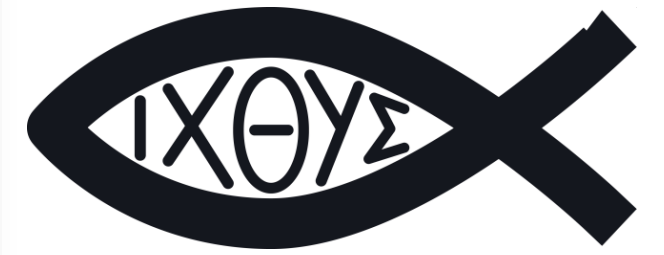


VOLUME I : SHOP BASICS, DRAWING, AND CAD

# GUIDE TO SHOP AND ENGINEERING

FOR SECONDARY SCHOOL STUDENTS

By Kent Misegades  
with  
Michael Patrick Leahy and Anthony Gockowski



*With a Biblical  
Worldview*

available at  
**LULU.com**

**Lecture Notes for  
PREFACE**



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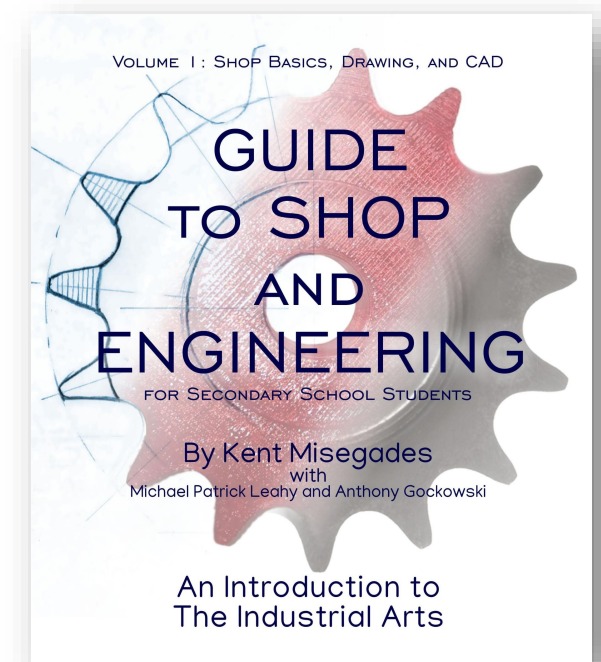
Chapter Nine: Sketching – Circles, Arcs, Ellipses and Curves

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Key Conversion Factors Between Metric and US Customary Units

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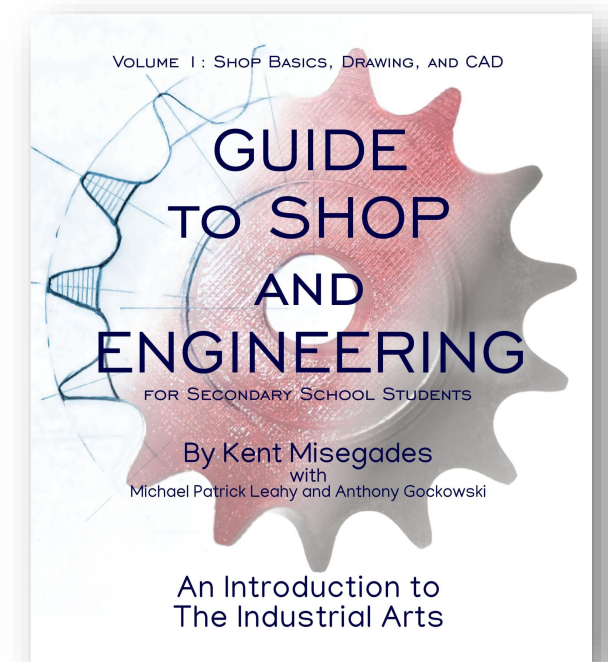
23 Shop Projects

Additional Reading

About the Author

Throughout the Guidebook: American Inventors

Throughout the Guidebook: Leading Schools



# How to Use these Lecture Notes

1. **Read** the printed volume, **Shop & Engineering**, for this chapter.
2. **Gather materials** needed for this chapter's lessons, exercises and for recommended projects.
3. Use these Lecture Notes to **teach and discuss** the material. They contain more than the print version!
4. Work through all the **exercises** and check results. Correct errors and repeat until **100% correct**.
5. Take time to discuss the “**Questions to Ponder**” and “**What the Bible Says About**” sections at the end.
6. **Reinforce classroom learning** by doing one or more related **projects** in your workshop.



