Your License to Drive

1. Learner’s permit applicants younger than 18 years old need ___1___ form(s) of identification.

2. List 4 items you can use to verify your social security number.
   1. Social security card
   3. Military ID
   2. Tax return, W2 or 1099
   4. SS statement

3. If you are younger than 19 years old, your parents can verify your Virginia residency.

4. In order to get a learner’s permit in Virginia, you must be at least ___15___ years and ___6___ months old.

5. The tests for a learner’s permit include a ___sign___ test, ___knowledge___ test and ___vision___ test.

6. If you are younger than 18 years old and fail either part of the learner’s permit test, you must wait ___15___ days before you can retake the tests.

7. A learner’s permit allows you to practice driving with a licensed driver at least ___21___ years old or with an immediate family member who is at least ___18___ and has a valid driver’s license.

8. When driving with a learner’s permit, you can have ___1___ passenger(s) younger than 21 years old in your vehicle.

9. In order to obtain a 90-day provisional driver’s license, you must be at least ___16___ years and ___3___ months old and, if under 19 years of age, have held a learner’s permit for ___9___ months.

10. All persons younger than ___19___ years old must successfully complete a state-approved ___driver education___ course before obtaining a license.

11. If you are younger than 18 years old, your parents must certify you have driven at least ___45___ hours, ___15___ of which must be driven after sunset, before you can receive a driver’s license.

12. The driving curfew for persons younger than 18 years old with a license or for anyone with a learner’s permit is from ___midnight___ to ___4 a.m.____

13. Circle the license below that is issued to a driver younger than 21 years old.

14. A driver’s license is valid for ___8___ years.
15. Name three types of restrictions that can be placed on a driver’s license:

1. **corrective lenses**  \(\text{automatic transmission}\)
2. **hearing aids**  \(\text{safety harness}\)
3. **manual controls**  \(\text{other adaptive equipment}\)

16. DMV or a judge can temporarily ___**suspend**___ your license if you violate the law.

17. Termination of your driving privilege is called ___**revocation**___.

18. If a driver refuses to take a breath test and violates the implied consent law, or if the breath test results show an illegal BAC, the driver’s privilege to operate a motor vehicle will be immediately suspended for ___**7**___ days.

19. List 5 other reasons you can temporarily or permanently lose your driver’s license:

1. **manslaughter**
2. **drag racing**
3. **demerit points**
4. **DUI**
5. **.02 BAC if < 21 years old**

20. To operate a motorcycle, you must have a ___**driver’s license**___ with a class ___**M**___ endorsement or a ___**motorcycle**___ only license.

21. If you want to drive a large truck or a van designed for more than 15 passengers, you must have a ___**CDL**___ license.

22. If you are younger than 21 years old, and drive with a BAC of at least .02, you can be fined and lose your driving privilege under the ___**zero tolerance**___ law.

23. You need ___**liability**___ insurance to be in compliance with Virginia’s financial responsibility law (or you can pay the ___$500 uninsured motorist___ fee).

24. The earliest date you will be able to obtain a learner’s permit is ___

\[\text{month} \quad \text{day} \quad \text{year}\]___

25. The earliest date you will be able to obtain a 180-day temporary license is ___

\[\text{month} \quad \text{day} \quad \text{year}\]___ (age + holding period for learner’s permit).
Organ and Tissue Donation

1. Explain transplantation.  
   The act of taking cells from one individual and placing them in another individual

2. A tissue donor can positively affect more than _200_ people.

3. Give two reasons why open discussion about organ and tissue donation is uncommon.
   a. People must face their own mortality
   b. Lack of knowledge

4. You can designate your desire to be an organ and tissue donor on your
   learner’s permit/driver’s license.

5. List 5 organs that can now be successfully transplanted.
   a. liver  b. heart  c. lungs  
   d. kidney  e. pancreas

   Brain dead is defined as the complete and irreversible cessation of all functions of the brain and brain stem.

True/False
_ F__7. Organ transplantation is considered an experimental treatment.
_ F__8. The more famous and rich you are, the sooner you will receive an organ.
_ T__9. The family of a donor does not receive any money or pay any fees.
_ T__10. It is important to share your decision to be an organ donor with your family.
Right of Way Concepts

1. What is the underlying principle of right of way rules?

   *The right of way principle is based on giving the privilege of safe passage to others.*

2. At the following uncontrolled intersection, indicate who has the right of way.

   Car A
   Car B
   No one

   A

   B

3. In the above situation, indicate who must yield. ____ B ____

4. In the following situations, circle the vehicle that must yield.

   a. 

   b. 

   c. 

   d. 

5. Describe what you should do when you approach this sign?

   *Check traffic, yield and be prepared to stop*

6. You are driving on a 2-lane roadway when you notice a rescue vehicle approaching from the rear with its lights and siren on. What should you do?

   *Move as far to the right as possible and allow the rescue vehicle to pass*
Railroad Safety

1. Most highway-rail crashes are the result of __________driver error_________.

2. Name four instances when a driver would be required to stop at a railroad crossing.
   1. gates down
   2. lights flashing
   3. train coming
   4. vehicle ahead required to stop (e.g., school bus, oil tanker)

3. What should you do if your vehicle stalls while crossing the railroad tracks?
   If no train is approaching, get out and try to push the vehicle off the tracks.
   If a train is approaching, get out and get clear of the tracks.

4. When you see this sign, you should:
   Start looking and listening for a train

5. This sign is the same as a __________yield_________ sign.

6. What can you do to improve your chances of hearing a train’s whistle?
   __________Lower volume of radio, open window slightly__________

7. How can you determine how many tracks are at a railroad crossing?
   __________If there is more than one track, the number of tracks will be indicated on the crossbuck__________

8. A train traveling 50 mph takes approximately __________1 ½ miles_________ to stop.

   1. __________Don’t drive onto the tracks unless you have space on the other side__________
   2. __________Don’t change gears on the tracks__________
   3. __________Be extra careful at night (25% of train vehicle crashes result from a driver running into the side of a vehicle)__________
   4. __________Keep going if the gate begins to lower once you are on the tracks__________
   5. __________Make sure all tracks are clear before you cross__________
   6. __________Never stop on the tracks__________

10. It is illegal to pass another vehicle within __________100_________ feet of a railroad crossing.
Signs, Signals & Pavement Markings

1. Cite the meaning of each sign shape:

   1. regulatory  2. RR crossing  3. stop  4. warning  5. yield  6. guidance  7. school zone

2. Match each sign color with its meaning.

   A. orange  B. yellow  C. blue  D. green  E. red  F. brown  G. fluorescent optic yellow

   E. prohibitive  G. school or pedestrian crossing  B. general warning  F. recreation area
   C. motorist services  D. directions  A. workzone

3. Give the meaning of:

   a. Steady red light
   b. Flashing red light
   c. Flashing yellow light

   a. stop/remain stopped
   b. stop/check traffic
   c. caution

   d. RR crossing/yield
   e. winding road ahead
   f. added lane

   g. lane reduction
   h. slippery when wet
   l. school zone

4. Roadway Markings

   a. A solid line indicates no passing zone.
   b. A broken line indicates pass with caution.
   c. A yellow line indicates two-way traffic.
d. A white line indicates ___one-way traffic____.

e. A broken yellow line indicates ___passing allowed___ and ____two-way traffic____.

5. What is the meaning of the thick white lines in this diagram?

   Stop behind this line for stop sign or red light

6. This hand signal indicates ____right turn____.

7. Name five places where passing is not permitted.
   1. ___hills___
   2. ___curves___
   3. ___intersections___
   4. ___RR crossings___
   5. ___solid lines___

8. Signal at least _100_ feet before your turn. (4 seconds)

9. The speed limit in school, business & residential areas is _25_ mph.

10. The speed limit on rural expressways is _65_ mph.

11. Parking is not permitted within

    ___15___ feet of a fire hydrant

    ___20___ feet of an intersection

    ___500___ feet of fire trucks stopped while answering an alarm

    ___50___ feet of a railroad crossing

12. This sign means: 

    Divided highway begins

13. A red circle with a diagonal line means ___do not/prohibitive___.

14. What potential dangers do drivers encounter in a work zone?

   Must alter speed and position and come into contact with people and equipment

15. The slogan “Give ‘em a BRAKE” means:

   Slow down and be prepared for potential dangers
Driver Preparation Procedures

1. Name four things you should check before entering a vehicle.
   1. __Check for small children and pets__.
   2. __Check for fluid leaks___________.
   3. __Check for tire inflation___________.
   4. __Check for obvious physical damage.__

2. Approach the driver’s door from the _front_ when parked next to a curb.

3. Approach the driver’s door from the _rear_ when parked in a parking lot.

4. The driver should sit at least __10__ inches from the steering wheel.

5. Place the driver’s hands in the correct position on this steering wheel.
   
   ![Image of steering wheel with X's and an X]

6. The top of the head restraint should be positioned __slightly above the ears__.

7. With a properly set rear view mirror, you should be able to see at least __200__ feet behind the vehicle. Set the side view mirrors __15__ degrees outward to reduce the blind spot and glare at night.
   
   ![Image of side view mirrors with an X]

8. Number the following starting tasks in their correct order (1 – 12).

   __2__Adjust mirrors __1__Adjust seat
   __4__Check parking brake __6__Put key in ignition
   __7__Make sure gear selector is in “P” or “N” __3__Adjust safety belts
   __5__Place foot on the brake __9__Check alert lights
   __8__Turn key to “on” position __10__Start the engine
   __12__Check warning lights & gauges __11__Set accessories
9. Number the following securing procedures first to last (1 – 5).

__1__ Stop  
__2__ Set the parking brake  
__4__ Turn off accessories  
__5__ Turn off ignition  
__3__ Place gear selector in Park

10. Identify these items found under the hood.

Windshield washer reservoir  
Oil dipstick  
Radiator cap  
Power steering fluid reservoir

11. Indicate how often you should check each of the following:

Tire pressure ___weekly___  
Engine fluids ___monthly___  
Air pressure in spare tire ___every 6 months___

12. How often should you change your engine oil?  
___Every 3000 miles or 3 months___

13. Name 5 maintenance items that should be professionally performed every 15,000 miles.

1. ___automatic transmission fluid___  
2. ___brakes___  
3. ___cooling system___  
4. ___steering linkage___  
5. ___air and fuel filters___
Vehicle Control Devices

1. Identify each of the following symbols:

- seat belt warning light
- defroster
- air bag alert light
- alternator light or gauge
- lights/high beam indicator
- oil light or gauge
- light switch
- turn signal indicators
- horn

Identify the following gauges:

- Speedometer
- Temp. gauge
- Tachometer
3. How can you determine whether the anti-lock brake system, air bag system and traction control system are working properly?

   When starting the engine, these alert lights will come on and then go off. This indicates the system has been checked and is working properly.

4. How can you tell if your lights are on high beam or low beam?

   - The blue high beam indicator will illuminate when using high beams.

