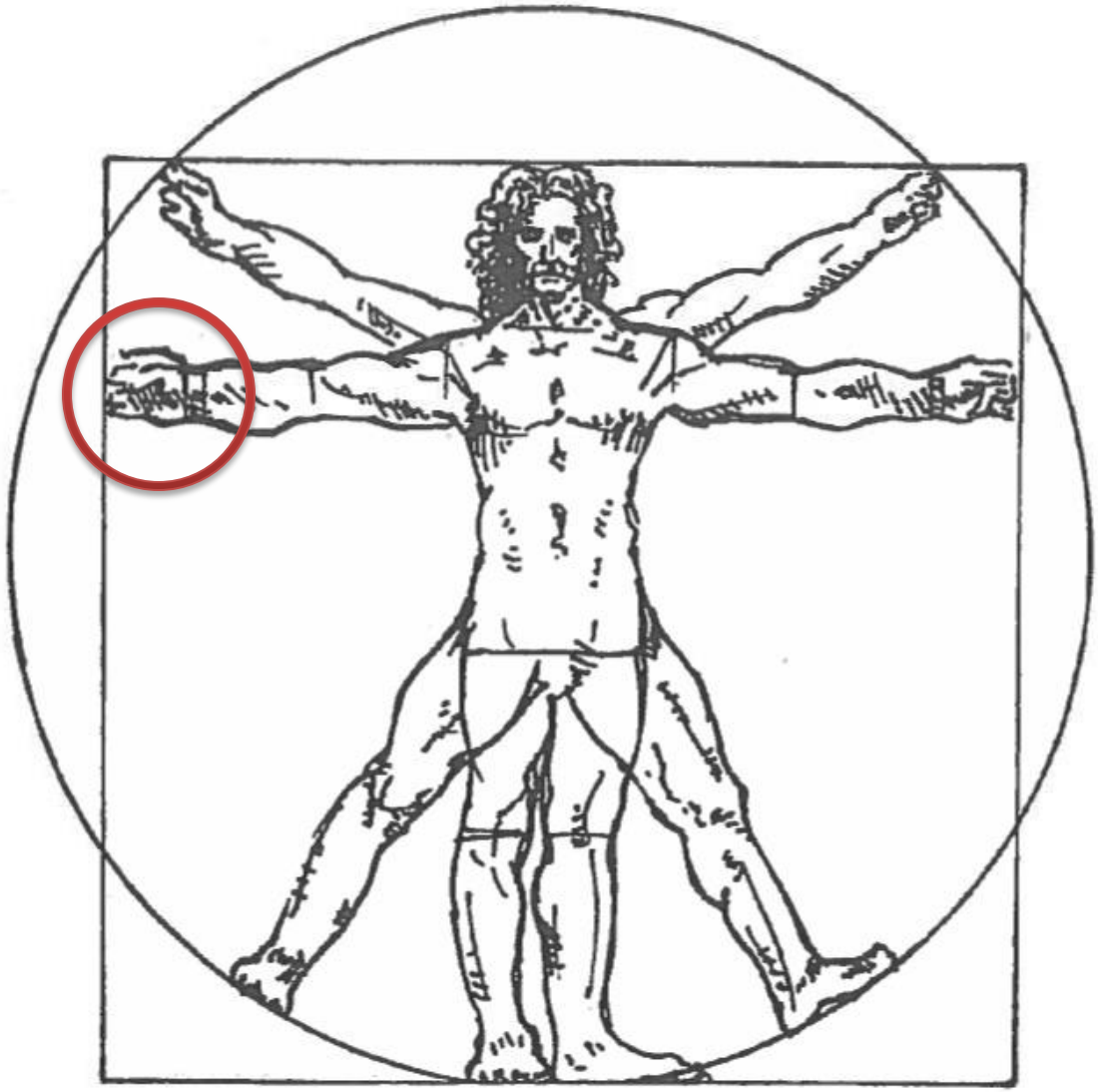
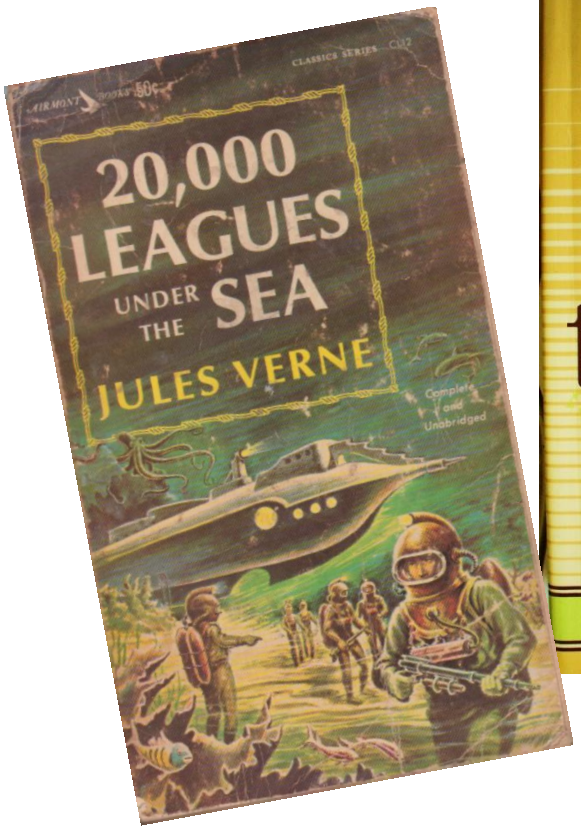
da Vinci Lends A Hand

