

CST Lab: Differential Leveling with the Smart Survey Notebook

Teacher: Percia Gomez	Date: 10.14.26
Class: Certified Surveying Technician - Level 1	Grade: 12th Grade
Course Background and Connection to Given Topic: The Surveying course introduces students to the principles and applications of land surveying used in civil engineering and the built environment. Students learn how to collect, calculate, analyze, and communicate field data through measurements of distances, and elevations. This lesson aligns with <i>Chapter 5: Measuring Vertical Distances</i>, where students apply differential leveling concepts and use professional surveying equipment to collect elevation data. The lesson connects to the CS3 Smart Streets research project, which investigates the safety effectiveness of daylighted intersections in NYC and how street design influences visibility, accessibility, and pedestrian safety. Students practice a professional digital field documentation workflow while understanding how survey data supports real-world engineering decisions.	
Time Frame: (2) 41 Mins Pd	

Lesson Overview
Unit/ Overarching Focus of Lesson: Differential Leveling - Students use professional surveying equipment and digital field documentation tools to collect, organize, and communicate elevation data through a differential leveling survey. - Students apply Certified Surveying Technician (CST) Level 1 concepts while using the Smart Survey Notebook as a digital field book to document their fieldwork.
Objectives/Aims: Students will demonstrate understanding/learning: - Operate surveying equipment to collect accurate field observations. <u>Use the Smart Survey Notebook as a professional digital field notebook.</u> - Create a Differential Leveling Loop containing more than 5 turning points. - Record professional field documentation including: - Point identification - Survey Type - BS and FS observations - Distance measurements - Point descriptions - Field notes - Photos - Perform manual Height of Instrument (HI) and elevation calculations. - Generate a professional survey deliverable using the Smart Survey Notebook PDF export feature.
Aligned Standards: New York State Standards: Career Development and Occupational Studies (CDOS): Standard 3a:

- Students use technology to acquire, process, analyze, and communicate engineering information.
- Students apply surveying technology and engineering practices to collect, organize, and communicate technical information.
- Students use engineering tools and processes to investigate real-world conditions and communicate solutions.

Next Generation Science Standards (NGSS):

HS-ETS1-3:

- Evaluate a solution to a complex real-world problem based on prioritized criteria and tradeoffs that account for a range of constraints.
- Students analyze how accurate engineering data supports decisions related to the built environment.

Common Core Standards:

- **CCSS.ELA-LITERACY.RST.11-12.3**
Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.
- **CCSS.ELA-LITERACY.RST.11-12.7**
Integrate and evaluate multiple sources of information presented in diverse formats and media.

Key Vocabulary and Concepts:

- **Differential Leveling:** A surveying method used to determine elevation differences between points.
- **Benchmark (BM):** A point with a known elevation used as a reference.
- **Backsight (BS):** The first rod reading taken from a known elevation.
- **Foresight (FS):** The final rod reading taken before moving the instrument.
- **Turning Point (TP):** A stable point used to transfer elevation from one instrument setup to another.
- **Height of Instrument (HI):** The elevation of the instrument's line of sight.
- **Elevation:** The vertical position of a point relative to a reference elevation.
- **Digital Field Notebook:** A technology-based field record used to collect, organize, and communicate survey information.
- **Survey Workflow:** The process of collecting, documenting, reviewing, and presenting professional survey data.

Materials & Resources:

Survey Equipment:

Automatic Level
Tripods
Leveling Rods
Measuring Tape
Safety Vest
Chalk

Technology:

Tablet/Laptop
[Smart Survey Notebook Application](#)
Internet connection for map access

Additional Resources:

[CST Level 1 Differential Leveling Interactive Slides](#)

Safety Practices:

- Follow standard surveying safety procedures.
- Maintain awareness of surroundings while working in a public space.
- Carry and transport equipment properly.
- Never leave surveying equipment unattended.
- Communicate clearly between instrument operator and rod person.

Differentiation Strategies:

- Students will receive guided notes covering:
 - Survey vocabulary
 - Differential leveling procedures
 - [Smart Survey Notebook workflow - Demo Video](#)
- Vocabulary will be supported through:
 - Visual examples
 - Diagrams
 - Translation support when needed
- Students will work in structured teams with assigned professional roles.

Cultural context: (within which the lesson will be grounded, and specific ideas/practices to be included in the lesson)

- Students complete surveying work in a real public space connected to their community.
- Students recognize that surveying is an essential engineering practice that supports the design, construction, and maintenance of infrastructure.
- Students consider how different users experience public spaces, including:
 - pedestrians
 - wheelchair users
 - cyclists
 - children
 - older adults
- Students document observations about accessibility, safety, and environmental conditions.
- Students are encouraged to connect engineering concepts to spaces they interact with in their daily lives.

