SURVEYOR | CASE 003

Grade 8 Career-Infused Learning • Paid Resource Preview

A real-world mathematics and career investigation.

Students join a fictional I-95 infrastructure survey crew to:

- Interpret plans, scale and coordinate measurements
- Calculate distances, elevation change and slope
- Audit conflicting evidence before a construction decision
- Identify workplace safety hazards
- Prepare a professional supervisor report

INCLUDED IN PURCHASE

9-page student field workbook | 6-page teacher guide, key and rubric

8 pages of supporting readings | 2 infographics

8-minute instructional video: Why Surveys Are Done

6 connected missions + supervisor report + portfolio reflection

This preview includes selected student pages only.

Complete activities and teacher answers are in the paid download.

MISSION 1 | Report to the Survey Crew

The project team needs reliable measurements before road drainage and construction points can be approved.

What does a surveyor do?

Surveyors measure, locate, and document positions and physical features. Depending on the assignment, their work supports property boundaries, construction layout, elevation checks, and verification of completed work. Surveyors use field instruments, records, calculations, and professional judgment.

Read the companion “How Surveyors Build Infrastructure” infographic. Then complete the job ticket.

Job-ticket question	Your response
Name two surveying responsibilities	
Name two records or tools surveyors use	
Who relies on accurate survey information?	
What should happen before a disputed marker is moved?	

Explain why surveying requires both mathematical and technical reading.

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PREVIEW ONLY

Selected sample • Full activities, answer key and rubric included with purchase

MISSION 2 | Read the Plan: Scale and Distance

A highway site plan uses the fictional scale 1 inch = 20 feet. The crew must translate drawing measurements into field distances.

Plan measurement	Your calculation	Actual distance
2 in		
3.5 in		
4 in		
6.25 in		

A utility line measures 3.5 inches on a second plan with a scale of 1 inch = 50 feet. Find the actual distance. Show units.

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The crew measures a 10-foot sloped line and a 6-foot vertical rise. Use the Pythagorean theorem to calculate the horizontal distance.

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PREVIEW ONLY

VNEC checkpoint — OBSERVE: Which numbers are directly given? INTERPRET: Which measurement is missing? COMPARE: Why is sloped distance different from horizontal map distance? APPLY: Show the result.

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Selected sample • Full activities, answer key and rubric included with purchase

MISSION 4 | Elevation and Drainage

The record plat lists Point A = 102.5 feet, Point B = 98.5 feet, with 200 horizontal feet between points.

1. Calculate the elevation change from A to B.

2. Calculate slope as a decimal and percentage. State the downhill direction.

3. The current field display reports Point B = 103.5 feet. Recalculate the signed elevation change and signed slope from A to B.

4. Compare the two results. Why should the crew stop and verify rather than immediately relocate a stake?

Note: This case teaches slope calculation, not a universal drainage design standard. Required grades and tolerances depend on the project and responsible engineers.

PREVIEW ONLY

Selected sample • Full activities, answer key and rubric included with purchase

MISSION 5 | Detective Uno’s Field Audit

The recorded plat and the current display disagree. Detective Uno says: “Hold on, son. We need more evidence!”

Evidence source	What should the crew verify?
Original field notes and arithmetic	
Instrument setup and calibration	
Coordinate reference and GNSS settings	
Weather, visibility and terrain	
Earlier plats and benchmarks	
Independent check measurement	

Identify two plausible explanations for the discrepancy. Do not claim either explanation is confirmed.

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Write one observation, one interpretation, and one piece of additional evidence you need.

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PREVIEW ONLY

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FINAL MISSION | Supervisor Report

Your team must communicate its findings before the construction crew proceeds.

Complete all five sections using evidence from Missions 2–6.

1. Job and location: What was being checked?

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2. Observed discrepancy: State both Point B readings and their source.

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3. Calculation: Compare recorded and current slopes with units and direction.

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4. Verification and safety: List two evidence checks and one safety requirement.

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5. Recommendation: Approve, hold, or revise? Justify your decision without assuming which reading is correct.

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PREVIEW ONLY

Selected sample • Full activities, answer key and rubric included with purchase