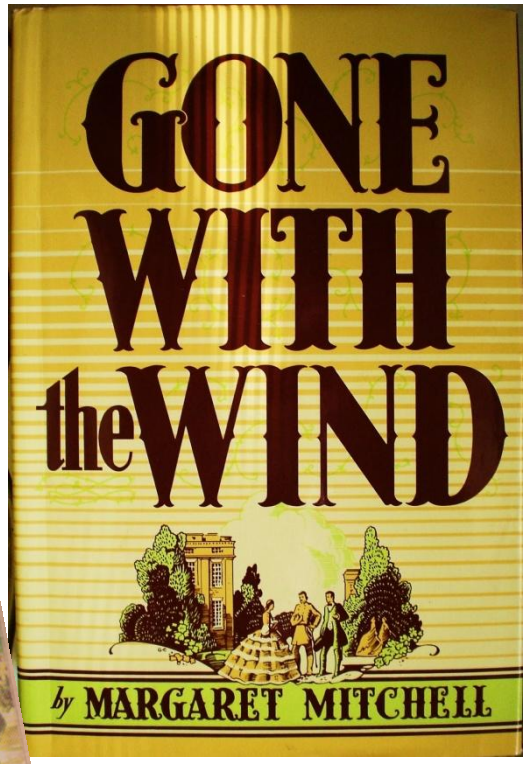
Literacy and Hands on STEM

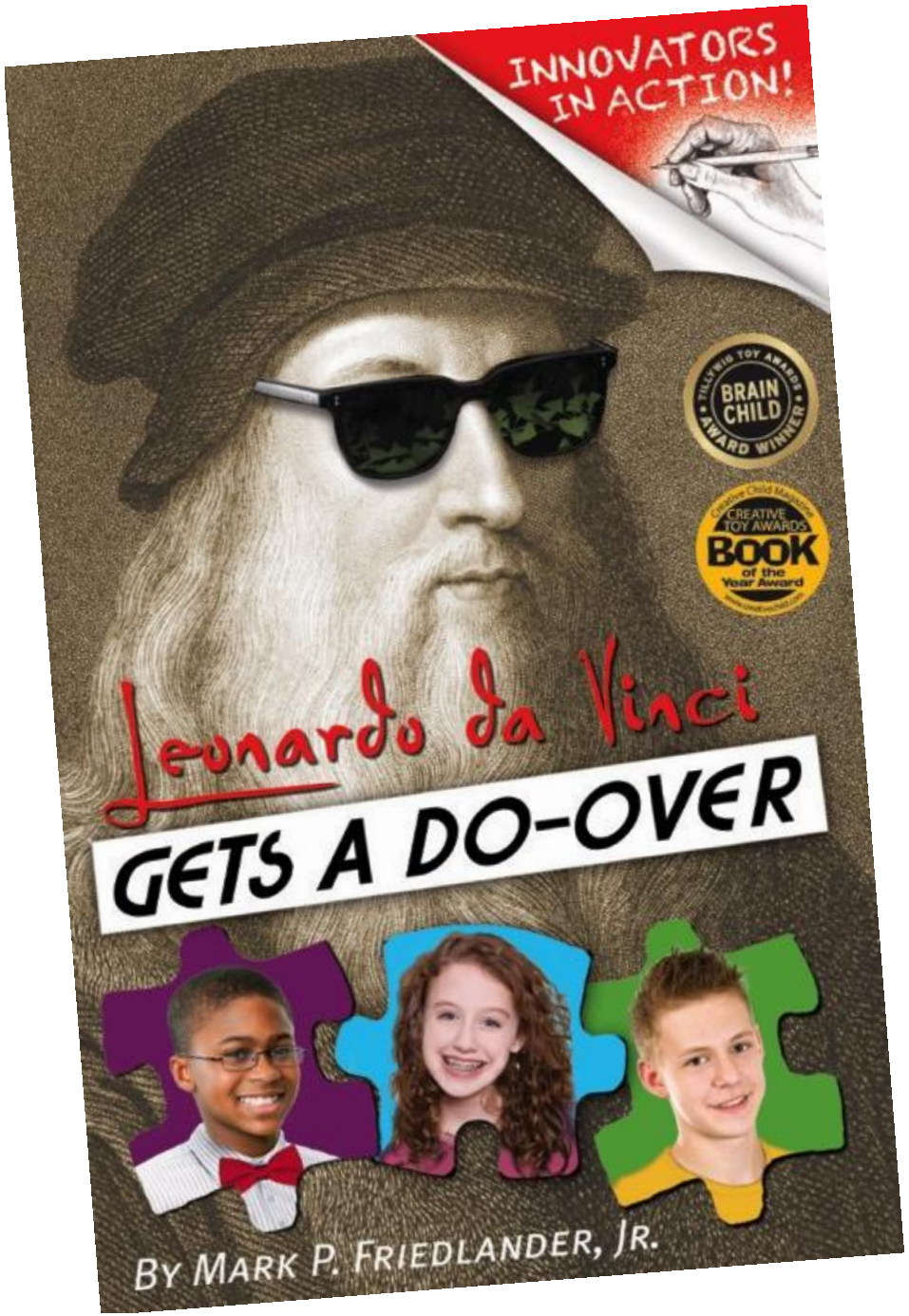
Mark P. Friedlander, Jr.



The Power of Fiction







Blended STEM Fiction

Innovators in Action: Leonardo da Vinci Gets A Do-Over

How the Book Works in Classrooms

Step #1: The kids read something they will enjoy!

Reading is good!

How the Book Works in Classrooms

