American Driver and Traffic Safety Education Association

Unit A Supplemental

Travel Planning, Loading, Towing and Driving Special Vehicles
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# Unit A Travel Planning, Loading, Towing and Driving Special Vehicles

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- Video Review A.2 and ANSWER KEY: Driving Special Vehicles
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Overview

Unit A will explain to the driver how to effectively plan for travel by preparing a trip plan, developing a driving route, and preparing the vehicle for travel.

Students will also be introduced to the skills required for safely towing a boat or trailer, the techniques for backing a trailer successfully, equipment needed to tow a trailer and how to load a trailer properly.

Objectives

The student will:

1. Describe the preparation needed before taking trips and planning considerations of the vehicle, vehicle loading and equipment, and personal considerations when driving to a destination far away.

2. Describe the skills required for safely towing a boat or trailer and the techniques required to back a trailer successfully.

3. List the basic equipment needed to tow a trailer safely, describe how to connect a trailer to a vehicle, and explain the procedure for distributing weight when loading a trailer.

4. Define key words associated with the unit objectives.

Words to Know

- Coupler
- Down time
- Highway hypnosis
- Hitch ball
- Increased following distance
- Jackknife
- Large vehicle considerations
- Navigation system
- Safety chains
- Tongue
- Towing
- Trailer hitch
# Unit A Travel Planning, Loading, Towing and Driving Special Vehicles

## Unit A Introduction

### Lesson Overview

- **Time Frame**: 2 hours

### Teacher Information and Resources

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| Unit A Test     | Unit A Test – Travel Planning, Loading, Towing and Driving Special Vehicles – 10 questions |
## Unit Objectives:
Student will define the meaning of the key words in Unit A.

<table>
<thead>
<tr>
<th>Key Words</th>
<th>Materials and Resources</th>
</tr>
</thead>
</table>
| ➢ **Learning Activity A.0**  
Throughout the instruction of Unit A, conduct learning activity to help students with vocabulary and spelling of key words. | ➢ Learning Activity A.0: Key Words – Word Wall |
Information

Students begin to assimilate a new language in driver and traffic safety education. Some words are familiar, but others are new. The use of a word wall helps students with vocabulary and spelling as well as provides students with a tool for reference without “giving away” answers.

Materials Needed

1. Make word cards out of paper, poster board, or card stock cut in strips.
2. Markers in various colors.
3. A space to post words (i.e., bulletin board).
4. Tape or stapler and staples to affix cards on the word wall.

Learning Activity

1. As the instructor introduces new words in a unit, the instructor should post these words on the word wall.
   a. The instructor should remind students to use the words on the wall for recall and correct spelling.
   b. When an instructor poses a question and a student correctly answers the question, the instructor should allow that student to make a word strip and post the strip in the designated location on the word wall. Because this is new learning, recalling words are part of the learning process.
   c. Students often enjoy decorating their word with a particular flair, color, or design.
2. Words may remain posted for just the unit or remain posted throughout the course.
# Unit A Travel Planning, Loading, Towing and Driving Special Vehicles

## Unit Objectives and Travel Planning

### Lesson Objective:
Student will describe the preparation needed before taking trips and planning considerations of the vehicle, vehicle loading and equipment, and personal considerations when driving to a destination far away.

### Part 1

#### Lesson Content

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<thead>
<tr>
<th>Lesson Content</th>
<th>Materials and Resources</th>
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</thead>
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<tr>
<td><strong>Unit Objectives</strong></td>
<td><strong>Slides A.1 and A.2:</strong> Title and Objectives</td>
</tr>
<tr>
<td>- Slides A.1 and A.2</td>
<td>- Slides A.1 and A.2: Title and Objectives</td>
</tr>
<tr>
<td>Give an overview of what students should know and be able to do by the end of this unit.</td>
<td>- Fact Sheet A.1: Travel Planning</td>
</tr>
<tr>
<td><strong>Travel Planning</strong></td>
<td>- Slides A.3 and A.4: Preparing for Any Trip (Plan the Route, Prepare and Maintain the Vehicle)</td>
</tr>
<tr>
<td>- Fact Sheet A.1</td>
<td>- Slides A.3 and A.4: Preparing for Any Trip (Plan the Route, Prepare and Maintain the Vehicle)</td>
</tr>
<tr>
<td>Duplicate and distribute Fact Sheet A.1 for students to use as a resource and study guide.</td>
<td>- Prepare and Maintain the Vehicle</td>
</tr>
<tr>
<td>- Slides A.3 and A.4</td>
<td>- Before traveling checks:</td>
</tr>
<tr>
<td>Discuss how to prepare for a long trip by planning the route and preparing the vehicle.</td>
<td>- Headlights</td>
</tr>
<tr>
<td>Explain how to regularly maintain the vehicle to keep it safe and efficient.</td>
<td>- Windshield wipers</td>
</tr>
<tr>
<td>- Identify route</td>
<td>- License plate</td>
</tr>
<tr>
<td>- Use websites which give directions</td>
<td>- Flat tires</td>
</tr>
<tr>
<td>- Know route numbers, entrance and exit numbers</td>
<td>- Engine compartment (license, oil change)</td>
</tr>
<tr>
<td>- Consider rest, fuel and food stops, construction and time of day</td>
<td>- Tires</td>
</tr>
<tr>
<td>- GPS can be useful, but set before driving</td>
<td>- Tires</td>
</tr>
</tbody>
</table>

