

# CHAPTER 3

## Lessons That Build Comprehension Skills in Any Genre

In this chapter, as well as Chapters 5 and 7, you'll find sample lessons that integrate the types of talk discussed in Chapter 2 to teach students how to think deeply about a text by making inferences, identifying main ideas and themes, discussing conflicts, and so on. The literature that I use for each lesson is included with this book; you can find the complete texts starting on page 86 and available for download at <http://resources.corwin.com/readtalkwrite>. You can invite students to read each text if it's at their instructional reading level, or you can read the text out loud. Presenting the lessons in this chapter will give you a feel for a student-centered approach that incorporates talk and writing; you will also get a sense of how I pace lessons, dividing them over two or more days.

Before trying the lessons, let me share some highlights of my planning process in selecting texts so you can adapt it to prepare your own lessons.

Step 1. Mine texts for teaching topics

Step 2. Plan lessons

Step 3. Develop effective assessments

### Step 1: Mine Texts for Teaching Topics

If you have to teach genre, refer to the genre chart for fiction in Chapter 4 (pages 128–129) and the chart for nonfiction in Chapter 6 (pages 193–195) for teaching ideas and questions. You can find suggestions for composing guiding questions and interpretive questions in Chapter 1 (page 9). I've included a key issue with each genre as this can support creating a guiding question.

When I read short or long texts to decide whether to use them in my classes, I read with my teacher's eye. If a piece grabs me and makes me think *I wonder what will happen. I must finish before I fix dinner!* or *My students will love this!* I reread or skim it and list possible teaching points, guiding questions, and background knowledge students might need on a chart like the one that follows. Over the years, I've built a treasure trove of reading materials that I can draw upon for read-alouds, guided practice, and instruction.

Generally, I use a short selection to teach one or two topics to students, and then it's time to move on to a different piece. A chapter book, on the other hand, can be used for several topics over a longer period of time. Consider the notes I took for Priscilla Cummings's story "Snow Day," shown on the next page; you can find the lesson using this story on pages 163–164.

# Mine Texts for Teaching Topics: Planning Chart

## Example of Planning Chart for a Short Story

**Title:** "Snow Day"

**Author:** Priscilla Cummings

**Genre:** Realistic short story

**Reading level:** Fifth grade

BACKGROUND KNOWLEDGE	THEME/ISSUE	LITERARY ELEMENTS	LITERARY TECHNIQUES/ STRUCTURE	READING STRATEGIES
Have students discuss what they'd do on a day off from school.	Friendship and empathy	Protagonist and problems Antagonists Settings Themes	Figurative language Flashback	Inferring characters' personality traits. Compare/contrast

### Potential Guiding Questions Related to Theme/Issue:

How does friendship affect our decisions?

What motivates people to act heroically?

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The chart shown above, which I store in my binder, helps me clearly see teaching possibilities for this text. When I see students are ready for a new text, I find one that offers different challenges. For example, if I want to teach conflict or events and people that change characters, then I would use a story like "Coming Clean" (page 86), which deals with a character's internal and external conflicts that cause him to change, or "Hoops Tryouts" (page 93), which shows how a character's actions change him.

Organizing my notes this way makes it easy to locate texts with similar themes or teaching points that I can use for reteaching, and it allows me to quickly find texts in the same genre at different reading levels. Next, let's examine my notes on Seymour Simon's "New Horizons in Space"; the lesson using this text is on pages 216–217.

# Mine Texts for Teaching Topics: Planning Chart

## Example of Planning Chart for Informational Text

Title: "New Horizons in Space"

Author: Seymour Simon

Genre: Informational text

Reading Level: Ninth/tenth grade

BACKGROUND KNOWLEDGE	THEME/ISSUE	LITERARY ELEMENTS	LITERARY TECHNIQUES/ STRUCTURE	READING STRATEGIES
On asteroids, asteroid belt, and mining for minerals	Dwindling rare and important metals Space is the next mining frontier	Point of view Purposes Themes	Problem/solution	Determining importance Drawing conclusions Main ideas

### Potential Guiding Questions Related to Genre/Theme/Issue:

How do dwindling resources affect our world?

What are new horizons in space?

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This is an excellent article for helping students draw conclusions, identify the author's purpose and point of view, and study the text structure of problem/solution. However, this piece would not help me teach making inferences using text details. To prepare a lesson on inferring, I could use either excerpt by Sandra Athans: *Tales From the Top of the World* or *Secrets of the Sky Caves*. On pages 72–73 is a lesson on inferring using *Tales From the Top of the World*. Finally, review my notes on Kathleen Krull's "How Ada Lovelace Leaped Into History"; the lesson based on this text is on pages 210–211.

# Mine Texts for Teaching Topics: Planning Chart

## Example Planning Chart for Biography

**Title:** "How Ada Lovelace Leaped Into History"

**Author:** Kathleen Krull

**Genre:** Biography

**Reading level:** Seventh grade

BACKGROUND KNOWLEDGE	THEME/ISSUE	LITERARY ELEMENTS	LITERARY TECHNIQUES/STRUCTURE	READING STRATEGIES
On the poet Lord Byron	Obstacles Domineering parents	Protagonist Antagonists Point of view, purposes Themes Conflict	Flashback	Inferring character's personality traits Compare/contrast

### Potential Guiding Questions Related to Theme/Issue:

What kinds of obstacles affect our decisions and lives?

How do other people influence our lives?

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This biography offers several teaching choices; however, I would only use it for two topics. Choice of topics depends on what your students need to learn and practice. You might return to a text later in the year to review a topic or to teach a new topic.

# Mine Texts for Teaching Topics: Planning Chart

Title \_\_\_\_\_ Author \_\_\_\_\_

Genre \_\_\_\_\_ Reading Level \_\_\_\_\_

BACKGROUND KNOWLEDGE	THEME/ISSUE	LITERARY ELEMENTS	LITERARY TECHNIQUES/ STRUCTURE	READING STRATEGIES
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**Potential Guiding Questions Related to Genre/Theme/Issue:**

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## Step 2: Plan Lessons

As I plan lessons, I like to think about them in three phases: preparation, the lesson, and reflect and intervene. To help you plan your own, I've listed beneath each of these phases some activities that typically occur. You do not have to do everything listed for every lesson! The topic, the content, and the needs of your students will determine what you include in a lesson.

### Preparation

- ▶ Activate background knowledge
- ▶ Preteach vocabulary
- ▶ Introduce topic and guiding question
- ▶ Read text

### The Lesson

- ▶ Think aloud
- ▶ Interactive read-aloud
- ▶ Student talk
- ▶ Writing about reading
- ▶ Guided and independent practice

### Reflect and Intervene

- ▶ Assess the learning
- ▶ Provide scaffolds
- ▶ Set up 5-minute conferences if needed

Setting priorities when planning is a must; otherwise you will feel overwhelmed and frustrated. Decide on the focus of a lesson—let's say internal antagonists—and then plug in the givens: activate background knowledge, assessments, types of talk, writing about reading, guided practice, and independent work. Work through these, and you can determine the amount of time needed, what kinds of modeling you'll do, and how to meet the needs of groups or individuals that require more support. In addition, as you teach lessons, you will gain the experience that makes planning easier and fun! You can use the Lesson Planning Think Sheet (see pages 68–69) to map out lesson ideas.

## Lesson Planning Think Sheet

**Topic:** The topic can be a literary element or technique, genre, text structure, or reading strategy.

**Literature Selection:** Every student should be able to read the text. If not, read it aloud or offer a similar selection at students' instructional reading level.

**Background Knowledge:** Consider the background knowledge students need to comprehend the text and how much time you will devote to building it.

**Vocabulary:** Evaluate the vocabulary in the text. Are there three to five words you should preteach?

**Guiding Question:** Craft a guiding question that prompts students to think deeply about the text and your topic.

**Text-Dependent Questions:** Teach students to work with a partner or in groups of 3 to 4 to write these (see Lesson 3.2, pages 74–75). Writing questions deepens students' knowledge of a text; discussing questions that students made engages them in the discussion. If this is new or too difficult for your students, then develop these questions yourself, thinking aloud to model the process for students.

**Assessment:** Use the reproducibles in lessons as examples of what to develop.

**Adjustments:** Make adjustments for English language learners and special education students. These can include easier texts, creating text-dependent questions they discuss and showing them how to locate information in a text that answers questions.

# Lesson Planning Think Sheet

## Topic

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## Literature Selection

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## Background Knowledge

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## Vocabulary

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## Guiding Question

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## Text-Dependent Questions

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## Assessment

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## Adjustments

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## Additional Comments

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## Step 3: Develop Effective Assessments

Here is where we address the “write” in the Read, Talk, Write process! When you think about assessing students, looking at their writing about reading should be high on your list. Writing in response to texts and conversation can take many forms, from sticky note jots to more developed entries in reading journals. In this book, I share reproducibles that make it easy for you to get started with writing about reading and self-evaluation as well as checklists for teachers and students; you can use these as models for developing your own student sheets. If you design student response sheets, make sure they reflect what students have learned and practiced.

You can also monitor students’ progress by conferring and documenting the conference on the form I’ve included on page 61, and by asking students to apply an aspect of the lesson to their independent reading. In addition, you’ll want to observe literary discussions and use checklists and/or jot some notes that document what you notice and use these for on-the-spot conferences and/or 5-minute conferences.

To simplify lesson planning and assessment, store completed plans in a three-ring binder so you can add lessons, insert comments about completed lessons, note adjustments, and record questions on a lesson you’ve presented.

## Ten Top-Notch Short Texts and Lessons

I know what a boon it is to have short, powerful fiction and nonfiction texts right in the professional book, so here they are! You can photocopy them for students beginning on page 86 or download them at <http://resources.corwin.com/readtalkwrite>.