# Engineering with a Biblical Worldview

- Everything in our lives is directed by **God**. At **home** and at **work**. His **wisdom and direction** for our lives is found in the **Bible**, so *of course* engineers should always have **scripture** first and foremost in their minds!
- Our **worldview** is developed as we establish beliefs about four critical topics: (from *Biblical Worldview*, Dr. J. Mulvihill)
  1. **Creation:** How did I get here? What is my purpose?
  2. **Rebellion:** What went wrong? Why is there evil and suffering?
  3. **Salvation:** What is the solution? Where do I find hope?
  4. **Restoration:** What happens in the future? How do we transform lives and change the world for the better?
- Engineers continually **face challenges** in their quest to develop products and solutions that ultimately “**transform lives and change the world for the better**”. The Bible provides many **answers**, the reason it should be found among every engineer’s **most-used reference books**.



# Volume I : Preface

# PREFACE



# What this chapter covers:

- The Purpose of **Education**
- The Purpose of **Work**
- History of **Shop & Engineering** and **Home Economics**
- Purpose of these **Lessons**
- **A Biblical Worldview** in Engineering?
- **A Challenge** to You!
- What the **Bible** says





# The Purpose of Education

“Education, then, becomes a matter of envisioning and equipping the next generation to rule well over God’s entire good-but-broken world, imitating Him well in the totality of the here-and-now, both in public and private, through human occupations of all kinds, hence occupying until He comes again.”

*From “The Lost Purpose of Learning”, Dr. Christian Overman, 2016.*







# Education or Schooling?



**Education:** a matter of envisioning and equipping the next generation to rule well over God's entire world. (2 Timothy 3:17)

**Schooling:** education or training received, especially at school or college.

**Learning:** should be life-long, not limited to a few years in a building. Occurs in school, colleges, universities, online, at home, apprenticeships, OTJ (On The Job), etc.



# The Purpose of Work

“Children must be given a compelling and biblical vision that **work is not a burden but a blessing** and that they are part of God’s kingdom mission to restore all things through Christ.”