Prior Knowledge:

Students should have experience with:

- Basic engineering measurement techniques.
- Introduction to surveying concepts.
- Reading technical information.
- Recording engineering observations.

Prior Lesson:

- Introduction to Surveying Equipment and Measurement Techniques.
- CST Level 1 Surveying Concepts.

Followup Lesson:

- Review and analysis of differential leveling results.
- Manual Survey Plan Drafting

Lesson Overview/ Abstract:

This lesson introduces students to a professional digital surveying workflow using the Smart Survey Notebook.

Students complete a differential leveling field investigation at Fort Greene Park (or school campus) using surveying equipment and a digital field notebook.

Students collect elevation data for a minimum of 5 turning points, document observations digitally, complete manual HI and elevation calculations, and create a professional survey report.

The Smart Survey Notebook supports the surveying workflow by helping students organize field observations, connect survey points, visualize data, and communicate results while maintaining the importance of manual calculations and engineering judgment.

Lesson Activities

Time	Activities	Rationale
5 min	<i>Do Now:</i> Field Preparation & Equipment Check Students begin class by preparing for the field investigation. Teacher reviews: • Safety expectations while working in a public space • Proper handling and transportation of surveying equipment • Expectations for professional fieldwork Students organize into surveying teams and receive professional roles: • Instrument Operator • Rod Person • Digital Recorder • Survey Assistant • Quality Control Engineer Teams collect required equipment and prepare technology before leaving the classroom. Materials/Actions: Automatic Level, Tripod, Level Rod, Tablets/Laptops, Safety Equipment	Students review safety procedures, organize equipment, and assume professional surveying roles to prepare for accurate and responsible fieldwork.
10 min	<i>Mini-Lecture:</i> Smart Survey Notebook Demonstration & Differential Leveling Review	Students review key surveying concepts and learn how digital tools support professional data

	Discussion Questions Why is accurate elevation data important when designing public spaces? How can elevation changes affect drainage, sidewalks, and accessibility? How might uneven surfaces impact pedestrians, wheelchair users, or cyclists? Why is accurate field documentation important in engineering? How can digital tools like the Smart Survey Notebook improve surveying? Teacher introduces the Smart Survey Notebook as a digital field notebook used by professional surveyors to collect, organize, and communicate survey information. Students learn the basic workflow: • Create a survey project • Add survey points • Select Differential Leveling as the Survey Type • Connect points into a Differential Leveling Run • Add descriptions, notes, and photos • Export a professional survey report Quick review of differential leveling concepts: • Benchmark • Backsight (BS) • Foresight (FS) • Turning Points • Height of Instrument (HI) • Elevation calculations Materials/Actions: Smart Survey Notebook, Projector	collection and documentation. This introduction connects differential leveling to a real-world engineering application. Students understand that surveying data supports decisions related to safety, accessibility, and the design of public spaces while learning how professional digital tools improve the collection and communication of field information.
57 min	Hands-On: Field Investigation: Differential Leveling Survey at Fort Greene Park Student teams complete a differential leveling survey using surveying equipment and the Smart Survey Notebook. Survey Requirements: • Establish starting Benchmark (Elevation = 100.00 ft) • Collect minimum of 5 Turning Points • Record BS and FS observations • Record distances and point descriptions • Add field notes and photos	Students apply surveying skills by collecting elevation data, operating equipment, recording observations, and creating a digital survey record similar to industry practices.

	• Create a Differential Leveling Run in the Smart Survey Notebook Students complete manual HI and elevation calculations using field observations. Community Engineering Observation: Students document site observations related to how different users experience the space, including accessibility, pathways, drainage, and safety conditions. Materials/Actions: Automatic Level, Tripod, Level Rod, Tablets/Laptops, Safety Equipment	
10min	Return to School: Equipment Organization, Data Review & Reflection Students: • Return and organize surveying equipment • Inspect equipment condition • Store materials properly • Verify all technology is returned • Review Smart Survey Notebook entries for completeness Reflection Questions: • How did the Smart Survey Notebook improve your field documentation process? • What challenges did your team experience during the survey? • Why is accurate documentation important in professional surveying? Materials/Actions: Equipment Storage Area, Reflection Sheet	Students verify their data, maintain equipment, and reflect on the importance of accuracy and documentation in professional surveying.