### Texts

“Coming Clean” by Anina Robb

“Defying Gravity: Mae Jemison” by Anina Robb

“Hoops Tryouts” by Anina Robb

“How Ada Lovelace Leaped Into History” by Kathleen Krull

“How Athens Got Its Name” Retelling by Joanna Davis-Swing

“Isaac Newton and the Day He Discovered the Rainbow” by Kathleen Krull

“Making Scientists Into Climbers” (Excerpt From *Secrets of the Sky Caves: Danger and Discovery on Nepal’s Mustang Cliffs*) by Sandra Athans

“New Horizons in Space” by Seymour Simon

“Snow Day” by Priscilla Cummings

“Who Climbs Everest?” (Excerpt From *Tales From the Top of the World: Climbing Mount Everest With Pete Athans*) by Sandra Athans



Available for download at <http://resources.corwin.com/readtalkwrite>

## Getting-Ready Tips

- ▶ As you prepare to teach the lessons that begin on page 72, make class sets of the texts and handouts for each lesson. Students should always have available:
  - Guidelines for Discussion (Chapter 1, page 17)
  - Prompts That Keep a Discussion Moving Forward (Chapter 2, page 25)
- ▶ If the text that goes with a lesson works for all students in your class, then students can read it independently. If not, you can read the text aloud.
- ▶ Most of the lessons use two types of talk. I often start with turn-and-talk to warm up students' thinking and then move to another kind of talk.
- ▶ Remember, it's not always necessary to share after a turn-and-talk when you hear and observe that all students "get it."
- ▶ As students discuss, accept any response as long as students paraphrase the text to support their position with specific details or with inferences that use details. Use the same partners throughout a lesson, and make sure every student has a copy of the materials for the lesson.

Circulate and listen carefully as students talk; share suggested time limits in each lesson. However, know that your students might need more or less time, so adjust accordingly.

# Inferring With Informational Text

The goal of this lesson is to help students experience how a literary discussion can help them infer while listening to you read aloud an excerpt from *Tales From the Top of the World* (page 119). As I read aloud each section of text, I invite students to turn-and-talk to warm up their thinking, but I also add partner talk for longer conversations of 8–15 minutes. Extending the talk offers students opportunities to explore ideas in the text and share their inferences.

## Materials

Excerpt from *Tales From the Top of the World: Climbing Mount Everest With Pete Athans* by Sandra Athans (page 119, or download at <http://resources.corwin.com/readtalkwrite>)

## Lesson Guidelines

### Day 1

#### Help Students Prepare to Read (15 minutes)

- ▶ Post a map of Nepal on a whiteboard and locate Kathmandu, where climbers start, and then locate Mount Everest.
- ▶ Organize students into partners or invite them to talk to the person sitting at their right or left.
- ▶ Ask students to turn-and-talk about:

*What is the height of Everest?*

*Why is this climb dangerous?*

- ▶ Have students share with the class.
- ▶ Invite partners to turn-and-talk for 2–3 minutes saying something like:

*What do you know about mountain climbing?*

- ▶ Have two to three pairs share different responses.

### Day 2

#### Read Aloud Part 1 (15–20 minutes)

- ▶ Read aloud the section headed “Who Climbs Everest?” and stop at the end of the first paragraph.
- ▶ Invite students to turn-and-talk by saying something like:

*What conclusions can you make about climbing Mount Everest? Why must you have previous climbing experiences and be in terrific physical shape to reach the top?*

- ▶ End the conversations, then read aloud the second paragraph.
- ▶ Have students partner talk (8 minutes) by saying something like:

*Why do expeditions up Everest always include Sherpas?*

**Read Aloud Part 2 (15–20 minutes)**

**Day 3**

- ▶ Read aloud the first paragraph of “Adjusting to Thin Air.”
- ▶ Have partners turn-and-talk for 2 minutes using a prompt such as:

*What do you think “thin air” means?*

- ▶ Read aloud the next two paragraphs.
- ▶ Invite students to partner talk (8 minutes) by saying something like:

*How does thin air affect people who climb Everest?*

- ▶ Invite a pair to share. If you want more details after they share, ask:

*Does anyone have more information to add?*

- ▶ Ask students to turn-and-talk for 2–3 minutes by saying something like:

*What can you infer about why people want to climb Everest?*

**Read Aloud Part 3 (15–20 minutes)**

**Day 4**

- ▶ Read aloud “Climbers Be Wary.”
- ▶ Have students partner talk (10 minutes) by saying something like:

*Discuss the text and make two inferences and/or connections among ideas about climbing Mount Everest. Include text evidence that supports each inference.*

- ▶ Ask students to share their inferences and then jot two to three in their notebooks.

**Notes to Yourself About Teaching the Lesson**

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# Exploring Interpretive Questions: Biography

Interpretive questions have more than one answer and add energy to a discussion, as students' analyses result in diverse responses. Use three kinds of talk to engage students in discussions of the biography for this lesson. Start with the turn-and-talk strategy to build students' background knowledge about the person. Move to partner talk for creating two interpretive questions that focus the discussion on key points. Finally, hold a whole-class discussion to discuss the questions students generated. If a whole-class discussion derails, restart it by asking a question or making a thought-provoking statement.

## Materials

"Isaac Newton and the Day He Discovered the Rainbow" by Kathleen Krull; smart notebooks

## Lesson Guidelines

### Day 1

#### Build Background Knowledge and Read for the Gist (30–35 minutes)

- Ask students to turn-and-talk for about 2 minutes and discuss:

*What do you know about Isaac Newton?*

- If students know little, show a video from YouTube or TeacherTube, or read selected passages from a biography.
- Read aloud or have students read "Isaac Newton and the Day He Discovered the Rainbow" to get the gist or the general ideas.

### Day 2

#### Teach Students to Create Interpretive Questions (15–20 minutes)

- Reread aloud or ask students to reread the biography in order to recall details to create interpretive questions (see guidelines on pages 9–12).
- Think aloud and show how you test a question to ensure that it's interpretive. Say something like:

*If I can find two different answers for a question, then it's an interpretive question. I'm going to test this question: Why did Newton purchase two prisms? First, he bought the prism as a toy. But I'm inferring that since Krull says Newton was brilliant and later refers to the prism as a science toy, he saw it as a way to learn. Second, he thought the prism was cool and, though he had little money, bought another.*

- Explain that words like *why*, *how*, *evaluate*, *compare*, and *contrast* can generate questions with more than one answer. Post these words.
- Organize partner talk and have students write two interpretive questions for paragraphs 1–10.

- ▶ Circulate and support students as they test a question to see if it has more than one answer. Here are the two questions seventh-grade students agreed to discuss:

*How did Newton differ from other college students? What does this say about his personality?*  
*How did Newton use the prism to prove that Aristotle and Hooke were wrong?*

- ▶ Record questions.

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### Whole-Class Discussion Using Interpretive Questions (15–20 minutes)

## Day 3

- ▶ Ask students to skim “Isaac Newton and the Day He Discovered the Rainbow” to the end of paragraph 10 to refresh their memories.
- ▶ Give students a copy of the interpretive questions related to the first half of the text that were generated the previous day, or project them onto a whiteboard. Invite students to discuss the questions as a whole class.
- ▶ Summarize the key points halfway through the discussion and at the end.
- ▶ Have students write key points for each question in their notebooks.

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### Whole-Class Discussion Using Interpretive Questions (30 minutes)

## Day 4

- ▶ Give students about 5–6 minutes to skim “Isaac Newton and the Day He Discovered the Rainbow” from paragraph 11 to the end.
- ▶ Use partner talk to have students compose two interpretive questions for paragraph 11 to the end (10–15 minutes). Here are the two questions seventh-grade students used:

*How did Newton conclude that white light wasn't white?*  
*Why did the author include the sidebar “Newton Not Always Right”?*

- ▶ Invite students to discuss as a whole class.
- ▶ Summarize the key points halfway through the discussion and again at the end.
- ▶ Ask students to list key points discussed in their notebooks.

### Notes to Yourself About Teaching the Lesson

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# Determining the Author's Purpose: Informational Text

The author's purpose for writing a text can be to explain, argue for, persuade, describe, create suspense, or entertain. By studying the author's words, students can identify the purpose. This lesson has students turn-and-talk to build background knowledge, then partner talk to discuss the gist and text details before discussing the author's purpose.

Each time you schedule partner talk, plan on listening to two pairs—three at the most. To gain insight into partner talks not observed, have students list in their notebooks several key points they discussed.

## Materials

Excerpt from *Secrets of the Sky Caves: Danger and Discovery on Nepal's Mustang Cliffs* by Sandra Athans; smart notebooks

## Lesson Guidelines

### Day 1

#### Build Background Knowledge (20 minutes)

- ▶ Project a map of Nepal. Locate the Mustang District of Nepal on the map.
- ▶ Find photographs of the Mustang District of Nepal on the Internet and project these. Have students turn-and-talk:

*Why are the caves called "cities in the sky"?*

- ▶ Offer students some background information on the Sky Caves of the Mustang Cliffs. You can use Sandra Athans's book or gather information from an Internet search. This website has a *National Geographic* article about the Mustang Caves and a photo gallery: <http://ngm.nationalgeographic.com/2012/10/mustang-caves/finkel-text>.

### Day 2

#### Read and Use Partner Talk to Get the Gist and Key Points (30–35 minutes)

- ▶ Read aloud or have students read the excerpt from *Secrets of the Sky Caves: Danger and Discovery on Nepal's Mustang Cliffs*.
- ▶ Invite students to partner talk to discuss the gist or general points the text makes (3–4 minutes).
- ▶ Ask partners to share (5 minutes).
- ▶ Reread aloud or have students reread the text.
- ▶ Have students partner talk to discuss key details in each section before determining the author's purpose (10–15 minutes).

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**Teach How to Determine the Author's Purpose (20–25 minutes)****Day 3**

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- Post four prompts to help students determine the author's purpose:

*Why did the author write this piece?*

*Does the structure of the text offer clues?*

*How does the author's use of language and structure make you feel?*

*Do you find more than one purpose?*

- Think aloud and use the prompts to determine the author's purpose for "The Rescue and Recovery Expedition." Say something like:

*The author explains why the 2008 expedition occurred. It was to find the papers in the caves. The author creates a feeling of mystery by using "mysterious" to describe the papers and by concluding that the papers have to be valuable because they had been stored in a high, remote place.*

- Invite students to partner talk to determine the author's purpose for paragraphs 3 and 4 (5–7 minutes). Here's what eighth-grade students said:

*In paragraph 3 the purpose is to explain how the team got permission for the expedition.*

*In paragraph 4, the purpose is to show the team was nervous and could be cursed; they want the blessing of Buddhist lamas. Three lamas went with them as protection from "danger and troublesome spirits."*

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**Use Partner Talk to Determine the Author's Purpose (25–30 minutes)****Day 4**

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- Post the four prompts from Day 3 for students to use.
- Divide the class into two groups. Partners in one group use "Making Scientists Into Climbers," and partners in the second group use "Library in the Sky" to determine the author's purpose (10–15 minutes).
- Invite students to share the author's purposes they uncovered.
  - Here's a purpose from group one:

*to explain why the climb is dangerous and why Ramble feared the climb*
  - Here's a purpose from group two:

*to show the joy in seeing the papers*
- Ask students to jot a purpose for their section in their notebooks.