Step #2: Use our Cross-Curricular Teacher's Guide to coordinate lesson plans as topics come up in the book

How the Book Works in Classrooms

Step #3: Use scenes from the book as a launching point to explore tangential STEM topics

Let’s See Some Examples! But first…

…Keep In Mind…

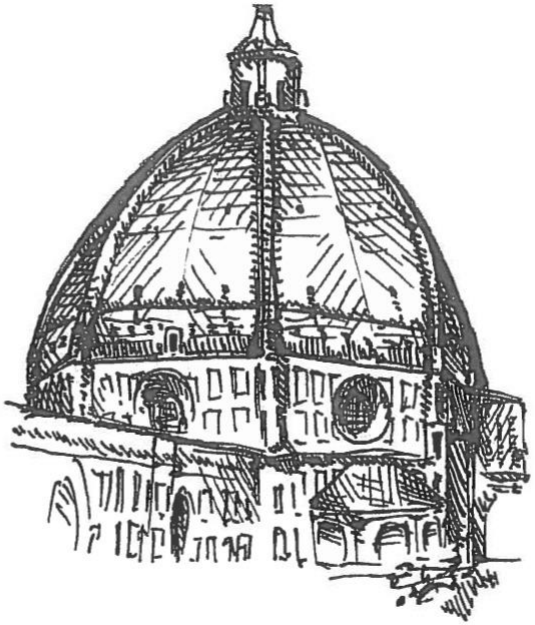
…What skills are we after?

