzzles.
  - Crafts.
  - Teach into, over, under, around etc. outdoors using play equipment.
  - Build tents with boxes, chairs/cushions etc.
- MEASUREMENT SKILLS
  - Teach concepts tall, short and big, small.
  - Free play with buckets -encourage pouring.
- CALENDAR AND WEATHER
  - Introduce weather related terminology.
  - Read fun children’s books together (see *Helpful Resources*, page 7).
- TIME AND MONEY
  - Introduce terminology daytime, night time primarily.
  - Won’t grasp money concepts, but can talk shapes of coins, size, etc.

### Three to Five Years:

- GEOMETRY AND SPATIAL SENSE
  - Puzzles.
  - Shapes in the world around them.
  - LEGO® and DUPLO® bricks, Tangrams etc.
- MEASUREMENT SKILLS
  - Bucket play-talk about more and less. Introduce different shape containers.
  - Around 5 years, introduce measuring cups (1 cup,  $\frac{1}{2}$ , and  $\frac{1}{4}$  when ready).
  - Compare object size.
- CALENDAR AND WEATHER
  - Between 4 -5 years introduce days of the week and related activities.
  - Around 5 years, begin teaching months, weeks and years.
  - Teach Calendar and Weather concepts together.

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## Three to Five Years (continued):

- TIME AND MONEY
  - Around 3 years, will understand “before” and “after”.
  - Set a schedule as much as possible.
  - Around 5 years, introduce the concepts of hour and half-hour.
  - With 3-year olds, begin to introduce coins: size, shape, how it feels to touch.

## Six Years and Up:

- GEOMETRY AND SPATIAL SENSE
  - Puzzles build geometry and spatial sense.
  - Allow to look at a shape for a couple minutes, remove it, and then have them draw it.
  - Will be able to recognize shapes regardless of orientation or size.
  - Around 7 years, will use and understand various terms that describe physical locations.
- MEASUREMENT SKILLS
  - Around 6 years, ready to move beyond basic descriptive words for size. Introduce measurement of things around the house with other household items (eg: pencils—no rulers yet). Create simple graphs.
  - Cook together.
- CALENDAR AND WEATHER
  - Between 6-7 years, will master days of the week, months, seasons.
  - Talk more about weather-create a weather graph for the month.
- TIME AND MONEY
  - Begin to tell time by hour; half hour.
  - Work on skip counting by 5s (introduce time in 5-minute increments).
  - Teach money concepts as they related to value-will be able to understand the concept that 4 quarters equals one-dollar bill.

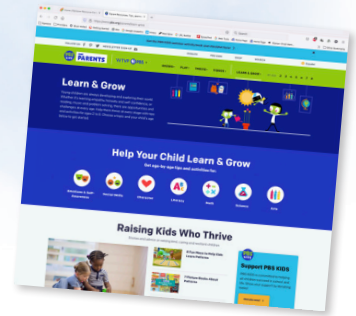
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# Counting to Calculus

## HELPFUL RESOURCES

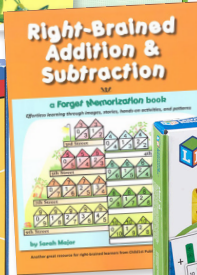
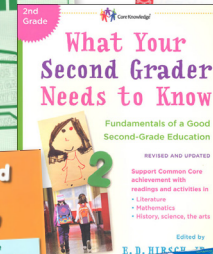
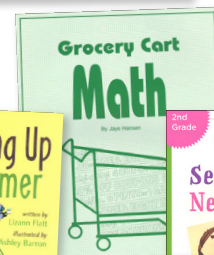
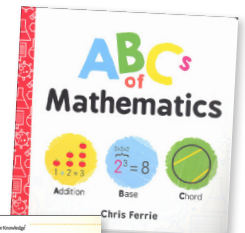
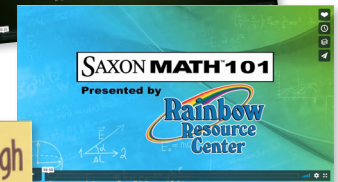
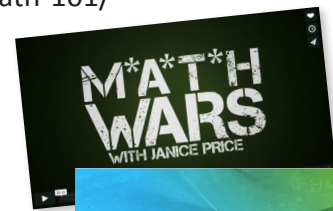
### Websites & Videos:

- **PBS Parents Interactive**  
<http://www.pbs.org/parents/child-development/>
- **Math Wars Video**  
<http://ourhomeschoolforum.com/videos/workshops/math-wars/>
- **Saxon Math 101 Video**  
<http://ourhomeschoolforum.com/videos/workshops/saxon-math-101/>
- **World Book Typical Course of Study**  
<https://www.worldbook.com/typical-course-of-study.aspx>



### Books & More:

- *Grocery Cart Math*
- Math in Nature Series
- *Early Bird: Weather* (Evan Moor)
- *What your \_\_\_\_\_ Grader Needs to Know* (PK-6)
- *Right Brain Math*
- Pizza Fraction Fun
- Fraction Circles
- MathLink Cubes/Activity Sets
- Your Business Math Series
- Mathseeds
- ABC's of Mathematics (Baby University)





# MATH CURRICULUM COMPARISON CHART

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	MATH Programs	Grades												Religious Content		Price Range				
		PK	K	1	2	3	4	5	6	7	8	9	10	11	12	Christian	N/Secular	\$	\$\$	\$\$\$
1.	Saxon K-3 *		•	•	•	•											•			•
2.	Saxon 3-12 *					•	•	•	•	•	•	•	•	•	•		•		•	
3.	Math-U-See *		•	•	•	•	•	•	•	•	•	•	•	•		•			•	
4.	Abeka Math	•	•	•	•	•	•	•	•	•	•	•	•	•		•			•	
5.	AOP LIFE PAC Math *		•	•	•	•	•	•	•	•	•	•	•	•		•		•		
6.	BJU Math		•	•	•	•	•	•	•	•	•	•	•	•		•			•	
7.	enVision Math (2017/2018)		•	•	•	•	•	•	•	•	•	•	•	•		•			•	
8.	Christian Light Math *			•	•	•	•	•	•	•	•	•	•	•		•		•		
9.	Primary Math 2022 (Singapore)		•	•	•	•	•	•								•		•		
10.	Primary Math (US) (Singapore) *		•	•	•	•	•	•								•		•		
11.	Primary Math Standards Edition (SE) (Singapore) *		•	•	•	•	•	•								•		•		
12.	Primary Math Common Core (CC) (Singapore)		•	•	•	•	•	•								•		•		
13.	Math in Focus 2020 (Singapore) *		•	•	•	•	•	•	•	•						•			•	
14.	Shaping Maths (Singapore)			•	•	•	•	•	•							•			•	
15.	RightStart Mathematics *		•	•	•	•	•	•	•	•						•			•	
16.	Life of Fred			•	•	•	•	•	•	•	•	•	•	•		•		•		
17.	Rod & Staff Mathematics			•	•	•	•	•	•	•	•	•	•		•		•			
18.	Ray's Arithmetic / Ray's for Today			•	•	•	•	•	•	•	•	•	•			•		•		
19.	Math Mammoth (Light Blue series) *			•	•	•	•	•	•	•						•		•		
20.	Math Lessons for a Living Education * (MasterBooks)		•	•	•	•	•	•	•							•		•		
21.	Purposeful Design Math (2nd Ed.)		•	•	•	•	•	•	•							•			•	
22.	MCP Mathematics		•	•	•	•	•	•	•							•		•		
23.	Making Math Meaningful		•	•	•	•	•	•	•	•						•		•		
24.	Simply Good & Beautiful Math *		•	•	•	•	•	•	•							•		•		
25.	Jump Math			•	•	•	•	•	•	•	•					•		•		
26.	Developmental Math		•	•	•	•	•	•	•	•	•	•	•	•		•		•		
27.	ShillerMath	•	•	•	•	•	•	•	•	•						•		•		
28.	A+ Tutorsoft Math			•	•	•	•	•	•	•						•		•		
29.	Mathematical Reasoning	•	•	•	•	•	•	•	•	•	•	•	•			•		•		
30.	Beast Academy (from Art of Problem Solving) *			•	•	•	•	•	•	•	•	•	•			•		•		
31.	Exploring Creation with Mathematics (Apologia) *			•	•	•	•	•								•		•		
32.	Miquon Math			•	•	•										•		•		
33.	Math with Confidence		•	•	•	•										•		•		
34.	Liberty Mathematics		•	•	•											•		•		
35.	Conventional (Spunky Donkey) / Study Time Math			•	•	•	•	•	•	•	•	•	•			•		•		
36.	Calvert Math		•	•	•											•		•		
37.	Strayer-Upton Practical Arithmetic					•	•	•	•	•	•					•		•		
38.	Starline Press Math					•	•	•	•	•	•	•	•	•		•			•	
39.	Math Power Basics								•	•	•	•	•	•		•		•		
40.	Art of Problem Solving *								•	•	•	•	•	•		•		•		
41.	Principles of Mathematics * / Algebra 2									•	•			•	•	•		•		
42.	A Fresh Approach									•	•	•	•	•		•		•		
43.	Jacobs Math										•	•				•		•		
44.	Foerster Math (Math Without Borders)										•	•	•	•		•		•		
45.	VideoText										•	•	•	•		•		•		