## Why Characters Change: Small-Group Discussion Using a Short Story

Books and stories are fictionalized representations of people and their lives. Lived-through events, other people, and personal decisions can change our beliefs, values, and who we are. A satisfying short story or novel—one that mirrors life—helps readers understand why and how plot, conflicts and problems, setting, and decisions can change the protagonist. Moreover, not only does the protagonist change, but the reader comes away with lingering thoughts about these changes that can impact his or her values.

This lesson asks you to organize students into groups of 4 or 6 for a small-group discussion using “Coming Clean” by Anina Robb. Small-group discussions invite students to be in charge of the entire discussion. Students will also engage in turn-and-talk and partner talk before launching their small-group discussions.

You can listen to one or two small-group discussions during 25–30 minutes. Have all students make a list of key points they discussed in their readers’ notebooks.

### Materials

“Coming Clean” by Anina Robb; smart notebooks

### Lesson Guidelines

#### Day 1

##### Preparation and Reading “Coming Clean” (25–30 minutes)

- ▶ Organize students into groups of 4 or 6.
- ▶ Ask students to turn-and-talk to discuss the meaning of *bodega* (1–2 minutes). Have students share so everyone understands its meaning.
- ▶ Invite students to think about a time they made a decision based on peer pressure and its consequences; have them write about this decision in their notebooks (4–5 minutes).
- ▶ Have students read “Coming Clean” to get the gist or general idea (10 minutes).
- ▶ Ask students to partner talk (10 minutes) by saying something like:

*Discuss the gist of the story and identify the decision Jasper made in order to be part of the skate park regulars.*

#### Day 2

##### Small-Group Discussions of a Guiding Question (20–25 minutes)

- ▶ Have students reread “Coming Clean” to recall plot details.
- ▶ Make sure each group has a discussion facilitator who understands the role and can use the Prompts That Keep a Discussion Moving Forward (page 25).
- ▶ Have the group facilitator say the guiding question. Here’s one I offer:

*How do decisions change our lives?*

- ▶ Ask students to discuss the question, clearly showing how peer pressure and Jasper’s decision changed him (12–15 minutes).



# Prompting In-the-Head Conversations: Biography

By asking students to use a bookmark to write their thoughts and reactions, teachers can observe the kinds of in-the-head conversations students have while they read. Bookmarks provide helpful insights that enable teachers to improve students' application of strategies through short conferences.

Your prompts can be directive and ask students to monitor how they infer or think about genre, literary elements, or text structure. However, you can also ask students to write what's going on inside their heads as they read in order to observe their thinking process.

## Materials

Excerpt from "How Ada Lovelace Leaped Into History" by Kathleen Krull; a bookmark

## Directions for Completing a Bookmark for Biography

Have students prepare a bookmark by folding a sheet of notebook paper in half lengthwise. You can direct students to one of the following prompts and have students write on the top of the bookmark their name, date, the prompt, and the title and author. Students can respond using as many sides of the bookmark as needed.

1. Evaluate Annabella's mothering abilities, paraphrasing evidence from the text.
2. Skim the text, thinking about Ada and noting what you learn about her personality. Paraphrase evidence from the text and use details to infer.
3. Write what you think as you read.
4. Note what about the text you found interesting and made you want to continue reading.

## Lesson Guidelines

### Day 1

#### Help Students Prepare (20–30 minutes)

- ▶ Give students a copy of the entire text "How Ada Lovelace Leaped Into History," and ask them to read the selection for the gist.
- ▶ Invite students to turn-and-talk and share what they thought the gist, or general meaning, was.

### Day 2

#### Document In-the-Head Conversations (15–20 minutes)

- ▶ Explain what kind of responses you want students to make by reviewing the directions for the bookmark with them.
- ▶ Show students how to set up their bookmarks by completing a model on the board. Here are some notes that show my reaction to information in the text, for *Write what you think as you read*.

*Wonder what was unusual about her growing up. Weird marriage and Ada didn't know Byron, her dad. Ada's mom seems to love math more than her daughter.*





# 5-Minute Intervention Conference Form

Name Seventh-Grade Student Date \_\_\_\_\_

**Directions:** Complete this conference form and use the information it contains to inform your practice. Store in the student's assessment folder to consult later as necessary.

## Before the Conference

**Focus the conference topic:** Finding themes, using "Isaac Newton and the Day He Discovered the Rainbow" by Kathleen Krull

### Points to discuss with the student:

- See what the student knows about theme.
- Think aloud using the three steps for identifying theme [see Lesson 5.3, pages 161–162] to model how I find theme using read-aloud or another common text.
- Encourage the student to ask questions.

### The kind of scaffolding I'll try:

- I'll identify the protagonist and then I'll ask the student to identify the topic using "Isaac Newton and the Day He Discovered the Rainbow."
- We'll discuss what Newton does, thinks, and says, and I'll see if the student can link this to the topic.
- I'll think aloud and create a theme statement and then ask the student to create one using a different general topic.

## After the Conference

**Note important comments the student made:** "This is hard; can't do it."

**My observations of the student:** Comments revealed low self-confidence that stopped her from taking risks. By sharing the process, I helped the student be able to write a theme statement. Gave lots of praise and explained how pleased I was that she tried and succeeded.

**Negotiated goal and how to reach it for the next conference:** Use a different short text to write two different theme statements. Use the three steps and write the thinking for each one. Do this when the class works independently.

**Date of the next conference:** One week from today

## Ten Tips for Conferencing With Students

1. **Choose a Single Topic:** Zoom in on one strategy, such as making inferences, linking literary elements to themes, determining important details and ideas, or showing how text features connect to main ideas.
2. **Complete the “Before the Conference” Section:** The prompts in this section help you reflect on what you plan to discuss and think of more than one possible scaffold to try. Having multiple scaffolds helps because if one doesn’t work, you have another at your fingertips.
3. **Be Positive:** Start by pointing out what the student has done well. It could be something you recently observed or the effort the student puts into analyzing texts.
4. **Count to 100:** When you ask a question to start the conversation, count to 100 and give the student time to think. The tendency is for teachers to fill the silence with talk and solutions. This doesn’t support students. Though your wait time might feel like an eternity, resist the urge to talk.
5. **Listen Carefully:** Avoid interrupting a student. Listen carefully and jot down questions you have; ask these once the student has finished talking. Throughout the conference, use your knowledge of this student to make comments and ask questions that boost the student’s confidence and encourage him to talk.
6. **Pose Questions That Prompt the Student to Recall Prior Lessons:** Review a mini-lesson or a think-aloud that relates to the conference’s topic. When you point the student to a specific lesson, you shift the focus away from her own thinking, which sometimes frees her up to find the solution from the lesson.
7. **Model and Think Aloud:** Sometimes you’ll need to think aloud to show the student how you apply a strategy to reading in order to refresh his memory and build enough confidence so the student risks completing guided practice.
8. **Negotiate Goals:** Start by recapping the conference and then inviting the student to set a goal that she can achieve in 1–2 weeks. If the student struggles with this, suggest two goals and ask her to choose one.
9. **Have the Student Develop a Plan to Achieve Goal:** Having a goal is the first step, but reaching that goal requires a plan. Help the student figure out what he has to do to reach the goal, and write the plan on the conference form. Give a copy of the plan to the student to tape into his reader’s notebook.
10. **Close a Conference With Positive Comments:** Say something positive to the student at the end of the conference so she leaves feeling that she improved and deepened her understanding of the conference’s topic. Start with *I noticed . . .* or *I like the way . . .*



# 5-Minute Intervention Conference Form

Name \_\_\_\_\_ Date \_\_\_\_\_

**Directions:** Complete this conference form and use the information it contains to inform your practice. Store in the student's assessment folder to consult later as necessary.

## Before the Conference

**Focus the conference topic:**

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**Points to discuss with the student:**

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**The kind of scaffolding I'll try:**

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## After the Conference

**Note important comments the student made:**

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**My observations of the student:**

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**Negotiated goal and how to reach it for the next conference:**

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**Date of the next conference:** \_\_\_\_\_



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## Reproducible Fiction and Nonfiction Texts

### COMING CLEAN

by Anina Robb

---

“Oh, not today, Papi,” Jasper shrugged and shrank down into his chair at the breakfast table. “Can’t I get a break? I just want to go to the skate park after school with Savion.” 1

Jasper’s father poured him a bowl of cereal and shook his head. 2

“No, not today. You know that Wednesday is the busiest day at the bodega and I need your help stocking shelves. The park will be there another day. I know you are disappointed. But this is the way that things are right now.” 3

Hunh. Right now? Jasper thought. This is the way things have been forever. Jasper had been helping his dad at the store for as long as he could remember. When he was a little kid, he had liked it. It made him feel grown up—especially when the customers got to know him and would slip him a dime or a quarter for helping. But now that he was in middle school, helping at his dad’s store was a drag. He wanted to hang out with Savion after school. He wanted to sleep in on the weekends. Instead, he was stocking shelves and mopping floors. 4

“At least will you teach me the register? I am almost 12 you know, Papi.” 5

“Okay. It’s a big responsibility. But maybe it is time you got a seat at the head of the store. I’ll show you this afternoon.” 6

“Great. Thanks! I’ll see you after school!” And Jasper was gone—heading out the apartment building down the block to his middle school—happy to have something to look forward to. 7

Savion, his best friend since first grade, was waiting by his locker. “So, are you going to come skating after school with all the guys?” 8

“I can’t. I have to work.” Jasper dug through his locker for his books. 9

“Man, you are always at that store.” 10

“Well, I’m working up front today.” 11

“Really? Interesting.” And Savion walked away. 12

“Hey, Wait up!” Jasper called after him. 13

In the lunchroom, a group of boys who were regulars at the skate park walked past Jasper and Savion. One of them, the best skater, nicknamed Spike, spoke up. “Hey, I hear you work at that bodega? You know, I really like candy.” They kept on walking past. 14

“What does that mean?” Jasper asked Savion. “And why do they all wear tie-dye shirts?” 15

“I don’t know.” Savion’s voice wandered off. 16

After school, Jasper went straight to the bodega like he promised his father. He left his book bag behind the counter and got to work restocking the shelves with all the Wednesday deliveries until his father was free to show him the register. His father was helping Ms. Santos with her shopping list in the back of the store. It was then when everything happened quickly. Savion came in holding his skateboard and right behind him was Spike. They both had their heads down and walked quickly down the penny-candy aisle. Spike gave Jasper a look that made Jasper’s blood feel like ice in his veins, and Jasper froze as he watched his best friend scoop up a handful of penny-candy and shove it in his jean’s pocket and walk right out of the store. Spike did the same thing. It all happened so fast. Jasper had no time to think about what he should do or say. He just stood there—frozen like a snowman. Like an idiot. 18

The next day at school, Savion was not waiting at Jasper’s locker for him. Instead, he was a few lockers down standing next to Spike and wearing a tie-dye shirt. In English class, Jasper passed Savion this note:

I CAN’T BELIEVE YOU STOLE FROM MY DAD’S STORE.

