Dams, Clams, and Cricket Jams

A Story of Counting, Balance, and Getting It Right

(and a Little Night Music)

APPENDICES FOR AUDIOBOOK LISTENERS

The Math Explorers Series – Volume 2

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Appendix A — Teaching Moments & Extensions

Guidance for Parents, Educators, and Curious Readers

Chapter 1 — After the Water Rose

Core Math Idea:
Change can be gradual, cumulative, and measurable.

What's Really Happening Here:
The storm does not break the system—it stresses it. The dam responds by adjusting, not collapsing. This introduces the idea that systems react proportionally to pressure.

Why This Matters:
Students begin to see that math is not only about numbers, but about **response to change** over time.

Common Misunderstanding to Watch For:
Assuming problems only appear suddenly or dramatically.

Optional Extension / Discussion Prompt:
Ask: "What are examples where something didn't fail—but changed instead?"

Chapter 2 — Forms, Explanations, and Things That Multiply

Core Math Idea:
Clear descriptions require breaking events into parts.

What's Really Happening Here:
Insurance forms force the characters to describe duration, intensity, and effect—early modeling of structured thinking and categorization.

Why This Matters:
Math often begins with **how we describe a situation**, not how we calculate it.

Common Misunderstanding to Watch For:
Thinking math only starts when numbers appear.

Optional Extension / Discussion Prompt:
Have students describe a recent event using "how long," "how strong," and "what changed."

Chapter 3 — When Zubin Tried to Explain Everything at Once

Core Math Idea:
Too much information at once prevents understanding.

What's Really Happening Here:
Zubin overwhelms the orchestra with structure before meaning. Learning improves when ideas are grouped and simplified.

Why This Matters:
This chapter models **cognitive load**—why pacing matters in math instruction.

Common Misunderstanding to Watch For:
Believing confusion means lack of ability.

Optional Extension / Discussion Prompt:
Ask: "When do explanations become less helpful?"

Chapter 4 — The Shape with No Corners

Core Math Idea:
Circles are defined by distance from a center, not edges.

What's Really Happening Here:
Crows analyze a roundabout, discovering radius, diameter, and uniform distance intuitively.

Why This Matters:
Geometry begins with **relationships**, not formulas.

Common Misunderstanding to Watch For:
Thinking shapes are defined by how they look, not how they behave.

Optional Extension / Discussion Prompt:
Have students find circular objects and identify the center.

Chapter 5 — Twice Became the Problem

Core Math Idea:
Doubling means adding the entire current amount—not a fixed number.

What's Really Happening Here:
The clams double quietly. The danger is not speed—it's **compounding growth**.

Why This Matters:
This is the book's first major shift from addition to multiplication thinking.

Common Misunderstanding to Watch For:
Thinking doubling means "adding the same amount each time."

Optional Extension / Discussion Prompt:
Model doubling with coins or blocks over several days.

Chapter 6 — Zubin Divides the Beat

Core Math Idea:
Fractions are parts of a whole that still fit together.

What's Really Happening Here:
Music divides time into equal parts—whole, half, quarter, and eighth notes—without formal fraction notation.

Why This Matters:
Fractions become **felt**, not feared.

Common Misunderstanding to Watch For:
Believing fractions are smaller because they are "worse" or "less important."

Optional Extension / Discussion Prompt:
Clap quarter and eighth beats together.

Chapter 7 — When the Water Paused (and Everyone Looked Up)

Core Math Idea:
External systems affect internal systems.

What's Really Happening Here:
Human activity downstream changes water flow upstream, illustrating interconnected systems.

Why This Matters:
Math models **relationships**, not isolated events.

Common Misunderstanding to Watch For:
Thinking one system can change without affecting others.

Optional Extension / Discussion Prompt:
Ask: "What systems in your life affect each other?"

Chapter 8 — Counting Stops Working

Core Math Idea:
Some quantities grow too fast for counting one by one.

What's Really Happening Here:
The clams move from doubling into exponential growth. Counting fails; new tools are required.