*From “Biblical Worldview”,  
Dr. Josh Mulvihill, RenewaNation,  
2019.*





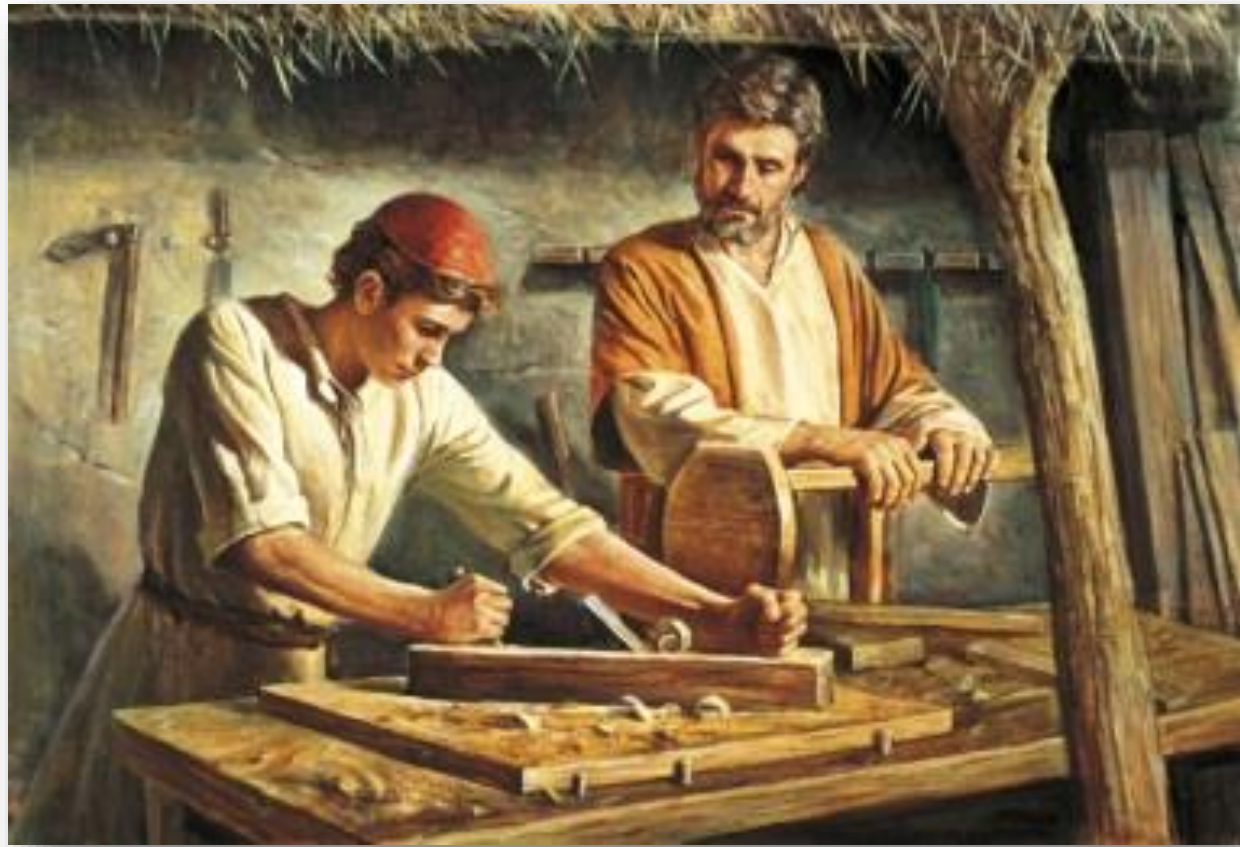
# Work & Education

“Work worth doing is any expenditure of energy, mental or physical, for pay or not, that rightly manages God’s stuff and **brings glory to Him** by employing one’s **God-given gifts and abilities** for the benefit of others – or **prepares one to do so.**”

*From “The Lost Purpose of Learning”, Dr. Christian Overman, 2016.*



# Historical Education



In ancient times, it was the responsibility of parents to teach their children skills that would allow them to thrive when they reached adulthood. Jesus Christ was trained in carpentry. The Apostle Paul learned the trade of tent-making.



# Shop and Home Economics



Through the late 1970s, two of the most popular and important classes taught to most students in American high schools were Industrial Arts (simply known as ‘shop’) and Home Economics. Their elimination has had many negative consequences for society and business.





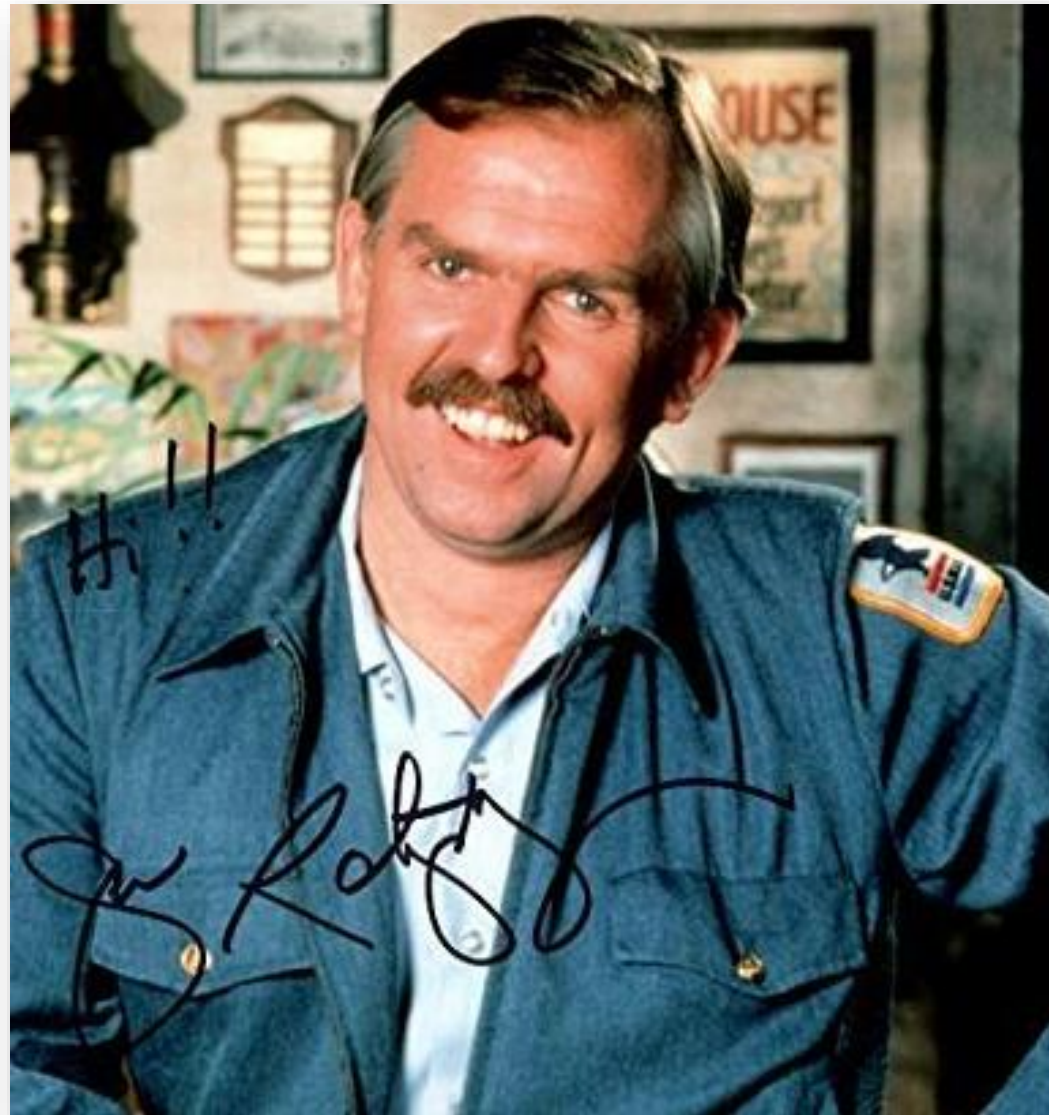
“If you want the kids’ test scores up, ... bring back shop and get kids actually learning stuff instead of teaching them how to take a test.” *Adam Savage, MythBusters TV series.*