After class, Savion waited for Jasper. “Hey, Jasper. Listen, I know you are bent out of shape, but listen, it was just a little penny-candy.” 19

And if you let the skaters steal from your dad's store then you can be a skater, too. Do you know how cool we will be? Do you know what this will do for our cred?"

Jasper asked with amazement in his voice, "Those guys will let me be a skater? Even though I can't get to the Wednesday practices?" 20

"Yeah, dude, you will be like the cool candy-man." 21

Jasper had never done anything like this before in his life. In fact, he'd always done the right thing. And he knew how hard his father worked to keep the store going and to make sure things were okay for him. It wasn't always easy—especially when his mom had gotten sick. Then it was just Jasper and his dad. But they had done okay, and the bodega had become the most popular one in the neighborhood. 22

But, wow, did Jasper ever want to be one of those skaters—and there was no way he was ever going to get to the Wednesday practices after school. His papi had made that clear. What was a little candy? His papi probably would not even notice. It couldn't matter that much. 23

"All right," he shook hands with Savion. "Let's do this." For the next two days after school, Spike sauntered in with Savion. They cruised the candy aisle, and Jasper turned his eyes down to the register while they pocketed fistfuls of hard candy and chocolates. When Jasper saw them, his heart raced so fast he thought he was going to pass out. Little beads of sweat gathered at his forehead and by his ears. He started to shake. Was this worth it after all, he wondered? 24

He peered out the corner of his eye and could see his father leaning over a mop in the store's back storage room as his friends raced out the front door of the store, laughing, shoving candies in their mouths. His father was in the back—trusting him to watch out for the whole store, for *their* whole store. Jasper decided that he had to tell his father what was going on that evening. 25

The walk with Papi from the bodega to their apartment was torture. Jasper dropped his book bag by the front door. While Jasper did homework, Papi cooked dinner. The smell of the fragrant rice and tortillas made Jasper's stomach grumble. "Wash up. Dinner is ready," Papi called. 26

Jasper turned the water faucets on and let his hands soak under the warm stream. He looked up at his reflection in the mirror. How could he have been so stupid? His father works all day then comes home and makes him dinner, and he is letting boys steal from his—no from *their* store, to be cool. What was he thinking? It was time to come clean. Jasper cupped his hands and splashed his face with water. He walked out of the bathroom knowing just what he had to do.

27

*Source:* Courtesy of Anina Robb.

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## DEFYING GRAVITY: MAE JEMISON

by Anina Robb

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Have you ever wanted to float above the earth? Or maybe defy gravity? Dr. Mae Jemison did, but she couldn't decide how to best achieve this goal. Perhaps she should study science and become an astronaut? Or maybe she should follow her love of dance and become a professional dancer? At first glance, these two dreams seem like they belong at the opposite ends of a wish list, but Mae Jemison followed both her dreams of dancing and becoming an astronaut. She became the first African American woman astronaut and showed the world how dancing and space travel aren't that different. 1

Born October 17, 1956, in Decatur, Alabama, Mae and her family moved to Chicago when she was only three. Mae always considered Chicago her home. As a young girl, Mae imagined "by now we'd be going into space like you were going to work." Her parents were always very supportive of her dreams of studying science—even if her teachers were not always so open-minded. When Mae was five years old, her kindergarten teacher asked her what she wanted to be when she grew up. Mae replied, "A scientist!" 2

Her teacher was surprised as there weren't many women scientists in 1961. So her teacher said, "You must mean a nurse?" 3

And Mae remembers thinking that there was nothing wrong with being a nurse, but that was not what she wanted to be. So she said, "No, a scientist!" 4

Mae also loved to dance. As a young girl, she took every kind of dance that she could—ballet, tap, jazz, and African. Most people might think that dance is the exact opposite of science. After all, it is an art. What could dance training possibly offer to becoming a scientist or an astronaut? As Mae put it, "In dance class, I grew stronger and gained an appreciation for hard work, physical strength, and grace." The lessons she learned from dance would eventually serve her very well in her astronaut training. 5

Mae graduated from high school early; she was only 16. At the time she did not realize that this was an achievement. It wasn't until she arrived at the campus of Stanford University in California—far from her Chicago home—that she realized how young she was. Throughout Mae's college years, her interests remained wide and varied—not just science. At Stanford she studied both physical and social sciences. Mae learned Russian and African languages. Her college degrees were in chemical engineering and African studies.

6

After college Mae was trying to figure out what she wanted to do with her life; she was trying to decide whether to continue on to medical school at Cornell or to become a professional dancer. Like a lot of young adults, she turned to her mother for advice. Her mother told her, "You can always dance if you are a doctor, but you can't doctor if you are a dancer." So Mae put aside her dream of professional dancing and went on to medical school for four years and became a doctor.

7

The next stop on Mae's career path was the Peace Corps. She served as a medical officer in the Peace Corps from 1983 to 1985. Her main job was to care for Peace Corps volunteers serving in Liberia and Sierra Leone, Africa. It was during this time that she applied to the astronaut program at NASA. Mae was inspired to follow through on her dream of becoming an astronaut by the African American actress who played Lieutenant Uhura on the TV show *Star Trek*. She also could tell that the space program was opening up to women after the historic flight of the first American woman, Sally Ride, in 1983.

8

In 1987, NASA accepted Mae into its Astronaut Training Program. Only 15 candidates were chosen that year out of over 2,000 applicants. She was part of a highly select group of trainees being groomed to fly the next shuttle into space. She trained at their facilities in Texas and in Florida and learned all about space exploration—the hard work and the physical strength needed to be an astronaut. She worked for NASA and waited for a chance to go up on one of the space shuttles.

9

### Fast Fact

In 2015 NASA received over 18,000 application for its astronaut training program!

In 1992 that chance finally came. The space shuttle *Endeavor* launched September 12, 1992, and Mae Jemison became the first African American woman to orbit the Earth. Mae has happy memories of that flight and looking out the window down onto planet Earth. She looked down at the Earth from the space shuttle and saw the city of Chicago—her childhood home. She said, “I felt like I belonged right there in space. I realized I would be comfortable anywhere in the universe because I belonged to and was part of it as much as any star, planet, asteroid, comet, or nebula.”

10

Because of her love of dance and as a salute to creativity, Mae took a poster of the Alvin Ailey American Dance Theater along with her on her historic space flight. Jemison says, “Many people don’t see the connection between science and dance, but I consider them both to be expressions of the boundless creativity that people have to share with one another.”

11

What is it that we can take away from Mae Jemison’s life experiences? It might be to never stop following your passions and dreams because we never know where they might lead us—maybe right out of this world!

12

*Source:* Courtesy of Anina Robb.



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# HOOPS TRYOUTS

by Anina Robb

---

“Brian! Breakfast!” Brian’s mom was knocking at his locked bedroom door. “Why is this door locked, young man?” 1

“I’ll be out in a second, Mom.” Brian leapt down from the top bar of his bunkbed from where he’d been hanging, stretching, his toes dangling, his white pajama pants flapping like a flag of surrender. 2

And, in fact, today that was all that Brian wanted to do—give up. He’d been stretching from his bunk for the last month and he was still the shortest boy in seventh grade. He was shorter than most of the girls. 3

Heck, he was shorter than the sixth graders. Basketball tryouts were today, and if he didn’t make the team, he’d disgrace his family. 4

“Finally,” his mom sighed as Brian slid into his chair at the kitchen table. She piled a heaping serving of scrambled eggs on his plate. “Eat up, you have a big day!” His big brother, Jonas, had already finished breakfast. 5

“A kiss good-bye for your mama?” Mom joked, and Jonas turned to bend down to kiss her. Then he smacked Brian on the head. Brian thought this could mean one of two things: I love you or you are an idiot. 6

Jonas was a sophomore in high school and almost six feet tall. He’d been a starter on the basketball team since junior high. Everyone knew he’d get a basketball college scholarship. Brian shoved the eggs in his mouth. 7

“Alex is here. Don’t forget your lunch money!” Mom called as Brian slid his plate into the sink and grabbed the coins from the bowl. Alex knocked on the screen door like a trusty alarm at 8:05. The two friends had been walking to school together since the second grade. But Alex only cared about basketball because his friend liked it—he was more interested in computers. 8

“Ready for tryouts?” 9

“I guess, ready as I’ll ever be.” Brian shrugged. 10



“What you gonna do about Lesh?” Matt Lesh thought he was the best basketball player in seventh grade because he was five feet ten. He’d been picking on Brian for being short for so long that Brian couldn’t remember a time that he hadn’t. In fact, it was Lesh who had inspired Brian to try to stretch himself out. Of course, Brian didn’t tell anyone he was trying it. 11

BRRRRING. The first bell was ringing, which meant five minutes to get to class. Brian fumbled at his locker. When he finally opened it, Matt Lesh darted around the corner and slammed his locker door shut, “Oops, my bad!” and he was gone. Brian didn’t have time to react or say anything. He had to get his locker open again so he could get to first block on time. 12