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When planning an extended drive, preparing in advance can help save time and money and make the trip a safe one.

- **Plan the route** – identify the route before leaving. This can be done using websites which give directions, such as Map Quest. Make sure you know the route numbers and entrance and exit numbers. Also consider rest, fuel, and food stops, potential construction areas and the time of day to avoid rush hour. Some drivers choose to use a navigation system or GPS to help with directions. These can be very useful if the driver takes the proper precautions to prevent driver distractions. Make sure to set the route in the device before driving.

- **Prepare the vehicle** – check the important mechanical components such as windshields and windows, lights, tires, all fluid levels, belts, hoses, and brakes.
  - Tires for inflation, balance, alignment, condition of tread and sidewalls
  - Brakes for wear and/or adjustment
  - Windshield wiper blades and all lights
  - Engine compartment (Tune-up if applicable, oil change, lubrication and filters, hoses, belts, brake, radiator and windshield wiper fluids)

- **Routine maintenance** – it is important to keep the vehicle maintained so it is safe and efficient to drive. Drivers should:
  - Select a service center
  - Make routine checks such as cleaning the windshield and headlights and checking the oil and battery regularly
  - Take the vehicle in for repair if any problems are detected
  - Follow the vehicle manufacturer’s recommended maintenance schedule for proper upkeep of the vehicle
  - Have the tires rotated, engine oil changed, and coolant and brakes checked every spring and fall if driving an average of 12,000 miles a year
### Travel Planning

#### Lesson Content

**➢ Slides A.5 and A.6**

Discuss how to prepare for a long trip by loading the vehicle properly and packing emergency equipment.

**➢ Slides A.5 and A.6: Preparing for Any Trip (Load the Vehicle, Pack Emergency Equipment)**

1. **Load the Vehicle**
   - Do not overload vehicle.
   - Load trunk area first and secure loose items.
   - 150 lbs. per belted seat plus 125-175 lbs. for luggage.
   - Car-top carriers affect braking and steering.

2. **Pack Emergency Equipment**
   - Be prepared for anything.
   - Maps with routes marked.
   - Flashlight, fire-aid kit.
   - Foods.
   - Jack, spare tire, lug wrench, jumper cables.
   - Tow line, gloves, blanket, radiator coolant, anti-freeze and windshield washer fluid.
   - Window scrapers, chains and warning reflector.
### Travel Planning

<table>
<thead>
<tr>
<th>Preparing for Any Trip</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Load the vehicle</strong> – do not overload the vehicle, which results in more fuel consumed, distribute weight evenly throughout the vehicle. Load the trunk area first and be sure to secure loose items.</td>
</tr>
<tr>
<td>– Load capacity is basically 150 lbs. per belted seating position plus 125-175 lbs. for luggage. Check owners’ manual.</td>
</tr>
<tr>
<td>– Soft items only within passenger compartment, i.e. pillows and/or blankets.</td>
</tr>
<tr>
<td>– Car-top carriers raise center of gravity and adversely affect braking and steering.</td>
</tr>
<tr>
<td><strong>Pack emergency equipment</strong> – be prepared for anything unexpected</td>
</tr>
<tr>
<td>– Maps with routes marked</td>
</tr>
<tr>
<td>– Flashlight, first-aid kit, screwdriver, pliers, adjustable end wrench and socket set</td>
</tr>
<tr>
<td>– Jack, spare tire, lug wrench, wheel blocks and battery jumper cables</td>
</tr>
<tr>
<td>– Tow line, gloves, blanket, radiator coolant/anti-freeze and windshield wiper fluid</td>
</tr>
<tr>
<td>– Window scraper, chains and warm clothing</td>
</tr>
<tr>
<td>Lesson Content</td>
</tr>
<tr>
<td>----------------</td>
</tr>
<tr>
<td><strong>Travel Planning</strong></td>
</tr>
<tr>
<td>➢ Slide A.7</td>
</tr>
<tr>
<td>Discuss how to prepare the driver for taking a long trip.</td>
</tr>
</tbody>
</table>

