

# Grade 10

The student will demonstrate an understanding of Virginia traffic laws, licensing procedures, and other responsibilities associated with the driving privilege. Key concepts include [DE.1](#)

- a** demonstrating an understanding of graduated driver licensing requirements, types of licenses, and required identification documentation; [DE.1.A](#)
- b** analyzing traffic safety information in the Virginia Driver's Manual; [DE.1.B](#)
- c** comparing the Virginia Driver's Manual information with the motor vehicle section of the Code of Virginia; and [DE.1.C](#)
- d** investigating the social implications and understanding the civic responsibility of the organ- and tissue- donation designation process. [DE.1.D](#)

The student will demonstrate an understanding of basic vehicle operating procedures. Key concepts/skills include [DE.2](#)

- a** understanding and sequentially demonstrating pre-driving procedures; [DE.2.A](#)
- b** comparing starting procedures for automatic and manual transmissions; [DE.2.B](#)
- c** interpreting and accurately responding to vehicle information, warning, and control devices; [DE.2.C](#)
- d** applying efficient accelerating, braking, and steering techniques; and [DE.2.D](#)
- e** demonstrating vehicle securing procedures. [DE.2.E](#)

The student will demonstrate the ability to use vehicle reference points and explain how visual referencing skills aid in judging vehicle position and distance when executing basic driving maneuvers for [DE.3](#)

- a** parking; [DE.3.A](#)
- b** turning; [DE.3.B](#)
- c** establishing lane position; and [DE.3.C](#)
- d** backing. [DE.3.D](#)

The student will identify how laws of physics (i.e., momentum, gravity, inertia) effect force of impact. Key concepts/skills include [DE.4](#)

- a** analyzing how sitting and hand position affect ergonomics and vehicle control; [DE.4.A](#)
- b** evaluating how steering, braking, and accelerating positively and negatively impact vehicle control and balance; [DE.4.B](#)

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- c** identifying and accurately compensating for shifts in vehicle load (from side to side, front to rear, and rear to front) that affect vehicle performance; DE.4.C
  - d** demonstrating how to prevent and correctly manage front tire traction loss (understeer) and rear tire traction loss (oversteer); and DE.4.D
  - e** analyzing the cause and severity of types of collisions, (i.e., head-on, near-frontal, broadside, rear-end, rollover, sideswipe). DE.4.E
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The student will demonstrate the ability to manage visibility, time, and space to reduce driving risks and avoid collisions. Key concepts/skills include DE.5

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- a** demonstrating targeting and tracking skills; DE.5.A
  - b** synthesizing information visually from the driving environment using the Search, Evaluate and Execute in Time (SEEt) space-management decision-making process; DE.5.B
  - c** applying following distance, time and other space management concepts; DE.5.C
  - d** selecting appropriate speed, maintaining adequate space, and skillfully judging time and distance to safely execute basic driving maneuvers; DE.5.D
  - e** estimating time and space needs for passing; and DE.5.E
  - f** identifying and adeptly responding to open and closed spaces and changes to line-of-sight and path-of-travel. DE.5.F
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The student will demonstrate skills to make appropriate adjustments when approaching controlled and uncontrolled intersections, curves, work zones, railroad crossings, and hills with line-of-sight and path-of-travel limitations. Key concepts/skills include DE.6

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- a** analyzing and applying right-of-way rules and demonstrating appropriate communication skills; DE.6.A
  - b** displaying responsible actions and safe response to roadway signs, signals, and markings; DE.6.B
  - c** assessing and managing slope/grade of terrain; and DE.6.C
  - d** modifying vehicle position and speed to manage the effects on momentum, balance, and control. DE.6.D
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The student will identify the unique characteristics of an expressway and apply risk management driving strategies. Key concepts/skills include DE.7

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- a** managing different types of interchanges (e.g., diamond, trumpet, cloverleaf); DE.7.A
  - b** entering, merging, and exiting without interrupting traffic flow, preparing for variable and higher speeds and managing toll facilities; DE.7.B
  - c** selecting appropriate speed, correct lane, lane position, changing lanes on multi-lane roadways, and detecting and avoiding highway hypnosis; and DE.7.C