At lunch things just got worse. In the lunch line Matt was full of put-downs: “How about some shrimp today? No, maybe a small fry? Would you like some peanuts with that?” Brian was getting hot; he could feel his face flushing red like the roses in his grandmother’s garden. 13

“Just ignore him, Brian,” Alex elbowed his friend along in line. “He’s not worth it.” 14

After school, the gym was bustling with boys trying out for the basketball team. The coaches lined everyone up in order from tallest to shortest, and wouldn’t you know? Brian was dead last. 15

“End of the line, huh, Brian?” Coach Peters chuckled. For a moment, Brian thought of splitting, just hightailing it out of there and not looking back. Geez, even the coaches were making fun of him. But he’d been practicing for weeks to get on this team, and he knew that being tall was not the end-all, be-all for junior high basketball. Besides, he was bound to grow sometime soon, and then everyone would need someone else to sneer at. 16

“All right,” Coach Peters boomed. “This tryout is made up of four different stations: a dribbling through cones drill, jump shooting, passing, and an agility drill. Let’s pair up and get started! Front of the line—you are with the back of the line and so on!” 17

Brian froze. It couldn’t be. This was his worst nightmare ever. He was paired with Matt Lesh. Matt jogged over, “You better make me look good, short stuff.” 18

And in that moment, Brian decided the thing to do was to make himself look good—to take all the work that he had put in over the last few weeks and show it off—not for Matt or his brother or his mom but for himself. He deserved a spot on this team because he was good and he worked hard and he was a team player. Brian took off to the first station, leaving Matt in his shadow. “Hey, wait up!” And that is how each station went—Brian dribbled by Matt, he out-passed him, he threw more jump shots, and his feet were lighter on the basketball court during the agility drills. 19

Sweaty and hot, the boys slumped onto the bleachers when the coaches blew the whistles. 20

“All right, good work out there today. Good hustle. A team roster will be posted tomorrow morning by the gym.” 21

As everyone started shuffling out of the double doors, Brian spotted Alex waiting for him across the street. Just as he turned to slip on his jacket, there was Matt Lesh behind him. He braced himself for the coming insult. Instead Matt raised his hand for a high-five. Brian reluctantly raised his, too. “Nice,” Matt nodded his head, and jogged away. 22

“What the heck was that?” Alex asked as they fell into step together. 23

Brian shrugged his shoulders. Even if he didn’t make the team tomorrow, he was hoping things would be different from here on out. 24

*Source:* Courtesy of Anina Robb.



# HOW ADA LOVELACE LEAPED INTO HISTORY

by Kathleen Krull

---

Ada Lovelace (1815–1852) grew up in a seriously unusual way. It was more like a science experiment than a childhood: How could her mother, Lady Annabella Byron, raise Ada to be as unlike her notorious father as possible? 1

Ada never knew her dad, who left England when she was still a baby. Annabella refused to tell her daughter anything about him until after he had died in Greece, when Ada was eight. Lord Byron may have been England’s most famous poet, but he was also—in the words of a former girlfriend—“mad, bad, and dangerous to know.” There was even a term—“Byronic”—for someone who was wild, dark, dramatic, rebellious. Just the opposite of a proper person in the stuffy Victorian era. 2

Annabella’s wealthy friends were appalled when she married Byron, and soon so was she. During their brief marriage, he dubbed Annabella the Princess of Parallelograms for her love of geometrical shapes. She was a well-educated woman for her day, especially in math and science, logical to a fault. Not particularly affectionate to her daughter, she was even known to refer her as “it.” 3

Annabella kept an iron grip on her daughter’s days from the moment Ada awoke at 6 a.m. until bedtime. She hired an army of top-notch scholars to educate Ada at home on every subject—except poetry. The emphasis was on facts, logic, and all branches of math, as well as languages and other subjects useful to know. Anything to squelch flights of fancy and prevent her from becoming a poet. 4

Poor Ada had no siblings or playmates. Instead she was watched over by several close friends of her mother, all unmarried. If she showed any rebelliousness or bad behavior, like talking too much or riding her horse too often, they reported back to her mother. Ada called them “the Furies” and hated them. 5

If she had a moment to herself, she could be found on the lawn 6  
outside the family's elegant estate, her cat Puff on her lap, reading a  
tome like Bingley's *Useful Knowledge*.

Even her diet was controlled, chiefly mutton (sheep) oozing 7  
grease, with fruits and vegetables served only rarely.

Ada decided early on she was a genius. She dabbled in drawing, 8  
music, and other fields, including—gasp—poetry. By age eight, she  
was definitely in love with numbers. Equations and calculations  
became her focus, as well as the latest news in science.

One day when Puff dragged in a bird he had killed, 12-year-old 9  
Ada carefully studied its wing. For the next year, she did experiments  
and research on bird anatomy. She became obsessed with getting  
humans to fly, even designing wings for herself of paper and wire.  
She was trying to invent a new branch of science, which she called  
Flyology.

At 13 she completed the drawing of a "Planetarium," a 10  
comprehensive map of the stars. At 17 one of her tutors raved that  
with her math talent Ada could become "an original mathematical  
investigator." Ada felt she was destined for a brilliant future in  
science—it was just a matter of focusing.

The following year, through another tutor, she met Charles 11  
Babbage, professor of mathematics, prolific inventor, and social  
butterfly. Every Saturday afternoon he invited a glittering crowd to  
his home to marvel at his amazing machines. Soon Ada, wearing one  
of her bright-colored dresses, was attending.

One of his marvels was the "Silver Dancer," a beautiful metallic 12  
figure that performed elegant dance moves according to its  
clockwork mechanism. Visitors loved the life-like dancing, but Ada  
was more interested in the coils and cogs inside.

Other machines of his were more practical. Babbage was 13  
wonderstruck at the gas lamps, the steam engine, the electricity  
revolutionizing England. He was also inspired by a French weaver  
who had invented the Jacquard loom. Using a sequence of cards  
with holes systematically punched in them, looms were being  
automated, "programmed" to weave beautiful patterns in fabrics.  
Babbage envisioned machines that would work in a similar fashion

to do automatic calculations, with a goal of improving accuracy in British navigation and engineering.

People were calling his creations “thinking machines,” but had little idea of what that meant or how they would work. The word computer wouldn’t be coined for another hundred years. Indeed, Babbage’s ideas were so ahead of his time that hardly anyone knew what he was talking about. 14

Ada was an exception. She asked him for copies of his plans for machines that she could study. 15

Babbage, in turn, was impressed by Ada’s brain, and especially her math skills. He called her the “Enchantress of Numbers.” They took long walks together, discussing science and math. 16

At 20, Ada married a gentleman approved by her mom, the Earl of Lovelace, a bit of an amateur inventor himself who tinkered on his two country estates. Having three children didn’t slow Ada down, and she kept up her math studies and visited Babbage whenever she could. 17

To his dismay, the English government was balking at the amount of money it would cost to fund his latest machine. “A very costly toy . . . worthless,” sniffed the prime minister. Babbage’s research stalled. 18

Then he was invited to Italy to lecture on the machine. An Italian engineer wrote up Babbage’s speech in French—a language that of course Ada knew. Babbage turned to her to translate the paper into English, and then asked her to add her own notes to it. 19

Ada Lovelace’s claim to fame rests on the nine months she took to carry out his request. 20

Her notes, published in 1843, were much longer than the original paper. She took it upon herself to explain how Babbage’s new machine differed from his others, a challenge that had defeated other scientists. 21

Ada did get frustrated, needing Babbage’s help with the algebra, not her strongest suit: “I am in much dismay at having got into so amazing a quagmire & botheration with these Numbers.” But she persisted until she understood the new machine—and presented a sample set of rules for it to carry out. It was a method for calculating a complicated set of numbers, and it was also the world’s first 22

computer program. It would weave “algebraical patterns just as the Jacquard loom weaves flowers and leaves,” she wrote.

Ada is often credited with being the first computer programmer. She didn’t really invent programming, but rather the idea of it. A way of testing it didn’t exist yet. But she could look at Babbage’s plans and see the possibility of something entirely new—a logic machine.

## Babbage’s Engines

The “Difference Engine” was Babbage’s first attempt at a computing machine. It could do one simple task: process numbers in sequences. He succeeded in getting government funding to build one and started showing it off. Ada was fascinated by the way it looked—like the inside of a clock, but on a much bigger scale, with hundreds of interlocking cogs and wheels.

His next attempt was the “Analytical Engine,” which he claimed would be able to solve math problems. Powered by steam, it would have required 25,000 parts and been 15 feet high and 20 feet long—the most complex machine ever built. He never did succeed in getting the funding to build one.

Finally, in 1991 the Science Museum of London used his diagrams to build an Analytical Engine—and it worked.

Then she leaped ahead of Babbage.

With startling insight, she foresaw the ability of his device to do a lot more than crunch numbers. She envisioned all kinds of general uses, from producing new music to figuring out how much fabric to buy for a gown to determining what proportions were needed to build a flying machine. “It can do whatever we know how to order it to perform,” she declared. She was talking about the modern computer in a way no one else was at the time. It was all about information, not just numbers. This was an imaginative leap worthy of her poet father.

She took a moment to congratulate herself. She boasted that she had become her own role model at 28: “a completely professional person.”

Alas, plagued by illnesses, her life was short and mostly unhappy. She used her math skills to try to predict the outcome of horse races, got addicted to gambling, and ran up huge debts. She died of cancer at 36 in 1852, still mostly under the thumb of her mother, who lived to be 68. According to Ada’s request, she was buried in the Byron family vault next to the father she had never known.

It took almost 100 years for Ada’s work to move forward. During World War II, a gigantic machine called the Automatic Sequence Controlled Calculator was used to break enemy codes and help win

the war for the Allied Powers. Another woman, U.S. Navy officer Grace Murray Hopper, was one of its first programmers.

As computers took over our world, the United States Department of Defense created a new computer language in 1980 and called it Ada—in honor of Countess Ada Lovelace.

28

*Source:* Courtesy of Kathleen Krull.

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## HOW ATHENS GOT ITS NAME

Retelling by Joanna Davis-Swing

---

In ancient times, when the world was young, Cecrops was born 1  
of the earth. Half man, half snake, he roamed rugged mountains,  
wooded valleys, and rocky shores. He traveled wide before venturing  
into the region of Attica in Greece. Here lived goat farmers and bee  
keepers in peaceful tranquility, and Cecrops became their king.