5. Explain the function of each of the following gauges (indicator lights):
   - alternator - checks the electrical system
   - oil – checks the engine lubricating system
   - temperature – checks the engine operating temperature
   - brake – checks the vehicle’s braking system.
Operating Vehicle Control Devices

1. Identify the vehicle controls in the pictures below:

1. ___ accelerator ______
2. ___ parking brake ______
3. ___ foot brake ______
4. ___ gear shift lever ______
5. ___ steering wheel ______
6. ___ ignition ______
7. ___ turn signal lever ______

2. If you want to back to the right, you should turn the steering wheel to the _______ right ______.

3. Give the meaning of each of the letters on the gear-shift selector and explain when each gear should be used.

<table>
<thead>
<tr>
<th>Letter</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>P</td>
<td>Park – the vehicle will not move</td>
</tr>
<tr>
<td>R</td>
<td>Reverse – vehicle will move backward</td>
</tr>
<tr>
<td>N</td>
<td>Neutral – no pulling power, but tires will roll</td>
</tr>
<tr>
<td>D</td>
<td>Drive – used for forward driving in most situations</td>
</tr>
<tr>
<td>L1</td>
<td>Low – provides more engine power for hills or uneven terrain</td>
</tr>
<tr>
<td>L2</td>
<td>Low – provides extra pulling power for steep hills or pulling heavy loads</td>
</tr>
</tbody>
</table>
Vehicle Balance

1. Weight transfer from one side of the vehicle to the other is known as: roll
2. Weight transfer that causes the vehicle to “fishtail” is known as: yaw
3. Weight transfer to the front or rear of the vehicle is known as: pitch
4. Circle the actions this driver is probably taking.
   - Acceleration
   - Braking
   - Steering left
   - Steering right
5. Vehicle weight transfer is caused by changes in speed and changes in direction.
6. Quick acceleration will result in weight transfer to the rear wheels.
7. Braking results in weight transfer to the front wheels.
8. Steering to the right will result in weight transfer to the left side.
9. Describe a balanced seating position that helps the driver maintain vehicle control and balance.
   - steering wheel position: at least 10 inches from driver’s torso
   - position of backrest of driver’s seat: straight (slightly beyond a 90 degree angle)
   - left foot position: on the “dead pedal” (left leg straight with foot on floor)
   - right foot position (heel): on the floor
   - hand position: 8 o’clock & 4 o’clock or 7 o’clock & 5 o’clock position
10. Maximum lock-to-lock steering movement in most modern vehicles is a total of 2 ½ -3 turns.
11. Why is hand-to-hand steering recommended for most maneuvers?
   Hand-to-hand steering provides better control. It helps the driver maintain vehicle balance by using smaller weight transfers and reduces the chance of too much steering input.
12. Define:

- covering the brake – placing the right foot over the brake but not applying brake pressure
- controlled braking (squeeze on) – braking with sufficient pressure to slow the vehicle while maintaining vehicle balance
- threshold braking – braking to a point just short of wheel lockup
- trail braking (squeeze off) – used to maintain speed and balance. This technique is often used at the end of controlled or threshold braking.

13. In the diagram below,

a. where will the vehicle’s weight transfer?
   Vehicle weight will transfer right side.

b. when should the driver brake?
   The driver should slow down before entering the curve.

   • why?
   Braking in the curve would add more weight transfer to the right side compromising the stability of the vehicle.

14. Diagram (using arrows) and describe hand-to-hand (push/pull/slide) steering for a right turn.

   The driver pushes the steering wheel with the left hand from the 8 o’clock position to the 10 o’clock position and then pulls the steering wheel with the right hand from the 2 o’clock position to the 4 o’clock position.

15. The weight transfer illustrated below is caused by ___quick acceleration____.
Visual Skills/BGE Mirror Settings/Vehicle Operating Space

1. Define the following.
   - **Focal vision:** used to read or identify distinct objects.
   - **Central vision:** fringe area around the focal vision. It is used to judge depth and position.
   - **Peripheral vision:** outer vision fields. Motion changes are often detected in the peripheral vision area.
   - **Target:** a fixed object that appears at the end of your path of travel.
   - **Targeting:** maintaining vehicle position by selecting a target well ahead of the vehicle.
   - **Path of travel:** where the driver directs and intends for the vehicle to travel.
   - **Vehicle operating space:** the area around the vehicle which is not visible to the driver.
   - **Traditional mirror settings:** mirror setting in which the view through the side view mirrors overlaps with what is seen in the rear view mirror.
   - **BGE mirror settings:** Blindzone/Glare elimination setting – In this mirror setting, the side view mirrors are set to allow the driver to monitor the adjacent lane and the rearview mirror is set to monitor what’s behind the vehicle.

2. How can you determine a vehicle's operating space (footprint)? Diagram the vehicle operating space around the vehicle below.

   *Class activity: With a student in the driver’s seat, have other students surround vehicle. One at a time, the students outside the vehicle will back up until the driver can see his/her feet.*

3. Diagram the areas shown in the side view mirrors using:
   - **Traditional Mirror Setting**
   - **BGE Mirror Setting**

4. List the advantages of the BGE mirror setting.
   - Blindzones are greatly reduced. Peripheral vision should detect objects in blindzone.
   - Blindzones can be checked with less time needed away from front vision.
   - At night, glare from outside mirrors is virtually eliminated.
Reference Points/Lane Positions

1. What is a reference point?
   A part of the vehicle that can be seen by the driver and is used to help the driver determine the position of the vehicle in relation to the roadway.

2. How do reference points help the driver?
   The driver can determine the exact location of the vehicle on the roadway when parking, turning, establishing lane position, stopping at stop lines, etc.

3. Draw and describe the standard reference points for each of the following:

   **Front limitation**
   - When the front bumper is even with a line, the line of sight from the driver to the line appears to run under the side view mirror.
   - 6” – 12” from right curb
   - The line of sight from the driver to the line runs through the center of the hood.
   - 2 – 3 feet from curb
   - The line of sight from the driver to the curb runs across the right ¼ of the hood to the curb.

   **Rear limitation**
   - When the rear bumper is even with a line, the line of sight from the driver to the line appears to run through the middle of the rear passenger’s window.
   - 0 – 6” from left line
   - The line of sight from the driver to the line runs down the crease between the hood and fender.

   **Module 2 – Topic 5a**
4. Describe the lane position for each of the following vehicles.

A = LP_1_

B = LP_2_

C = LP_4_

D = LP_3_

E = LP_5_

5. When the vehicle is in LP1, the line of sight (LOS) from the driver to the right edge or edge line of the roadway runs through the center of the right half of the hood to the edge of the roadway.

6. When the LOS from the driver to the center line runs through the hood seam, the vehicle is in LP_2_.

7. If there is construction on your right, you should move to LP_2_ to increase the space between your car and the construction area.

8. Move to LP_3_ prior to making a right turn.

9. LP_4_ and LP_5_ both involve occupying two lanes. Describe 2 situations that you may encounter that would cause you to choose either of these lane positions.

As you enter a curve, you see the oncoming vehicle coming into your lane. You have a small shoulder on your right side!

There is construction in your lane and there is no oncoming traffic.
Entering the Roadway/Moving to the Curb/Backing

1. List the seven (7) steps to safely pull away from a curb.

   1. __foot firmly on the brake____
   2. __select proper gear____
   3. __check traffic____
   4. __give proper signal____
   5. __release parking brake____
   6. __select gap in traffic____
   7. __move to proper lane____

2. When entering the roadway from a curb, your target should be lane position 1.

3. Describe the proper procedure for pulling to a curb.
   • check traffic
   • give proper signal
   • select target
   • recheck blind zones (bicyclists, pedestrians, etc.)
   • adjust speed with control braking
   • move gradually
   • use reference point to establish 6” from curb
   • cancel signal

4. Complete the following:

   Today I will begin practicing my backing skills. Let me refresh my memory about what we learned in the classroom. Before I begin backing, I must check ___around my vehicle and look into my ___mirrors___ to be sure the area is free of pedestrians and other obstacles. I will begin with my foot on the ___brake____. I must remember that my ___heel___ should be on the floor for good control. Now I will shift to ___reverse____ and look over ___my right shoulder________.

   I have often wondered what signal I should give when backing. In class we discussed the fact that the signal for backing is ___the backup lights____ and that they come on ___automatically___ when I shift to ___reverse____.

   Before I begin moving, I must remember to release the ___parking brake____. Just as I do when moving forward, it is important that I find a ___target___ to establish vehicle position. This will be at least ___3 car lengths___ behind the vehicle since the area directly behind the vehicle is not visible to me.

   It is often not necessary to use the ___accelerator___ for speed. As a matter of fact, I may have to maintain some pressure on the ___brake___ to maintain a slow, safe speed.
Vision and Perception

1. The vision needed to read and identify distinct objects is called _focal__ vision. This visual area is usually ___3 to 5___ degrees wide.

2. The area of vision needed to judge distance and determine position is the _central__ vision. This area is usually between ___30__ and ___36__ degrees in width.

3. The _peripheral___ vision area (diagramed below) is approximately ___175-185___ degrees wide and is needed to detect ___motion___ and ___color___ changes.

4. If a vehicle is approaching from the side, you should be able to detect its motion using _peripheral__ vision. You will then be able to identify the type of vehicle using _central__ vision. Finally, you can determine make and model of the vehicle using _focal___ vision.

5. Good visual habits involve establishing a path of travel with a targeted area ___20___ seconds ahead of the vehicle. This is known as a _visual lead__.

6. When you are unable to see your target area ahead, you should _reduce speed__.

7. As the speed of a vehicle increases, central and peripheral vision __decrease__.

8. A following interval of 2 seconds provides time to steer out of problem areas or brake for problems on dry surfaces at speeds up to ___35___ mph.

9. A following interval of 3 seconds provides time to steer out of problem areas or brake for problems on dry surfaces at speeds up to ___45___ mph.

10. A following interval of 4 seconds provides time to steer out of problem areas or brake for problems on dry surfaces at speeds up to ___65___ mph.

11. Using the following diagram, describe how to calculate a 3-second following interval.

   ![Diagram of visual perception areas]

   *The rear of vehicle 1 passes the selected object. Driver of vehicle 2 begins counting 1001, 1002. The driver of vehicle 2 should complete the count to 1003 BEFORE the front of vehicle 2 reaches the selected object.*
Space Management System/Developing Good Habits

1. Describe a Space Management System.

*A space management system is a process used to manage time, space & visibility to reduce risk situations. Examples of space management systems include the Smith, IPDE, SIPDE & the SEEiT systems.*

2. What do each of the letters in the SEEiT space management system stand for?

   S
   e
   a
   r
   c
   h
   _____
   E
   v
   a
   l
   u
   a
   t
   e
   _____
   E
   x
   e
   c
   u
   t
   e
   _____
   i
   n
   _____
   T
   i
   m
   e
   _____

3. The space around your vehicle is described as either **open**, **closed** or **changing**.

4. List three (3) potential hazards in this picture:

   1. ___ *pedestrians*
   2. ___ *oncoming vehicle*
   3. ___ *bicyclist*

5. What can you do if the bicyclist moves into your path of travel?

   Brake and steer to avoid a collision.

6. What lane position would you suggest for this situation?

   Lane position 4

7. When executing a decision to avoid a crash, you can either change

   ____ *speed* _____ or ____ *position* _____.

8. You are approaching an intersection and the light is green. There is a vehicle approaching from the left and an oncoming vehicle signaling a left turn. Describe the SEEiT space management process you would apply to this situation.