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**d** demonstrating an understanding of the integrated numbering system for highways within the nationwide grid in the contiguous United States. DE.7.D

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The student will demonstrate the ability to communicate presence and intentions to other highway transportation users. Key concepts/skills include DE.8

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**a** interpreting vehicle position and driver action; DE.8.A

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**b** utilizing vehicle communication devices; and DE.8.B

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**c** demonstrating hand signals for slow/stop, right turn and left turn. DE.8.C

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The student will analyze and describe the physiological, psychological, and cognitive effects of alcohol, marijuana and other drugs and their impact on a driver's awareness of risks, and involvement in collisions. Key concepts/skills include DE.9

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**a** evaluating the impact of prescription and nonprescription medications on mood, personality, risk taking, coordination, judgment, reaction time, and driver performance; DE.9.A

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**b** demonstrating an understanding that driving while impaired by any substance (legal or illegal drugs) places the driver and others in harm's way. DE.9.B

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**c** researching the effects of alcohol, marijuana, and other drugs on vision and space management; DE.9.C

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**d** analyzing how the synergistic effects of using two or more drugs at the same time can amplify the impairing effects of each drug; and DE.9.D

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**e** examining physiological and biological factors that influence how alcohol, marijuana, and other drugs are absorbed, metabolized, and eliminated from the body. DE.9.E

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The student will identify and analyze the legal and economic consequences associated with alcohol, marijuana, and other drug use while driving. Key concepts/skills include DE.10

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**a** analyzing the impact of positive and negative peer pressure; DE.10.A

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**b** describing the mediating influence of refusal and peer-intervention skills on preventing alcohol, marijuana, and other drug misuse; DE.10.B

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**c** comparing Implied Consent, Zero Tolerance and Use and Lose laws and demonstrating an understanding of why driving while impaired is illegal; DE.10.C

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**d** researching Administrative License Revocation, loss of license, ignition interlock and other licensing restrictions, DE.10.D

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**e** analyzing court costs, insurance requirements, Virginia Alcohol Safety Action Program referral, and other penalties associated with impaired driving; and DE.10.E

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**f** evaluating the effectiveness of alternative safe transportation programs as countermeasures for reducing impaired driving. DE.10.F

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The student will recognize the consequences of aggressive driving and the influence of emotions on driving behaviors. Key concepts/skills include [DE.11](#)

- a** evaluating how stress and anxiety affect driver fitness and mental preparedness; [DE.11.A](#)
- b** identifying how anger management strategies reduce hostility and frustration; [DE.11.B](#)
- c** analyzing how aggressive driving and road rage pose a threat to the health and safety of everyone on the road; and [DE.11.C](#)
- d** quantifying the legal and financial consequences of reckless driving and road rage. [DE.11.D](#)

The student will analyze the effects of fatigue and other conditions that impact driver performance. Key concepts include [DE.12](#)

- a** identifying fatigue warning signs and countermeasures; [DE.12.A](#)
- b** analyzing the relationship between circadian rhythms and sleep deprivation; [DE.12.B](#)
- c** comparing the effect of short- and long-term physical and cognitive disorders on the driving tasks; and [DE.12.C](#)
- d** evaluating how chronic health conditions may affect driver performance. [DE.12.D](#)

The student will identify visual, auditory, manual, and cognitive distractions that divert attention from the driving task and analyze how divided visual and mental attention contribute to driver error. Key concepts/skills include [DE.13](#)

- a** researching and evaluating the most dangerous distracted driving behaviors (e.g., texting, setting navigation systems, reading emails, adjusting radio and other controls, eating, drinking, smoking, personal grooming); [DE.13.A](#)
- b** gathering and analyzing strategies to prevent distractions that take the driver's eyes off the road and hands off the wheel; [DE.13.B](#)
- c** identifying interior distractions (e.g., interactive technologies, passengers, pets, insects); [DE.13.C](#)
- d** evaluating the impact of exterior distractions ( e.g., looking at crash scenes, places of interest, billboards, emergency vehicles); and [DE.13.D](#)
- e** demonstrating an understanding of distracted driving laws and analyzing the cost of distracted driving. [DE.13.E](#)