This chart was assembled by Rainbow Resource Curriculum Consultants and is intended to be a comparative tool based on our own understanding of these programs and is not necessarily reflective of publishers' opinions. Some designations are "best fit" not absolute.

	Approach			Manipulatives			Teacher Involvement			CCSS Aligned	Notes
	Spiral	Sequential	Conceptual/Topical	Req	Opt	RRC kit	Low	Med	High		
1.	•			•		•			•		Scripted teacher manuals.
2.	•				•		•				Teaching tutorials available separately.
3.		•		•				•			Mastery-based. Some Christian content. NEW Algebra 1 course (standards based & independent learning).
4.	•							•			
5.		•						•			Monarch online only available from AOP.
6.	•								•		Paper manipulatives included.
7.		•						•		•	Digital component.
8.	•							•			Suggested manipulatives for lower grades.
9.		•		•				•			Digital manipulatives. Online components.
10.		•			•			•			
11.		•			•			•			Aligned to 1997 CA Standards. 2008 Ed.
12.		•			•			•		•	
13.		•		•		•		•		•	Accelerated option available in 7th for Algebra prep.
14.		•			•			•		•	2013. Singaporean money. Metric. Online component.
15.	•	•		•					•	•	Manipulative Kit sold separately.
16.		•					•				Brief Christian references in elementary levels.
17.		•						•			
18.		•			•			•			
19.		•			•		•				B & W or color versions available.
20.		•						•			
21.		•			•	•			•		e-book option for teacher edition.
22.		•						•			Modified Sequential.
23.			•	•				•			
24.	•			•				•			Free, online teaching videos for grade 4 and up.
25.		•							•	•	Free online teacher resources.
26.		•			•		•				Skill-based levels.
27.		•		•					•		Discovery, Montessori approach.
28.		•					•				Computer-based.
29.	•						•				
30.			•				•				Recommended for gifted students.
31.		•		•		•		•	•		Free online resources; activity/project based. Optional tests begin in Grade 5.
32.			•	•					•		Uses Cuisenaire rods.
33.	•				•	•		•			
34.		•							•		Consumable workbooks.
35.	•							•			Optional manipulatives for Spunky.
36.		•			•			•			
37.		•						•			No Teacher Guide.
38.		•					•				
39.		•					•				Written at 4th grade level / for struggling students.
40.		•					•				Recommended for gifted students.
41.		•					•				
42.		•					•				
43.		•					•				Teaching tutorials available separately.
44.		•					•				MWB Teaching tutorials available separately.
45.		•					•				DVD or online format.