

Study Guide:

Schneider's *A Beginner's Guide to Constructing the Universe*

Prepared by Rachel DeMille

This Study Guide is prepared as a companion to the Mentoring in the Classics Audio Series.

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This Month's Mentoring Content

The Introductory Mentoring Audio, provided via a link in your course email, consists of a small-group tutoring session including Oliver, Rachel, and daughters Emma (22) and America "Meri" (11).

Please take a moment to download your audio content to your computer immediately so you have uninterrupted access to it!

Ideas for Writing or Discussion:

- What is "math"?
- How does your definition of "math" differ after reading this book?
- Which of the 7 Steps of math study have you emphasized most in your life?
- Which step are you utilizing most with those you teach and mentor?
- Which step are you planning to emphasize most in the next while, in your own studies? In your teaching?
- What math terms do you use in everyday language?
 - What's the **difference**?
 - The **solution** is relatively simple.
 - You've got a big **problem**!
 - There are more **factors** than you're admitting.
 - The **sum** of the **parts** is **great than** the **whole**.
 - A **lesser** man would never have endured that.
- How can using math terms in your everyday language enhance your thinking, and help your children/students develop more fluency with the language of math? (exponential, rounded, fraction, dividend, quarter, equal, tangent,?)
- Have you found yourself thinking more about math during/since the time you have spent reading this book?
- What new patterns and problems have you noticed or entertained in your mind?

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Resources for Additional Study:

- [Math Resources on TJEd.org \[http://TJEd.org/Math-Sci/\]](http://TJEd.org/Math-Sci/)
- [What's Math Got to Do With It?](#)
- [Sensus Plenior/Sensus Solum](#)
- [Enhance your daily Math Vocabulary!](#)
- [Lockhart's Lament](#)
- [Florence Nightingale, Mathematician](#)
- [Math Games for Families and Children](#)
- [Math Classics for Adults](#)
- [Math Classics for Kids](#)
- [Math Videos to Inspire You](#)
- [Schneider's website and resources \(scroll down for fun links!\)](#)

What's Math Got To Do With It?



I've often said that the ***“Why”*** we teach something informs the ***“How.”***

Years ago Oliver wrote an introduction to a math course. He articulated ***“Why”*** we learn and teach math, and I think having this vision is not only inspiring and motivating, but really helps us focus our approach and methods.

He created a list of “values” that clearly articulates the meaning and purpose of math education, and (along with the introductory paragraphs written by the course instructor, Troy Henke) I share it here with you:

“Mathematics is an integral part of a statesman’s education Math teaches a person to think in a way that no other field does. As a person studies math, he learns to:

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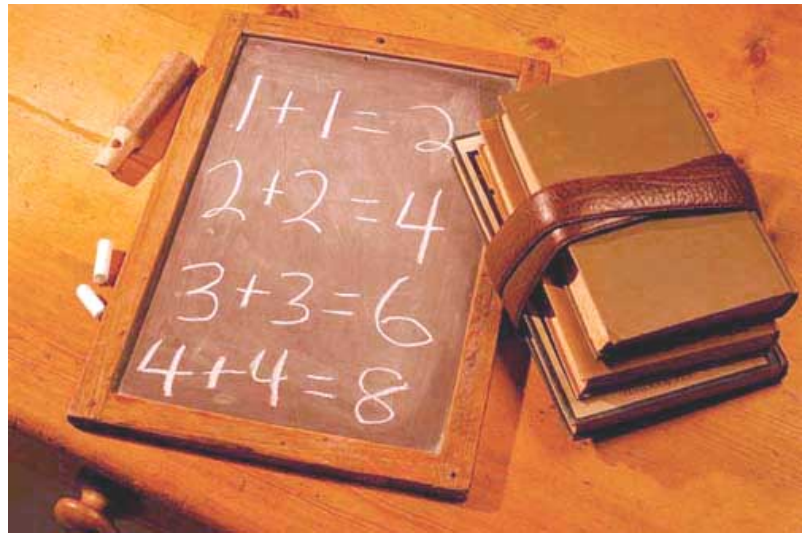
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1. Seek and recognize patterns
2. Explore the relationship between things
3. See similarities and also distinctions
4. Analyze logically but with a deep sense that there is a right answer and a set ideal worth detecting
5. Compare and contrast
6. See things in black and white
7. See infinite shades of grey and therefore avoid jumping to conclusions
8. Seek evidence for conclusions and check opinion with first-hand research
9. Put his own pen to paper before accepting what society tells him
10. Seek for absolutes
11. Remain open to surprising new information which makes past conclusions limited though perhaps still accurate

“Now, clearly, the practical art must also be mastered—we want you to be able to pass any standardized test with the highest marks.

“But more importantly, we want you to be able to think like an Archimedes, a Descartes, a Newton, a Sophie Germain, an Einstein.”



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How to Learn and Teach Math:

- 1. Discover stories about math, and those who use, study and love it.**
- 2. Fall in love with shapes, patterns, numbers, etc.**
- 3. Be, or find, a close example of a math-loving math student**
- 4. Use spreadsheets in every-day life**
- 5. Read Math Classics**
- 6. Study math problems, skills, techniques, language and testing**
- 7. Study the Greats on a higher level**

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Steps of Math Study

Study the Greats

Skills/
Tests

Read Math
Classics

Use Spreadsheets

Be or Find a Close Example

Fall in Love with Shapes and Numbers

Discover the stories of Math and those who
love it

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Level 5 Mentor Prompt on *A Beginner's Guide to Constructing the Universe*:

Using a pen in the margins and endsheets, or a separate notebook, record the conversation that occurs between Michael Schneider and yourself.

Capture your epiphanies and questions, and make a note of the things you want to share with others.

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