**Preparing the Driver for a Trip**
- Get plenty of sleep
- Drive during waking hours
- Take breaks and do not drive for long periods
- Be aware of "highway hypnosis" and "drowsy driving"
- Be prepared for anything
- Make reservations in advance
- Let others know where you are staying
- Determine costs
### Preparing the Driver for a Trip

- **Prepare the driver** – the driver is the most important factor in having a safe road trip
  - **Get plenty of sleep** – get at least 7 or 8 hours of sleep
  - **Drive during waking hours** – this will prevent drowsy driving; avoid driving after dark when visibility is limited and particularly after 11 p.m. when you are more apt to fall asleep while driving
  - **Take breaks** – stop every 2 or 3 hours or every 100 miles with 10 – 15 minute breaks
  - **Be aware of “highway hypnosis”** – occurs particularly on a rural expressway with little traffic when traveling at high speeds for long periods of time, the driver may become hypnotized by constant staring ahead on the roadway, which may result in driving in a dulled, drowsy or trancelike condition, plan breaks and pull to a safe area if tired
  - **Do not drive for extended periods of time** – if one person will be doing all of the driving, 6 to 8 hours of driving in any one day should be considered the limit. If sharing the driving between two people, driving should not exceed 10 – 12 hours.
  - **Be aware of “down time”** – the period between one and five p.m. and plan to take a break during that period
  - **Be prepared for anything** – bring extra set of keys, insurance information, money, water to drink, high energy food and fruit, vehicle owner’s manual, and maps
  - **Make reservations in advance** – if camping or staying in hotels/motels make the reservations ahead of time
  - **Let others know where you are staying** – let a family member or trusted friend know where and how to reach you in an emergency
  - **Determine costs** – determine approximate costs of fuel, meals, lodging and entertainment and be prepared to pay any large repair bill in case of a vehicle breakdown
### Handling Large Vehicles

**Video Review A.2**

Duplicate and distribute Video Review A.2. Students should complete the worksheet as they watch the video.

**Slides A.8 and A.9 – Video A.2**

Discuss the topics covered in Video A.2.

Play Video A.2.

*Driving Special Vehicles*

(Time: 3 minutes 56 seconds)

After viewing, review Video Review A.2, using Answer Key to gauge student understanding of the video.
Video Overview A.2: Driving Special Vehicles

Title
Driving Special Vehicles

Time
3 minutes 56 seconds

Topics Covered
1. How to safely drive a large vehicle or vehicle towing a trailer.
2. How to back a vehicle towing a trailer.

Video Review
1. Have students complete a video review worksheet as they watch the video.
2. After viewing the video, review the worksheet to gauge students’ understanding of the video.

Instructor Notes
<table>
<thead>
<tr>
<th>Name</th>
<th>Date</th>
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</table>

1. What is the maximum recommended speed for most car-trailer combinations?

______________________________________________________________________

2. How much braking time or following distance do you need when towing a trailer?

______________________________________________________________________

3. What is a good rule of thumb when going up and down a hill while towing a trailer?

______________________________________________________________________

4. What should you do when turning at sharp corners while towing a trailer?

______________________________________________________________________

5. What should you do if the trailer starts to jackknife while backing?

______________________________________________________________________
## Video Review A.2: Driving Special Vehicles ANSWER KEY

<table>
<thead>
<tr>
<th>Name</th>
<th>Date</th>
</tr>
</thead>
</table>

1. What is the maximum recommended speed for most car-trailer combinations?  
   **Answer:** 55 mph

2. How much braking time or following distance do you need when towing a trailer?  
   **Answer:** Follow the 4 second rule and use 5 seconds or more for adverse conditions

3. What is a good rule of thumb when going up and down a hill while towing a trailer?  
   **Answer:** Use the same gear you used for going down the hill as you used to go up it

4. What should you do when turning at sharp corners while towing a trailer?  
   **Answer:** Drive slightly past the normal turning point then turn to the outside of the lane you are entering

5. What should you do if the trailer starts to jackknife while backing?  
   **Answer:** Stop, pull forward, straighten it out and try again
# Towing and Driving Special Vehicles

## Part 2

### Lesson Content

**Handling Large Vehicles**

- **Fact Sheet A.2**
  
  Duplicate and distribute Fact Sheet A.2 for students to use as a resource and study guide.