   Search – have identified two potential dangers
   Evaluate – Will the light turn yellow? Will the vehicle approaching from the left stop? Will the vehicle turning left yield right of way?
   Execute – Cover brake and be prepared to stop in case any of the above scenarios happen.
9. As the black vehicle approaches this intersection, what should the driver be searching for? 
*The driver should be searching for traffic control devices, actions of the motorcyclist, traffic behind and cross traffic.*

10. What action should the driver of the white vehicle take if the motorcyclist enters the intersection? 
*The driver of the white vehicle should be prepared to stop in case the motorcyclist does not stop.*

11. Complete the following chart listing the levels of driver awareness and performance.

<table>
<thead>
<tr>
<th>Driver Awareness Level</th>
<th>Driver Performance Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>Habit</td>
<td>Acceptable</td>
</tr>
<tr>
<td>Judgment</td>
<td>Acceptable</td>
</tr>
<tr>
<td>Habit</td>
<td>Unacceptable</td>
</tr>
<tr>
<td>Judgment</td>
<td>Unacceptable</td>
</tr>
</tbody>
</table>

12. Which of the above levels of awareness and performance are most likely to lead to a crash? 
*The habit level with unacceptable performance is the level most likely to lead to a crash.*

13. List the top four driver errors leading to a crash. (According to *Virginia Crash Facts*)

1. _____ inattention
2. _____ failure to yield
3. _____ following too close
4. _____ speed too fast
1. Define risk.  
*Risk is defined as chance of injury, damage or loss.*

2. Define chance.  
*Chance is the probability or likelihood of a crash.*

3. Give examples of potential injuries, damage or loss resulting from a crash.  
Potential injuries include injuries to yourself or others. (e.g., bruises, broken bones, paralysis, death)  
Damage refers to personal property. (e.g., vehicle damage, damage to contents in vehicle, property damage)  
Loss could include such things as financial loss, loss of opportunity, loss of time, etc.

4. How does increasing speed increase risk?  
*Increased speed results in less reaction time, longer braking distances and more severe collisions.*

5. Differentiate between risk assessment, risk acceptance and risk compensation.  
*Risk assessment is the ability to recognize and determine level of risk.*  
*Risk acceptance is how much a person is willing to risk.*  
*Risk compensation is making adjustments or changing behavior to reduce risk.*

6. Name the 3 principles for reduced risk and give an example of each.  
*Never risk more than you can afford to lose. Should I not wear my seat belt, not have collision insurance, etc.*  
*Do not risk a lot for a little. Is it really worth the risk to drive on icy roads to buy a soda?*  
*Consider the odds and your situation. Can I control the actions of other drivers in inclement weather?*

7. List 7 behaviors that increase driving risk.  
*Speeding*  
*Failure to yield right of way*  
*DUI*  
*Disregarding a traffic sign or signal*  
*Following to close*  
*Improper turns*  
*Unsafe passing*  
*Failure to wear a safety belt*  
*Talking on cell phone while driving*

8. List examples of good driving habits that reduce driving risks.  
*Developing sound habits and judgments*  
*Practice a space management system (SEEIT)*  
*Develop good decision-making skills*
Space Management

1. Give the name, number and color code on the following diagram for the six basic areas of operating space around the vehicle.

<table>
<thead>
<tr>
<th>Right front/ 3 / Maroon</th>
<th>Right rear/ 5 / White</th>
</tr>
</thead>
<tbody>
<tr>
<td>Front/ 1 / Yellow</td>
<td>Rear/ 6 / Blue</td>
</tr>
<tr>
<td>Left front/ 2 / Green</td>
<td>Left rear/ 4 / Red</td>
</tr>
</tbody>
</table>

2. Describe an open area - a zone, space or area that has no restrictions to the line of sight or path of travel.

3. Describe a closed area - a zone, space or area that is not available for a car’s path of travel or has a restriction to the driver’s line of sight.

4. Describe a changing area - an open zone which becomes a closed zone or a closed zone that is changing to an open zone.

5. You are driving the vehicle circled. The vehicle ahead suddenly begins braking.

   • What areas are closed? __________ front/rear/ and possibly the left rear area

   • What is the best decision to minimize risk?
     A left lane change

6. You are driving the circled vehicle and notice the vehicle behind is approaching rapidly. What is your best response to reduce risk?

   Accelerate and move into the right lane
7. Describe the open, closed or changing area for each of the following. (e.g., a red light is a closed front area)

- A parked car to your right __closed right front and right rear zones____.
- To make a right lane change you need __open right front and right rear areas__.
- A vehicle in your left mirror blind area is __a closed left rear area_____.
- A bicyclist in your right mirror blind area is __a closed right rear area__. 
- A vehicle passing you on the right __closed right rear & changing right front area__.
- A large truck following closely behind is __a closed rear zone__.
- A yellow traffic signal is __changing front zone______________.

8. You are driving in the middle lane in the diagram below. If the motorcycle suddenly changes lanes into your path of travel, to avoid a potential crash, you should:

- brake ______
- swerve left __X____
- swerve right ______
Turning/Lane Changes

1. On the diagram below:
   - Draw the correct path of travel for a right turn for this vehicle.
   - Draw an arrow indicating the line of sight through the turn.
   - Draw an X on anything that may obstruct the line of sight.

2. How far in advance should you prepare for a right turn?
   - 200 – 300 feet before the turn

3. Name two ways you can communicate your intention to turn.
   - Turn signal and position help communicate your intention to turn. Tapping the brake pedal will communicate your intention to down before the turn.

4. When do you slow down for the turn?
   - You need to reduce your speed before your turn.

5. When do you begin to accelerate when making a right turn?
   - You begin accelerating at the apex of the turn when your line of sight is 20 seconds ahead in your path of travel.

6. What visual reference will help you determine when to begin the turn?
   - Begin the turn when the side view mirror appears to be even with the curb.

7. What type of steering should you use to make this right turn?
   - Hand-to-hand steering

You are driving the dark vehicle in the diagram below in a 35 mph speed zone.

8. What areas must you check before beginning a lane change?
   - rear, left rear, left front

9. Name two possible reasons for making the lane change.
   - slow moving vehicle or an obstruction is blocking your path, your lane ends, your destination requires a turn from a different lane, or construction in your lane

10. How can you communicate the lane change?
    - By using a turn signal
Turnabouts/Parking

1. Diagram a 2-point turn (backing into a driveway).

2. Indicate your line of sight on the diagram above.

3. What is your visual reference point for backing into the driveway?

   The driver should begin steering into the driveway when the line of sight from the driver to the edge of the driveway runs through the center of the back passenger window.

4. What is the safest way to change direction in the city?

   The safest way to change direction in the city is to go around the block.

5. Diagram a 3-point turn.

6. It is safer to ____ back into traffic or ____ back out of traffic.

7. Diagram how to angle park.

   - You should approach the angle parking space approximately ____ feet away.
   - Your target while angle parking is ____ the center of the parking space ____.
   - Your visual reference point for beginning to steer is ____ when the side mirror appears to align with the first line of the space ____.
   - You should use ____ hand-to-hand ____ steering for this maneuver.
8. Diagram the proper path of travel for perpendicular parking.

   o You should approach the perpendicular parking space approximately ___5-7___ feet away.

   o When perpendicular parking, your target should be ___the center of the parking space_______.

   o Your reference point for beginning to steer is ___when the side view mirror appears to align with the first line of the parking space_______.

   o You should use ___hand-to-hand___ steering for this maneuver.

9. Diagram the proper path of travel for parallel parking.

   o A parallel parking space should be at least ___5 feet___ longer than your vehicle.

   o The starting position for parallel parking is about ___3___ feet next to the vehicle parked in front of the space.

   o The reference point for beginning a parallel parking maneuver is to stop when your back bumper is even with ___the back bumper of the vehicle parked in front of the space_______.

   o The reference point for determining when to change steering direction from right to left while parallel parking on the right is ___when the driver can see the right headlight of the vehicle parked behind in the side view mirror_______.

10. Diagram which way the wheels should be turned when parking.

    Uphill with a curb   Uphill without a curb   Downhill with a curb
Processing Information

1. A driver needs __time__, __space____ and ____visibility____ to safely operate a vehicle.

2. A vehicle needs __time____, ___space____ and ___traction____ to safely perform driving maneuvers.

3. Good searching technique requires the ability to know _how_, __when__, __where__ to search, and __what____ to search for.

4. Name each of the three vision areas and tell what each is used for.  

   1. __peripheral – used to detect motion and color changes__
   2. __focal – used to identify distinct objects ________
   3. __central – used to judge distance and determine position__

5. Explain the statement: “The eyes don’t tell the brain what they see—the brain tells the eyes what to look for” as it relates to the search process.  

   Searching is the process of looking for potential hazards while driving. The brain must be programmed to look for specific information. If the brain is not programmed to search effectively, the eyes simply scan the area and respond to the most colorful and/or moving objects.

6. Fill in the correct time interval for each of the following:

<table>
<thead>
<tr>
<th>Time interval</th>
<th>Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>2 sec.</td>
<td>This following interval is usually inadequate. It will only allow a driver to steer to avoid a collision.</td>
</tr>
<tr>
<td>4 sec.</td>
<td>This is the recommended minimum following interval. This allows time to brake or change position.</td>
</tr>
<tr>
<td>8-12 sec.</td>
<td>Needed to identify an alternate path of travel this far ahead of the vehicle.</td>
</tr>
<tr>
<td>12-15 sec.</td>
<td>Needed to identify objects that require an alternate path of travel.</td>
</tr>
<tr>
<td>4-8 sec.</td>
<td>Needed to search the immediate path of travel. This time interval should provide time to stop on dry roadways.</td>
</tr>
<tr>
<td>20-30 sec.</td>
<td>Needed to search \ ahead of the vehicle to evaluate the intended path of travel. This should also be your target area.</td>
</tr>
</tbody>
</table>
7. Give four examples of objects which you would need to search for in each of the following categories:

<table>
<thead>
<tr>
<th>Highway conditions</th>
<th>Traffic Controls</th>
<th>Motor Vehicles</th>
<th>Non-Motorized Users</th>
</tr>
</thead>
<tbody>
<tr>
<td>Roadway traction</td>
<td>Unmarked</td>
<td>Camper</td>
<td>Bicycles</td>
</tr>
<tr>
<td>Affixed objects</td>
<td>intersections</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Shoulders</td>
<td>Signs</td>
<td></td>
<td>SUV</td>
</tr>
<tr>
<td>Affixed objects</td>
<td>Signs</td>
<td></td>
<td>Animals</td>
</tr>
<tr>
<td>Curves</td>
<td>Signals</td>
<td></td>
<td>Motorcycles</td>
</tr>
<tr>
<td>Slopes</td>
<td></td>
<td></td>
<td>Pedestrians</td>
</tr>
<tr>
<td>Wind</td>
<td>Roadway markings</td>
<td>Trucks</td>
<td>Skateboarders</td>
</tr>
<tr>
<td>Glare</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

A Short Road Trip

It looks like I will be driving in moderate traffic today. My last lesson wasn’t too bad. There was not much traffic and I was able to concentrate on targeting and turning. Today, I think we will be working on space management and lane position. My instructor says he likes commentary driving to make sure I see all of the potential driving risks.

Instructor: “During the last lesson, you were able to concentrate on centering and turning the vehicle. Today we will begin working on your ability to establish and maintain adequate space around your vehicle.”

Student: “I’ve never driven in a lot of traffic before. I’m a little nervous. I remember most of what we talked about in the classroom.”

Instructor: “Don’t worry, just keep plenty of space between your vehicle and the other vehicles and you’ll be fine. We will begin by driving down the Boulevard and practice the SEEiT space management system. Can you tell me what SEEiT stands for?”

Student: Yes. Search Evaluate Execute In Time.

Instructor: “Good. Now while you are driving, I want you to use commentary driving to let me know where you are searching, what you are evaluating and what your best choices for executing will be.”

Student: “I’m searching my intended path of travel 20 seconds ahead. I see a red light. It has been red for a while. Maybe if I reduce my speed, it will be green when we get there. Good! I judged that correctly. Now, there is some construction up ahead on the right. I think I will move to LP to give myself more space. I just checked my rearview mirror and noticed there is a truck behind me. I need to increase the space in front of my vehicle so I won’t have to brake suddenly. The vehicle in front of me has his emergency flashers on and is moving slowly. Let me check mirrors and blindzone to see if I can safely change positions. The left mirror is clear and I still need to make a quick headcheck before changing lanes. All clear. Now I will signal, recheck traffic and move gradually to the other lane.”
Instructor: “We will be turning right at the next traffic light.”