He planned a beautiful city, set atop a large rock that rose 2  
from the plains. Fertile land spread out below, and the nearby sea  
boasted two open harbors. The gods on Olympus watched Cecrops  
and approved of his plans. They could foresee that his city would rise  
to fame and fortune in the world, and they wanted a share of the  
glory. Indeed, the gods fought over who was to be the patron of the  
city. Zeus, who deplored fighting on Mount Olympus, declared a  
contest between Poseidon, god of the sea, and Athena, goddess of  
wisdom. Each would give Cecrops a gift, and Cecrops himself would  
decide who would be patron of his city.

On the appointed day, Poseidon and Athena gathered with 3  
Cecrops and his people on top of the rock. Poseidon carried his  
trident and stood proudly surveying the land. Modest Athena wore  
her golden helmet and carried her spear. Cecrops signaled for the  
contest to begin, and Poseidon immediately raised his trident high,  
then struck it mightily into the ground. The rock shook and the  
earth trembled. A great crack appeared in the rock and spread wide,  
filling with water. The people gasped at this marvel and rushed  
forward to taste the water. It was saltwater, fitting for Poseidon, god  
of the sea, but of limited use to humans and farmers.

Athena smiled gently, then bent to the ground. In silence, she 4  
dug into the earth and worked in the dirt. Gradually, a small plant  
emerged; it grew and grew until it was full size, covered in green  
leaves and laden with yellowish-green berries. Athena gazed upon  
the tree in satisfaction but did not utter a word.



Poseidon looked at the tree, then he looked at the saltwater spring. He roared with laughter, which traveled out to sea. Finally there was silence. Athena spoke: "This small tree is yet mighty. Oil from its fruit will be one of the favorite offerings of the gods, and rich men will bedeck themselves with it for the feast. Women will use it to light the lamps and do the cooking. This oil will be prized among all the lands, so the city will grow wealthy and renowned as its merchants trade the world over. This is my gift."

5

Cecrops had little trouble making up his mind. He chose Athena as the winner and named the city after her: Athens. And so it came to be that Athena's gift provided prosperity to her city, which has been honored for its beauty and wisdom ever since.

6

*Source:* Courtesy of Joanna Davis-Swing.



# ISAAC NEWTON AND THE DAY HE DISCOVERED THE RAINBOW

by Kathleen Krull

---

On that particular day in the early 1660s, he was not yet Isaac Newton the greatest scientist ever. He was merely an unpopular, solitary, brilliant college student. 1

That day Newton spent a rare few hours outside, at the annual market near his college. He bought a toy—a prism, a piece of glass cut according to precise angles. Though he had next to no money, the prism was so cool that he promptly bought another. 2

Shortly afterward, the plague hit England hard, and the only way to avoid catching it was to avoid other people—not a problem for a guy like Newton. In 1666, at age 24, he was forced to leave college and retreat to his remote childhood home, Woolsthorpe Manor, with his prisms and other science toys. 3

While other students might have goofed off, Newton sat still . . . and thought. Which of the many puzzles in nature could he solve while he was waiting out the plague? 4

All was quiet except for the moaning of sheep. He lived in a time and place of no distractions—no Facebook, TV, cell phone, video games, newspapers, malls. 5

The sparkling prisms caught his eye. What if he could understand the nature of color—something more accurate than what he was being taught in college? 6

Ever since the ancient Greek Aristotle said so, scholars assumed that white light was one simple thing, uniform, solid. Color, therefore, was the product of white light mixed with black. Even those in Newton's day, like Robert Hooke, continued to insist that color was a mixture of light and darkness. Hooke had invented his own personal color scale, ranging from bright red, which he claimed was pure white light mixed with the tiniest amount of darkness, to soft blue and then black, which was darkness completely blocking out the light. 7

Newton didn't see how Aristotle or Hooke could be right. After all, a white page with black writing did not appear in color when viewed from a distance and the black and white blended. It appeared as gray. So he set out to prove the experts wrong—one of his very favorite activities.

8

The prism was the perfect tool for his experiment. Others, like Hooke, were using prisms too, admiring the colors they projected when sunlight fell on them. They believed that the prism itself was somehow coloring the light. In their experiments they had placed a screen close to one side of the prism and seen the spot of light come out the other side as a mixture of color.

9

Newton suspected that more accurate results could be had by moving the prism farther away. In his lonely study upstairs, he positioned the prism at the far wall so that it was 22 feet from the window. He let a skinny beam of sunlight pass through the prism. He observed that the beam spread out into colored bands of light, which he called a spectrum. The white light had split into different colors. How?

10

Newton kept thinking. His theory was that each color was a wave of light and that each wave had the ability to be refracted, or bent, by something. A refracting substance, such as a prism, could bend each wavelength of light by a different angle or amount. The shorter wavelengths—those toward the violet end of the spectrum—were being bent the most. The longer wavelengths—those toward the red end of the spectrum—were being bent the least. Therefore, all the colors already existed in white light, and the prism was simply fanning them out according to their ability to be bent. Color was a matter of wavelengths radiating in a range visible to the human eye.

11

## Newton Not Always Right

You know how everyone always tells you *not* to stare directly at the sun? Young Newton hadn't heard this important advice when he did his earliest experiments with color. He wanted to know if colors would look different when he stared at the sun. So he stared, and sure enough, the colors did change. But then specks began flickering before his eyes, and he was haunted for days. After one of these bone-headed experiments, it took two weeks before he got his normal vision back. Why he didn't go blind has always baffled people.

Trying unnecessarily to correspond to the seven notes of the musical scale (a wrong turn on his part), Newton used the seven color names red, orange, yellow, green, blue, indigo, and violet for the segments of the spectrum. 12

But the important thing he discovered was that the white light contained all the other colors. This was huge. 13

He was forgetting to eat, forgetting to sleep. So far, so good. 14

Now, to prove that the prism was not coloring the light, Newton did an "Experimentum Crucis." No, this wasn't a spell stolen from Harry Potter, but what scientists call a crucial experiment. 15

### Ever Since Newton

Though Newton laid the basics, scientists continue to debate color theory, often aided by artists. About 150 years after Newton, scientists began proposing a theory that three types of color receptors exist in the retina of the eye. In the 1960s, scientists proved the existence of these receptor cells, calling them cones. The three cones were sensitive to the red, blue, and green hues of the spectrum, and those hues can be blended endlessly. Today it is believed that the eye can perceive over 2.8 million different hues—more colors than even Newton could imagine.

Newton placed a screen in between the window and his prism, and he cut a slit in it. He allowed only the pure green light to pass through the slit. 16

Then he grabbed his second prism and placed it in the green light. If the prism was coloring the light, the green would come out a different color. 17

But the green light remained green. The prism had no effect. 18

Newton rarely smiled, but he might have then. There was no one he could brag to yet—his rundown farmhouse was about a mile from the nearest road. But he had just established that colors were 19

governed by scientific principles, and he suspected the rest of the natural world was, too. Oh, and he had become the first person to really understand the rainbow.

It was time to go think some more under his apple tree. . . . 20

*Source:* Courtesy of Kathleen Krull.



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## MAKING SCIENTISTS INTO CLIMBERS

### (Excerpt From *Secrets of the Sky Caves: Danger and Discovery on Nepal's Mustang Cliffs*)

by Sandra Athans

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**Editor's Note:** *This piece is an excerpt from Secrets of the Sky Caves by Sandra Athans. The book describes a series of expeditions to the sky caves of the Mustang Cliffs, located in a remote part of the Asian nation of Nepal. The caves, built near the tops of steep cliffs, contain manuscripts and bones of the cliff dwellers, including a 2,000-year-old skull. Peter Athans and a group of scientists, scholars, and mountain climbers explored these caves from 2007 to 2013. Peter's sister, Sandra Athans, wrote about these expeditions.*

*On the expeditions were Peter Athans, the leader; his wife Liesl and their two children; Mark Aldenderfer, an archaeologist; Charles Ramble, a scholar of Tibetan history; Jeff Watt, an expert on Himalayan art and history; and Kris Ericksen, a climber and photographer. This excerpt chronicles the group's dangerous climb to the sky caves and their discovery of the Bon manuscript written by scribes. The manuscript contained prayers, religious lessons, and an illustration of the founder of the Bon faith.*

Scaling the unstable cliffs in Mustang is risky, even for world-class mountain climbers. For Charles Ramble and the other scholars, the risks were even greater. They are not trained mountain climbers. 1

It was important for the scientists to study the artifacts and caves on-site. Context, or the environment in which materials are found, can provide important clues about a discovery. For instance, Aldenderfer needed to examine the high cave cities up close. Ramble had to see the Tibetan papers as they lay in the cave. That way, they could note details that might be overlooked if they left it to the mountain climbers to collect and photograph materials for them. "History is very important," said Ramble. "You can't make up the past. You have to look very 2

carefully at what the evidence is. The general lesson is, don't take anything at face value and don't accept anything without evidence."

To make the climbing easier for the scientist, the team selected its routes carefully. It tried to avoid areas that demanded advanced climbing skills. "We tried to access the caves by the safest route possible," said Kris Ericksen. 3

The climbing was especially hard for Ramble because he had a fear of heights. But he said, "When you want knowledge so badly, you can't let things get in the way. My fear of heights was not going to prevent me from accessing that cave." 4

To help Ramble overcome his fear, the climbers coached him as he climbed. Athans guided and encouraged him with instructions such as, "Face into the rock. Place your left foot first and then place your right hand on the yellow rock by your thigh. That's it, Charles." 5

### Library in the Sky

Ramble made a successful climb. Once he was inside the cave, he took a deep breath. An instant later, he was again breathless. Several feet from the cave opening, a thick carpet of thousands of written pages lay before him. Some of the text had been created with woodblock printing. Other writing had been penned by hand. Some pages featured tiny paintings. The pages glistened in the natural light coming from the cave opening. 6

The papers were in shambles. They were covered with bird droppings and had been battered by harsh weather. Some of the paintings had been cut from their pages—stolen by looters some time before. 7

The team collected and lowered the papers in a climber's haul bag to the lamas at the base of the cliff. The explorers sent down thirty loads—eight thousand pages in all. Once he was safely down the cliff face, Ramble and the other team members set up a field lab in a tent at the base of the cliff. There, they photographed and scanned the entire collection of papers. The job took hours. 8

Ramble knows how to read ancient Tibetan. He saw that the papers in the cave were mostly from a single ancient manuscript. It contained information on the Bon faith. The lamas also knew ancient Tibetan. They helped Ramble translate the text into English. 9

To learn more about the manuscript, Ramble and the others searched for the last page. They hoped it contained information called a colophon. The colophons of ancient manuscripts often list the name of the person who owned the document, the name of the scribe—the person who did the writing and printing—and the date the document was created.