Lesson Assessments

Follow-Up Assignment:

Manual Survey Plan Drafting

Students use the Smart Survey Notebook data collected during the field investigation to create a hand-drafted survey plan on 20" × 30" graph paper.

Students demonstrate their ability to:

- Interpret survey data.
- Transfer field measurements into a graphical representation.
- Apply professional drafting standards.
- Communicate engineering information through both digital and manual methods.

Additional Accommodations for Students:

- Provide screenshots and **step-by-step Smart Survey Notebook instructions**.
- Provide structured team roles.
- [Provide visual demonstrations before fieldwork](#).
- Allow students to collaborate during data collection and documentation.
- Provide calculation templates for students requiring additional support.

Methods of Assessment:

Formative Assessment:

- Teacher observation during equipment setup.
- Review of Smart Survey Notebook entries.
- Questioning during fieldwork.
- Team collaboration checks.

Summative Assessment:

- Professional Digital Survey Report Submission.

Additional Resources:[Smart Survey Notebook](#)[Interactive Slide Deck](#)

CST Lab: Differential Leveling with the Smart Survey Notebook

Teacher: Percia Gomez	Date: TBD
Class: Certified Surveying Technician - Level 1	Grade: 12th Grade
Course Background and Connection to Given Topic: The Surveying course introduces students to the principles and applications of land surveying used in civil engineering and the built environment. Students learn how to collect, calculate, analyze, and communicate field data through measurements of distances, angles, and elevations. This lesson aligns with <i>Chapter 5: Measuring Vertical Distances</i>, where students apply differential leveling concepts and use professional surveying equipment to collect elevation data. The lesson connects to the CS3 Smart Streets research project, which investigates the safety effectiveness of daylighted intersections in NYC and how street design influences visibility, accessibility, and pedestrian safety. Students practice a professional digital field documentation workflow while understanding how survey data supports real-world engineering decisions.	
Time Frame: (2) 41 Mins Pd	

Lesson Overview

Unit/ Overarching Focus of Lesson: Differential Leveling

- Students use **professional surveying equipment** and **digital field documentation tools** to collect, organize, and communicate elevation data through a differential leveling survey.
- Students apply Certified Surveying Technician (CST) Level 1 concepts while using the Smart Survey Notebook as a digital field book to document their fieldwork.

Objectives/Aims: Students will demonstrate understanding/learning:

- Operate surveying equipment to collect accurate field observations.
- [Use the Smart Survey Notebook as a professional digital field notebook.](#)
- Create a Differential Leveling Run containing 10 turning points.
- Record professional field documentation including:
 - Point identification
 - Survey Type
 - BS and FS observations
 - Distance measurements
 - Point descriptions
 - Field notes
 - Photos
- Perform manual Height of Instrument (HI) and elevation calculations.
- Generate a professional survey deliverable using the Smart Survey Notebook PDF export feature.

Aligned Standards:

New York State Standards:

Career Development and Occupational Studies (CDOS):**Standard 3a:**

- Students use technology to acquire, process, analyze, and communicate engineering information.
- Students apply surveying technology and engineering practices to collect, organize, and communicate technical information.
- Students use engineering tools and processes to investigate real-world conditions and communicate solutions.

Next Generation Science Standards (NGSS):**HS-ETS1-3:**

- Evaluate a solution to a complex real-world problem based on prioritized criteria and tradeoffs that account for a range of constraints.
- Students analyze how accurate engineering data supports decisions related to the built environment.

Common Core Standards:

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Key Vocabulary and Concepts:

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- **Turning Point (TP):** A stable point used to transfer elevation from one instrument setup to another.
- **Height of Instrument (HI):** The elevation of the instrument's line of sight.
- **Elevation:** The vertical position of a point relative to a reference elevation.
- **Digital Field Notebook:** A technology-based field record used to collect, organize, and communicate survey information.
- **Survey Workflow:** The process of collecting, documenting, reviewing, and presenting professional survey data.

Materials & Resources:**Survey Equipment:**

Automatic Level
Tripods
Leveling Rods
Measuring Tape
Safety Vest

Technology:

Tablet/Laptop
[Smart Survey Notebook Application](#)
Internet connection for map access

Additional Resources:

[CST Level 1 Differential Leveling Interactive Slides](#)

Safety Practices:

- Follow standard surveying safety procedures.

- Maintain awareness of surroundings while working in a public space.
- Carry and transport equipment properly.
- Never leave surveying equipment unattended.
- Communicate clearly between instrument operator and rod person.

