Protect a Household — Teacher Guide

Financial Algebra · Unit 8: Insurance & Risk

3 class periods | Small groups (3–4) | Skills: Skill 1, Skill 2, Skill 3, Skill 4

Overview

Insurance is how households turn big, unpredictable losses into small, predictable payments. Your team will design an insurance plan for the Tran family: choosing a health plan using expected value, setting auto deductibles and liability limits, and deciding what to self-insure — all within a budget.

Skills covered

- Compare premiums and deductibles (insurance-skill-01)
- Model out-of-pocket costs (insurance-skill-02)
- Calculate expected value (insurance-skill-03)
- Evaluate financial risk (insurance-skill-04)

Required materials

- Student packet
- Calculators/spreadsheet
- Decision Lab “Insurance Decision Lab”

Suggested pacing

Session	Focus
Day 1	Tasks 1–2
Day 2	Tasks 3–4
Day 3	Presentations

Implementation guidance

- Remind students: premiums do not count toward the out-of-pocket maximum.
- The chronic condition makes the “Typical” year less likely to be light — encourage discussion.

Worked calculations

Task 1

1. Gold: Typical $7,440.00, Busy $8,140.00, Major $11,240.00; EV $8,030.00; worst $11,240.00.
2. Silver: Typical $6,300.00, Busy $8,840.00, Major $13,560.00; EV $7,788.00; worst $13,560.00.
3. Bronze HSA: Typical $4,020.00, Busy $9,520.00, Major $14,520.00; EV $6,720.00; worst $14,520.00.

Task 3

1. Option A (6 mo): 310 + 240 + 70 = $620 → $1,240/yr. Option B: 385 + 165 + 48 = $598 → $1,196/yr.
2. Collision max payout = 6,500 − deductible; with a ~8% claim chance, expected payout ≈ $440–$480/yr vs. premium $330–$480/yr.
3. Higher liability (100/300/100) protects savings and future income for $150/yr more.

Task 4 (sample)

1. Silver $380 + auto B $199.33/mo + renters $19 = $598.33/mo — within budget with room for HSA-style savings.

Sample student responses

> “Bronze has the lowest expected cost ($6,720.00), but its worst case is $14,520.00 — far beyond the family’s savings. Because of the chronic condition, we chose Silver (expected $7,788.00).”

Common misconceptions

- Choosing by premium alone.
- Thinking insurance pays everything after the deductible.
- Keeping full coverage on a low-value car without checking the math.

Differentiation

Support

- Provide the health cost formula organizer.

Extend

- Model an HSA's tax advantage.

Extension opportunities

- Research your state's minimum auto liability limits.

100-point rubric

Category (points)	Exemplary (100%)	Proficient (~80%)	Developing (~60%)	Beginning (~30%)
Financial understanding (20)	Uses vocabulary precisely and explains every financial concept involved, including assumptions.	Mostly accurate explanations with minor vocabulary gaps.	Partial understanding; some concepts misapplied.	Little evidence of understanding.
Mathematical accuracy (25)	Out-of-pocket, EV, and premium totals correct.	1–2 minor errors that do not change conclusions.	Several errors or missing work.	Calculations largely missing or incorrect.
Analysis & comparison (20)	Compares every option on the same basis and tests at least one changed assumption.	Compares options with small gaps.	Comparison superficial or uneven.	Little analysis.
Justification (15)	Recommendation is supported by specific numbers and weighs non-financial factors and risks.	Mostly supported.	Mostly opinion.	No justification.
Communication & presentation (10)	Clear, organized, well-labeled tables, charts, and writing.	Minor clarity issues.	Hard to follow in places.	Disorganized.
Completion (10)	Every checklist item complete.	One item missing.	Two or three items missing.	Most items missing.

Total: 100 points. Alternative recommendations earn full credit when supported by accurate evidence.

Student documents (reference)

Family health plan options (fictional, monthly premium for family)

Plan	Premium/mo	Deductible	Coinsurance	Copay	OOP max
Gold	$520	$1,000	10%	$25	$5,000
Silver	$380	$3,000	20%	$40	$9,000
Bronze HSA	$210	$7,000	20%	—	$12,000

Family medical-year estimates (hypothetical)

Scenario	Probability	Covered bills	Office visits
Typical	60%	$1,500	6
Busy	30%	$7,000	12
Major event	10%	$45,000	18

Auto insurance quotes (6 months)

Coverage	Option A	Option B
Liability limits	25/50/25 — $310	100/300/100 — $385
Collision	$500 deductible — $240	$1,000 deductible — $165
Comprehensive	$250 deductible — $70	$500 deductible — $48
No collision	Saves the collision premium	

Renters insurance

Coverage	Premium
$30,000 property + $100,000 liability, $500 deductible	$17/month
$30,000 property + $300,000 liability, $1,000 deductible	$19/month