

“TEACHING SCIENCE THROUGH
MODEL ROCKETRY”

22901-2457

-- New 2nd EDITION --
wayne@pen.k12.va.us

Tony Wayne
58 Court Place
Charlottesville, VA

e-mail

A BOOK FOR ANYONE WHO TEACHES SCIENCE OR ROCKETRY

IF YOU DON'T TEACH, maybe you have a science teacher that you would like to teach rocketry. Pass this along to them.

ORDER INFORMATION

Send \$40 + \$4 for shipping to the address above. Virginia residents or Virginia' teachers paying with a personal check send an additional \$1.83 for state tax -even if you are buying for your school.

----- THIS BOOK IS NOT AVAILABLE IN STORES -----

OVERVIEW OF THE BOOK

TEACHING SCIENCE THROUGH MODEL ROCKETRY is a book for anyone who teaches science or model rocketry. TEACHING SCIENCE THROUGH MODEL ROCKETRY stresses learning through a hands-on approach. It is nearly 400 pages in length! TEACHING SCIENCE THROUGH MODEL ROCKETRY is a culmination of teaching over 840 hours of rocketry classes and launching over 1200 rockets. The book is set up so that you can teach anything from a 5 hour class to a 30 hour class. I have included many diagrams and pictures to aid in the explanations. All topics begin with the basic concepts and gradually lead to a deeper understanding. This book is written for use in grades 4/5 to 12th. The book is spiral bound to allow easy photocopying.

ABREVIATED TABLE OF CONTENTS FROM THE BOOK

Curriculum, Lesson Plans and Class Set Up

- Rocket Class Safety
- Rocketry Lab Class Set Up
- An Individual's Responsibility for Team Work
- 5 and 30 Hour Curriculum Overview
- Daily Rocketry Lesson Plans with Class Hints, Tips and Insights
- Graph Evaluating Exercise (Background)
- Graph Evaluating Check List (Example)
- Graph Evaluating Exercise

- Rocket Construction Notes

Newton's Laws

- Newton's Laws (demos)
- Galileo's Experiment
- Water Rocket Lab
- 2 Liter Water Rocket Construction Instructions
- 2 Liter Water Rocket Lab (write up)
- Paper Airplane Action-Reaction Activity
- Instructions for the Construction of the "Comeback Can"

How to Teach Rocket Center of Pressure and Center of Gravity

- Center of Gravity (concept explanation)
- Estimating the Center of Pressure
- Center of Gravity - Center of Pressure (demos)
- Center of Gravity - Center of Pressure (hand out and rocket activity)
- Paper Plane Activity - Center of Gravity - Center of Pressure
- Airplane from Card Stock Instructions
- Airplane from a Manila Folder Instructions

Teaching About Rocket Motors

- Motor Background
- Model Rocket Motor Thrust vs Time Graphs (worksheets)
- Model Rocket Motor Thrust vs Time Graphs (answers with explanations)
- Rocket Launch Demonstration Ejection Delay
- Rocket Launch Demonstration Newton's Second Law
- Rocket Launch Demonstration Newton's Second Law (demo #2)
- Rocket Launch Demonstration Impulse Motor Class

How to Calculate a Rocket's Altitude

- Calculating Altitude Background
- How to Calculate Rocket Altitudes
- 2 Station Altitude Tracking
- 10 Altitude Tracking Examples
- 10 Altitude Tracking Examples (answers)
- Altitude Calculation (notes)
- Launch Trouble-Shooting List
- Recovery Trouble Shooting List

How to Set Up the Launch and the Launch Site

- Doing a Launch with a Large Crowd
- Field Safety Rules Posters
- Launch (Team) Responsibilities
- Launch Script
- Rocket Record Sheet (Individual)
- Rocket Record Sheet (Whole Class)

Other Rocket Plans of Interest

- "GlideRock" Assembly Instructions
- Flex Wing Glider Instructions

Rocketry Labs

- Over 60 Pages of labs

Classroom Transparencies

- Rocket Flight and Motors (5 overlays)
- Rocket Flight and Motors (Composite)
- Cross-Section View of a Rocket Motor
- Center of Gravity and Motion (2 overlays)
- Gyroscopic Principle
- Gyroscopic Principle
- Action Re-Action and Flight
- Action Re-Action and Flight

Toy Flight Science

- Air has Mass
- Pressure
- Static and Dynamic Pressure
- The Force of Drag
- Disk Toys
- Lift
- Law of Gyroscopic Precession
- Flying Ring Toys and Downwash
- How Does All This Relate to Rocketry?

Other Related Support Materials

- Paper Airplane Lab
- Glider Construction Instructions
- Glider Dimensions
- Elementary Aero Dynamics
- Field Communications
 - Rocketry Work Table
 - Rocketry Field Box
 - Lawn Dart Award
 - Highest Rocket Award
 - Participation Award
 - Gyro Guidance (poster)
 - Factoids (19 pages of mini-posters)
 - Generic Rocketry Membership Cards Sheet
 - Teacher Launch Supply List
 - Teacher Class Supply List
 - Boomerang Instructions
 - Simple, Cheap, Launch System
 - The Simple(?) Launch System and Its Operating Theory
 - Designing the Class Launcher
 - "Home Made" Launcher Construction Power Do's and Don'ts
 - Multi-Launcher Converter
 - Rocket Construction Stand
 - Field Mapping Activity
 - Air Car Lab and Instructions
 - 2 Liter Water Rocket Launcher Construction
 - Calculator Board

- Displaying the Rocket Labs' Results (on a Blackboard)
- Rocketry Resource List