Differentiation Strategies:

- Students will receive guided notes covering:
 - Survey vocabulary
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 - [Smart Survey Notebook workflow - Demo Video](#)
- Vocabulary will be supported through:
 - Visual examples
 - Diagrams
 - Translation support when needed
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Cultural context: (within which the lesson will be grounded, and specific ideas/practices to be included in the lesson)

- Students complete surveying work in a real public space connected to their community.
- Students recognize that surveying is an essential engineering practice that supports the design, construction, and maintenance of infrastructure.
- Students consider how different users experience public spaces, including:
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 - wheelchair users
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 - children
 - older adults
- Students document observations about accessibility, safety, and environmental conditions.
- Students are encouraged to connect engineering concepts to spaces they interact with in their daily lives.

Prior Knowledge:

Students should have experience with:

- Basic engineering measurement techniques.
- Introduction to surveying concepts.

• Reading technical information. • Recording engineering observations.	
Prior Lesson: • Introduction to Surveying Equipment and Measurement Techniques. • CST Level 1 Surveying Concepts.	Followup Lesson: • Review and analysis of differential leveling results. • Manual Survey Plan Drafting
Lesson Overview/ Abstract: This lesson introduces students to a professional digital surveying workflow using the Smart Survey Notebook. Students complete a differential leveling field investigation at Fort Greene Park (or school campus) using surveying equipment and a digital field notebook. Students collect elevation data for a minimum of 10 turning points, document observations digitally, complete manual HI and elevation calculations, and create a professional survey report. The Smart Survey Notebook supports the surveying workflow by helping students organize field observations, connect survey points, visualize data, and communicate results while maintaining the importance of manual calculations and engineering judgment.	

Lesson Activities		
Time	Activities	Rationale
5 min	<i>Do Now:</i> Field Preparation & Equipment Check Students begin class by preparing for the field investigation. Teacher reviews: • Safety expectations while working in a public space • Proper handling and transportation of surveying equipment • Expectations for professional fieldwork Students organize into surveying teams and receive professional roles: • Instrument Operator • Rod Person	Students review safety procedures, organize equipment, and assume professional surveying roles to prepare for accurate and responsible fieldwork.

	• Digital Recorder • Survey Assistant • Quality Control Engineer Teams collect required equipment and prepare technology before leaving the classroom. Materials/Actions: Automatic Level, Tripod, Level Rod, Tablets/Laptops, Safety Equipment	
10 min	<i>Mini-Lecture:</i> Smart Survey Notebook Demonstration & Differential Leveling Review Discussion Questions Why is accurate elevation data important when designing public spaces? How can elevation changes affect drainage, sidewalks, and accessibility? How might uneven surfaces impact pedestrians, wheelchair users, or cyclists? Why is accurate field documentation important in engineering? How can digital tools like the Smart Survey Notebook improve surveying? Teacher introduces the Smart Survey Notebook as a digital field notebook used by professional surveyors to collect, organize, and communicate survey information. Students learn the basic workflow: • Create a survey project • Add survey points • Select Differential Leveling as the Survey Type • Connect points into a Differential Leveling Run • Add descriptions, notes, and photos • Export a professional survey report Quick review of differential leveling concepts: • Benchmark • Backsight (BS) • Foresight (FS) • Turning Points • Height of Instrument (HI) • Elevation calculations	Students review key surveying concepts and learn how digital tools support professional data collection and documentation. This introduction connects differential leveling to a real-world engineering application. Students understand that surveying data supports decisions related to safety, accessibility, and the design of public spaces while learning how professional digital tools improve the collection and communication of field information.

	Materials/Actions: Smart Survey Notebook, Projector	
57 min	Hands-On: Field Investigation: Differential Leveling Survey at Fort Greene Park Student teams complete a differential leveling survey using surveying equipment and the Smart Survey Notebook. Survey Requirements: • Establish starting Benchmark (Elevation = 100.00 ft) • Collect minimum of 10 Turning Points • Record BS and FS observations • Record distances and point descriptions • Add field notes and photos • Create a Differential Leveling Run in the Smart Survey Notebook Students complete manual HI and elevation calculations using field observations. Community Engineering Observation: Students document site observations related to how different users experience the space, including accessibility, pathways, drainage, and safety conditions. Materials/Actions: Automatic Level, Tripod, Level Rod, Tablets/Laptops, Safety Equipment	Students apply surveying skills by collecting elevation data, operating equipment, recording observations, and creating a digital survey record similar to industry practices.
10min	Return to School: Equipment Organization, Data Review & Reflection Students: • Return and organize surveying equipment • Inspect equipment condition • Store materials properly • Verify all technology is returned • Review Smart Survey Notebook entries for completeness Reflection Questions: • How did the Smart Survey Notebook improve your field documentation process? • What challenges did your team experience during the survey?	Students verify their data, maintain equipment, and reflect on the importance of accuracy and documentation in professional surveying.