“The skills gap today, in my opinion, is a result of the removal of shop class and the repeated message that the best path for most people happens to be the most expensive path. This is why, in my opinion, we have \$1.6 trillion of student loans on the books, and 7.3 million open positions, most of which don’t require a four-year degree.” *Mike Rowe, Dirty Jobs TV series.*





“They also canceled shop classes about 30 years ago, just wiped them out. And, who knows, maybe it was political because if you don’t give people skills they have to rely on the government. But if you give them skills, they don’t need the government.”

*John Ratzenberger, house framer and Cheers actor.*





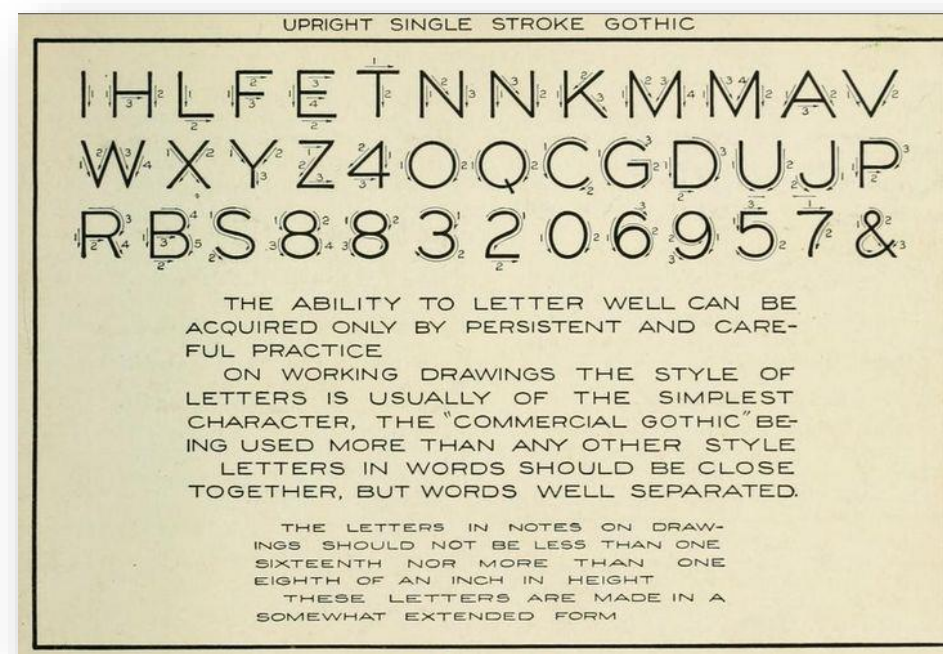
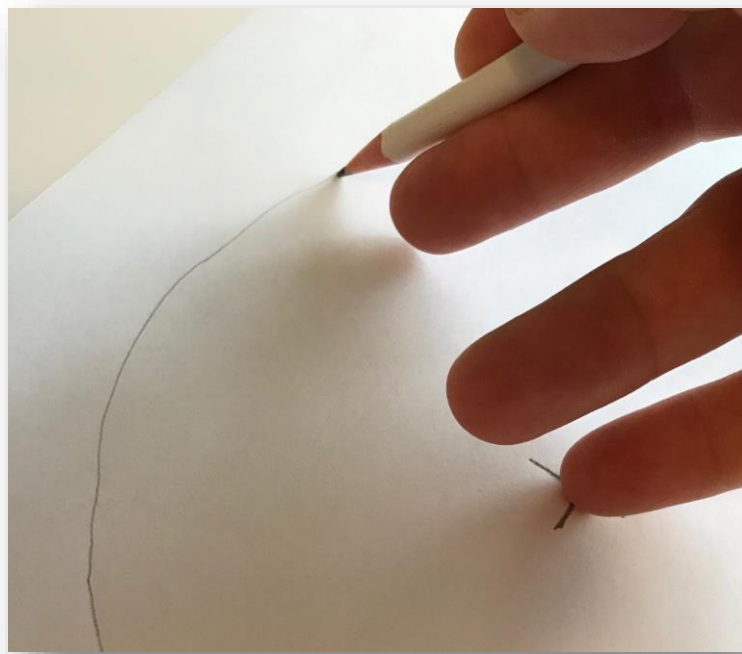
# Purpose of “Shop and Engineering”



