Grade 6 Math · Lesson 2 — Below Zero at the Bank

Integers and integer operations · ages 10 to 13 · 45 minutes · the workbook, one screen, this page, a pencil and paper

At a Glance

- **The book:** 6th Grade Math Workbook: Real-World Problem Solving, Chapter 2 (The Banker), by Dr. Gene A Constant.
- **Free tool:** Budget Builder (money coming in and going out of a real budget), free, no login, plays in the browser: globalsovereignuniversity.org/budget-builder.
- **Ages and time:** Grade 6 · ages 10 to 13 · 45 minutes.
- **Prep (5 min):** read the Teaching Creed and have the workbook open to Chapter 2. Draw a number line from −10 to 10 on paper. Ten pennies or buttons help.

Why this lesson

Negative numbers are not a trick. They are how every bank account, thermometer and map tells the truth about debt, cold and depth. A child who reads −50 as "owes fifty dollars" never has to memorize sign rules blindly; the rules make sense because the money does.

What the learner will be able to do

- Read a negative balance as money owed.
- Order integers on a number line.
- Add and subtract integers, including subtracting a negative.
- Multiply and divide integers with the sign rules.

The 45-Minute Climb

How to read this: the gold box in each step is your lesson, word for word. Run it as written. The notes beneath are optional support. "The group" means your family; "host" means you.

1 · The Hook (5 min)

"You have $350 in the bank and write a check for $400. How much money do you have now?"

Say it like this: Many children say "zero." Ask: can the bank just forget the extra fifty dollars? That is where −50 comes from.

2 · Work It Together (15 min)

Open the workbook to the worked example An Overdrawn Account and walk it on the paper number line: start at 350, move left 400, land at −50. Then read A Deposit Into the Red: from −200, a deposit of 350 moves right and lands at +150.

Use pennies as dollars: pennies on the table are money you have, pennies in your hand are money you owe. Then open Budget Builder and track one pretend month together.

3 · The Talk (8 min)

1. Why is −120 less than −30, even though 120 is bigger than 30? 2. Why does subtracting a negative make a number bigger? 3. A loss of $1,200 is split by 6 people. Why is each share negative?

You are not fishing for one right answer. You are listening for understanding:

- Q1: Because owing $120 is worse than owing $30. On the number line, −120 is farther left.
- Q2: Taking away a debt leaves you better off. 25 − (−40) is like the bank cancelling a $40 debt.
- Q3: Each person takes on part of a loss. A negative divided by a positive is negative.

4 · Solo Climb (12 min)

Five problems on your own, with your work shown.
1. A checking account has $500. After a $675 purchase, what is the balance?
2. Order from least to greatest: −45, 23, −12, 0, −50, 18.
3. Find: (−50) − (−25)
4. An account starts at $250. Then: −$80, +$125, −$200, +$50. What is the final balance?
5. A loss of $1,200 is shared equally by 6 investors. What is each share, written as a negative number?

Why solo: a test, a job and real life ask you to work alone. Five problems rehearse exactly that. The answers are at the end of this plan.

Keep It Fresh (5 min, the next day)

Two review problems from earlier chapters.
1. Which is the better buy: 12 oz for $3.60 or 20 oz for $5.40?
2. Find: (−15) + (−23)

Ready to move on? Four of the five Solo Climb problems right, with work shown, means this skill is solid. If not, reread the worked examples together and try two more problems from the chapter before the next lesson. Short review of old skills keeps them from fading.

5 · The Takeaway (5 min)

"A negative number is a debt or a drop below zero. Subtracting a negative takes the debt away." · Homework: Look at a real or pretend bank statement with a grown-up. Write each line as a signed number and find the final balance.

The badge moment: finishing all five steps earns the Bronze ring of this lesson's badge, The Honest Banker. Mark it on the Climber's Passport now; the homework is how Silver and Gold are earned during the week.

Common Mistakes to Watch For

- Ordering negatives by their size without the sign: putting −50 after −12.
- Treating 25 − (−40) as 25 − 40.
- Forgetting that two negatives multiplied make a positive.

The Teaching Creed

You are not the expert; the book and the method are. Your job is to ask "how do you know?" one more time than feels natural, and to celebrate wrong answers out loud. In here, a wrong answer is where the lesson lives.

GENO, GSU's free tutor, can explain any step a second way, any hour, in 83 languages, with no login: globalsovereignuniversity.org/free-tutor. A prompt for the host: Ask GENO: "My child got 65 for 25 − 40. Help them find the mistake with a number line, without giving the answer."

Adapt It and Measure It

Differentiation

- Struggling: use pennies and the number line for every problem.
- Ahead: write a five-line bank statement that ends at exactly −$35.
- Large co-op: one team is the bank, the other the customers; trade written deposits and checks.
- Reluctant: use a thermometer and the weather report instead of money.

Evidence of learning (no exam)

Look for three things. **Tried**: finished all five Solo Climb problems with work shown. **Noticed**: can name the mistake in Common Mistakes that they almost made. **Changed**: the next day, solves one new problem from the same chapter without help. Those three words are the whole rubric, and they match the badge tiers below.

Gamify It — The Campus Climb

Every GSU lesson is one badge on the Climber's Passport, earned at four depths: Bronze, Silver, Gold and Platinum.

LESSON 2 BADGE — The Honest Banker · Bronze — The Climb: finished the 45-minute lesson, all five steps. · Silver — The Try: did the homework and explained it to the host. · Gold — The Proof: completed the chapter's Action Report in the workbook with every answer checked against the Answer Key. · Platinum — The Teacher: ran this lesson as host for someone else. The harvest of a teacher is teachers.

Answers for the Host

1. −$175
2. −50, −45, −12, 0, 18, 23
3. −25
4. $145
5. −$200

Keep It Fresh: 1. 20 oz ($0.27 per ounce versus $0.30) · 2. −38

Every answer above comes from the workbook's own Answer Key. The book behind this lesson: 6th Grade Math Workbook: Real-World Problem Solving, Chapter 2 (The Banker).

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