Why This Matters:
Students learn **when a method stops being useful**.

Common Misunderstanding to Watch For:
Believing more effort fixes an outdated strategy.

Optional Extension / Discussion Prompt:
Compare counting grains of rice vs. estimating groups.

Chapter 9 — The Routes Refuse to Stay Single

Core Math Idea:
Multiplication repeats entire groups, not individual units.

What's Really Happening Here:
Crows repeat whole routes, discovering multiplication as repeated wholes.

Why This Matters:
This clarifies the conceptual difference between addition and multiplication.

Common Misunderstanding to Watch For:
Thinking multiplication is "just faster adding."

Optional Extension / Discussion Prompt:
Draw a route and repeat it several times—count total distance.

Chapter 10 — Sounds Begin to Belong Together

Core Math Idea:
Patterns emerge through grouping and coordination.

What's Really Happening Here:
Reading, music, and math align through rhythm and repetition.

Why This Matters:
Learning is often **cross-disciplinary**, even when it feels separate.

Common Misunderstanding to Watch For:
Believing skills exist in isolation.

Optional Extension / Discussion Prompt:
Identify patterns in music, language, or movement.

Chapter 11 — The Water Turns Something Else

Core Math Idea:
Growth changes system behavior, not just size.

What's Really Happening Here:
The stream behaves differently because of cumulative changes.

Why This Matters:
Students see that **thresholds** matter.

Common Misunderstanding to Watch For:
Thinking change is always linear.

Optional Extension / Discussion Prompt:
Discuss moments when "a little more" caused big change.

Chapter 12 — Night Answers Back

Core Math Idea:
Patterns continue even when unseen.

What's Really Happening Here:
Nighttime activity reinforces continuity and unseen processes.

Why This Matters:
Math often models things we cannot directly observe.

Common Misunderstanding to Watch For:
Assuming unseen means inactive.

Optional Extension / Discussion Prompt:
What happens overnight that we don't see?

Chapter 13 — Help Arrives on Very Small Feet

Core Math Idea:
Small agents can have large effects.

What's Really Happening Here:
Tiny helpers shift outcomes through repetition and placement.

Why This Matters:
Scale does not determine importance.

Common Misunderstanding to Watch For:
Ignoring small contributors.

Optional Extension / Discussion Prompt:
Identify small actions with big impact.

Chapter 14 — The Music Asks for Voices

Core Math Idea:
Systems stabilize when participation increases.

What's Really Happening Here:
Music improves when more voices align correctly.

Why This Matters:
Coordination strengthens systems.

Common Misunderstanding to Watch For:
Thinking more participants always cause chaos.

Optional Extension / Discussion Prompt:
What improves when more people cooperate?

Chapter 15 — Things Begin to Feel Official

Core Math Idea:
Recognition formalizes systems.

What's Really Happening Here:
Structures gain stability when acknowledged and named.

Why This Matters:
Math benefits from **definition and clarity**.

Common Misunderstanding to Watch For:
Believing labels create meaning instead of describing it.

Optional Extension / Discussion Prompt:
Why do we name concepts?

Chapter 16 — Everything Counts (and Nothing Was Finished)

Core Math Idea:
Math models ongoing systems, not endings.

What's Really Happening Here:
Problems remain open. Counting continues. Learning persists.

Why This Matters:
Math is a **process**, not a conclusion.

Common Misunderstanding to Watch For:
Expecting every problem to "wrap up."

Optional Extension / Discussion Prompt:
Ask: "What questions are still open?"

Final Note for Appendix A

This book continues the quiet philosophy of the Math Explorers Series:

- Notice first
- Count carefully
- Adjust slowly
- Respect systems
- Help each other

Book Two expands from counting into growth, harmony, and energy—but always with the same restraint.

Book Three is already listening.

And it sings.



