# Lesson 2.18: Buying Low, Rebalancing, and Return Math

**Unit:** Unit 2, Me, My Goals, My Money (Individual Growth and Life Readiness) **Topic:** 2.4 ClassroomStreet Investor Challenge **Grade:** 6 to 8 (written at grade 7; see Differentiation for the grade 6 support and grade 8 stretch) **Days:** 1 class period of 40 minutes **Room:** classroom with devices (paper ledger version in Project 02)

## Standards

- NYS module line: NYS IGLR 4. Financial Readiness e) Determine ways for saving money
- CTE theme line: CTE FCL 2. Saving, Investing, and Sharing c) Explore different savings and investment tools and methods
- CTE theme line: CTE FCL 2. Saving, Investing, and Sharing f) Apply decision-making skills to saving, investing, and donating decisions
- NYS FACS Learning Standard 3 (Intermediate), Key Idea: Students will understand and be able to manage personal resources of talent, time, energy, and money and make effective decisions in order to balance their obligations to work, family, and self.; Performance Indicator: Students understand the resources available to them, make informed decisions about the use of those resources, and know some ways to expand resources.
- CDOS Standard 3a Universal Foundation Skills: Basic Skills
- National FCS 3.0: 3.3.4 Compare different ways to save and invest.

## Enduring understanding and essential question

**Big idea:** A number by itself (up 2,000, down 800) does not tell you how well you did. Percent return does, because it compares what you ended with to what you started with, and it lets you compare a safe portfolio to a risky one on the same days. **Essential question:** After the crash, is the cheap venture a bargain or a trap, and how would the math help you decide?

## Objectives

By the end of this lesson, students will be able to:

1. (Low) Given a starting value and an ending value, state the percent return formula (ending minus starting, divided by starting, times 100) and compute it for one example.
2. (Mid) Given their own ledger, compute their portfolio's percent return so far and the percent change of one venture across the crisis.
3. (High) Given a safe portfolio and a risky portfolio tracked over the same eight days, compare their percent returns at the peak, the bottom, and today, and decide in writing which they would rather have held and why.

## Vocabulary

Tier 2 (general academic): compare, percent, change, recover Tier 3 (FACS): percent return, buying low, rebalancing, peak, bottom, starting value, ending value. See the unit vocabulary list for Turkish, Portuguese, and Spanish.

## Materials and setup

- Devices and login cards
- Handout 02.18 - Return Math.md, one per student
- Calculators, one per student
- Investor Journal in the folder
- Slides: Slides 02.18 - Buying Low Rebalancing and Return Math
- Exit cards
- Setup notes: set the market to window 33 before class; the recovery begins here and runs through window 40 today. Print or note the closing prices from windows 24 (the peak before the crisis) and 32 (the bottom) for Sparkstone, so the do now has real numbers from this class's run. *[Sal: the numbers in the handout are example prices from your README starting values and a made-up price path; the live site's path will differ. Use the handout numbers for the practice problems and the live numbers for the "my own return" box.]* Tell the math teacher this is percent change week.

## Pre-assessment

The grade 8 stretch students already computed a percent drop in Lesson 2.17. Everyone else has subtracted from 25,000 every day in the journal but not divided. The do now shows who can turn "up 26.60 a unit" into a percent without help; expect few.

## Do now and hook (Time: 3 min)

On the board: "Sparkstone was AQ57.80 before the crisis and AQ31.20 at the bottom. Someone bought 100 units at the bottom. If the price goes back to 57.80, how much does that person make? Now the harder one: what percent of their money did they make?" *[Sal: swap in your class's real peak and bottom.]*

Debrief: 26.60 a unit, 2,660 on 100 units. The percent is 2,660 divided by 3,120, about 85 percent. Then the hook: "That is what buying low means. It is also what everyone who sold at the bottom handed to the person who bought from them. Today you learn the one formula that tells you who won."

## Procedure

| Step | Teacher will | Students will | Time |
|---|---|---|---|
| 1. Direct instruction: recovery, buying low, and rebalancing | Slides 3 to 5. Recovery: after a crash, prices of ventures that are still real businesses | Copy the three definitions into the notes box. | 5 min |

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| | drift back up, not all at once and not all of them. Buying low: buying a venture after it fell, because you believe it will recover; the risk is that some do not. Rebalancing after a crash: your pie changed shape without you doing anything (the risky slices shrank); rebalancing means buying a little of what fell and selling a little of what held, to get back to the pie you chose on Day 5. Say plainly that nobody knows the bottom until it is behind them. | | |
| 2. Learning activity: Return Math | Hand out the handout. Part A: the formula, one worked example, four practice problems (two gains, two losses). Part B: my own return: starting value 25,000, total fortune now from the screen, percent return computed by hand and checked on the calculator. Part C: the safe portfolio and the risky portfolio over the same eight days at the peak, the bottom, and today, | Work Part A alone, Part B alone from their own screen, Part C in pairs. Circle the portfolio they would rather have held and write why. | 12 min |

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| | with a mixed portfolio for comparison; compute all nine returns and answer the two questions. Circulate; the common error is dividing by the ending value. | | |
| 3. Trading window: rebalance | Advance windows 33 to 40, one click about every 75 seconds; the dispatches turn positive. Say once: “If your pie changed shape in the crisis, this is the window to fix it. If you are buying low, write which venture and what you expect on Entry 8 first.” Circulate. | Rebalance, buy low, or hold. Record trades on Entry 8. | 10 min |
| 4. Investor Journal, Entry 8 | Prompt: what I did, why, what happened, plus: my percent return so far is ___ (from Part B), and the venture that hurt me most fell ___ percent across the crisis. | Write Entry 8 with total fortune and the two percents. | 6 min |
| Closure | See Closure. | 4 min | |

Totals 40 minutes: 3 + 5 + 12 + 10 + 6 + 4.

