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| **TEXAS CTE LESSON PLAN**[www.txcte.org](http://www.txcte.org) |
| **Lesson Identification and TEKS Addressed** |
| **Career Cluster** | Law, Public Safety, Corrections and Security |
| **Course Name** | Law Enforcement II |
| **Lesson/Unit Title** | Crash Scene Investigation |
| **TEKS Student Expectations** | **130.337. (C) Knowledge and Skills** (16) The student investigates and documents a motor vehicle accident. The student is expected to: (A) record simulated crash scene evidence using standard report procedures; (B) analyze simulated crash scene evidence using standard laws, regulations, and procedures; (C) perform mathematical calculations using speed, velocity, time, and distance; (D) draw scale diagrams of simulated collisions using templates; and (E) interpret crash scene evidence |
| **Basic Direct Teach Lesson**(Includes Special Education Modifications/Accommodations and one English Language Proficiency Standards (ELPS) Strategy) |
| **Instructional Objectives** | The student will be able to:1. Identify key terms needed to complete an investigation.
2. Record simulated crash scene evidence using standard report procedures.
3. Analyze simulated crash scene evidence using standard laws, regulations, and procedures.
4. Draw a diagram to scale of simulated collisions using templates.
5. Perform mathematical calculations using speed, velocity, time, and distance.
6. Interpret crash scene evidence.
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| **Rationale** | There is a large amount of detail that goes into investigating and documenting a motor vehicle crash. Students need to be familiar with laws and policies regarding these crashes to be effective in law enforcement. |
| **Duration of Lesson** | Four to six hours or approximately 8 45-minute class periods to teach.  |
| **Word Wall/Key Vocabulary***(ELPS c1a,c,f; c2b; c3a,b,d; c4c; c5b) PDAS II(5)* |  |
| **Materials/Specialized Equipment Needed** | * Crash Scene Investigation Key Terms
* Computers with Internet access
* LCD projector
* White board/chalk board
* Clipboard or hard writing surface
* Black markers
* Traffic templates
* Rulers
* Calculators
* Copies of Crash Report for each student (plus extras)
* Texas Department of Transportation (TXDOT)
* Motor Vehicle Crash Manual <http://ftp.dot.state.tx.us/pub/txdot-info/library/forms/cit/crash102_final_10_08.pdf>
* Instructions to Police for Reporting Crashes <http://ftp.dot.state.tx.us/pub/txdot-info/trf/crash_notifications/cr_100_2012.pdf>
* Vehicle Damage Guide for Crash Investigators <http://ftp.dot.state.tx.us/pub/txdot-info/library/forms/cit/crash80_final_draft_7_08.pdf>
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| **Anticipatory Set**(May include pre-assessment for prior knowledge) | Everyone has been in or has witnessed an accident. Being able to accurately record the details of that accident is important for many reasons from insurance to law. Ask the students to recall when they have been in a car crash. Have a student describe his or her experience for the students who have not been in a crash. Have the students imagine that they are officers, and use the following questions to continue the discussion. Use the Discussion Rubric for assessment.* What information would you need to investigate the crash?
* How would you begin documenting the scene?
* How difficult would it be for you to diagram the scene (especially if the crash involved a fatality)?
* Who would you need to talk to during the investigation?
* What information would you need to obtain from persons involved in crash?
* What information would you need from the vehicle and how would you go about obtaining it?
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| **Direct Instruction \*** | Key Points1. Record/Collect Evidence
	1. Fully identify all parties involved (who)
	2. Record as much vehicle information as possible (what)
		1. CYMBALS
		2. Color
		3. Year
		4. Make/Model
		5. Body style
		6. Additional information
		7. License number
		8. State of registration
		9. Owner information
		10. Damage
		11. Damage (crush) rating
		12. Scrapes or skids length
		13. Damage to other items (i.e. poles, rails, or street signs)
	3. Interview all parties involved to determine what happened (who, what, and how)
		1. Drivers
		2. Passengers
		3. Witnesses
		4. First responders
		5. Medical personnel
	4. Record all injuries
	5. Determine when the crash occurred (when)
2. Analyze Crash Scene Evidence
	1. Five Mutually Exclusive Categories of Injury
		1. Fatal Injury – any injury that results in death within thirty days of the crash
		2. Incapacitating injury – any injury, other than a fatal injury, which prevents the injured person from walking, driving, or normally continuing the activities he or she can perform before the injury occurred
		3. Non-incapacitating injury – any injury, other than a fatal injury or an incapacitating injury, which is evident to observers at the scene of the crash in which the injury occurred