Deductive reasoning

the process of reasoning from one or more statements (premises) to reach a logically certain conclusion.

Deductive reasoning links premises with conclusions.

Chapter 1: The Meeting



Glance to the Guide

- What topics are explored?
  - Math
    - Ratios and Proportions
    - Conversions
  - World History
    - The Italian Renaissance
    - Early European explorers

Let’s do a Hands-On Activity!

Hands-On Activity #1:
What Does One Billion Look Like?

Hands-On Activity #1: What Does One Billion Look Like?

How long would it take to count to a billion?

Hands-On Activity #2:
What In The World Was He Thinking?

Amerigo Vespucci

vs.

Christopher Columbus

Instructions:
What in the World Was He Thinking?

Columbus's Evidence for the Indies	Vespucci's Evidence for New World

Instructions:
What in the World Was He Thinking?

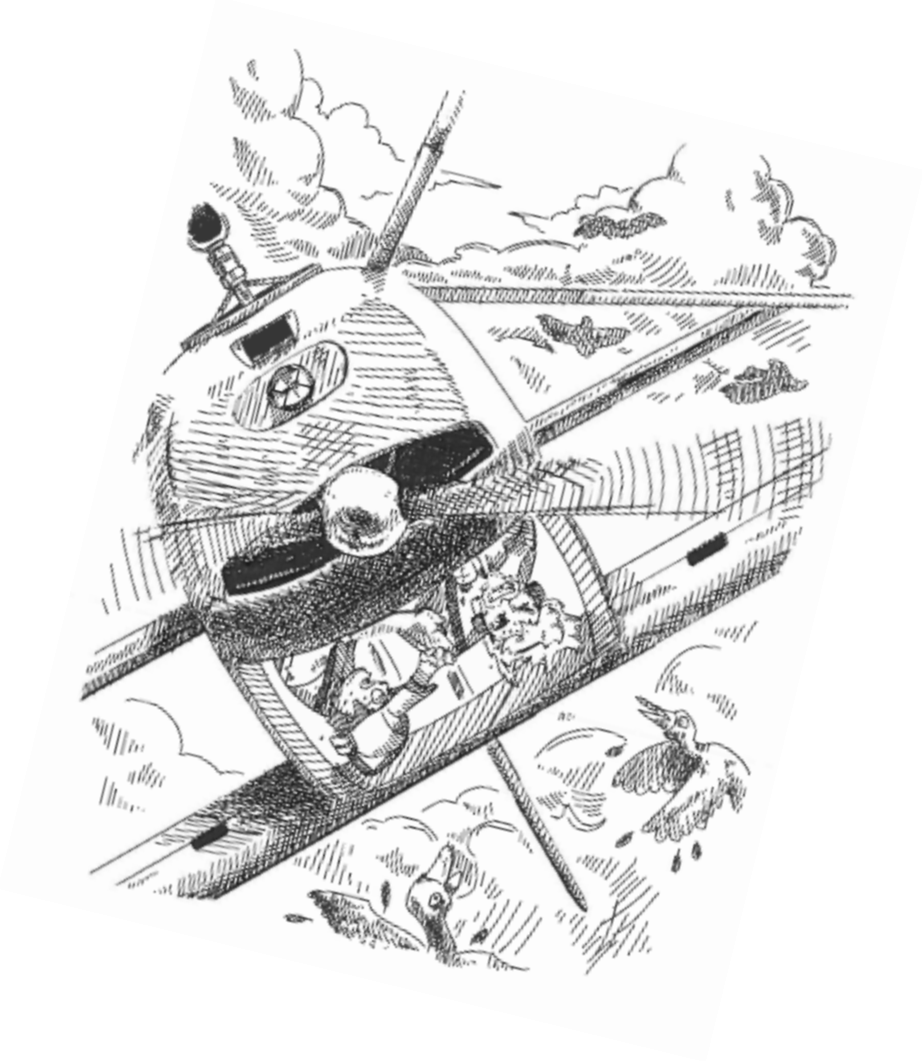
Conclusions:

Problems with preconceived notions

Benefits of objective analysis

(You get a continent named after you)

Chapter 8: The Airplane



Glance to the Guide

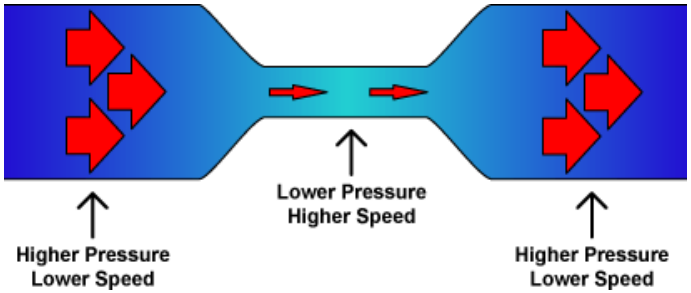
- What topics are explored?
  - Science
    - Principles of Flight
    - Bernoulli's Principle
  - Math
    - Conversions
  - History
    - History of Flight

Let’s do a Hands-On Activity!

Hands On Activity #3: Bernouilli's Principle Investigation

≠

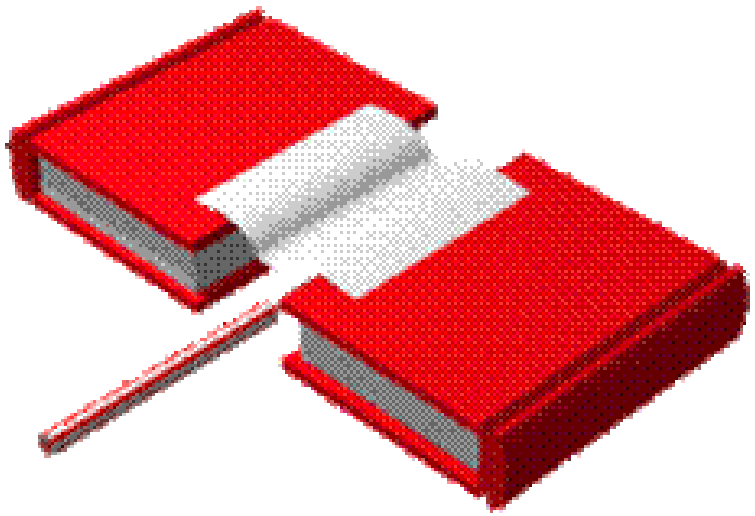
Common Sources of Confusion



Principal Skinner

≠ Principle

Hands On Activity #3:
Bernouilli's Principle Investigation



Hands On Activity #3: Bernouilli's Principle Investigation

Think about what's going on…
and hold that thought!