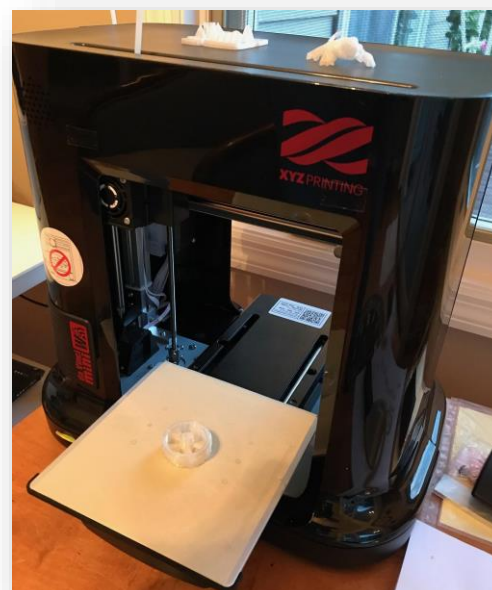
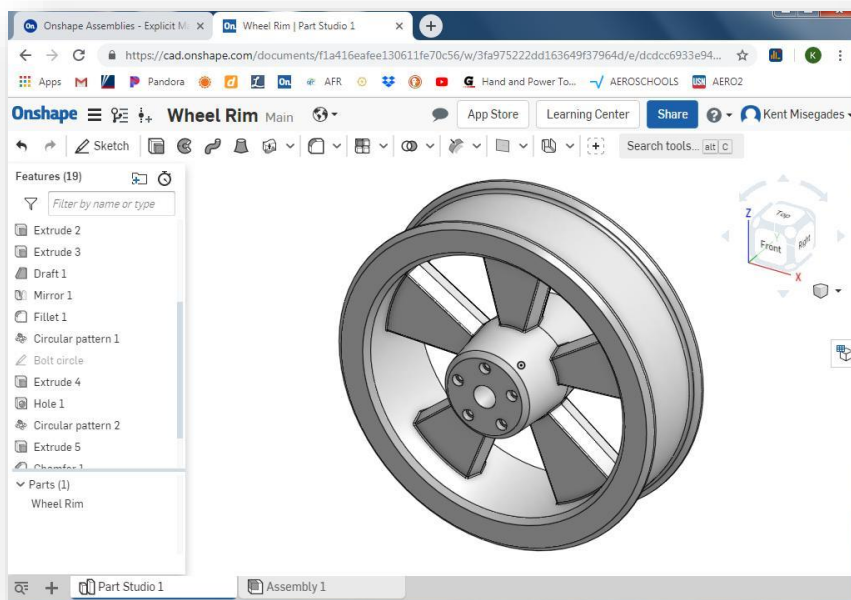
- Introduce principles of Mechanical Engineering
  - ✓ broadest discipline in engineering
  - ✓ relevant to many different industries
  - ✓ modest facility needs and costs
  - ✓ learn at any age, don't need a degree to succeed
- Learn about tools and basic workshop skills
- Learn about famous American Inventors
- Earn certification in CAD (Computer-Aided Design)
- Perform numerous useful & fun shop projects
- Prepare for apprenticeships, engineering colleges, or entrepreneurship
- **Understand how the Bible views these topics**



# Scope of Shop & Engineering Vol. I



classical sketching & drawing skills & lettering



CAD, 3D Printing and challenging shop projects



# A Proven 4-Year Curriculum



- Year 1: Shop Basics, Drawing and CAD
- Year 2: Engineering Topics I, Shop & Fabrication I
- Year 3: Engineering Topics II, Shop & Fabrication II
- Year 4: Start 4-year Apprenticeship or Capstone project