	• Why is accurate documentation important in professional surveying? Materials/Actions: Equipment Storage Area, Reflection Sheet	
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Lesson Assessments	
Follow-Up Assignment: Manual Survey Plan Drafting Students use the Smart Survey Notebook data collected during the field investigation to create a hand-drafted survey plan on 20" × 30" graph paper. Students demonstrate their ability to: • Interpret survey data. • Transfer field measurements into a graphical representation. • Apply professional drafting standards. • Communicate engineering information through both digital and manual methods.	
Additional Accommodations for Students: • Provide screenshots and step-by-step Smart Survey Notebook instructions. • Provide structured team roles: Instrument Operator, Rod Person, Digital Recorder, Survey Assistant, Quality Control Engineer • Provide visual demonstrations before fieldwork. • Allow students to collaborate during data collection and documentation. • Provide calculation templates for students requiring additional support.	
Methods of Assessment: Formative Assessment: • Teacher observation during equipment setup. • Review of Smart Survey Notebook entries. • Questioning during fieldwork. • Team collaboration checks. Summative Assessment: • Professional Digital Survey Report Submission.	
Additional Resources: Smart Survey Notebook Interactive Slide Deck	

CST Lab: Investigating Street Safety Through Data: Using Syntra to Analyze Daylighted Intersections in New York City

Teacher: Percia Gomez	Date:
Class: Certified Surveying Technician - Level 1	Grade: 12th Grade
Course Background and Connection to Given Topic:	
Time Frame: 84 Mins	

Lesson Overview

Unit/ Overarching Focus of Lesson: Differential Leveling

- Students investigate how **engineering decisions influence transportation safety by using Syntra**, an AI-assisted research and decision-support platform. Students analyze real transportation, zoning, land use, demographic, and crash datasets from Harlem and Fort Greene to determine how neighborhood context may influence the effectiveness of daylighted intersections. Students learn that engineers use technology to organize evidence while applying professional judgment to interpret data and develop recommendations. This lesson is grounded in authentic engineering practices and emphasizes evidence-based decision-making rather than relying on technology to generate conclusions.

Objectives/Aims: Students will demonstrate understanding/learning:

- Explain the purpose of daylighted intersections and their role in transportation safety.
- Use Syntra to investigate real engineering datasets from Harlem and Fort Greene.
- Analyze relationships among zoning, land use, population density, built environment, and crash characteristics.
- Compare two intersections using engineering evidence.
- Develop and justify an engineering recommendation supported by multiple data sources.
- Distinguish between observed associations and causal conclusions.

Aligned Standards:

New York State Standards:

Career Development and Occupational Studies (CDOS) Standard 3a:

- Students use technology to acquire, process, analyze, and communicate engineering information.
- Students apply surveying technology and engineering practices to collect, organize, and communicate technical information.
- Students use engineering tools and processes to investigate real-world conditions and communicate solutions.

Next Generation Science Standards (NGSS):

HS-ETS1-3:

- Evaluate a solution to a complex real-world problem based on prioritized criteria and tradeoffs that

account for a range of constraints.

- Students analyze how accurate engineering data supports decisions related to the built environment.

Common Core Standards:

- **CCSS.ELA-LITERACY.RST.11-12.3**

Follow precisely a complex multistep procedure when carrying out experiments, taking measurements, or performing technical tasks.

- **CCSS.ELA-LITERACY.RST.11-12.7**

Integrate and evaluate multiple sources of information presented in diverse formats and media.

Key Vocabulary and Concepts:

- Daylighting
- Intersection
- Built Environment
- Zoning
- Land Use
- Population Density
- Crash Severity
- Transportation Engineering
- Correlation
- Causation
- Comparative Case Study
- Evidence-Based Decision Making

Materials & Resources:

- Computer or Chromebook
- Internet Access
- Syntra Platform
- Student Investigation Guide
- Engineering Notebook
- Reflection Sheet
- Projector

Safety Practices:

- Follow classroom digital citizenship expectations.
- Use online data responsibly.
- Respect differing viewpoints during engineering discussions.
- Maintain professional collaboration within engineering teams.