The student will identify changes in the environment that affect visibility and traction and evaluate appropriate communication, speed, and lane position adjustment to reduce risks. Key concepts/skills include [DE.14](#)

- a** mitigating limitations (e.g., nighttime visibility, overdriving headlights, curve-adaptive headlights) when driving at night; [DE.14.A](#)
- b** evaluating multiple solutions for smoke- and weather-related conditions that reduce visibility; [DE.14.B](#)
- c** demonstrating an understanding and responding appropriately to road construction and other adverse road conditions; and [DE.14.C](#)
- d** examining the difference between electronic vehicle stability control and traction control systems. [DE.14.D](#)

The student will demonstrate an understanding of the proper use of vehicle occupant protection features and analyze how they can reduce injury severity and increase collision survival. Key concepts/skills include DE.15

- a investigating the efficacy of active restraint systems (e.g., seat belts, head restraints, child safety seats); DE.15.A
- b analyzing the effect of seating and steering wheel position on injury severity; DE.15.B
- c investigating legal obligation, ethical decision making, and the importance of advocating for proper use of vehicle occupant-protection devices; and DE.15.C
- d researching Virginia's occupant protection laws and understanding the dangers of riding in the bed of a truck; and DE.15.D
- e analyzing automotive safety and highway transportation system career options based on personal interests, abilities, achievements, and goals. DE.15.E

The student will analyze how technological innovations affect driving practices and reduce human error. Key concepts/skills include DE.16

- a demonstrating an understanding of advanced safety features (e.g., electronic stability control systems, blind spot detection, forward collision warning, lane departure warning); DE.16.A
- b comparing efficacy of passive occupant protection systems to include thorax, curtain, knee and other airbags and adaptive cervical head restraint systems; DE.16.B
- c demonstrating an understanding of advanced driver assist features (e.g., rearview video systems, automatic emergency braking, pedestrian automatic emergency braking, rear automatic emergency braking, lane centering assist); DE.16.C
- d researching partially automated safety features (e.g., lane keeping assist, adaptive cruise control, traffic jam assist, self-park); DE.16.D
- e analyzing the impact of fully autonomous safety features (e.g., autopilot self-driving vehicles that will integrate onto roadways by progressing through six levels of driver assistance technology advancements in coming years); and DE.16.E
- f analyzing the transformative potential of new mobility options and employment opportunities that automated vehicles may provide for millions of people with disabilities. DE.16.F

The student will identify and evaluate emergency-response strategies to avoid or reduce the severity of a collision. Key concepts/skills include DE.17

- a analyzing and demonstrating evasive maneuvers, using braking and steering combinations while maintaining front and rear traction control; DE.17.A
- b identifying open space as an emergency escape route; DE.17.B
- c recognizing how decisions are influenced and limited by the environment, the vehicle, driver error, and driver capabilities; and DE.17.C
- d demonstrating a gradual stepwise approach to safe off-road recovery. DE.17.D

The student will identify and describe the performance characteristics of other road users and apply problem-solving skills to minimize risks when sharing the roadway. Key concepts/ skills include investigating the unique characteristics and vulnerabilities of [DE.18](#)

- a** pedestrians and animals; [DE.18.A](#)
- b** bicycles, scooters, mopeds, and motorcycles; [DE.18.B](#)
- c** tractor-trailers, trucks, and construction vehicles; [DE.18.C](#)
- d** sport utility vehicles, recreation vehicles, and trailers; [DE.18.D](#)
- e** emergency vehicles; [DE.18.E](#)
- f** funeral processions; [DE.18.F](#)
- g** passenger and school buses; [DE.18.G](#)
- h** farm machinery and horse-drawn vehicles; and [DE.18.H](#)
- i** highway workers. [DE.18.I](#)

The student will compare vehicle braking systems and explain proper braking techniques for various conditions. Key concepts/skills include [DE.19](#)