Appendix B — Glossary

adjusted *(adj.)* — changed slightly so something works better
adagio *(n.)* — a musical term meaning slow and calm
alignment *(n.)* — when parts line up the way they should
angle *(n.)* — the space where two lines meet
anticipate *(v.)* — to think about what will happen before it does
array *(n.)* — an organized arrangement of items, often in rows or groups

balance *(n.)* — when forces or parts are spread so nothing tips or collapses
beam *(n.)* — a long, strong piece used to support weight
bed *(n.)* — a group of clams living close together in mud or sand
behavior *(n.)* — how something acts or responds over time
bridge *(n.)* — a structure built to cross water or land
build-up *(n.)* — gradual increase over time

calculate *(v.)* — to figure something out using numbers
carry *(v.)* — to move or support something; in math, to move value to another place
cello *(n.)* — a large string instrument with a deep, warm sound
center *(n.)* — the middle point of something
check *(n.)* — a written promise of payment
chorus *(n.)* — a group singing together
circle *(n.)* — a round shape with no corners or edges
clarinet *(n.)* — a woodwind instrument played with a reed
claim *(n.)* — a request for help or payment after damage
cluster *(n.)* — a group gathered closely together
compensate *(v.)* — to make up for a change by adjusting something else
conductor *(n.)* — the person who leads musicians and keeps time
consonance *(n.)* — sounds that feel calm and pleasant together
constraint *(n.)* — a limit that affects what can be done
coverage *(n.)* — protection against loss or damage
current *(n.)* — moving water in a stream or river

dam *(n.)* — a structure built to slow or control water
deductible *(n.)* — the part of damage someone must cover themselves
delivery *(n.)* — bringing something from one place to another
diameter *(n.)* — a line across a circle through the center
dissonance *(n.)* — sounds that feel tense or uncomfortable together
distribution *(n.)* — how something is spread out
doubling *(v.)* — making something twice as large

eighth note *(n.)* — a musical note that lasts one-eighth of a measure
electricity *(n.)* — energy created when power moves
ensemble *(n.)* — a group working or performing together
estimate *(v.)* — to make a careful guess using what you know
exponent *(n.)* — a number that shows how many times something is multiplied by itself

finale *(n.)* — the last part of a musical piece
flow *(n.)* — smooth movement, especially of water or sound
fraction *(n.)* — a part of a whole
french horn *(n.)* — a brass instrument with a wide, curling shape

group *(n.)* — several individuals together
growth *(n.)* — increase over time

half note *(n.)* — a musical note that lasts half a measure
harmony *(n.)* — different sounds working well together
hold *(v.)* — to support without breaking

insurance *(n.)* — a system for helping after damage or loss
instrument *(n.)* — something used to make music

ledger *(n.)* — a record of numbers or information
leash *(n.)* — a group of foxes
linear *(adj.)* — growing by the same amount each time
load *(n.)* — weight something must carry

measure *(v.)* — to find the size, amount, or length
meter *(n.)* — how music is counted in repeating beats
misaligned *(adj.)* — not lined up correctly
movement *(n.)* — a main section of a musical piece
murder *(n.)* — a traditional name for a group of crows
multiply *(v.)* — to increase by repeating equal groups

note *(n.)* — a musical sound
observe *(v.)* — to watch carefully before acting
orchestra *(n.)* — a group of musicians playing together

pattern *(n.)* — something that repeats in a predictable way
parliament *(n.)* — a group of owls
pause *(n.)* — a short stop

pressure *(n.)* — force pushing against something
priority *(n.)* — something that comes first
proportion *(n.)* — how parts relate to the whole

quarter note *(n.)* — a musical note that lasts one beat
radius *(n.)* — a line from the center of a circle to its edge
rebuild *(v.)* — to build again after damage
redistribute *(v.)* — to spread out again in a better way
repetition *(n.)* — doing something again and again
rhythm *(n.)* — a repeating pattern of sound

route *(n.)* — a planned path
scherzo *(n.)* — a musical movement that is fast and playful
school *(n.)* — a group of fish
sequence *(n.)* — the order things happen
sonata *(n.)* — a musical form with different sections that return
stability *(n.)* — when something stays steady
structure *(n.)* — something built from parts that work together
system *(n.)* — many connected parts working together

tempo *(n.)* — the speed of music
timing *(n.)* — choosing the right moment
transfer *(v.)* — to move something from one place to another
triple *(v.)* — to make something three times larger
tuba *(n.)* — a large brass instrument with a deep sound

unit *(n.)* — a standard way to measure
variation *(n.)* — a change that keeps the same basic idea

waterwheel *(n.)* — a wheel turned by moving water
weight *(n.)* — how heavy something is
whole note *(n.)* — a musical note that lasts a full measure

This page is not blank - it's simply on vacation.