## Questions to ask

Monitor understanding:

- Start 25,000, end 23,000. What goes on top of the fraction? What goes on the bottom?
- A venture fell from 40 to 30. Is that a 10 percent drop or a 25 percent drop?
- Your return is negative. Does that mean you did worse than everyone else?

Deepen learning:

- The safe portfolio returned 0.3 percent over eight days and never dropped. The risky one is down 23 percent today and was up 19 percent at the peak. Which one would you want if this were money for college in ten years? For rent next month?
- Why can a venture fall 50 percent and then rise 50 percent and still not be back where it started?
- A percent return in eight days means nothing by itself; a bank pays about 4 percent in a whole year. What would a 4 percent gain in eight days tell you about the risk?

## Check for understanding

Step 2, Part A: clipboard yes or no per student on “divides by the starting value” and “puts a negative sign on a loss.” Part C: yes or no on “risky portfolio at the bottom is negative and larger than the mixed portfolio’s loss.” A “got it” answer sounds like: “Ending minus starting, over starting. Mine is 22,400 minus 25,000, over 25,000, so negative 10.4 percent.”

## Closure (Time: 4 min)

Exit card: “Write the percent return formula in words. Then: my return today is ___ percent, and the safe portfolio’s return today is ___ percent. One sentence: which is better, and better for what?” Three students read the last sentence aloud. Sort into “got it” (formula correct, both numbers present) and “needs more” (a worked-example card goes in the folder before Lesson 2.19, where the report needs this number).

## Differentiation and supports

- ELL: the formula is shown as a picture (a fraction with “end minus start” on top and “start” on the bottom) on the slide and the handout; the words peak and bottom have a mountain drawing; sentence starter "My return is ___ percent because ___" on the journal template; pair with a partner for Part C.
- IEP and 504 (general): calculators for all; Part A can be two problems instead of four; the handout has the subtraction line and the division line printed as separate boxes; extended time by finishing Part C at the start of Lesson 2.19; a student who cannot compute Part B by hand can read the percent from the site’s gain or loss line if it shows one and copy it with the formula next to it. *[Sal: confirm whether the live portfolio screen shows a percent.]*
- Grade 6 support: the practice problems use round numbers (start 100, end 120); Part C is the safe and the risky portfolio only, with the mixed portfolio done as a class.
- Grade 8 stretch: the student also computes the percent return of the risky portfolio from the bottom to today (the recovery return, which is large and positive) and explains why it is not the same as the return from the start; and finds the venture with the biggest percent swing in their own ledger.
- UDL checkpoint used: multiple means of representation (the formula as words, as a picture, and as a worked example) and multiple means of action and expression (Part B uses the student’s own numbers; Part C can be answered with a circled letter and one sentence).

- No-device alternative: Part B uses the ledger sheet total instead of the screen; the paper price table in Handout 02.19 - Paper Ledger.md gives the Day 8 prices for the rebalancing window.

## Assessment

| Objective | Standards met | Learning task | Assessment (formative or summative; tool) |
|---|---|---|---|
| 1. State and compute percent return | CDOS 3a Basic Skills; National FCS 3.3.4 | Handout Part A; exit card | Formative; handout checked against the key |
| 2. Compute own return and one venture's crisis drop | IGLR 4. e); Std 3 PI B; CDOS 3a Basic Skills | Handout Part B; Entry 8 | Formative now; summative on Rubric 02 criterion 4 (the report's math), where the percent return is required |
| 3. Compare safe and risky portfolios and decide | FCL 2. c); FCL 2. f); National FCS 3.3.4 | Handout Part C and the rebalance decision in Entry 8 | Formative now; summative on Rubric 02 criterion 2 (analysis and decision making) |

## Homework

None. Optional: pick any price you know (a game, a sneaker, a phone) that changed this year and compute the percent change.

## Connections

Math: percent change is a grade 7 standard (ratios and proportional relationships); the math teacher can grade Part A as a math assignment the same week if both teachers agree, and FACS gets students who have seen the formula twice in two rooms.

## Sources

- NYS Middle Level CTE FACS Content Module 01, Individual Growth and Life Readiness, line 4. e).
- NYS Middle Level CTE Theme Module 03, Financial and Consumer Literacy, lines 2. c) and 2. f).
- NYS FACS Standard 3, Intermediate; CDOS 3a Basic Skills; National FCS 3.0 competency 3.3.4, all per 02 Standards/STANDARDS CROSSWALK.md.
- Sal's own materials: Fortune_Street_Lesson_Plan.docx (Day 9, Recovery and Buy-Low Opportunities; Day 10, return calculations; Day 11, rebalancing; and the standards note "Return calculations involve percentage change: (Final Value minus

Initial Value) / Initial Value”); FortuneStreet/README.md (starting prices used in the handout).

## Teacher notes

- If the period runs short, cut Part C to the safe and risky columns only and skip the mixed one. Never cut Part B; every student needs their own percent return for the report tomorrow.
- Sal’s original Day 10 taught risk-adjusted return (the Sharpe ratio idea). It is cut here for time and grade level; the grade 8 stretch (recovery return vs return from start) carries the idea that when you measure from matters.
- Common mistake: dividing by the ending value. The handout prints “start” on the bottom in bold; say it three times anyway.
- Common mistake: a student with a negative return thinks they “failed.” Point at Part C: the class’s best possible risky portfolio is also negative today. The report scores the reasoning, not the rank.
- Tomorrow is the closing bell. Freeze the market at window 40 at the end of this period; do not advance before Lesson 2.19. *[Sal: if the live site auto-advances overnight, the leaderboard tomorrow will not match today’s exit cards. Turn it off or note the last window number on the board.]*