- a** demonstrating proper use of conventional hydraulic brake systems and understanding of new technologies such as regenerative braking; [DE.19.A](#)
- b** demonstrating and evaluating appropriate use of controlled braking, trail braking, and threshold braking; [DE.19.B](#)
- c** engaging antilock brake systems (ABS) and steering toward a target; and [DE.19.C](#)
- d** analyzing how preventive maintenance and the annual state safety inspection reduces the possibility of brake failure and enhances safety. [DE.19.D](#)

The student will analyze how regular preventive maintenance reduces the possibility of vehicle failures and recognize the warning signs that indicate the need for maintenance, repair, or replacement. Key concepts/skills include demonstrating an understanding of [DE.20](#)

- a** vehicle warning devices; [DE.20.A](#)
- b** lights and signals; [DE.20.B](#)
- c** steering and suspension systems; [DE.20.C](#)
- d** tires and braking systems; [DE.20.D](#)
- e** fluids, cooling systems, and belts; and [DE.20.E](#)
- f** fuel system and ignition electronics. [DE.20.F](#)

The student will investigate vehicle ownership responsibilities including the processes and legal responsibilities for purchasing or leasing a

- a** demonstrating an understanding of the Financial Responsibility Law (Code of Virginia § 46.2-706); [DE.21.A](#)
- b** differentiating between required and optional insurance coverage; [DE.21.B](#)
- c** demonstrating an understanding of title and vehicle and registration requirements; [DE.21.C](#)

vehicle as well as the operating and maintenance costs. Key concepts/skills include [DE.21](#)

- d** analyzing vehicle inspection and emissions requirements; [DE.21.D](#)
- e** evaluating the advantages and disadvantages of purchasing or leasing an all-electric, hybrid electric, hydrogen fuel cell, ethanol, biodiesel, natural gas or traditional gaspowered vehicle; and [DE.21.E](#)
- f** calculating depreciation and estimating a budget for routine maintenance and repair costs for new and older vehicles. [DE.21.F](#)

The student will demonstrate competent map-reading and road-trip-planning skills by utilizing available resources. Key concepts/skills include [DE.22](#)

- a** analyzing reliable trip-planning resources; [DE.22.A](#)
- b** creating an itinerary, calculating total trip time, investigating alternative routes, traffic, rest stops, and other options;- [DE.22.B](#)
- c** calculating the cost of a trip to include fuel, tolls, daily and total mileage, fuel efficiency, food, hotels, and other variables; and [DE.22.C](#)
- d** demonstrating an understanding of safe and legal practices for using navigation tools while driving. [DE.22.D](#)

The student will research and evaluate the environmental impact of transportation options and how to choose fuel-efficient vehicles. Key concepts/skills include [DE.23](#)

- a** analyzing how all-electric, hybrid electric, hydrogen fuel cell, ethanol, biodiesel, and natural gas-powered vehicles conserve fuel and lower vehicle emissions; [DE.23.A](#)
- b** comparing and evaluating the environmental impact of using public transportation, walking, cycling, ridesharing, and carpooling; [DE.23.B](#)
- c** examining the health risks of air pollution and how some passenger vehicles produce significant amounts of nitrogen oxides, carbon monoxide, and other pollution; [DE.23.C](#)
- d** investigating appropriate disposal of batteries, fluids, tires, and other environmentally hazardous materials; and [DE.23.D](#)
- e** demonstrating an understanding of energy conservation, alternative or renewable sources of energy, conservation of natural resources, and green driving practices (e.g., smooth acceleration, idle reduction, properly inflated tires, eliminating excess weight, anticipating stops). [DE.23.E](#)

The student will demonstrate an understanding of safe interaction with law enforcement and the steps to take if involved in or a witness to a crash. Key concepts/skills include [DE.24](#)

- a** analyzing factors that may enhance safe interaction with law enforcement at the roadside (e.g., don't panic, slow down, signal and locate a safe location, pull over, turn engine and radio off, keep hands on steering wheel, show respect, provide registration, driver's license, and proof of insurance when asked); [DE.24.A](#)
- b** investigating the consequences of moving violations and demerit points; and [DE.24.B](#)

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**c** examining the driver's legal responsibilities at a crash scene (Code of Virginia § 46.2-896). **DE.24.C**