- **Slide A.10**
  
  Discuss how to handle large vehicles, such as motor homes, recreation vehicles, moving trucks, wide-axle pickup trucks and delivery trucks.

### Materials and Resources

- **Fact Sheet A.2: Towing and Driving Special Vehicles**

- **Slide A.10: Handling Large Vehicles**
There are many types of large vehicles that passenger drivers are licensed to drive, including motor homes and recreational vehicles, moving trucks, wide-axle pickup trucks and delivery trucks. To operate these vehicles safely, the driver needs to understand their dimensions and limitations.

- **Weight factor** – large vehicles weigh more than the average passenger vehicle and the extra weight can affect the driver’s ability to accelerate, turn and slow down

- **Accelerating** – heavier vehicles accelerate more slowly so allow enough space to get up to speed

- **Turning** – heavier vehicles have a higher center of gravity, which can make turning maneuvers more challenging; therefore, it is critical to slow down well in advance of turns and use smooth, gradual steering movements

- **Decelerating** – heavier vehicles need more distance than other vehicles to slow down, meaning a driver should allow more space between his/her vehicle and the vehicle ahead
### Lesson Content

<table>
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<th>Handling Special Vehicles</th>
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<td><strong>Slides A.11 and A.12</strong></td>
</tr>
<tr>
<td>Discuss the special handling characteristics and skills for towing a vehicle or driving an RV or large vehicle.</td>
</tr>
<tr>
<td>Discuss how to maneuver the vehicle when making left and right turns.</td>
</tr>
</tbody>
</table>

### Materials and Resources

<table>
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<tr>
<th>Slides A.11 and A.12: Handling Special Vehicles</th>
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<td><img src="image1" alt="Handling Special Vehicles" />.jpg</td>
</tr>
<tr>
<td><img src="image2" alt="Handling Special Vehicles" />.jpg</td>
</tr>
</tbody>
</table>
Before towing a vehicle or driving an RV, drivers need to learn some special skills.

- **Trailers** – come in all shapes and sizes, including utility trailers, tandem axles, horse and boat trailers, and travel trailers.

- **Load limits** – all vehicles have gross vehicle weight or weight-to-trailer towing-capacity limits, so it is critical not to exceed a vehicle’s recommended load or trailer load limits. Refer to your owner’s manual or vehicle’s doorjamb for this information.

- **Practice where there is no traffic** – before driving these vehicles, practice in a driveway or vacant parking lot

- **Starting** – check traffic carefully and allow a larger gap in traffic before pulling out; check both side mirrors to be sure the trailer does not intrude into an adjoining lane

- **Turning** – it is critical to use the right outside mirror to check the vehicle’s or trailer’s clearance from the curb
  - **Right turns** – the driver should move farther from the curb or edge of the pavement than s/he would with a car and delay turning until well beyond the curb line
  - **Left turns** – the driver should proceed farther into the intersection than normal to allow adequate space for the trailer or motor home and should check the left outside mirror to see that the vehicle clears any vehicles waiting at the intersection
### Handling Special Vehicles

- **Slides A.13 through A.15**

  Discuss how to maneuver the vehicle when passing and driving through curves.

  Discuss what to do if trailer sway or whipping occurs.

  Emphasize the need to increase following distance one second for each additional 10 feet beyond 15 feet of overall vehicle and trailer length.

### Materials and Resources

- **Slides A.13 through A.15: Handling Special Vehicles**

  - **Handling Special Vehicles**
    - **Passing**
      - Need more time and space to pass
    - **If whipping occurs**
      - Do not steer or apply brakes
      - Let off gas and firmly hold wheel
      - Trailer will stabilize as vehicle slows down
  
  - **Roads that curve right**
    - Allow more distance from edge of pavement
    - Keep toward the center line
  
  - **Roads that curve left**
    - Stay to the right so you do not cross the center line

  - **Increase following distance one second for each additional 10 feet beyond 15 feet of overall vehicle and trailer length**
Handling Special Vehicles

- **Overtaking and passing** – drivers need more time and space to overtake and pass another vehicle; therefore; they should check their blind areas to ensure they are far enough ahead to signal and move back into the travel lane.

- **Being passed and overtaken** – turbulent air from large vehicles passing can make the vehicle and trailer sway. Be prepared and DO NOT counter-steer, hold the steering straight ahead until the sway subsides.

- **If trailer sway or whipping occurs** – If the trailer begins to sway excessively or whip violently; do not steer, do not apply your brakes, let off the gas pedal and firmly hold the steering wheel in a straight-ahead position. The trailer will stabilize as the vehicle slows down. Never speed up to try to control sway.