Appendix C — Games and Activities for Parents, Teachers, and Curious Readers

Book Two continues teaching math and music quietly.
Not by naming formulas.
Not by rushing answers.
But by showing how numbers, patterns, sound, and systems interact when many parts are working at once.

This book builds directly on Book One and gently introduces:

• fractions through rhythm and time
• multiplication through repetition and grouping
• harmony as balance, not sameness
• systems that affect other systems
• early ideas related to growth and scaling

Everything below is optional.
Nothing requires special materials.
All activities are short, flexible, and meant to feel like exploration—not work.

Use what fits.
Skip what doesn't.

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1. Fractions You Can Hear

(Chapters: Early Orchestra / Learning the Beat)

In the orchestra, time is divided before it is played.

Quarter notes.
Half notes.
Whole notes.
Eighth notes.

No one calls them fractions.
But they are.

Try this:

- Clap four steady beats.
- Count aloud: one, two, three, four.
- Now clap only on beats 1 and 3.
- Then clap only once per four beats.

Ask:

- "Which felt longer?"
- "Which felt shorter?"
- "Did time change—or did how we used it change?"

This builds:

- fractions
- division of time
- understanding that parts must still fit the whole

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2. Multiplication Is Repetition

(Chapters: The Waterwheel / Patterns That Return)

The waterwheel turns again and again.
The orchestra repeats patterns.
The crows repeat distances.

That repetition is multiplication.

Try this:

- Tap a steady beat.
- Count how many taps happen in ten seconds.
- Now tap twice as fast.
- Count again.

Ask:

- "Did we add taps—or repeat them faster?"
- "What stayed the same?"
- "What changed?"

This builds:

- multiplication
- rate
- growth through repetition

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3. Harmony Is Cooperation

(Chapters: Learning to Play Together)

Harmony is not sameness.
It is difference that fits.

Some sounds feel calm together.
Some feel tense.
Neither is wrong—but they feel different.

Try this listening game:

- Hum a steady note.
- Have someone hum a different note at the same time.
- Change notes.
- Stop and talk about how it felt.

Ask:

- "Which sounds felt smooth?"
- "Which felt tense?"
- "Did any feel exciting instead of wrong?"

This builds:

- listening
- comparison

- emotional awareness of patterns

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4. Counting Groups, Not Just Objects

(Chapters: The Animals Gather)

Book Two introduces many group names:

• a murder of crows
• an orchestra of insects
• a parliament of owls
• a leash of foxes

Grouping changes behavior.

Try this:

- Gather small objects (blocks, coins, paper).
- Group them in different ways.
- Count by groups instead of one-by-one.

Ask:

- "Which way made counting easier?"
- "Which way made patterns clearer?"
- "Why do groups exist?"

This builds:

- multiplication
- sets
- structure

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5. When Systems Affect Other Systems

(Chapters: The Stream and the Dam)

The waterwheel changes the stream.
The stream changes the dam.
The dam must adjust—even though it did nothing wrong.

This is systems thinking.

Try this demonstration:

- Stack books to make a small ramp.
- Roll a ball down.
- Change the bottom slightly.
- Roll again.

Ask:

- "What changed?"
- "What stayed the same?"
- "Did anything break—or just need adjusting?"

This builds:

- cause and effect
- indirect impact
- careful reasoning

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6. Growth That Changes Shape

(Chapters: Repetition That Accelerates)

When something doubles again and again, growth changes quickly.

The book does not explain this.
It shows it.