Student: “I will need to get back into the right lane. I am checking my rearview mirror and see ___ the headlights of the vehicle I passed___ so I know it is safe to return to the right lane. Since we will be making a right turn, I need to go to LP _3_. The light is red. There is a vehicle in front of us. I will stop far enough back to be able to see ___ the vehicle’s rear tires on the pavement ___. This will help with my visibility and make sure I have an ___ escape route ___ if there is a hazard I need to avoid. The vehicle ahead is making a right turn on red. Now it’s my turn. I have to remember to ___ stop ___ first then check ___ traffic __. OK, it’s safe to go. Opps! I almost forgot to check ___ ahead ___ for oncoming traffic with a green arrow making a left turn. Now it’s OK to go. I remember from the last lesson that I must turn into the ___ first open lane ___.”

Instructor: “We will make a left on Confederate Ave.”

Student: “There are two lanes going in my direction. I will need to make a lane change. My best position for a left turn is LP _2_.”

Instructor: “Why is your stop line closer than the one in the right lane?”

Student: It’s called a staggered stop. It gives ___ more space ___ and ___ better visibility ___ to vehicles entering the roadway from the right.”

Instructor: “We will pull to the curb just ahead. Don’t forget to ___ signal ___ and check ___ traffic ___ before you move. It’s time to change drivers. What are the steps to properly secure the vehicle?”

Student: “I must shift to park, set the parking brake, turn off all accessories & turn off the ignition.”
Intersections

1. Before entering an intersection,
   • check left and right for traffic and pedestrians;
   • check ahead for oncoming traffic turning left; and
   • count to 3 to allow other vehicles to clear the intersection.

2. Crossing a two-lane roadway from a stop takes about 6 seconds.

3. If a vehicle is approaching from the right at 30 mph (45 feet per second), you will need a gap of at least 270 feet to safely cross the intersection.

4. If a vehicle is approaching from the right at 50 mph (75 feet per second), you will need a gap of at least 450 feet to safely cross the intersection.

5. When waiting to make a left turn, the front wheels should be facing straight ahead.

6. In the diagram below, you (car B) will be turning left from a stop.

   ![Diagram]
   
   • It will take you approximately 11 seconds to make the turn and establish space around your vehicle.
   • Vehicle A is traveling 30 mph (45 fps). You will need a gap of approximately 495 feet to safely make the turn.
     
     
     \[
     (11 \text{ sec.} \times 45 \text{ fps} = 495 \text{ feet})
     \]

7. If vehicle A’s speed is 50 mph (75 fps), the needed gap will increase to 825 feet.
   
   \[
   (11 \text{ sec.} \times 75 \text{ fps} = 825 \text{ feet})
   \]

8. The markings in the lane below indicate a shared left turn lane.
9. When executing a left turn from a driveway, how can a shared left turn lane help you make the turn safely?

*When there is no traffic coming from the left, you can pull into the shared left turn lane and wait for the traffic coming from the right to clear.*

10. Draw the correct path of travel for the vehicle below making a left turn.

11. Indicate the correct path of travel of each of the following turns.

   - Right turn
   - Left turn
Curves and Hills

1. Draw the driver’s line of sight through this curve.

2. Draw the driver’s line of sight through this curve.

3. In this situation:
   - How is your line of sight restricted? The driver cannot see over the crest of the hill.
   - What should you be searching for? vehicles driving over the hill straying over the yellow lines or a blocked roadway ahead
   - Are there any escape routes? no
   - What is your best lane position as you approach the crest of the hill? LP3

4. Mark the apex of this curve.

5. When should you slow down for a curve? You need to slow down before the curve

6. When should you begin accelerating? Once the apex is reached, light acceleration is used to pull the car out of the curve.

7. Why is it essential to check traffic behind before cresting a hill? Because visibility is limited as you approach the crest, you should know what is behind you in case it becomes necessary to brake unexpectedly.
Passing

1. Vehicle A is passing vehicle B. Vehicle B is 15 feet long and is traveling 30 mph. Vehicle A will accelerate to 40 mph to pass. Vehicle A will start 2 seconds back and need 60 feet in front of B before returning to the lane.

   a. How many feet will A travel before starting to pass?
      2 seconds x 60 feet per second = __120__ feet.

   b. How many feet must car A travel to overtake B and establish a safe space before returning to the right lane? Length of car B + distance allowed before returning to lane = __75__ feet.

   c. Car A must travel a total of __195__ more than B in order to safely complete this pass. (a + b)

2. If vehicle A is traveling 60 feet per second (40 + 20) and vehicle B is traveling 45 feet per second (30 + 15), how many more feet per second is A traveling than B?

   a. 60 – 45 = __15__.

3. Based on answer 2, how many seconds will it take car A to pass car B safely?

   a. Additional distance traveled by A to pass B A(1.c) __195__ divided by difference in distance traveled per second by each vehicle (2.a) __15__.
      \( \frac{1.195}{2.15} = _{13} \) seconds.

4. Since vehicle A is traveling 60 fps, how far will it travel while passing vehicle B?

   a. 60 fps x 3.a = __780__.

5. If a vehicle is approaching from the opposite direction at 40 mph, how much total space is needed to safely complete this pass?

   __1560__ feet – This would be approximately __5__ football fields!
6. Vehicle B is a 100-foot long truck. Vehicle A must start 4 seconds behind B to ensure visibility around the truck. How far will vehicle A travel to safely pass the truck and return to the right lane?

   a. 2 seconds x 60 fps = 120 feet
   b. To overtake the truck and establish a safe space = 160 feet
   c. Car A must travel 280 feet more than Truck B to safely pass.
   d. Car A is traveling 15 feet per second faster than Truck B. (60 fps – 45 fps)
   e. It will take 19 seconds to safely complete the pass. (c divided by d)
   f. Vehicle B must travel 1140 feet to safely pass the truck and return to the right lane. (60 fps x answer e)
   g. To allow for a vehicle approaching from the opposite direction at 40 mph, what is the total space needed to safely pass this truck?

       2280 feet – This is approximately 7 1/2 football fields!

7. List 5 places where passing is not permitted.

   1. hills
   2. curves
   3. RR crossings
   4. intersections
   5. solid yellow lines

8. Describe how using headlights during the daytime increases safety during passing maneuvers?
   Headlights increase the visibility of a vehicle, passing vehicles, and oncoming vehicles.

9. How can you determine it is safe to return to the right lane after passing another vehicle?
   When the driver can see the entire front end of the vehicle being passed in the rear view mirror.
Characteristics of Expressways

1. List five characteristics of an expressway.
   1. __controlled access________
   2. __high speed traffic________
   3. __divided by a barrier________
   4. __vehicle restrictions________
   5. __multiple lanes________

2. As speed increases, steering input to maneuver the vehicle __decreases__.

3. Describe the best evaluation and execution decisions you would make in the following expressway situations.
   a. You are trying to merge onto the expressway.

      ________________
      ________________
      ________________
      ________________
      ________________
      ________________

      Evaluation: ____determine speed of traffic, select a gap in traffic____

      Execution: ____adjust speed to speed of traffic & merge into gap____

   b. You are being tailgated.

      ________________
      ________________
      ________________
      ________________
      ________________

      Evaluation: ____Slow down and check to see if another lane available____

      Execution: ____increase space margin in front of vehicle and if possible change lanes as soon as possible____
4. Identify each of the following interchanges:

- cloverleaf
- diamond
- trumpet
- frontage road

5. Give the meaning of each of the following signs or markings often found on expressways.

- **Interstate sign**
- **Merge**
- **Restricted lane (HOV)**
- **Added lane**
Expressways
Entering/Changing Lanes/and Exiting

1. The three parts of an expressway entrance are:
   1. _____ Access
   2. _____ Acceleration
   3. _____ Merge

2. Mark each of the above areas on the diagram below.

3. List two things you should search for when approaching an expressway ramp.
   1. _____ Entrance number, direction & other destination information
   2. _____ Signs indicating “WRONG WAY” or “DO NOT ENTER”

4. The purpose of the acceleration lane is to _accelerate_ to ___speed of traffic__.

5. You should NOT do which of the following when merging onto the expressway.
   • Search for conflicts
   • Stop
   • Be prepare to drive onto shoulder if necessary
   • Create space around your vehicle

6. Give four reasons to change lanes on an expressway.
   1. __to allow another driver to merge onto the expressway____
   2. __to pass__________________________
   3. __when the lane ahead blocked____________________
   4. __when following large vehicles that block your vision____
7. Describe the intended use for each expressway lane.

- Entrance/Exit – traffic enters or exits the expressway
- Right Lane – traffic entering or exiting and slower traffic
- Middle Lane – long distance driving
- Left Lane – passing and faster traffic

8. On the diagram below,
   • name and mark the two parts of an expressway exit.
   • indicate when the driver should begin to reduce speed.

9. The diagram below is a weave lane in which traffic exiting and entering the expressway use the same ramp.

10. Is the exiting or entering traffic required to yield on the ramp above?
    The traffic entering the expressway is required to yield to the traffic already on the expressway.
High Speed Considerations

1. If you need to change direction on an expressway, you must ___ exit at the next available exit and re-enter again going in the correct direction ___.

2. If you miss your exit, you should ____ continue to the next exit _____.

3. Where are U-turns allowed on expressways?
   no where

4. Describe “pack driving”?
   When vehicles “bunch up” on the expressway.
   • Why is it dangerous?
     Pack driving robs the drivers of a space cushion.

5. Why do many expressway crashes result in chain-reaction collisions?
   Many expressway crashes result in chain reaction collisions because drivers do not establish enough space around their vehicles to allow for escape routes.

6. Explain highway hypnosis?
   Highway hypnosis is a dulled, drowsy condition experienced by some drivers because expressway driving often becomes monotonous.

7. What steps can a driver take to combat highway hypnosis?
   The driver should plan regular breaks at rest stops and switch drivers often if possible.

8. Describe “ramp metering” and why it is used.
   Ramp metering is the use of sensors and lights that allow only one vehicle to enter the roadway at a time. It is used to control the number and spacing of vehicles on the expressway.
9. How does driving on the expressway in urban areas differ from driving on the expressway in rural areas?

The volume of traffic is usually greater in urban areas. Often the speed of traffic will reduce to a crawl during peak driving hours. Drivers should try to avoid the right lane unless exiting the expressway.

10. When traveling on the expressway, why is it important to know exit numbers before you begin the trip?

It is important to position for an exit at least 1/4 mile before the exit. Since exit numbers correspond to mile marker numbers, knowing the exit number in advance will allow you to position for the exit as needed.

You can determine if an exit is on the right or left by the position of the exit number. Ex: This is a right exit because Exit 45A is positioned on the right side of the sign. Exit numbers in Virginia also correspond with the mile marker numbers.

11. When changing lanes from the right lane to the middle lane on an expressway, what two flows of traffic must you check and why?