		4. Possible injury – any reported or claimed injury which is not a fatal injury, incapacitating injury, or non-incapacitating evident injury
		5. No injury – a situation in which there is no reason to believe that the person received any bodily harm from the motor vehicle traffic crash in which he or she was involved
	2. Classification by Type
		1. The type classification, also called First Harmful Event, for motor vehicle traffic crashes applies to the nature of the crash and the location of the motor vehicle in relation to the roadway at the time of the first injury or damage-producing event
		2. Two classification categories include broad injury and damage-producing events, collision and non-collision, have ten mutually exclusive categories describing the nature of crashes that may occur on or off the roadway. They are
			1. Non-collision involving a motor vehicle in transport
				1. Overturning
				2. Other non-collision
			2. Collision between a motor vehicle in transport and a(n)
				1. Pedestrian
				2. Motor vehicle in transport
				3. Parked motor vehicle
				4. Railway train
				5. Pedal cyclist
				6. Animal
				7. Fixed object
				8. Other object
3. Drawing Diagrams
	1. Preparing an accurate, legible crash scene diagram is one of the most important tasks performed by crash scene investigators
	2. The crash scene diagram is a graphic representation of the crash scene
	3. The crash scene diagram and the narrative crash report are the records that insurance companies, courts, traffic engineers, and others may review
	4. Diagramming the crash
		1. Create a field sketch of the scene
			1. A rough drawing that “maps” the crash scene as observed by the crash scene investigator on his or her arrival
			2. The purpose of the field sketch is to assist the investigator in recording measurements taken at the scene
			3. The crash scene investigator should retain the field sketch and rough investigation notes in the case file
			4. The investigator draws the field sketch by first recording the outline of the roadways and then drawing all things relevant to the crash in their relative positions
		2. The field sketch should include the following information which will appear in the final crash scene diagram:
			1. Features of the roadway (i.e., fog lines, centerlines, etc.)
			2. Positions of vehicles, bodies, debris, blood, etc.
			3. Positions of traffic control devices, including advanced warning devices
			4. Environmental factors such as snow, ice, and standing water
			5. Any item or terrain feature that may have been a factor in the crash
			6. Names of streets and addresses, if applicable
			7. Type of road surface or other surface information when the crash is off the road
			8. Anything that may have obstructed the driver’s vision and contributed to the crash
			9. Types and locations of road lights if the crash occurred at night
			10. Skid marks or other relevant marks (i.e., tire prints in snow or mud) or gouges
			11. Debris related to the crash
			12. Road grade or super elevation
			13. Lane and road widths
		3. Reference points
		4. Use numbers to identify the vehicles involved in the crash
		5. Use letters to identify the reference points
		6. Orient the sketch so that north is at the top of the page
		7. Write all information on the sketch so that it is parallel with the top and bottom edges of the sketch
			1. This makes the sketch look neater
			2. It also makes reading the information of the sketch easier
4. Mathematical Calculations
	1. Speed = distance / time or s = d / t
	2. Velocity = 1.466(speed) or v = 1.466(s)
	3. Time = (velocity)(acceleration due to gravity)(drag factor) or t = vgf
	4. Distance = (velocity)(time in seconds) or d = vt
5. Final Scale Drawing
	1. Plan
		1. Determine the largest axis (north-south or east-west) with which to orient your paper
		2. Choose the scale of the drawing (i.e., 1 inch = 20 feet, 1 inch = 10 feet, etc.)
	2. Draw
		1. Draw the streets first
		2. Most intersections can be drawn from pairs of parallel lines in either a “┼” or “┬” configuration
		3. Reconstruct angled intersections from the measurements taken by extending the curb lines to form a triangle
	3. Add reference point(s) to the drawing
	4. Draw any other relevant item in its correct position
		1. Decide the scale you will use and record it on your diagram
		2. Draw all the object and geographic locations within one scale foot of actual measurements
		3. Designate “North” with the appropriate direction symbol at the top of the page, and write the word “Approximate”
		4. Label all reference points with “Rp” followed by a number
		5. Label all spots as “A, B, C, etc.”
		6. Use a traffic template to draw
		7. Identify all streets and roads by
		8. Name and number
		9. Composition of surface
		10. Grade
		11. Super elevation
		12. Write all numbers and letters on the drawing parallel to the top and the bottom edges of the paper
		13. Indicate the front of the vehicle with a small triangle, with the point (tip) towards the front of the vehicle