Differentiation Strategies:

- Provide bilingual engineering vocabulary sheets.
- Use visual diagrams and maps to support comprehension.
- Provide sentence frames for academic discussion.
- Allow collaborative investigation before independent writing.
- Offer text-to-speech and translation tools when appropriate.

- Assign engineering teams.

Cultural Context: (within which the lesson will be grounded, and specific ideas/practices to be included in the lesson)

This lesson is grounded in students' experiences as New Yorkers. Harlem and Fort Greene represent communities with distinct histories, land uses, transportation networks, and built environments. Students investigate how engineering decisions influence accessibility, pedestrian safety, and neighborhood mobility. Rather than viewing communities through a deficit lens, students recognize the strengths and unique characteristics of each neighborhood while considering how engineering can improve safety and quality of life for all residents. Students also examine transportation design from the perspectives of children, older adults, cyclists, transit riders, and individuals with disabilities, reinforcing the importance of inclusive and equitable infrastructure.

Prior Knowledge:

Students should have experience with:

- Basic engineering measurement techniques.
- Introduction to surveying concepts.
- Reading technical information.
- Recording engineering observations.

Prior Lesson:

- Students previously explored roadway geometry and transportation infrastructure, including how engineering design influences traffic flow and pedestrian movement.

Follow-up Lesson:

- Students will use field observations and surveying techniques to collect data on local intersections and compare their findings with the engineering datasets available in Syntra.

Lesson Overview/ Abstract:

Students assume the role of transportation engineers tasked with evaluating daylighted intersections in Harlem and Fort Greene. Using Syntra, students analyze real zoning, land use, crash, demographic, and transportation datasets to determine how neighborhood characteristics may influence street safety. Working collaboratively, students compare intersections, identify patterns, evaluate evidence, and develop engineering recommendations supported by multiple sources of data. Students learn that technology assists engineers in organizing information, but professional judgment is required to interpret results and communicate responsible recommendations.

Lesson Activities		
Time	Activities	Rationale
5 min	<i>Do Now:</i> Students examine photographs of two intersections, one with daylighting and one without. They answer: Which intersection appears safer? What additional information would an engineer need before making a recommendation? <i>Action/Materials:</i> Projector, Images	
5 min	<i>Mini-Lecture:</i> Introduce daylighting, Local Law 66, correlation vs. causation, and Syntra's purpose as a research and decision-support platform. Demonstrate the interactive map, intersection profiles, comparison tool, and neighborhood dashboard. <i>Action/Materials:</i> Syntra, Presentation	
10 min	<i>CS3 Smart Streets Connection:</i> Discuss how transportation engineering affects neighborhoods students know. Connect street design to accessibility, emergency response, school safety, bicycle infrastructure, and pedestrian mobility. Students discuss how engineering decisions influence different community members. <i>Action/Materials:</i> NYC Maps, Syntra	
57 min	<i>Hands-On:</i> Student teams explore Harlem and Fort Greene using Syntra. They analyze one intersection, compare two intersections, investigate zoning, land use, crash characteristics, and built-environment conditions, then complete an Engineering Investigation Guide with supporting evidence. <i>Action/Materials:</i> Computers, Syntra, Investigation Guide	

10min	Group Debrief & Reflection: Teams present one engineering finding supported by evidence. Students explain how data influenced their recommendation and identify one limitation of the available information. <i>Action/Materials:</i> <i>Reflection Sheet</i>	
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Lesson Assessments

Follow-Up Assignment:

Write a one-page engineering recommendation to the NYC Department of Transportation explaining whether additional daylighting treatments should be prioritized in Harlem or Fort Greene. Students must support their recommendation with at least three pieces of evidence from Syntra and acknowledge one limitation of the available data.

Additional Accommodations for Students:

- Graphic organizers for data collection
- Sentence starters for engineering claims
- Extended time as needed
- Visual supports and annotated screenshots
- Flexible grouping
- Multiple options for demonstrating understanding (written response, presentation, or infographic)
- Closed captions and text-to-speech supports
- Translation resources for multilingual learners

Methods of Assessment:

Formative

- Teacher observation during group investigations
- Engineering discussion participation
- Completion of the investigation guide
- Accuracy of data interpretation

Summative

- Engineering Recommendation evaluating:
- Appropriate use of Syntra data
- Interpretation of multiple datasets
- Quality of evidence
- Engineering reasoning
- Professional communication
- Recognition of study limitations

Additional Resources:

Optional:
Bibliography