# Rubies

A Proverbs 31 Girls' Club



Preparing Today's Girls to Become  
Tomorrow's Proverbs 31 Women

**Not included here but  
an excellent program  
to learn home-maker  
skills from the past!**

**Rubies Girls' Club  
Aberdeen, NC  
[rubiesgirlsclubs.com](http://rubiesgirlsclubs.com)**





# A CHALLENGE TO YOU

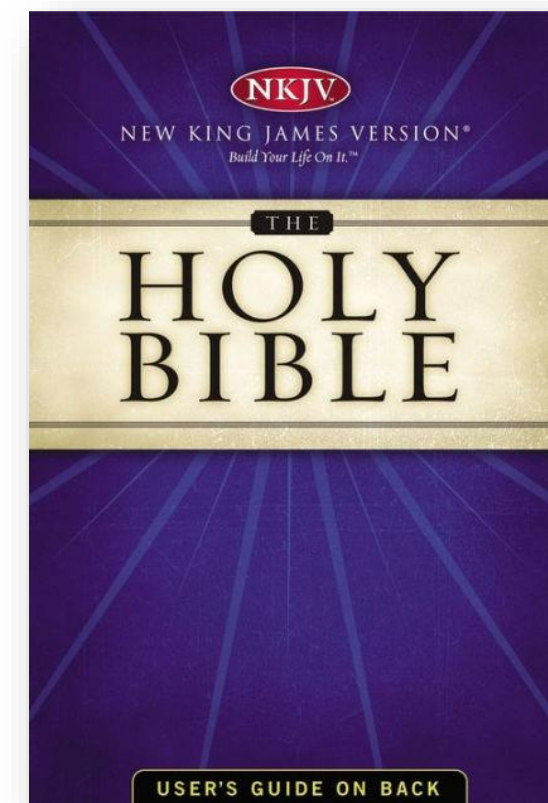
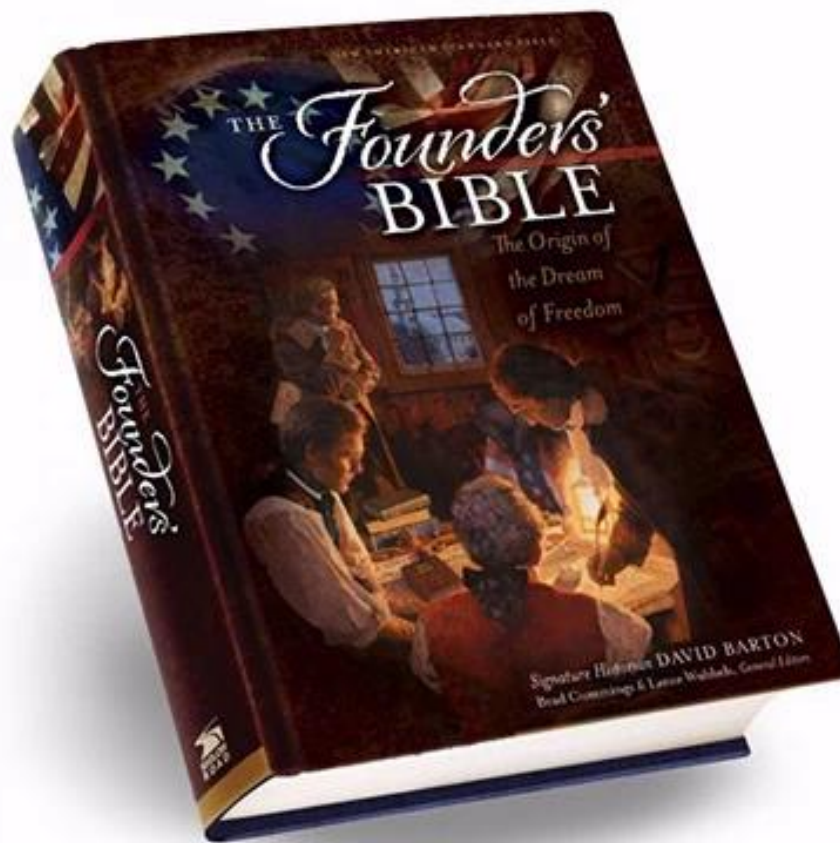
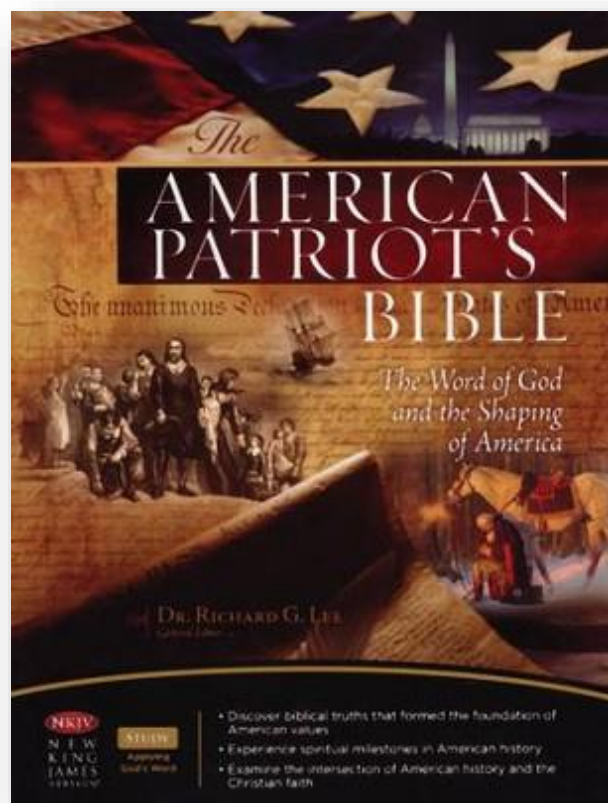
- What are your **God-given gifts and abilities**? We all have them, but only some people follow them.
- You should **pursue these**, in order to serve God to the fullest - it is His intent in planting these “seeds” in you. Doing this leads to a rich, fulfilling life.
- Identify a Christian who has excelled in this area. Study their path in life. **What knowledge & skills do you need** to do the same?
- Can you obtain the needed education **outside** of government K-12 schools and formal/expensive college study? (the answer is probably **YES**).