- **Curves** – for roads that curve right, allow more distance from the edge of the pavement and keep toward the center line. For roads that curve to the left stay to the right so you do not cross the center line.

- **Increase following distance** – increase following distance one second for each additional 10 feet beyond 15 feet of overall vehicle and trailer length.
### Backing a Trailer

**Slide A.16**

Explain the techniques required to back a trailer successfully by placing hand at the bottom of the steering wheel and turning the wheel in the direction the driver wants to turn.

**Slide A.17**

Explain the techniques required to back a trailer successfully by turning the steering wheel in the opposite direction.

**Slide A.18**

Discuss errors to avoid and what to do if the trailer jackknifes.

**Slide A.16: Backing a Trailer by Turning Steering Wheel in Direction Driver Wants to Turn**

- Back wheel and look directly over your shoulder through the rear window.
- Keep your hand at the bottom of the steering wheel.
- To move the trailer left, move your hand to the left.
- To back to the right, move your hand to the right.

**Slide A.17: Backing a Trailer by Turning Steering Wheel in the Opposite Direction**

- To back to the left, turn the steering wheel to the right.
- Straighten the wheel.
- To turn the steering wheel to the right, straighten the wheel.

**Slide A.18: Errors to Avoid When Backing**

- Turning the steering wheel too far
- Holding the steering wheel in a turned position too long
- If trailer starts to jackknife, stop and pull ahead to straighten, then begin again.
Backing a Trailer

Backing a trailer can be difficult for new trailer operators. It is best to avoid backing if possible, but sometimes backing is necessary, so drivers should learn to do it. There are two different ways to back a trailer.

1. **Backing by turning the steering wheel in the direction driver wants to turn:**
   
   Try this easy method to help control direction while backing up a trailer. Typically used when you can see over your shoulder through the rear window.
   
   - Back slowly and look directly over your shoulder through the rear window (without using your mirrors), unless you cannot see out your rear window
   - Keep your left hand at the bottom of the steering wheel, with your right arm over back of passenger seat
   - To move the trailer left, move your hand to the left
   - To back to the right, move your hand to the right
   - If the trailer starts to jackknife, which forms a V-shape between the trailer and towing vehicle, stop, pull ahead to straighten out; then begin again. Once you start to go correctly, follow the trailer around. Turning the steering wheel too far or holding the steering wheel in a turned position too long can cause the trailer and vehicle to jackknife.

2. **Backing by turning the steering wheel in the opposite direction:**
   
   Typically used when you cannot look directly over your shoulder. When using this method you must use the mirrors. When backing, the driver will turn the steering wheel in the opposite direction s/he wants the vehicle to go.
   
   - To back to the left, turn the steering wheel to the right
   - Straighten the wheel
   - Turn the wheel in the opposite direction
   - Straighten the wheel as the trailer responds to the towing vehicle’s action
   - Turn the steering wheel to the right
   - Straighten the wheel and back the towing vehicle and trailer
# Equipment, Connecting and Loading a Trailer Properly

## Lesson Objective:
Student will list the basic equipment needed to tow a trailer safely, describe how to connect a trailer to a vehicle, and explain the procedure for distributing weight when loading a trailer.

## Lesson Content

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<tr>
<th>Equipment, Connecting and Loading a Trailer Properly</th>
<th>Materials and Resources</th>
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</thead>
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<td>➢ <strong>Video Review A.3</strong></td>
<td>➢ Video Review A.3 and Answer Key: Safe Trailering</td>
</tr>
<tr>
<td>Duplicate and distribute Video Review A.3. Students should complete the worksheet as they watch the video.</td>
<td></td>
</tr>
<tr>
<td>➢ <strong>Slides A.19 and A.20 – Video A.3</strong></td>
<td>➢ Slide A.19 and A.20: Video A.3 Safe Trailering</td>
</tr>
<tr>
<td>Discuss the topics covered in Video A.3.</td>
<td></td>
</tr>
</tbody>
</table>

- **Safe Trailering**
  - **Safe Trailering**
  - **Safe Trailering**

**Safe Trailering**
(Time: 4 minutes 59 seconds)

After viewing, review Video Review A.3, using Answer Key to gauge student understanding of the video.
<table>
<thead>
<tr>
<th>Video Overview A.3: Safe Trailering</th>
</tr>
</thead>
</table>

**Title**

Safe Trailering

**Time**

4 minutes 59 seconds

**Topics Covered**

1. Basic equipment needed to tow a trailer safely.
2. How to attach a vehicle to a trailer.
3. How to load a trailer properly.

**Video Review**

1. Have students complete a video review worksheet as they watch the video.
2. After viewing the video, review the worksheet to gauge students’ understanding of the video.