Guy holding thought bubble

Hands-On Activity #4: Build a Model Wing or Airfoil

Note: airfoil is not something used to cover leftovers during flight

Hands-On Activity #4:
Build a Model Wing or Airfoil

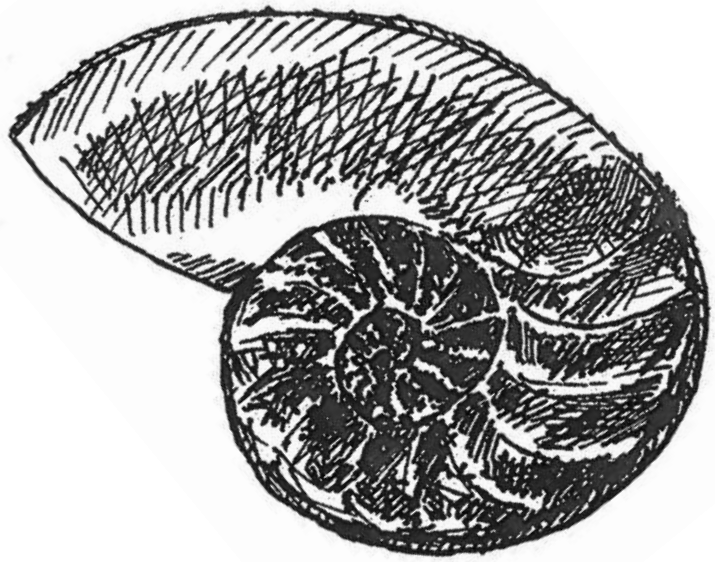
What did we see happen when the wing pulled through the air?

Don’t Miss The Connection!

How does what we learned about Bernouilli’s Principle apply to the wing?

What must be true about airflow over the wing for the wing to work?

Chapter 11: “A Lesson Learned”

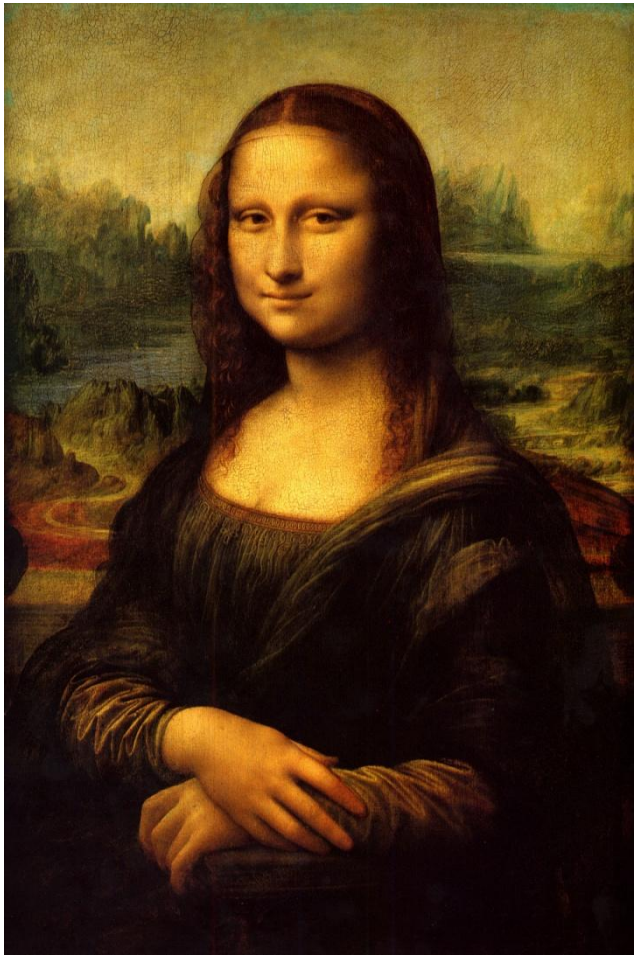


Glance to the Guide

- What topics are explored?
  - Math
    - Fibonacci Sequence
    - Geometry
  - Art and History
    - The Mona Lisa
    - Importance of Art in Pre-Industrial Society

Let’s do a Hands-On Activity!

Hands-On Activity #5: Visualizing the Fibonacci Series



Hands-On Activity #5: Visualizing the Fibonacci Series

The Fibonacci Series

1, 1, 2, 3, 5, 8, 13, 21, 34, 55, 89, 144, 233…

Dividing each number by the number before it…

1/1 = 1, 2/1 = 2, 3/2 = 1.5, 5/3 = 1.667, 8/5 = 1.6,
13/8 = 1.625, 21/13 = 1.6153

1, 2, 1.5, 1.667, 1.6, 1.625, 1.615… 1.618

Chapter 14:
The Final Adventure

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Bridging the gap between the blackboard and the blacktop