Try this:

- Start with one coin.
- Double it.

- Double again.
- Count each time.

Ask:

- "Did it grow the same amount each time?"
- "Did it feel slow at first?"
- "What surprised you?"

This introduces:

- exponential growth (gently)
- comparison
- prediction

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7. What Is Money, Really?

(Chapters: Elm and the Acorns)

Elm receives acorns—but doesn't know what they mean yet.
That confusion is intentional.

Try this discussion:

- Ask what money is for.
- Ask what money is not.
- Ask what happens if you have it but don't need it yet.

This builds:

- abstraction
- delayed decision-making
- reasoning beyond numbers

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8. Silence Is Still Part of the Pattern

(Chapters: Learning When Not to Play)

The orchestra learns when not to play.
The beavers learn when not to build.

Silence and waiting matter.

Try this:

- Clap four beats.
- Clap only on beat one.
- Stay silent the rest of the time.

Ask:

- "Was silence easy?"
- "Did it still feel like part of the rhythm?"

This builds:

- restraint
- timing
- patience

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9. No One Has to Be Perfect

(Chapters: Adjusting Without Blame)

In Book Two:

• problems are noticed early
• solutions are adjusted
• no one rushes
• no one shows off

That matters.

Try this reframing:
When a child says,
"I did it wrong,"
respond with:

"What did you notice?"

That question builds:

- confidence
- curiosity
- real problem-solving skills

Final Thought on Appendix C

Math and music are not about speed.
They are about fit.

They ask:

- Does this belong?
- Does this work with the rest?
- What happens if we change just one thing?

Book Two continues teaching young readers to:

• notice patterns
• listen carefully
• count with purpose
• adjust gently
• trust that understanding grows over time

Those skills do not fade.
They compound.

And that—
quietly—
is the point.

A Final Note to Parents, Teachers, and Curious Readers
If this book felt calm, that was intentional.

The goal was never to rush toward answers
or to impress with explanations.

Instead, Book Two invites readers to slow down
and notice how understanding grows when many small parts
work together.

Music does not hurry its harmony.
Numbers do not demand speed to make sense.
Systems rarely improve by force.

They improve through attention.

Throughout this book, patterns repeat.
Groups form.
Rhythms emerge.
Adjustments are made—not because something failed,
but because change always asks for balance.

That is how real learning works.

Children do not need every concept named.
They need space to observe. They need permission to wonder.
They need time to return to an idea and see it differently.

If a reader closed this book with more questions than answers,
that is not a problem.

It is a beginning.

Thank you for reading alongside them.
For listening.
For allowing understanding to arrive quietly—
and to grow at its own pace.

That kind of learning lasts.

Notes and Ideas

Books by the Author

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The Whining Mill
A light novel about life, friction, dogs, and the strange ways people end up together.

About the Author

David I. Schoen, known to generations of students as Professor Dave, has spent decades helping learners of all ages discover clarity, confidence, and even a little joy in the worlds of language, math, and learning. A veteran educator, tutor, and writer—and an unapologetic lover of books—he specializes in turning complicated ideas into simple, friendly explanations that actually stick.

Dave has guided thousands of students through English, math, writing, grammar, and test preparation, as well as the always-adventurous process of becoming a stronger thinker. His teaching blends humor, precision, and storytelling—a combination that has helped learners from elementary school through adulthood feel empowered instead of intimidated.

He is also an active private pilot, and has been flying for over three decades—an experience that has shaped the realism, detail, and sense of wonder behind *Tamias Learns to Fly* and *The Flying Explorers Series*. Before becoming an author and educator, he worked as an Air Traffic Controller at JFK International Airport, one of the world's busiest airports, for almost two decades. Aviation is in his blood, just as it is slowly coming to be in Tamias'.

When he isn't teaching or writing, Dave can usually be found creating new educational books, experimenting in the kitchen, playing the piano, or working on inventive projects that combine family, learning, and fun. He lives on Long Island, New York, where he is constantly surrounded by stories waiting to be told.

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Keep your head up!