**Instructor Notes**
<table>
<thead>
<tr>
<th>Name</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
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</tr>
</tbody>
</table>

1. How do you determine the ratings and sizes of the hitch components?

_____________________________________________________________________
_____________________________________________________________________

2. Why is it important to make sure the coupler is tight over the hitch ball when connecting a trailer?

_____________________________________________________________________
_____________________________________________________________________

3. Where do the safety chains connect to?

_____________________________________________________________________
_____________________________________________________________________

4. When loading a trailer where should you place the heaviest objects?

_____________________________________________________________________
_____________________________________________________________________

Video Review A.3: Safe Trailering
<table>
<thead>
<tr>
<th>Name</th>
<th>Date</th>
</tr>
</thead>
</table>

1. How do you determine the ratings and sizes of the hitch components?  
   *Answer: Each component is labeled with weight ratings and the ball diameter is stamped on the hitch ball and coupler*

2. Why is it important to make sure the coupler is tight over the hitch ball when connecting a trailer?  
   *Answer: So the trailer doesn’t become disconnected from the tow vehicle*

3. Where do the safety chains connect to?  
   *Answer: Under the vehicle to the trailer hitch*

4. When loading a trailer where should you place the heaviest objects?  
   *Answer: In the front of the trailer*
<table>
<thead>
<tr>
<th>Lesson Content</th>
<th>Materials and Resources</th>
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<tbody>
<tr>
<td><strong>Basic Equipment for Towing</strong></td>
<td>➢ Fact Sheet A.3: Equipment and Loading a Trailer Properly</td>
</tr>
<tr>
<td>➢ Fact Sheet A.3</td>
<td>➢ Slide A.21: Basic Equipment for Towing</td>
</tr>
<tr>
<td>Duplicate and distribute Fact Sheet A.3 for students to use as a resource and study guide.</td>
<td></td>
</tr>
<tr>
<td>➢ Slide A.21</td>
<td>➢ Slide A.22: Basic Equipment for Towing</td>
</tr>
<tr>
<td>Discuss the basic equipment needed to tow a trailer.</td>
<td></td>
</tr>
<tr>
<td>➢ Slide A.22</td>
<td></td>
</tr>
<tr>
<td>Discuss the components of a car-trailer combination and emphasize that the system must work together.</td>
<td></td>
</tr>
</tbody>
</table>
Additional equipment
An ordinary passenger vehicle is not ready to tow trailers. Additional equipment is needed, such as a heavy-duty suspension, an increased-capacity cooling system and a high-ratio axle. Drivers will also need additional, oversize mirrors. Air pressure in the rear tires of vehicles may be increased to handle the additional weight of the trailer.

Emergency equipment
Regular emergency equipment usually is adequate for towing light trailers, but if towing a heavier boat or travel trailer the driver will need special equipment, such as a hydraulic jack, red flags and flares, wheel chocks, flashlights and trouble lights, and tow chains/ropes. The driver will also need some basic tools and an adequate jack and lug wrench to change tires.

Trailer hitch
Drivers towing trailers will need a well-engineered hitch, generally bolted to the vehicle frame. When installed they should also include safety chains and an electrical connection for trailer brake lights and taillights.

Hitch ball
For different use classifications, engineers recommend a minimum-size hitch ball for passenger car-trailer couplings. This information can be found in the trailer manual. Usually the hitch and ball-mount attachment allows a short distance between the two vehicles.

The system
When a car tows a trailer, both the car and the trailer cease to exist as separate vehicles. They merge to form a single unit: the car-trailer combination. The driver, automobile, hitch, trailer and load are interdependent elements of a total system. A single-element approach is not adequate.
### Connecting and Disconnecting a Trailer

- Slide A.23

Discuss how to connect and disconnect a trailer from a vehicle.

#### Connecting a Trailer

- Ball and coupler combinations – tight and sized correctly
- Safety chains – crossed beneath the coupler and connected to the hitch
- Breakaway chains – hooked to hitch or frame member
- Electrical connections – set up so lights function properly
Connecting and Disconnecting a Trailer

The car-trailer combination must be securely connected via the hitch and coupler, with safety chains and breakaway chain (on trailers with brakes) properly attached. A good general rule is: when you begin trailer hookup, always finish the process without pausing or stopping to do something else. Otherwise, you may forget to complete the connection properly.

**Ball and coupler combinations** vary, but all should be tight, and checked periodically to maintain tightness. Hitch balls vary in size (1-7/8”, 2” or 2-5/16”) and should be mated to the same size coupler or to a coupler that fits multiple sizes.