You must check the traffic in the middle lane and the traffic in the left lane as the driver in the left lane may be getting ready to execute a right lane change into the same space you plan to enter.
Introduction to Alcohol

1. List 5 reasons why people choose to drink alcohol.
   1. peer pressure
   2. parents use alcohol
   3. our culture accepts drinking
   4. to seek relief from anxiety & frustrations
   5. to have a good time

2. At what age is drinking and driving legal? never

3. Fill in the chart below.

<table>
<thead>
<tr>
<th>Activity</th>
<th>Short term Rewards</th>
<th>Long term Rewards</th>
<th>Short term Consequences</th>
<th>Long term Consequences</th>
</tr>
</thead>
<tbody>
<tr>
<td>Drinking Alcohol</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Drug use</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Riding with a drinking driver</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Driving after using alcohol or drugs</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

(Students will complete this either individually or in groups to be used for class discussion)
Nature of Alcohol Related Crashes

1. Why are statistics for drug-related motor vehicle crashes often unavailable?

_Statistics for drug-related motor vehicle crashes are often not available because of the lack of comprehensive and uniform testing and standardized impairment levels._

2. Fill in the chart below: (Based on 2007 statistics)

<p>| | |</p>
<table>
<thead>
<tr>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Total number of crashes in Virginia</td>
<td>146,405</td>
</tr>
<tr>
<td>B. Total number of alcohol related crashes in Virginia</td>
<td>11,215</td>
</tr>
<tr>
<td>C. Percentage of alcohol related crashes in Virginia</td>
<td>7.7</td>
</tr>
<tr>
<td></td>
<td>(B ÷ A)</td>
</tr>
<tr>
<td>D. Number of drivers under the legal drinking age involved in alcohol-related crashes</td>
<td>1255</td>
</tr>
<tr>
<td>E. Total number of drivers involved in alcohol related crashes</td>
<td>11,251</td>
</tr>
<tr>
<td>F. Percentage of alcohol related crashes involved in underage drinking drivers</td>
<td>11</td>
</tr>
<tr>
<td></td>
<td>(D ÷ E)</td>
</tr>
<tr>
<td>G. Total number of licensed drivers in Virginia younger than 21</td>
<td>332,000</td>
</tr>
<tr>
<td>H. Total number of licensed drivers in Virginia</td>
<td>5,436,825</td>
</tr>
<tr>
<td>I. Percentage of licensed drivers in Virginia younger than 21</td>
<td>6</td>
</tr>
<tr>
<td></td>
<td>(G ÷ H)</td>
</tr>
<tr>
<td>J. Licensed drivers younger than 21 are over represented in alcohol related crashes by</td>
<td>5%</td>
</tr>
</tbody>
</table>

3. List two reasons licensed drivers younger than 21 years old are over represented in alcohol related crashes.

_Inexperienced at driving  
Inexperienced at drinking_
BAC FACTORS

1. Define BAC.

*Blood Alcohol Concentration is the percentage of alcohol related to the total amount of blood in the body. For example, one drop of alcohol per 999 drops of blood equals a .10 BAC.*

3. List six factors which affect an individual's BAC.

- Body weight
- Time spent drinking alcohol
- Gender
- Food consumed prior to and while drinking
- Alcohol content of the drink
- Size of the drink consumed

3. An alcoholic beverage which is 100 proof is _50_ % alcohol.

4. Determine the total alcohol content of the following:

<table>
<thead>
<tr>
<th>Drink Size</th>
<th>Drink</th>
<th>Alcohol Content</th>
<th>Total Alcohol Content</th>
</tr>
</thead>
<tbody>
<tr>
<td>12 oz</td>
<td>Beer</td>
<td>.045</td>
<td>.54 oz</td>
</tr>
<tr>
<td>12 oz</td>
<td>Beer</td>
<td>.052</td>
<td>.64 oz</td>
</tr>
<tr>
<td>12 oz</td>
<td>Light Beer</td>
<td>.035</td>
<td>.42 oz</td>
</tr>
<tr>
<td>16 oz</td>
<td>Beer</td>
<td>.045</td>
<td>.72 oz</td>
</tr>
<tr>
<td>1 oz</td>
<td>Whiskey</td>
<td>80° (.40)</td>
<td>.40 oz</td>
</tr>
<tr>
<td>1.5 oz</td>
<td>Whiskey</td>
<td>80°</td>
<td>.60 oz</td>
</tr>
<tr>
<td>5 oz</td>
<td>Wine</td>
<td>.12</td>
<td>.60 oz</td>
</tr>
<tr>
<td>12 oz</td>
<td>Malt Liquor</td>
<td>.077</td>
<td>.84 oz</td>
</tr>
<tr>
<td>12 oz</td>
<td>Cooler</td>
<td>.051</td>
<td>.61 oz</td>
</tr>
</tbody>
</table>
5. Are all alcoholic drinks the same?

No

6. What factors are responsible for the differences in alcohol content in various drinks?

Size of the drink
Percentage of alcohol in drink

7. Refer to slides T-7.8 and T-7.9.
   a. A 200 lb. male who registered a BAC of .03 has probably consumed _22_ ounces of light beer within an hour.
   b. A 200 lb. female who registered a BAC of .03 has probably consumed _18_ ounces of light beer within an hour.
   c. A 150 lb. male who registered a BAC of .03 has probably consumed _17_ ounces of light beer within an hour.
   d. A 150 lb. female who registered a BAC of .03 has probably consumed _13_ ounces of light beer within an hour.

8. Explain why there is a difference in the amount of alcohol needed for a male or female of the same weight to reach a .03 BAC.

Women do not metabolize alcohol as well as men due to limited production of the breakdown enzyme alcohol dehydrogenase that breaks alcohol down.

9. Explain the differences in the amount of alcohol needed for a 150 lb. male and a 200 lb. male to reach a .03 BAC.

Larger persons have more blood and other fluids than smaller persons. Since BAC is a mathematical ratio of alcohol to body fluids, it takes more alcohol to reach the same alcohol concentration in a larger person.

10. How does the amount of food in the stomach affect the absorption of alcohol?

Food coats the lining of the stomach and slows down the absorption of alcohol into the bloodstream. However, the alcohol will eventually reach the bloodstream.

11. Most alcohol is eliminated from the body through ___oxidation in the liver___.

12. The BAC elimination rate is approximately ___015___ per hour.

13. If a person has a BAC of .045 at 9 o'clock, when will he/she reach a zero BAC?

Around 12 o'clock – It will take the body 3 hours to reduce the BAC .045 (.015 x 3 = .045)
Physiological and Psychological Effects of Alcohol

1. Alcohol damage can cause either __alcoholic hepatitis__ or __cirrhosis__ of the liver.

2. The need to consume more of a drug to reach a given effect or the body’s ability to eliminate the drug faster is called ____tolerance____.

3. How does the use of alcohol affect the
   a. heart – Alcohol reduces the heart’s contractibility. Elevated diastolic blood pressure, swelling, and congestive heart failure are all associated with heavy drinking.
   b. stomach – Alcohol irritates the lining of the stomach and increases acidity. This can cause gastritis and ulcers.
   c. brain – Long term effects of alcohol on the brain include destruction of brain nerve cells and memory loss.

4. Give a brief explanation of how alcohol may affect each of the following:
   a. attention – Alcohol affects a person’s ability to comprehend several sources of information at the same time. Since driving requires attention to a large quantity of information, this is a significant impairment.
   b. memory – Alcohol reduces the brain’s ability to store and retain information. This impairment has been shown to occur at BACs as low as .03. Excessive use of alcohol can also result in “blackouts” (when the person does not remember anything that happened).
   c. emotions – Simple observation demonstrates that emotional control diminishes as more alcohol is consumed.
   d. aggression – Aggressive behavior is enhanced, especially when alcohol and competition are combined. This can become deadly in situations that escalate into road rage.

5. How can a person’s mood impact the effects of alcohol?
   Alcohol may completely alter the mood of a person or it may intensify an existing mood. Anger affects the same part of the brain as alcohol. Thus, if a person is angry and drinking, the effects of the alcohol may heighten that anger into rage.

6. What happens when alcohol is mixed with other drugs?
   Any depressant will interact with alcohol to accentuate the alcohol’s effect. In addition, the chemical reaction between alcohol and some other drugs may produce a much greater effect than alcohol or the drug taken alone.
Effects of Alcohol and Other Drugs on the Driving Task

1. Briefly explain how each of the following components of vision is affected by alcohol.

   a. Eye focus: Alcohol delays the eye’s ability to quickly change focus for close to far thus a driver may experience difficulty especially at higher speeds.

   b. Double vision: Each eye needs to work in conjunction with the other. Alcohol impairs this coordination and may produce double vision. Closing one eye will help some people cope with this condition, but doing that will greatly affect peripheral vision and distance judgment.

   c. Judging distance: - Alcohol reduces the ability to judge distances accurately.

   d. Side vision: - Alcohol reduces this field of vision. As the amount of alcohol increases, the side field of vision decreases.

   e. Night vision: - Alcohol reduces the ability of the eye to control the amount of light entering the pupil. This may intensify the effects of glare at night.

2. BACs as low as .015 -.049 produce increased risk-taking behaviors.

3. A BAC as low as .03 has been shown to diminish a driver’s ability to make multiple predictions.

4. A 16-19 year old driver with a BAC of .015 -.049 is 2.5 times more likely to be killed in a motor vehicle related crash than an alcohol-free driver.

5. A 16-19 year old driver with a BAC of .08 -.099 is 40 times more likely to be killed in a motor vehicle related crash than an alcohol-free driver.

6. List 5 ways drugs other than alcohol can affect the driving task.

   1. perception – understanding what we see or hear

   2. judgment – ability to make good decisions

   3. coordination

   4. vision

   5. mood

7. The drug (other than alcohol) most often found in drivers involved in crashes is marijuana.
8. List four effects marijuana has on the driving task.
   1. **Loss of tracking ability**
   2. **Inability to maintain a safe following distance**
   3. **Loss of ability to remain attentive to the driving task**
   4. **Reduced ability to divide attention between changing traffic situations**

9. Fill in the following chart:

<table>
<thead>
<tr>
<th>Prescription Drug</th>
<th>Examples</th>
<th>Medical uses</th>
<th>Driver impairment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Tranquilizers</td>
<td>valium, librium, unium</td>
<td>lower blood pressure relieve anxiety</td>
<td>similar to alcohol</td>
</tr>
<tr>
<td>Stimulants</td>
<td>retilin, appetite suppressants</td>
<td>weight reduction, keep alert</td>
<td>distractability, possible hallucinations</td>
</tr>
<tr>
<td>Narcotics</td>
<td>morphine, codeine</td>
<td>pain relievers</td>
<td>similar to alcohol</td>
</tr>
</tbody>
</table>

10. Impaired driving when taking prescription drugs carries the same legal penalties as a **DUI** conviction.
Driver Fatigue/Road Rage

Define fatigue.

*Fatigue is a physical state following a period of rigorous or extended mental or physical activity that is characterized by a lessened capacity for work and reduced mental efficiency.*

Give several examples of instances when fatigue has interfered with your performance in school, athletics, etc.

*Not enough sleep – poor performance on test*
*Stress at home – unable to perform well on athletic team*

Describe the circadian rhythm cycle.

*The circadian rhythm cycle is the body’s natural “down time”. It affects most people between 1 and 5 p.m. and around normal bedtime.*

List four strategies for delaying the onset of fatigue while driving.

*Avoid leaning forward*
*Avoid driving long stretches*
*Keep your eyes moving*
*Let in fresh air*
*Change drivers at regular intervals*
*Wear your safety belt*
*Adjust HVAC to cooler temperatures*

Think of three people you have observed driving. Call them Person A, Person B and Person C. Write yes or no in each column below to describe how they behave in daily life and while driving.

<table>
<thead>
<tr>
<th></th>
<th>Person A</th>
<th>Person B</th>
<th>Person C</th>
</tr>
</thead>
<tbody>
<tr>
<td>In Daily Life</td>
<td>While</td>
<td>In Daily</td>
<td>While</td>
</tr>
<tr>
<td>A. Obeys laws</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>B. Complains about actions of other people</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>C. Yells at others unnecessarily</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>D. Waits in line patiently</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>E. Is always in a hurry</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>F. Is considerate of others</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>G. Admits own mistakes</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>H. Usually is calm and relaxed</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>
6. Based on the previous chart, what conclusions can you draw? Does driving bring out the worst in people? Support your answer.