# What does the Bible

# Bible

say about this chapter?



# What Psalm 78:4-5 Says:

78:4 We will not hide them from their children,  
**Telling to the generation to come the praises of the Lord,**  
And His strength and His wonderful works that He has done.

5 For He established a testimony in Jacob,  
And appointed a law in Israel,  
Which He commanded our fathers,  
**That they should make them known to their children;**



# What Proverbs 31:10-31 Says:

31:10 Who can find a virtuous wife? **For her worth is far above rubies.** 11 The heart of her husband safely trusts her; So he will have no lack of gain. 12 She does him good and not evil All the days of her life. 13 She seeks wool and flax, And willingly works with her hands. 14 She is like the merchant ships, She brings her food from afar. 15 She also rises while it is yet night, And provides food for her household, And a portion for her maidservants. 16 She considers a field and buys it; From her profits she plants a vineyard. 17 She girds herself with strength, And strengthens her arms. 18 She perceives that her merchandise is good, And her lamp does not go out by night. 19 She stretches out her hands to the distaff, And her hand holds the spindle. 20 She extends her hand to the poor, Yes, she reaches out her hands to the needy.





# What Proverbs 31:10-31 Says:

21 She is not afraid of snow for her household, For all her household is clothed with scarlet. 22 She makes tapestry for herself; Her clothing is fine linen and purple. 23 Her husband is known in the gates, When he sits among the elders of the land. 24 She makes linen garments and sells them, And supplies sashes for the merchants. 25 Strength and honor are her clothing; She shall rejoice in time to come. 26 She opens her mouth with wisdom, And on her tongue is the law of kindness. 27 She watches over the ways of her household, And does not eat the bread of idleness. 28 Her children rise up and call her blessed; Her husband also, and he praises her: 29 “Many daughters have done well, But you excel them all.” 30 Charm is deceitful and beauty is passing, But a woman who fears the Lord, she shall be praised. 31 **Give her of the fruit of her hands, And let her own works praise her in the gates.**



# Rubies

A Proverbs 31 Girls' Club



Preparing Today's Girls to Become  
Tomorrow's Proverbs 31 Women

**Rubies Girls' Club  
Aberdeen, NC  
[rubiesgirlsclubs.com](http://rubiesgirlsclubs.com)**



# What Ephesians 6:1-4 Says:

## Children and Parents

6:1 Children, obey your parents in the Lord, for this is right. 2 “Honor your father and mother,” which is the first commandment with promise: 3 “that it may be well with you and you may live long on the earth.”