To connect the trailer:

1. Lift the coupler onto the ball
2. Tighten hand wheel
3. Jiggle on coupler and push back on trailer, tighten hand wheel until very tight and have good connection
4. Attach safety chains by crisscrossing chains and wrapping them through the holes on the hitch, adjust slack and secure safety hooks
5. Connect the lights

**Safety chains** – permanently attached to the trailer tongue should be crossed beneath the coupler and connected to the hitch or to a frame member of the tow vehicle. Allow enough slack for turns but make sure the chains do not drag on the ground.

**The breakaway chain** will activate trailer brakes if disengagement of the trailer from the hitch or car occurs. This chain also should be hooked to a frame member or the hitch. Use slightly less slack than the safety chains.

**Electrical connections** should be made according to instructions so that trailer brake lights, turn indicators and other lights function properly.

Regardless of the elements of your car-trailer combination, make a step-by-step checklist to follow in properly connecting the system. This checklist can be followed—in reverse order—to disconnect the system.
<table>
<thead>
<tr>
<th>Lesson Content</th>
<th>Materials and Resources</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Loading a Trailer Properly</strong></td>
<td>➢ Slide A.24</td>
</tr>
<tr>
<td>➢ Slide A.24</td>
<td>Slide A.24: Loading a Trailer Properly</td>
</tr>
<tr>
<td>Discuss how to properly load a trailer.</td>
<td><img src="image" alt="Loading a Trailer Properly" /></td>
</tr>
</tbody>
</table>

- The rear of the vehicle should support 10% – 15% of the trailer load.
- Arrange 60% of weight in front half of trailer and 40% in rear.
- Be sure trailer is level.
### Equipment, Connecting and Loading a Trailer Properly

#### Fact Sheet A.3 continued

## Loading a Trailer Properly

### Stay under the limits

Many SUVs and cars with rear seat room for three passengers allow a total rear seat and cargo area maximum load of 650 lbs. As part of a car-trailer combination, trailer tongue weight is added to the rear of the car and adjustments may need to be made, because the allowed 650 lbs. is reduced by the value of the trailer tongue weight. As more weight is added to the rear of an already front-heavy car, the handling characteristics start to change. To minimize the amount of this handling change, drivers should minimize the amount of weight (cargo and passengers) carried in the rear area of the car. Reducing this load is best accomplished by placing the heaviest passenger to the front seat and the lighter passengers and cargo or no passengers and cargo in the rear seat and trunk of the vehicle.

Trailers should be loaded more heavily in front so that approximately 5 to 15 percent (depending on type of trailer) of their total weight is carried on the tow car hitch. Never load the vehicle beyond the owner’s manual limits when towing a trailer and be sure to include trailer tongue weight as part of the load.

### Load trailers heavier in front

The total weight of the load should not exceed the weight capacity of the trailer. Trailers must be loaded heavier in front or the trailer will sway violently, called whipping. Arrange 60 percent of the weight in the front half of the trailer and 40 percent in the rear. Distribute the weight equally from side to side. Keep the center of gravity low, with heavy items (including books) on the floor of the trailer, not packed on top. Keep the center of gravity forward (approximately 10 percent of the loaded trailer weight on the tow-car hitch). If your specific trailer has different loading instructions, be sure to follow those instructions.

### Be sure trailer is level

Walk around to see if the tow vehicle and trailer are level after loading. The tow vehicle and trailer should be about parallel to the ground, or the tow vehicle may dip slightly in the rear due to tongue weight. Too much weight in the rear of the trailer will lift the rear of the towing vehicle and cause whipping. Too much weight in the front of the trailer will raise the towing vehicle’s front end excessively.
## Lesson Objective:
Student will evaluate their knowledge of the content presented in Unit A through review questions, key word matchup worksheet and unit test.

<table>
<thead>
<tr>
<th>Lesson Content</th>
<th>Materials and Resources</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Review Questions</strong></td>
<td>➢ Unit A Review Questions</td>
</tr>
<tr>
<td>➢ Review Questions</td>
<td>Ask review questions to summarize discussion on Unit A.</td>
</tr>
</tbody>
</table>
### Unit A Review Questions

1. What should a driver consider when planning a route?
   *Answer: rest stops, fuel stops, food stops, potential construction areas, and rush hour*

2. What should the driver check on the vehicle before taking a long trip?
   *Answer: windshields and windows, lights, tires, fluid levels, belts, hoses and brakes*

3. What is the load capacity for passenger vehicles?
   *Answer: 150 lbs. per belted seating position plus 125 – 175 lbs. for luggage*