7. Name three types of aggressive drivers.
   - Quiet road rage aggressive drivers
   - Verbal road rage aggressive drivers
   - Epic road rage aggressive drivers

8. Describe several behaviors often exhibited by an aggressive driver.
   - Braking suddenly to “scare” a tailgater
   - Exceeding the speed limit by more than 10 mph
   - Changing lanes without signaling
   - “Cruising” in the passing lane
   - Criticizing other drivers
   - Tailgating

9. Describe a possible response of an aggressive driver and a defensive driver in the following situations.
   - You are driving at 65 mph in the passing lane on an expressway. The driver of the vehicle behind begins flashing his lights and blowing the horn.
     
     **Aggressive driver:**
     Maintains position and possibly slows down to aggravate the other driver

     **Non-aggressive defensive driver:**
     Changes lanes to allow the other driver to pass safely

   - You are in the right lane of a four-lane highway (2 lanes in each direction). There is a lane reduction sign ahead indicating traffic must merge into the right lane. A vehicle in the left lane accelerates to pass you and moves into the space cushion in front of your vehicle.
     
     **Aggressive driver:**
     Speeds up to make the lane change difficult for other driver
     Blows horn
     Yells at other driver

     **Non-aggressive defensive driver:**
     Reduces speed to let other driver in
     Reestablishes a safe following distance

10. Give an example of each of the following anger containment techniques.
    - Don’t up the ante – Do not respond to aggressive behavior exhibited by others. Avoid eye contact with an angry driver.
    - Choose the road “less traveled” - Act tolerant. Be forgiving. Be courteous.
Visibility in Adverse Conditions

1. You are approaching a vehicle with high beam head lights on. You quickly dim your high beam lights. The other driver does not respond. What should you do? Keep your lights on low beam. Look to the right edge of the lane or roadway as you pass the vehicle. Make brief glances ahead to monitor the path of travel.

2. How does the contemporary (BGE) mirror setting reduce glare? With the outside mirrors set approximately 15 degrees out, the glare from other vehicle’s headlights is reflected away from the driver.

3. In the diagram below, fill in the low beam headlight illumination distances.

   - area ahead = 300-500 ft.
   - roadway = _100-150 ft._

4. Why is 40-45 mph considered the maximum safe speed to travel at night when using low beam headlights? The driver should be able to stop in the distance the roadway is illuminated.

5. How does heavy weight in the trunk of your vehicle affect headlight illumination? Because the weight will cause the front end of the vehicle to rise, the light beam will be too high above the road surface.

6. Dirty headlights can cause up to a _50-90%_ loss of headlight efficiency.

7. When driving at night, how does having the interior light on affect your visibility? Interior lights cause a glare on the front windshield and reduce the eye’s ability to adapt to the dark exterior environment.

8. The lights of the vehicle behind you are on high beam. This is causing a glare in your rear-view mirror. What can you do to help alleviate this problem? To alleviate this problem, switch the day/night lever to the night setting. This causes the glare to be reflected upward rather than into the driver’s eyes.

9. What lights should be used in this situation? Low beam

10. How can using your air conditioner help defog windows? The air conditioner dehumidifies (pulls moisture from the air) which helps to dissipate moisture on the windows.

11. You are driving on an expressway. The fog has made it almost impossible to see. There are no exits nearby. Where is the safest place to stop? Pull the end of a guard rail and back up close to it. This will reduce your chances of being hit by other motorists.
12. What danger is represented in the illustration below?

Visibility | Stopping Distance

This is known as “overdriving your headlights”. The vehicle is unable to stop in the distance illuminated by the headlights.

13. How can gusting winds or strong steady crosswinds affect vehicle control?

Strong winds create a problem called buffeting. This condition occurs on bridges, through mountain passes and when being passed by large trucks. These wind gust and blasts can cause total loss of control of the vehicle.

14. What is the first thing the driver of this vehicle should do?

Clean all snow off the vehicle.

15. Apply the SEEiT system to the situation pictured below.

S Search for pedestrians, oncoming vehicles, vehicles leaving driveways, intersections, etc.

E Evaluate – The oncoming vehicle is on his side of the roadway. (What would you do if he begins to slide into your path of travel?)

E Execute – Cover the brake and identify an escape if needed.

In

Time
1. What precautions must this driver take to maintain control of his vehicle?

   *Know the depth of the water. Six inches of water can cause loss of control.*
   *Reduce speed to reduce the chance of hydroplaning. Wait for any oncoming vehicles to clear the water before crossing. Driver toward the center as the water depth is usually less there. Dry the brakes immediately after crossing low water.*

2. Describe how hydroplaning occurs?

   *Hydroplaning occurs when water builds up between the tire and road surface. This results in no traction or control for the affected tires.*

3. How could this situation have been avoided?

   *You should not attempt to drive across bodies of water unless you know the depth.*

4. If the water depth is 2 feet or greater, what will probably happen to this vehicle?

   *The vehicle will probably float.*

5. Name ways to estimate the depth of water on a roadway.

   *Look for items that will help you estimate the depth of the water such as fence posts, fire hydrants, and parked vehicles. If the water comes to the bottom of your vehicle, do not proceed. Turn around and find another route.*

6. After driving through deep water, how can you dry the brakes?

   *To dry brakes, apply slight pressure to the brake pedal with the left foot while continuing to accelerate with the right foot. This creates heat in the brakes and helps dry them.*
7. How can you minimize the effects of the glare produced by intense sunlight?
   *Keep the windshield clean inside and out. Use sunglasses.*

8. What maintenance services should you perform on a vehicle after driving through dusty or sandy areas?
   *Have the oil, oil filter and air filter changed.*

9. Fill in the charts below.

<table>
<thead>
<tr>
<th>Item</th>
<th>COLD WEATHER CHECKS</th>
<th>HOT WEATHER CHECKS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Battery</td>
<td>Fluid/Clean cables/cranking power</td>
<td>Fluid/Clean cables/cranking power</td>
</tr>
<tr>
<td>Radiator</td>
<td>Proper antifreeze/water ratio/level</td>
<td>Proper coolant/water ratio/level</td>
</tr>
<tr>
<td>Tires</td>
<td>Proper inflation/tread for ice or snow</td>
<td>Proper inflation/tread</td>
</tr>
<tr>
<td>Oil</td>
<td>May want to change to a thinner oil</td>
<td>May want to change to a thicker oil</td>
</tr>
</tbody>
</table>

11. List five tips for driving in snow or ice.
   *Clean all snow off vehicle and clean all windows before starting out.*

   *Accelerate gently.*

   *Increase following distance.*

   *Significantly reduce speed.*

   *Maintain an open line of sight and path of travel.*

   *Give yourself extra room to stop.*

   *Do NOT use cruise control on slippery surfaces!*

12. When driving into a strong headwind, you may have to _accelerate_ to maintain speed. When there is a tailwind, you will need to _brake_ to maintain speed.
Protecting Occupants

1. Identify and explain the purpose of each of the following occupant protection devices.

<table>
<thead>
<tr>
<th>Name</th>
<th>Purpose</th>
</tr>
</thead>
<tbody>
<tr>
<td>Safety belt</td>
<td>Keep occupants in position</td>
</tr>
<tr>
<td>Head restraint</td>
<td>Prevent whiplash injuries</td>
</tr>
<tr>
<td>Air bag</td>
<td>Provides additional protection against impact with the vehicles interior</td>
</tr>
</tbody>
</table>

2. If a vehicle in which you are a passenger is traveling at 65 mph, your body is traveling _65_ mph. If the vehicle hits a tree and stops immediately, your body is still traveling _65_ mph.

3. What do you think will cause your body to stop moving in the situation described above if you are not wearing a safety belt?

_The steering wheel, windshield or tree will stop your body._

4. A safety belt should fit snugly across the _sternum_ and _hips_.

5. Describe how to properly adjust a head restraint.

_The head restraint should be adjusted to the middle of the back of the head just above the ears._

6. All children younger than _6_ years old are required to be in a child restraint device.

7. All children younger than _12_ years old should ride in the back seat of a vehicle. Babies less than _20_ lbs. should be in a rear facing child restraint in the rear seat of the vehicle.
8. Why are airbags considered supplemental restraint systems?
   Air bags are considered supplemental because they automatically activate with no input from passengers and they are intended to be used in conjunction with safety belts not in place of them.

9. Explain safety adjustments needed for a driver with an airbag-equipped vehicle.

   Seating position: at least 10 inches from steering wheel
   Steering wheel tilt: tilted toward the chest
   Hand position: balanced position below 9-3

10. An airbag deploys at speeds up to 200 mph.

11. Using the diagram below, explain how a safety belt works.

   ![Diagram of safety belt system]
   This safety belt system works with a pendulum and ratchet system. When the vehicle is moving, the pendulum is straight and the ratchet is not engaged. Sudden slowing of the vehicle causes the pendulum to move and the ratchet to be engaged and stop the belt movement.

13. What is meant by the “second collision” in a motor vehicle crash?
   The first collision is when the vehicle makes contact with an outside force, stopping the vehicle. The “second collision” occurs when the bodies in the vehicle collide with vehicle parts.

14. If your friends give the following “reasons” for not wearing a safety belt, what would be your response?

   1. I drive at low speeds most of the time.

      Your response
      Most fatal crashes occur at speed less than 45 mph. To calculate the force of impact, multiply the speed by weight (e.g., a 125 lb person traveling 30 mph would create a force of 3750).

   2. I’d rather be thrown clear of the car in a collision.

      Your response
      Statistics have proven that your chance of surviving a crash is much greater if you remain in the vehicle. Survival of automobile race drivers in high speed crashes is a good example of this fact.

   3. I only drive on short trips.

      Your response
      Most fatal crashes occur within 25 miles of the victim’s home.
Roadway and Vehicle Technology

1. Explain how each of the roadside technologies below makes roadways safer.

   - Rumble strips are installed on the edge of the roadway to alert drivers who run off the road.
   - Crash attenuators are liquid or sand filled drums which help reduce the force of impact when hit.
   - Guard rail ends have been buried in the ground to reduce the severity of a crash.

2. Explain when and why you would place your vehicle in this position.
   This vehicle has been backed up to a guard rail end. This will greatly reduce the likelihood of the vehicle being hit by other vehicles using the roadway. This is the safer position when stopped in low visibility weather or for vehicle failure.

3. From the list below, choose the automotive technology that is activated to complete the next four questions.

<table>
<thead>
<tr>
<th>Anti-lock brake system</th>
<th>Traction control system</th>
</tr>
</thead>
<tbody>
<tr>
<td>Suspension control system</td>
<td>Electronic stability program</td>
</tr>
</tbody>
</table>

1. _Electronic stability program_ analyzes where the driver is trying to steer the vehicle and where the vehicle is actually going. If the vehicle is not responding correctly to steering input, any one of the brakes is selectively applied to help the driver regain control.

2. While the driver is accelerating, a _traction control system_ will automatically activate brake sensors if a wheel begins spinning.

3. The _suspension control system_ adjusts vehicle balance by adjusting the fluid or air pressure of shock absorbers or struts when too much weight is suddenly shifted to a wheel.