*Individualized Education Plan (IEP) for all special education students must be followed. Examples of accommodations may include, but are not limited to:*None |
| **Guided Practice \*** | Virtual Crash Investigation. Divide the class into groups of 2–4 students and complete the Crash Scene Investigation Game http://edheads.org/ (*Note*: as an alternative, this activity may be completed as a class). Use the Peer Evaluation Rubric for assessment.Mock Crash Scene. To prepare for this activity you must:* + - Plan the mock crash scene
		- Create (or have the students create) the following
* Insurance cards
* Passenger Information
* Street names/Address
* Vehicle Damage
* Any other information for students to complete their report

Then have the groups write a crash scene investigation report and present their report to the class. Check the students’ reports and presentations for accuracy and use the Peer Evaluation Rubric and the Presentation Rubric for assessment.Simulate a crash scene (*Note*: you may want to stage the crash scene with actual vehicles in a vacant parking lot). Provide students with a copy of the crash report to complete as they investigate the crash.Optional: Print 1–2 copies (or provide access to a digital copy) of the following for the students to reference:* Motor Vehicle Crash Manual <http://ftp.dot.state.tx.us/pub/txdot-info/library/forms/cit/crash102_final_10_08.pdf>
* Instructions to Police for Reporting Crashes <http://ftp.dot.state.tx.us/pub/txdot-info/trf/crash_notifications/cr_100_2012.pdf>
* Vehicle Damage Guide for Crash Investigators <http://ftp.dot.state.tx.us/pub/txdot-info/library/forms/cit/crash80_final_draft_7_08.pdf>

After you have prepared the mock crash scene divide the class into groups and have them investigate the crash using the following materials:* Clipboard or hard writing surface
* Black markers
* Traffic templates
* Rulers
* Calculators

Then have the groups write a crash scene investigation report and present their report to the class. Check the students’ reports and presentations for accuracy and use the Peer Evaluation Rubric and the Presentation Rubric for assessment.*Individualized Education Plan (IEP) for all special education students must be followed. Examples of accommodations may include, but are not limited to:*Give the students a copy of the police crash report and the instructions for completing a police crash report. Then provide the students with information about two vehicles involved in a crash. Then the students will use the instructions booklet to complete the crash report line by line. The TXDOT Motor Vehicle Crash Manual ([http://ftp.dot.state.tx.us/pub/txdot-info/library/forms/cit/crash102\_final\_10\_08.pdf)](http://ftp.dot.state.tx.us/pub/txdot-info/library/forms/cit/crash102_final_10_08.pdf) will help students learn what information is needed in each of the boxes on the crash report. Use the Individual Work Rubric for assessment. |
| **Independent Practice/Laboratory Experience/Differentiated Activities \*** | Have the groups write a crash scene investigation report and present their report to the class. Check the students’ reports and presentations for accuracy and use the Peer Evaluation Rubric and the Presentation Rubric for assessment.*Individualized Education Plan (IEP) for all special education students must be followed. Examples of accommodations may include, but are not limited to:*None |
| **Lesson Closure** | Have student reflect on the virtual crash scene. What three new things did they learn? |
| **Summative/End of Lesson Assessment \***  | * Crash Scene Investigation Key Term Quiz and Key
* Discussion Rubric
* Individual Work Rubric
* Peer Evaluation Rubric
* Presentation Rubric

*Individualized Education Plan (IEP) for all special education students must be followed. Examples of accommodations may include, but are not limited to:*None |
| **References/Resources/****Teacher Preparation** | Texas Department of Transportation (TXDOT)* Motor Vehicle Crash Manual <http://ftp.dot.state.tx.us/pub/txdot-info/library/forms/cit/crash102_final_10_08.pdf>
* Instructions to Police for Reporting Crashes <http://ftp.dot.state.tx.us/pub/txdot-info/trf/crash_notifications/cr_100_2012.pdf>
* Vehicle Damage Guide for Crash Investigators [http://ftp.dot.state.tx.us/pub/txdot-](http://ftp.dot.state.tx.us/pub/txdot-info/library/forms/cit/crash80_final_draft_7_08.pdf)

info/library/forms/cit/crash80\_final\_draft\_7\_08.pdf |
| **Additional Required Components** |
| **English Language Proficiency Standards (ELPS) Strategies** |  |
| **College and Career Readiness Connection[[1]](#footnote-1)** | Mathematics StandardsVIII. Problem Solving and ReasoningB. Logical reasoning1. Develop and evaluate convincing arguments.
2. Use various types of reasoning.
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| **Recommended Strategies** |
| **Reading Strategies** |  |
| **Quotes** |  |
| **Multimedia/Visual Strategy****Presentation Slides + One Additional Technology Connection** |  |
| **Graphic Organizers/Handout** |  |
| **Writing Strategies****Journal Entries + 1 Additional Writing Strategy** |  |
| **Communication****90 Second Speech Topics** |  |
| **Other Essential Lesson Components** |
| **Enrichment Activity**(e.g., homework assignment) | For enrichment, allow the students who have a solid understanding of crash scene investigation to create a crash scene scenario for the other students to investigate and report. The students will need to model the type of information provided after the crash scenario on Crash Scene Investigation activity. It should include vehicle diagrams, driver, passenger, and car information, as well as witness statements. Use the Peer Evaluation Rubric for assessment. |
| **Family/Community Connection** |  |
| **CTSO connection(s)** | SkillsUSA |
| **Service Learning Projects** |  |
| **Lesson Notes** |  |

1. Visit the Texas College and Career Readiness Standards at <http://www.thecb.state.tx.us/collegereadiness/CRS.pdf>, Texas Higher Education Coordinating Board (THECB), 2009. [↑](#footnote-ref-1)