10

Scouring the thousands of pages for the colophon was a lot like searching for a needle in a haystack. But to everyone’s amazement, the team members found it. The colophon revealed the name of the scribe who had written out the Bon text. It also named the nobleman who had hired him to write it. But it did not provide a date for the manuscript.

11

In addition to the manuscript, the team found other written materials in the cave. Members found a book of proverbs, or wise sayings, and a manual for solving legal disputes. With the help of the lamas, Ramble translated these documents too.

12

**Editor’s Note:** *Many expeditions to the Mustang Cliffs followed the one described in this excerpt. The human remains discovered in the caves have been stored in Mustang. A site that contains a cave mural has protective enclosures to keep the drawings safe. Charles Ramble continues to translate the Bon manuscripts, now stored in a Buddhist monastery in the village of Lo Monthang. Ramble works with scholars from Nepal and other parts of the world to translate the manuscript that interests students of religion. The scientific studies of the artifacts found in the caves are ongoing and will take many years to complete.*

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# NEW HORIZONS IN SPACE

by Seymour Simon

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Many science fiction stories that I read when I was younger told of going to the moon, exploring Mars, and discovering thousands of planets circling distant stars in the Milky Way galaxy. These stories have become real, science fact not science fiction. Now, a new frontier in space is opening—mining for minerals on asteroids. This may soon become the latest science fiction to become true science nonfiction—and it may provide resources that we Earth people desperately need. 1

Mining for minerals in space is the process of finding and collecting minerals and other raw materials from asteroids, planetary moons, and other space objects near Earth. Working in space is very expensive and much of the equipment still has to be developed and designed, so it's not likely that this will happen right away. However, in November 2015, the United States Congress passed and the president approved a bill making mining legal in space. There are private companies working on this already. 2

But mineral reserves on Earth are limited and people are consuming them faster and faster. Based on known reserves and how fast we are using them in modern industry and food production, scientists estimate that many essential minerals could be exhausted on Earth in 50–60 years. These include important metals such as gold and silver (rare and expensive), platinum and palladium (precious metals used in electronics), tungsten, iron, nickel, copper, and aluminum (used to make cars and planes and many other things). 3

## What Can We Do When We Run Out of These Crucial Substances?

Space mining is one possible solution to the problem. Some of these important minerals may be mined on asteroids and sent back to Earth for use in manufacturing and food production. The 4



minerals can also be used on the same asteroid where they are found to build solar-powered stations and satellites. Water from the ice on some of the asteroids can be processed into hydrogen and oxygen for rocket fuel and for humans to breathe.

Earth and the many thousands of asteroids circling the sun in our solar system were all created from the same basic elements when the solar system was formed. This means that asteroids have many of the same materials that are present in Earth's crust. Most of the asteroids orbit around the sun in a region between Mars and Jupiter called the Asteroid Belt. Other bunches of asteroids, such as the Trojans and the Greeks, are found in groups near the orbit of Jupiter, the giant planet of our solar system. Near-Earth asteroids and some comets travel into the inner solar system and pass close to or cross over the orbit of Earth.

5

## How Would We Get There? And How Would We Get Back?

Much of the rocket fuel needed to launch a spaceship is used just in takeoff from Earth. Fortunately, all of the asteroids have a much lower gravity than Earth and even the moon. So landing a spaceship on a low-gravity, near-Earth asteroid uses much less fuel than landing on the moon and is much easier than landing on Mars. This means that nearby asteroids are likely places for early mining trials.

6

There are three main types of asteroids.

7

- C-type asteroids have a lot of water (in the form of ice) as well as carbon and other minerals for fertilizers that can be used to grow food in space colonies for astronaut miners.
- S-type asteroids have little water but contain many valuable minerals. Scientists have estimated that even a small S-type asteroid, only 10 meters (about 11 yards) across, contains over a million pounds of different metals and over a hundred pounds of rare metals such as gold and platinum.
- M-type asteroids are rare but contain 10 times more metal than S-types.

In recent years, 12 asteroids out of 9,000 searched by a group of space scientists were identified as prospective sites that could be mined with present-day rocket and mining technology. Though rich with valuable resources, they are quite small, ranging in size from 2 to 20 meters (6.5 to 65.5 feet) in diameter. These asteroids could be propelled by rockets into a near-Earth orbit and then mined for essential elements. 8

Several companies are involved in space mining and asteroid research locating. One group, the B612 Foundation, is dedicated to protecting Earth from asteroid strikes. It conducts research to help detect asteroids that might strike Earth one day and to find the means to change their paths to avoid such collisions. Data gathered by this group could also be used to identify possible asteroids that could be used for collecting mineral resources. 9

Other private companies are making plans on how best to find and extract minerals from asteroids. In recent years NASA has mentioned that it is interested in studying whether it is possible to launch humans to land on asteroids. New spaceships would have to be developed that are different than the ones currently used to operate in Earth orbit or in the gravities of the moon and Mars. 10

One way or another, space mining might lower the cost and change the way we explore space. The abundance of water on some of the asteroids could be used to produce fuel to further explore more asteroids and return their mineral resources to help the people of Earth. The exciting science fiction magazines I read many years ago may become a gateway to new realities of science fact. 11

*Source:* Courtesy of Seymour Simon.



# SNOW DAY

by Priscilla Cummings

---

“Blood!” Digger called out. “Brady! J.T.! Come quick!” 1

My friend and I looked at each other. Our mouths dropped and we 2  
took off through the snow-covered field. It wasn’t easy running in our  
boots. We must’ve looked like two turkey buzzards the way we lifted our  
feet up and down out of the snow and flapped our arms to get some  
momentum going.

Just under a foot of powdery white flakes had fallen overnight, but it 3  
was enough to cancel school. A snow day! We three called each other as  
soon as we were up. We had to wait for J.T. to get some chores done on the  
chicken farm where he lives. But then my mom made blueberry pancakes  
so that gave me time to eat. I even got to thinking that Digger would like  
some of those pancakes, too. Over at his house, the kids all just got up and  
ate whatever was there. One time it was Goldfish crackers! Almost never  
pancakes or eggs, so I knew he’d love an invite—and he did.

“Stop right there,” my mom ordered, holding our empty plates as we 4  
opened the door to go. “Digger, where are your gloves?”

He lifted his shoulders and let them drop. “I don’t know,” he said. 5

I hadn’t noticed he wasn’t wearing gloves. But half the time we 6  
were outside in winter, Digger didn’t have a hat or gloves on. He never  
complained, though. I’ve always thought that Digger was pretty tough. We  
were only in sixth grade and already he talked about how he was going to  
be a Marine someday.

“Here,” my mom said. She set down the plates and fetched a pair of 7  
leather gloves I’d just gotten for Christmas. I hoped Digger didn’t lose  
them.

“Brady,” Mom said when we were halfway out the door. “I know 8  
this is a snow day and you boys want to have some fun. But it’s also  
your opportunity to get that science report done, so save part of your  
afternoon, okay?”

I nodded, but no way was I going to write about dolphins on a snow 9  
day!

Finally, we were out of there, closing the door quickly because my yellow lab, Tilly, wanted to come, too, and this was one time when we had to leave her home. 10

"Come on!" I shouted to Digger, not wanting to suffer Tilly's whining. 11

We plunged into the snow and raced each other over across our yard, onto the street, and finally up the long, curvy driveway, already plowed, to Digger's grandfather's farm. It was maybe our favorite place on the face of this earth. In warm weather, we made tree forts in the woods, rode the hay bailer, slept in the barn with bats, and sucked on raw, sour rhubarb from the garden. Winters, with a fresh snow, we liked to go tracking, guessing which animals had come through, trying to figure out where they came from and where they went. If you wanted to track animals you had to do it first thing while the tracks were fresh, and before the sun started melting everything. 12

Right off, behind the barn, I saw what looked like fox paw prints, evenly spaced because of the way the animal trotted. I'd been seeing a fox lately, a big, bushy-tailed red one, and I was eager to know where it slept overnight. J.T. wanted to find the fox, too, so we started following its tracks. Digger picked up on two deer and went in the other direction until we heard him holler, "Blood!" 13

When we met up we saw right off the bright red splotches on white snow. 14

"Think it got shot?" I asked. 15

"Better not have!" Digger exclaimed. "This land's posted. No one's supposed to hunt here, not ever!" 16

Even though Digger's grandfather didn't have milking cows on the farm anymore, he still had a few heifers. No way were hunters allowed on his property. 17

"Still, it doesn't stop some people," I told him. 18

J.T. snorted, agreeing with me. 19

"If it did get shot, maybe we can find it and help," Digger said, surprising me a little because I didn't normally think of him as soft on animals. 20

So we set off following the blood trail. Weird, but a feeling of dread, a kind of queasiness in the pit of my stomach, came over me. I've often wondered since then: Can a person sense something bad is about to happen? 21

The deer tracks took us all the way across the pasture and down a hill to the cow pond. It's a pretty big pond and what happened is that the wind blew some of the snow off the pond before it piled up, so there were patches of bare ice. Where there was snow, however, we saw an interesting crisscross of tracks. Maybe a lot of animals had already come seeking a drink. 22

"Look!" I exclaimed to J.T. "The fox tracks again!" I followed them, walking fast and sliding some on the bare ice while J.T. and Digger pursued that wounded deer. 23

Suddenly, about halfway across the pond, I heard a heavy *crack!* It was so loud it echoed in the hollow. 24

I stopped immediately. I knew it was the ice. But there wasn't time to change course. The next crack tore through the frozen water like a giant zipper, the ice giving way beneath my feet. I sunk in fast and was sucked up to my armpits in cold, icy water. 25