4. The _anti-lock braking system_ allows the driver to apply maximum braking power without losing steering control.
Traction Loss Concerns

1. Define traction.

_Traction is the grip between the tires and the road surface which allows a vehicle to start, stop, and/or change direction._

2. Name the three types of vehicle traction and give an example of each.

_Static – the vehicle is not moving. This allows maximum traction between the tire and road surface._

_Rolling – when the vehicle is moving. Amount of traction in this situation depends on tire and road surfaces._

_Sliding – vehicle is moving/tires are not rolling. This results from loss of traction while the vehicle is in motion._

3. Why is traction reduced during the first 15 minutes after it starts raining?

_At the beginning of a rainstorm, water, dirt, oil and rubber combine on the roadway surface making the road extremely slippery._

4. How can each of the following affect tire traction?

_Brakes unevenly adjusted: Brakes pulling in one direction or the other can lead to a skid._

_Tires with worn tread: Tread is necessary for traction in wet weather. Worn tread cannot channel water effectively and will result in traction loss and hydroplaning in wet weather._

_Uneven tire pressure: The effects of uneven tire pressure are similar to the effects of unevenly adjusted brakes. The vehicle may pull to one side or the other and result in a skid._

5. Sudden or hard braking results in a weight transfer to the _front_ of the vehicle and a possible loss of traction to the _rear_ tires.

6. Sudden or hard acceleration results in a weight transfer to the _rear_ of the vehicle and a possible loss of traction to the _front_ tires.

7. Sudden or excessive steering results in weight transfer to the _side_ and possible loss of traction to both the _front_ and _rear_ tires.

8. In the diagram below, the driver is steering _left_ but the vehicle is continuing to move _straight_. This results from loss of traction to the _front_ tires and is called _understeer_.

![Diagram showing intended and actual path of travel](image-url)
9. If you find yourself in the situation above, your first response should be to _release_ the accelerator or brake. Look and steer toward _your intended path of travel_. If your vehicle is equipped with ABS, braking will help shift the weight to the _front_ to help regain traction. A quick _jab_ of the brakes in vehicles without ABS will produce the same weight transfer. To avoid this situation, you should _brake_ before entering a curve or turn and avoid _over_ steering.

10. In the diagram below, the driver’s intended path of travel is _straight_ but the rear of the vehicle is _sliding right_. This results from loss of traction to the _rear_ tires and is called _oversteer_.

[Diagram of vehicle with intended and actual path of travel]

11. If you find yourself in the situation above, your first response should be to _release_ the brake or accelerator. Look and steer toward _your intended path of travel_. Very light progressive acceleration will help shift weight to the _rear_ to help regain traction.

12. ABS is helpful in _understeer_ traction loss and traction control systems are helpful in _oversteer_ traction loss.

13. If you run off the road,

- stay _off the road_ until you regain vehicle balance;
- ease off the _accelerator_ and activate _ABS_ (if vehicle is equipped);
- align the middle of the vehicle with _the edge of roadway_;
- check _traffic_;
- if clear, return to the roadway using no more than _1/8 – 1/4_ turn of the steering wheel; and target _intended path of travel_.

[Red X mark]
Vehicle Functions/Malfunctions

1. What do each of the following lights indicate? What should you do if they come on while you are driving?

   This light/gauge warns you when the coolant in the engine is too hot or too low. If it comes on, pull off the road in a safe place and allow the engine to cool. Check hoses and belts and add water/coolant mixture as needed to get professional help.

   The oil pressure warning light/gauge warns you when the oil is not circulating at the proper pressure or there is not enough oil. If this light comes on, check the oil level (on a level surface with the engine off) or get professional help.

   The alternator warning light/gauge monitors the electrical system. If the gauge shows “discharge” or the light comes on while the engine is running, the alternator is not recharging the battery. This means the vehicle is running off the battery’s stored power. When the battery power is depleted, the engine will stop. Turn off all accessories when this light comes on and get professional help as soon as possible.

   Service Engine

   This is a warning light that illuminates prior to starting the vehicle. If this light does not go out, professional help is needed to diagnose the problem.

2. The following lights come on when the key is turned to the on position. Explain what each light indicates and what you should do if the light does not go out.

   This is the air bag alert light. The system runs an automatic check on the air bag system when you start the engine. However after starting the engine, the light should go out immediately. If it does not, there may be a problem with the air bag system.

   This is the anti-lock brake system alert light. The system runs an automatic check on the ABS system. The light should go out immediately after starting the engine. If it does not, there may be a problem with the ABS system.

   This is the safety belt warning light. It serves as a reminder to buckle up the safety belts. In some vehicles, this light will go out after a certain time period (5 to 8 seconds).
I just received my PDL-90 last week. My parents let me drive by myself for the first time yesterday. What an experience! I didn’t want them to know how nervous I was so I pretended to know how to handle any situation that might occur. Boy was I in for a surprise! I had driven about 10 miles when suddenly the car began to pull hard to the right. Remembering what I had learned in driver education, I determined I was probably experiencing a __tire blowout__. Thankfully, I paid attention that day! So I

• held the steering wheel firmly;
• took my foot __off the accelerator__;
• did not touch the __brake__;
• let the vehicle __slow down__;
• checked traffic, turned on the __emergency flashers__ and drove to ___a protected location off the roadway_____ to replace the tire.

After getting safely off the road, I found that my right front tire was flat. Fortunately everything I needed to change the tire was in the trunk. I secured the vehicle by making sure it was in __park__, setting the parking brake and removing the __keys__. To make sure the vehicle would not move, I placed blocks__behind the rear tires__. I slightly loosened the __lug nuts__. I then jacked the vehicle up enough to be able to remove the old tire and replace it with the spare. Once the spare was in place, I replaced the lug nuts in a __diagonal__ pattern and finger tightened each nut. I then lowered the jack until the tire __touched the ground__, which allowed me to use the lug wrench to tighten the lug nuts. Once tightened, I could let the vehicle all the way down, recheck the lug nuts and put everything back in the trunk.

When I tried to start the vehicle, I could smell gasoline and the engine would not start. It must be __flooded__. I tried to start the engine a couple more times with no luck. Then I remembered that I should __push the accelerator all the way down__ while trying to start the engine. That worked.

Boy I was glad to get home. I found out there is a lot more to driving than just avoiding conflicts and keeping the car on the road.

4. Describe the proper driver actions in the following situations.

• Accelerator sticks – Shift to neutral, look for an escape path, steer smoothly and brake gently and pull off the roadway to stop

• Foot brake fails – Pump the brakes rapidly. This may build up enough brake pressure to steer off the roadway and stop. If this doesn’t work, downshift to a lower gear, look for an escape route and apply the parking brake gradually (holding the release button to maintain control).
Tires & Suspension

1. The two main purposes of tires are to _grip the road for traction_ and _provide air-filled cushions for a smoother ride_.

2. Why are good tires essential for vehicle control?
   *The traction between the tires and roadway allows the driver to accelerate, brake and steer the vehicle.*

3. A C rating for traction on a tire indicates _the tire meets MINIMUM government standards_.

4. A vehicle owner can find the proper tire inflation in the following locations:
   - In the owners manual
   - Mounted on a plate on the door jamb

5. What is the purpose of tire tread?
   *The purpose of tire tread is to provide traction on wet roadways. The tread channels the water away to allow tires to remain in contact with the road surface.*

6. An easy method of measuring tread depth is to _use the penny test_. This is done by placing a penny head first into the tread groove – if you can see the top of Lincoln’s head, replace the tire.

7. Two major dangers of under-inflated tires are:
   - Under-inflated tires make handling the vehicle more difficult.
   - Under-inflated tires increase the risk of a blowout.

8. Excessive wear in the middle of a tire indicates _an over-inflated tire_.

9. List some common indications of steering problems.
   - Play or excessive movement in the steering wheel
   - Steering difficulty, even though the tires are properly inflated
   - Shimmying, wobbling, shaking or pulling to one side under normal driving conditions
   - Squealing sounds when making turns

10. If a vehicle bounces more than usual, it may indicate worn _shocks_.

For more information on tire safety visit:
    www.rma.org/tire_safety/driver_education_tire_safety_curriculum/
1. Briefly explain what is happening in each of the strokes of a four-stroke cycle engine.
   1-intake – The gas/air mixture is drawn into the piston
   2-compression- The piston pushes upward and compresses the gas/air mixture.
   3-ignition – a spark is supplied by the spark plug, igniting the gas/air mixture and forcing the piston down.
   4 – exhaust – The piston pushes upward and forces burnt gasses into the exhaust system.

2. Which of the vehicle systems is pictured below?

   The electrical system

3. Why is the air filter included as part of the fuel system?

   Air is drawn through the air filter into the carburetor/fuel injectors where it is mixed with gas. Engines burn a gas/air mixture.

4. What is the purpose of the drive shaft in a rear-wheel drive vehicle?

   The drive shaft carries power from the transmission to the rear in rear-wheel drive vehicles.

5. Explain the purpose of each of the parts of the exhaust system.

   Burned gases from the engine are collected in the exhaust manifold. The catalytic converter reduces the amount of harmful gases. The exhaust pipe carries the gases to the muffler. The muffler absorbs noise. The tailpipe takes the gases from the vehicle into the surrounding air.
6. Give the name and function of each of the items pictured below.

- **Jumper cables** are used to transfer electrical energy from a good battery to a dead battery to start the vehicle with the dead battery.

- **The oil filter** cleans the oil as it circulates. The oil filter should be changed with every oil change.

- **The water/coolant mixture circulates through the radiator.** It is in the radiator that this mixture is cooled by the fan.

- **The spark plug** supplies the electrical spark that ignites the gas/air mixture in the pistons.

- **The fan** is located behind the radiator and cools the water/coolant mixture as it circulates through the radiator.

- **The battery** provides power to start the engine. It also allows you to operate accessories when the engine is not running.

- **The air filter** filters out dust and other dirt particles out of the air to be mixed with gas.
Anti-Lock Brake Systems

1. How do you know if your vehicle is equipped with ABS?

   ![ABS Light]
   
   This light will appear on the dashboard when the ignition is turned on.

2. How can you determine if the ABS system is working properly?

   The ABS light on the dashboard will immediately go out.

3. How do anti-lock brakes affect:

   braking distance?
   Braking distance may be longer on some surfaces such as snow or loose gravel.

   steerability?
   Steerability refers to the ability to maneuver the vehicle where the driver wants it to go. Because the wheels continue to roll and not slide with ABS, the driver maintains steerability.

4. Draw the path of travel for vehicle A in the illustrations below.

   Car B stops suddenly. Car A applies maximum braking and steers left.

   VEHICLE A IS NOT EQUIPPED WITH ABS

   ![Vehicle A without ABS]

   VEHICLE A IS EQUIPPED WITH ABS

   ![Vehicle A with ABS]

5. Explain the following ABS procedures.

   stomp – Hit the brake hard to activate the ABS

   stay – Maintain pressure on the brake. Don’t let up.

   steer – Steer towards the intended path of travel.

6. If the brake pedal pulsates and the braking system makes unusual noises, what should the driver do?

   Continue braking as the pulsating brake pedal and braking noises are normal when ABS is activated.
Vehicle Performance

1. Draw the “no zone” for the truck below.

2. What mistake is the car making in the diagram below?

   It is a mistake to move into the space on the right side of the truck. The truck may be planning to turn right and will need a larger turning radius to make the turn in order to prevent the rear tires of the trailer from hitting the curb.

3. How can the driver of the car below determine that he/she has established a good following distance?

   To determine that a minimum following distance has been established, the driver should be able to see the truck’s side mirror.

4. What rules of the road must this cyclist follow?

   The cyclist must follow the same rules of the road as any motorist.