4 And you, **fathers**, do not provoke your children to wrath, **but bring them up in the training and admonition of the Lord.**



# What 1 Thessalonians 4:9-12 Says:

## A Brotherly and Orderly Life

9 But concerning brotherly love you have no need that I should write to you, for you yourselves are taught by God to love one another; 10 and indeed you do so toward all the brethren who are in all Macedonia. But we urge you, brethren, that you increase more and more; 11 that you also aspire to lead a quiet life, to mind your own business, **and to work with your own hands, as we commanded you**, 12 that you may walk properly toward those who are outside, and that you may lack nothing.



# What Titus 2:1-8 Says:

## Qualities of a Sound Church

2:1 But as for you, speak the things which are proper for sound doctrine: 2 that the older men be sober, reverent, temperate, sound in faith, in love, in patience; 3 the older women likewise, that they be reverent in behavior, not slanderers, not given to much wine, teachers of good things— 4 that they **admonish the young women** to love their husbands, to love their children, 5 to be discreet, chaste, **homemakers**, good, obedient to their own husbands, that the word of God may not be blasphemed. 6 Likewise, **exhort the young men** to be sober-minded, 7 in all things showing yourself to be a **pattern of good works**; in doctrine showing integrity, reverence, incorruptibility, 8 sound speech that cannot be condemned, that one who is an opponent may be ashamed, having nothing evil to say of you.



# What 2 Timothy 3:14-17 Says:

3:14 But you must continue in the things which you have **learned** and been assured of, knowing from whom you have **learned** them, 15 and that from **childhood** you have known the Holy Scriptures, which are able to make you wise for salvation through faith which is in Christ Jesus.

16 All Scripture is given by inspiration of God, and is profitable for doctrine, for reproof, for correction, for instruction in righteousness, 17 **that the man of God may be complete, thoroughly equipped for every good work.**



# Recommended Shop Projects

## Volume I : Preface



End of Volume I : Preface

Let's Get Started  
on your Future as an  
Engineer!





# These Lessons Inspired By

## RenewaNation

Helping Children Develop a Biblical Worldview



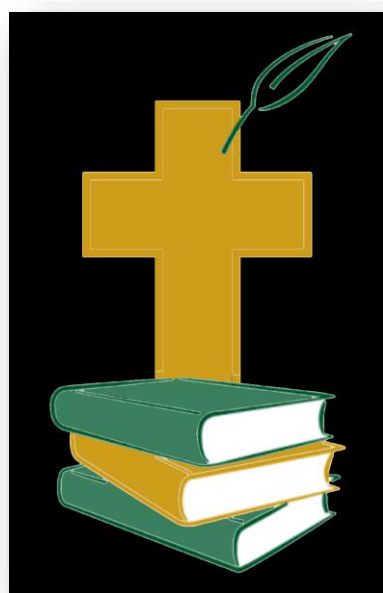
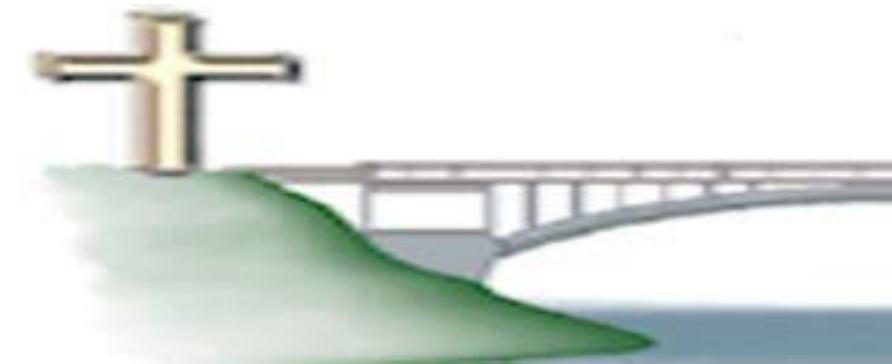
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BOB JONES  
UNIVERSITY  
EST. 1927



# The Author – Kent Paul Misegades



The author's 1952 Cessna 170B



Glen-L "Tuffy" built by author

- Christian, Husband, Father, Grandfather
- 40+ years engineering experience, much as manager, director and business owner
- Pilot, aircraft & boat builder since teenage years
- BSc Mechanical Engineering, Auburn University - *War Eagle!*
- MSc Applied Aerodynamics, Von Karman Institute for Fluid Dynamics
- Helped establish world-class K-12 schools, Thales Academies
- Co-founded world-class apprenticeships, NCTAP.org
- Developed and taught high school shop & engineering curricula
- Passion is flying, sailing, designing & making things - and teaching young people skills
- Founder and President of AeroSouth.net, Seven Lakes, North Carolina