"Guys! Help!" I shouted. It was all I could get out before I was gasping and struggling just to keep my head above that frigid water. My boots, my lined jeans, my parka, they all weighed a ton. I slapped at the water and chunks of ice with my heavy, mittened hands but already I felt my limbs going numb. 26

Seemed like a long time, but I know now it was mere seconds before my friends rushed toward me. 27

"We're here!" Digger shouted. 28

"Hold on!" J.T. called out. 29

But the ice opened up in front of them and they had to backtrack fast. 30

Digger circled swiftly around the growing hole in the ice. "Brady, can you get over to the edge here?" 31

I tried to look at him. "I can't . . ." I mumbled because an amazing sleepiness was setting in and I could barely speak. 32

"I'll get a branch!" J.T. shouted to Digger. 33

“No time!” Digger yelled back to him. “Come here and grab my feet!” 34

I didn’t get what they were doing then. I was already fading out, I think. 35

In one swift movement, Digger dove over the ice and stretched out his bare hands toward me. J.T. kneeled behind, holding his feet. 36

“Grab ahold!” Digger yelled at me. 37

Weakly, I flailed in the water. The cold was paralyzing my arms and hands. 38

“Do it *now!*” Digger hollered at the top of his lungs. 39

I hated it when he yelled at me. I forced my arms and hands with everything I had and felt Digger’s hands grab my own. 40

Next thing I knew he was hauling me out of that icy pond. Digger peeled off my soaking wet parka while J.T. pushed my arms into his dry one. 41

My feet felt like a ton of cold, wet cement had been plastered to them, but those two guys walked me across the pond, halfway lifting me, up the hill, across the field, and all the way back to Digger’s grandfather’s house. 42

It was kind of a blur after that. Digger’s grampa drew a warm bath and I was stripped down and put in the water while phone calls were made. Next thing I knew my mom and dad were there wrapping me in towels and warm blankets and then dry clothes. It was later, sitting in Digger’s grandfather’s living room, all of us sipping on hot chocolate, shaking our heads and being thankful—even laughing some—that I noticed the chip in Digger’s front tooth. 43

An hour later, J.T. and I went home with Digger. We wanted to see him get praised for being the hero, I guess. But that’s not what happened. At Digger’s house, his truck driver dad was still asleep and Digger’s brother and sister had just spilled grape juice on the kitchen table, which had Digger’s mom peeved. 44

I knew Digger wasn’t going to make a big deal out of what he’d done, so in a loud voice I told his mom right there, “You won’t believe this, but Digger just saved my life! Pulled me out of the frozen cow pond!” 45

"It was amazing!" J.T. chimed in. 46

But maybe we didn't look like we just escaped death. Not with 47  
our clean, dry clothes and all.

Digger's mom paused in her cleanup task and looked up. 48  
"That so?"

"Absolutely!" I assured her. 49

J.T. nodded like his head was going to fall off. 50

The corners of her mouth lifted, but she didn't have time to say 51  
anything more because just then, Digger's dad came into the kitchen  
rubbing his eyes and asked what all the commotion was about,  
didn't we know he needed his sleep?

"Digger just saved my life!" I repeated. 52

"Yeah?" Digger's father squinted and scratched his bald head. 53

"Yeah. It was pretty incredible," Digger admitted. He smiled big, 54  
the way he deserved to smile.

And just like that the expression on Digger's dad's face changed. 55  
"What the heck?" he demanded. He walked over to Digger and  
roughly lifted his son's chin. "You chip your front tooth?"

Digger felt it with his index finger. "Must have," he said, although 56  
I'm pretty sure he already knew. "Huh. I guess 'cause I threw myself  
on the ice."

"You knucklehead!" His father held his hands up like what was he 57  
going to do with Digger and went to pour himself a cup of coffee.  
"I ain't payin' to have that fixed. You do something stupid like that,  
*you* pay for it."

The three of us stood there, silent—and stunned. 58

His dad took a sip of coffee and threw us a look. 59

"What?" 60

But no one spoke. The air seemed to have gone out of the room. 61

"Go on," his father said with a scowl. "You boys beat it! Digger, go 62  
to your room."

J.T. and I got out of there fast. We knew better than to stick 63  
around when Digger's dad got going. J.T. went on home and so did I.

I told my parents what happened and then went into the living 64  
room, where I picked up the remote and sprawled on the couch.  
My dad had an errand to run and my mom went back to cooking a



special meal for me, including my all-time favorite dessert, which is apple pie.

After a while, I turned off the TV because I couldn't get into it. 65  
 Instead, I went to my room to work on that dolphin report. I was looking through my notes, some I took from Wikipedia, when I reread how dolphins establish such strong social bonds that they will stay with other injured or ill dolphins, even helping them to breathe by bringing them to the surface if needed.

At first, it made me daydream about the wounded deer we'd been 66  
 following. Like what happened to it? And was another deer helping it? Then I got to thinking about Digger and I couldn't get it out of my head. I knew I had to do something.

Both Mom and Dad thought my idea was a good one. As soon 67  
 as that apple pie was done, we put it in a box, got in the car, and drove over to Digger's house.

Digger's mom let us in and there was Digger's dad, sitting in his big 68  
 chair watching a wrestling show on TV.

"We brought Digger a pie," I told them. 69

Digger's little sister and brother, LeeAnn and Hank, ran up to peer 70  
 in the box.

Hank's eyes grew large. 71

"It says his name!" LeeAnn exclaimed. "In frosting!" 72

I smiled because she didn't know how to read yet. "No," I told her 73  
 gently. "It says 'hero.' Your big brother saved my life today. I want to thank him."

"I'll go get him!" LeeAnn offered. And no one stopped her as she 74  
 rushed off to fetch Digger.

That's when my dad said to Mr. Griswald, "Look, we'd like to pay 75  
 to have that front tooth fixed."

Mr. Griswald finally got up out of his chair and Mrs. Griswald 76  
 turned off the TV.

"Y'all don't need to do that," he mumbled. 77

"Really, we'd like to," my mom said. "It's the least we can do." 78

"It's my fault Digger chipped his tooth," I added. 79

"Yeah, well, we'll see," said Digger's dad. He scratched his bald 80  
 head again and looked over at the pie.



Mom handed the box to Mrs. Griswald and I was giving her a carton of vanilla ice cream in a plastic bag when Digger came in, leaning back but pulled with both hands by LeeAnn and Hank.	81
I smiled at him. "How you doin'?"	82
"Okay," he said with a slight shrug, uncertain what was happening.	83
"They brung you a pie!" LeeAnn said excitedly. "Can we eat it now?"	84
We didn't stay long. I knew Mr. Griswald was eager to get a fork in that pie. I could only hope we'd made things a little bit better—if only for a while.	85
"Don't slip on the ice," Mom said as we left.	86
I glanced at her because it seemed like a funny thing to say to me after what had happened <i>and</i> because just then I was thinking about a pod of dolphins jumping through tropical water.	87
"Brady!" Digger called as we picked our way down the front steps.	88
When I turned he was handing me my gloves. "I forgot to give them back."	89
I waved him off.	90
"Keep 'em," I said. "Hey—and thanks again for saving my life."	91
Digger dropped his hand and squeezed the gloves. He took in and let out a deep breath. A few seconds passed.	92
"See you tomorrow," I said.	93

*Source:* Courtesy of Priscilla Cummings.



## WHO CLIMBS EVEREST?

(Excerpt From *Tales From the Top of the World: Climbing Mount Everest With Pete Athans*)

by Sandra Athans

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Everest is not a mountain for beginners. Mountaineers who attempt Everest have usually scaled other peaks in the Himalayas and other high mountain chains. 1

Most climbers make the journey as part of an organized group. Companies sometimes sponsor, or pay for, Everest expeditions. For instance, The North Face, a company that makes outdoor equipment, has sponsored Everest expeditions to test its climbing gear. The National Geographic Society, an educational organization, has sent climbers and camera crews up Everest to make documentary films. Sometimes climbers help scientists conduct experiments on the mountain. 2

Some people pay money to have experienced guides lead them up Everest. But that doesn't mean just anyone can sign up and pay to go to the top. Guide organizations insist that their clients have previous mountain climbing experience. Clients must also be in top physical shape. 3

Most expeditions on Everest include Sherpas. The Sherpas are an ethnic group that originated in Tibet and then moved to Nepal. They practice Buddhism, a common Asian religion. Climber Tenzing Norgay was a Sherpa. Many modern Sherpas are expert mountaineers who work for mountain climbing expeditions. Sherpa staff members set up climbing ropes, carry gear to high camps, assist with medical needs and rescues, cook meals, and more. 4

### Adjusting to Thin Air

Scientists measure the altitude, or height, of landforms by their distance above the sea (sea level). At sea level, it is easy to breathe because the air is rich in oxygen. The higher you go above sea level, the less oxygen the air holds. We say the air at high altitudes is "thin" because it has less oxygen. 5

At about 5,000 feet (1,524 m) above sea level, our bodies begin to sense a change in oxygen levels. People must breathe more deeply and quickly to get the oxygen they need. Above 8,000 feet (2,438 m), people can begin to suffer from high-altitude ailments. These include headaches and coughs. 6

To keep from getting sick on Everest, climbers must acclimatize, or adjust, to the low oxygen levels. Climbers make forays, or short climbs up and down sections of the mountain, instead of trying to climb to the top all at once. Forays help climbers acclimatize to the high altitude. 7

### Climbers Be Wary

Hold on to your balaclava! Wind gusts on Everest can exceed 250 miles (400 km) per hour. The winds come from the jet stream. This strong current of air sometimes roars across the top of the mountain. To avoid the worst of the jet stream, climbers usually tackle Everest in early May or September. At those times, the jet stream blows north of the Everest region. 8

On Everest, deadly snowstorms can kick up quickly, without warning. One of the worst storms ever recorded occurred in 1996. The storm engulfed the upper part of the mountain in snow. It killed eight climbers. Journalist and mountaineer Jon Krakauer described this “murderous storm” in his best-selling book *Into Thin Air*. 9

Altogether, bad weather has led to more than twenty deaths on Everest. Even though climbers know the dangers they might encounter, they believe the rewards of climbing Everest outweigh the risks. 10

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