5. What are the top two errors resulting in motorist/cyclist crashes?
A motorist making a left turn in front of a motorcycle
*A motorcyclist driving in a motorist blind zone resulting in a collision when the motorist attempts to change lanes.*

6. Fill in the chart below with the appropriate characteristics for each of the listed vehicles.

<table>
<thead>
<tr>
<th>Characteristics</th>
<th>TRUCK</th>
<th>SUV</th>
<th>MOTORCYCLE</th>
<th>TRUCK</th>
<th>TRAIN</th>
<th>CONSTRUCTION VEHICLES</th>
<th>FARM MACHINERY</th>
<th>RECREATIONAL VEHICLE</th>
<th>BICYCLE</th>
<th>MOPED</th>
</tr>
</thead>
<tbody>
<tr>
<td>Quick acceleration</td>
<td></td>
<td></td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Slow acceleration</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Required to stop at intersections</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Good occupant protection</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Poor occupant protection</td>
<td></td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Easily seen</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Hard to see</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>x</td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>High center of gravity</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Extended stopping distance</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Oversized vehicle</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Quick maneuverability</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>x</td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Large blindzones</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Large turning radius</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
<td>x</td>
<td>x</td>
<td>x</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

7. How can the driver of a motor vehicle help protect motorcyclists?
   *Search for motorcyclists.*
   *Allow more space around motorcyclists.*
   *Remember motorcycles weight less and stop quicker than automobiles.*

8. Most vehicle/train crashes result from **driver error**.

9. This sign is the same as a **yield** sign.
Financial Responsibility

1. Virginia’s financial responsibility law requires that all registered motor vehicle owners show proof of ability to pay for any damages that may result from an automobile collision. Two methods of satisfying this law are liability insurance or uninsured motorist fee.

2. The minimum amount of insurance coverage required by law is
   - $25,000 for bodily injury or death of one person;
   - $50,000 for bodily injury or death of two or more persons; and
   - $20,000 for property damage.

Read each description below. Fill in the blank with the type of insurance you think will cover each incident.

3. The light ahead is red. You begin to slow down but the driver of the vehicle behind you does not respond. His vehicle runs into your vehicle and damages your fender.

4. You are shocked to discover that your vehicle has been stolen.

5. You are approaching a red light and your brakes fail. Unfortunately, you hit a vehicle in the intersection and injure the driver. The other driver sues you for medical expenses.

6. Which type of insurance will pay for your vehicle in the previous question?

7. You approach a curve too fast causing your vehicle to leave the roadway and run into a yard damaging several bushes.

8. You are parked at the mall. When you return from shopping, you discover that someone has hit the side of your vehicle and left without leaving any information.

9. Uninsured motorist fee in Virginia is $500 and provides no insurance coverage.
10. Describe how each of the following can affect the cost of insurance:

age – Because young drivers statistically are involved in more crashes, their rates are higher.

gen – Men have more crashes than women, therefore their rates are higher.

deductible – Raising the amount of the deductible will lower the premium.

driving record – Insurance companies have a “point” system for violations. As points increase, so do rates.

vehicle equipment – Many companies will give a discount for vehicles with safety equipment such as ABS, side air bags, etc.

11. Mr. X was driving his car and was involved in a serious crash that was his fault. One of his legs was broken in the collision. Two people in the other car were also injured. Mr. Y, the owner of the other vehicle, and Mrs. Z, his passenger, were both hospitalized. The medical expenses for Mr. Y and Mrs. Z were $24,000 and $26,000 respectively. Mr. X’s medical expenses were $850 and the damage to Mr. X’s car was $8,500. Mr. Y’s car was declared a total loss with an actual cash value of $22,500. Using the information on the right, answer the questions below.

How much will Mr. X’s insurance company pay for Mr. Y’s medical expenses?

$24,000

Under which coverage will Mr. Y be paid for his medical expenses?

liability

How much will Mr. X have to pay for Mr. Y’s medical expenses?

0

Why? He has enough liability insurance to cover the cost.

How much will the insurance company pay Mrs. Z for her medical expenses?

$25,000

How much will Mr. X have to pay Mrs. Z for her medical expenses?

$1,000

Why? Mr. X only has a limit of $25,000 per person on his liability insurance.

What kind of insurance will pay for Mr. X’s medical expenses?

medical pay

Which coverage will pay for the repair of Mr. Y’s car?

liability

How much will the insurance company pay for the repairs to Mr. Y’s car?

$20,000

How much will Mr. X have to pay for Mr. Y’s car repairs?

$2,500

Why? Mr. X’s property damage liability is limited to $20,000

Which coverage will pay for the repairs to Mr. X’s car?

collision

How much will the insurance company pay to repair Mr. X’s car?

$8,250

How much will Mr. X have to pay to repair his car?

$250

Why? Because he has $250 deductible.
Buying a Used Vehicle

Examine a used vehicle and fill in the chart below:

<table>
<thead>
<tr>
<th>STATIONARY CHECKS</th>
<th>Yes</th>
<th>No</th>
<th>INTERIOR</th>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>BODY</td>
<td></td>
<td></td>
<td>Upholstery in good condition</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Seams/doors &amp; fenders align evenly</td>
<td></td>
<td></td>
<td>Dashboard in good condition</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Has no body filler</td>
<td></td>
<td></td>
<td>Headliner in good condition</td>
<td></td>
<td></td>
</tr>
<tr>
<td>All body panels same color</td>
<td></td>
<td></td>
<td>Seats adjust easily</td>
<td></td>
<td></td>
</tr>
<tr>
<td>TIRES</td>
<td></td>
<td></td>
<td>Door handles &amp; window cranks work easily</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Same amount of tread</td>
<td></td>
<td></td>
<td>Interior and dash lights work</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Same size</td>
<td></td>
<td></td>
<td>HVAC system works</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spare tire/ jack/ lug wrench</td>
<td></td>
<td></td>
<td>CHECKS TO BE MADE WITH A LICENSED DRIVER ONLY</td>
<td></td>
<td></td>
</tr>
<tr>
<td>SUSPENSION</td>
<td></td>
<td></td>
<td>CHECKS WITH ENGINE RUNNING</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Vehicle appears to be level</td>
<td></td>
<td></td>
<td>Warning &amp; access lights function properly</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Corners do not bounce more than 2 times</td>
<td></td>
<td></td>
<td>Starts easily</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Does not make noise when corners are bounced</td>
<td></td>
<td></td>
<td>Idles smoothly</td>
<td></td>
<td></td>
</tr>
<tr>
<td>ENGINE COMPARTMENT</td>
<td></td>
<td></td>
<td>Parking brake holds vehicle firmly</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No signs of oil or fluid leaks</td>
<td></td>
<td></td>
<td>Engine runs smoothly during operation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No cracks in belts</td>
<td></td>
<td></td>
<td>Engine has reserve power</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No bulges or cracks in hoses</td>
<td></td>
<td></td>
<td>No warning lights come on during operation</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Correct amount of fluids - brake/oil/transmission/steering</td>
<td></td>
<td></td>
<td>Transmission shifts smoothly</td>
<td></td>
<td></td>
</tr>
<tr>
<td>UNDER THE VEHICLE</td>
<td></td>
<td></td>
<td>Brakes stop vehicle adequately</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No fluid leaks</td>
<td></td>
<td></td>
<td>Vehicle does not pull to either side when the brakes are applied</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Exhaust system free of rust</td>
<td></td>
<td></td>
<td>There is no vibration in the steering wheel</td>
<td></td>
<td></td>
</tr>
<tr>
<td>No bulges on inside of tires</td>
<td></td>
<td></td>
<td>The vehicle responds immediately to steering input</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

*There is no answer key as this is used for a classroom discussion.*
Estimating the Cost of Owning a Vehicle

No answer key is needed as students supply their own estimates.

Use this worksheet to estimate the cost of owning and operating a vehicle.

<table>
<thead>
<tr>
<th>Description</th>
<th>Example Costs</th>
<th>Your Vehicle Costs</th>
</tr>
</thead>
<tbody>
<tr>
<td>A. Vehicle Initial Cost</td>
<td>($20,000)</td>
<td></td>
</tr>
<tr>
<td>B. Titling Tax (3%)</td>
<td>($600)</td>
<td></td>
</tr>
<tr>
<td>C. Down Payment</td>
<td>($2,000)</td>
<td></td>
</tr>
<tr>
<td>D. Amount financed</td>
<td>($18,600)</td>
<td></td>
</tr>
<tr>
<td>E. Finance Charge</td>
<td>($2,700)</td>
<td></td>
</tr>
<tr>
<td>F. Payments per year</td>
<td>($7,130)</td>
<td></td>
</tr>
<tr>
<td>G. Insurance per year</td>
<td>($1,500)</td>
<td></td>
</tr>
<tr>
<td>H. Registration &amp; tags</td>
<td>($50)</td>
<td></td>
</tr>
</tbody>
</table>

Amount financed x interest rate x number of years financed divided by 2.
Ex: $18,600 x .10 (interest rate) = $1,860
1,860 x 3 = $5,580/2 = $2,790

Amount financed + finance charge / number of months financed.
Ex. $18,600 + $2,790 = $21,390/3 = $7,130

You will be required to purchase collision insurance as well as liability insurance since the vehicle is financed.

License plates are approximately $30 per year (more if special plate).
County tags are approximately $20.
<table>
<thead>
<tr>
<th>Item</th>
<th>Cost</th>
<th>Formula/Explanation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Estimated total mileage per year</td>
<td>(15,000)</td>
<td></td>
</tr>
<tr>
<td>Yearly cost of oil changes</td>
<td>($ 125)</td>
<td>Total mileage/3000 (recommended oil change) x $25</td>
</tr>
<tr>
<td>Cost of fuel per year</td>
<td>($ 1,180)</td>
<td>Total mileage divided by mpg multiplied by price of gas. Ex: 15000/21(mpg) = 715 gal. @ $165 = $1180</td>
</tr>
<tr>
<td>Yearly cost of tires</td>
<td>($ 150)</td>
<td>Multiply miles per year by .01. Based on a set of tires lasting 40,000 miles and costing $400.</td>
</tr>
<tr>
<td>Yearly cost of repairs and maintenance</td>
<td>($ 300)</td>
<td>Multiply miles driven by .02. Includes air filters, fuel filters, tire rotation, alignments, etc. DOES NOT INCLUDE MAJOR REPAIRS SUCH AS TRANSMISSION, ENGINE,</td>
</tr>
<tr>
<td>Total yearly costs</td>
<td>($10,435)</td>
<td>Sum: F+G+H+J+K+L+M</td>
</tr>
<tr>
<td>Monthly costs of owning a vehicle</td>
<td>($ 870)</td>
<td></td>
</tr>
</tbody>
</table>
Trip Planning

1. How does a car-top carrier affect vehicle handling?
   A car-top carrier will raise the center of gravity of the vehicle, causing it to be more likely to roll over in abrupt steering situations or on sloped roadways.

2. What is the safest time of day to travel?
   Since two out of three fatal crashes occur at night, avoid driving after dark when visibility is limited and particularly after 11 p.m. when you are fatigued and more apt to fall asleep. When driving alone, never drive more than six to eight hours. When there are two or more drivers, total driving time should not exceed 10-11 hours. Know your circadian rhythm.

   Use a Virginia map to answer the following questions.

3. Explain each of the following symbols found on the map’s legend.
   - This symbol indicates a interstate highway.
   - This symbol depicts the location of a hospital.
   - This is the symbol for a rest area.
   - The location of a commercial airport is depicted by this symbol.
   - You can determine the exit number with this symbol.

4. According to the map’s index, Winchester’s coordinates are:

5. Using your map’s mileage distance chart, calculate how far it is from Richmond to Winchester?

6. If Winchester is 10 ½ inches from Richmond on the map, using your map’s mileage scale, determine the distance between Winchester and Richmond.

7. Identify a travel route from Norfolk to the Eastern Shore of Virginia?

8. Plan a trip from Harrisonburg to Richmond.
   What state rural route could you take for the entire trip?
   If you prefer interstate travel, what two interstates would you use?
   If you average 50 miles per hour, how long will the trip take?
   If your vehicle averages 22 mpg and gas costs $1.65, how much should you budget for gas for the round trip?
   What national park is close to Harrisonburg?