4. What should the driver do to prepare for a long trip?
   *Answer: get plenty of sleep, make reservations in advance, let others know where s/he is staying and determine costs of trip*

5. How long should a person drive in any one day and how often should s/he take breaks?
   *Answer: 6 to 8 hours is the limit for one person and should break every 2 – 3 hours for 10 – 15 minutes*

6. How does towing a trailer or driving a large vehicle affect the handling?
   *Answer: accelerate more slowly, higher center of gravity which can make turning more challenging, need more distance to slow down*

7. What should the driver do when making a right turn when towing a trailer or driving a large vehicle?
   *Answer: move further from the curb or edge of the pavement than in a car and delay turning until well beyond the curb line*

8. How much should a driver towing a trailer or driving a large vehicle increase his/her following distance?
   *Answer: one second for each additional 10 feet beyond 15 feet of overall vehicle and trailer length*

9. What should a driver do if the trailer s/he is backing starts to jackknife?
   *Answer: stop and pull ahead to straighten out, then begin again*

10. What percent of weight should be loaded in the front of a trailer?
    *Answer: 60 percent*
### Words to Know Review

- **Fact Sheet A.4**
  - Duplicate and distribute Fact Sheet A.6. Use the definitions page as a resource for teaching and for the students as a resource and study guide.

- **Worksheet A.4**
  - Duplicate and distribute. Have students complete the worksheet.
  - Review the answers.

---

### Materials and Resources

- **Fact Sheet A.4: Unit A Words to Know Definitions Page**

- **Worksheet A.4 and Answer Key: Unit A Words to Know Matchup**
### Unit A Words to Know Definitions Page

<table>
<thead>
<tr>
<th>Term</th>
<th>Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Coupler</td>
<td>connecting device mounted at the front of the trailer tongue that connects directly to the hitch ball on the car</td>
</tr>
<tr>
<td>Down time</td>
<td>the period between one and five p.m., when drivers should plan to take a break when driving</td>
</tr>
<tr>
<td>Highway hypnosis</td>
<td>when the driver becomes hypnotized by constant staring ahead on the roadway, which may result in driving in a dulled, drowsy or trancelike condition, usually occurs when driving on rural expressways with little traffic and high speeds for long periods of time</td>
</tr>
<tr>
<td>Hitch ball</td>
<td>ball shaped part of the hitch, which connects to the coupler</td>
</tr>
<tr>
<td>Increased following distance</td>
<td>when driving large vehicles or towing a trailer drivers should increase their following distance one second for each additional 10 feet beyond 15 feet of overall vehicle and trailer length</td>
</tr>
<tr>
<td>Jackknife</td>
<td>forms a V-shape between the trailer and towing vehicle and may occur when backing a trailer</td>
</tr>
<tr>
<td>Large vehicle considerations</td>
<td>the effects of the driver’s ability to accelerate, turn and slow down when driving large vehicles or towing a trailer</td>
</tr>
<tr>
<td>Navigation system</td>
<td>electronic device to help with directions while driving, which can be useful if the driver takes precautions to prevent driver distractions</td>
</tr>
<tr>
<td>Safety chains</td>
<td>one end attaches permanently to the trailer tongue, the other end attaches to the car’s hitch, which keeps a connection should the trailer detach</td>
</tr>
<tr>
<td>Tongue</td>
<td>part of the trailer which extends forward from the trailer body and includes the coupler</td>
</tr>
<tr>
<td>Towing</td>
<td>the process of pulling a trailer with a chain, line, bar or some other form of couplings</td>
</tr>
<tr>
<td>Trailer hitch</td>
<td>a device, mounted on the rear of the vehicle, attaches a trailer to the tow vehicle, and is the point of connection between the tow vehicle and trailer</td>
</tr>
</tbody>
</table>
### Unit A Travel Planning, Loading, Towing and Driving Special Vehicles

#### Unit A Words to Know Matchup

<table>
<thead>
<tr>
<th>Name</th>
<th>Date</th>
</tr>
</thead>
</table>

**Directions:** Match the clues on the left with the words in the list on the right. Place the matching letter in the blank to the left of the number.

<table>
<thead>
<tr>
<th>Clue</th>
<th>Word</th>
</tr>
</thead>
<tbody>
<tr>
<td>______1. Electronic device to help with directions while driving, which can be useful if the driver takes precautions to prevent driver distractions</td>
<td>A. Coupler</td>
</tr>
<tr>
<td>______2. One second for each additional 10 feet beyond 15 feet of overall vehicle and trailer length</td>
<td>B. Down time</td>
</tr>
<tr>
<td>______3. The effects of the driver’s ability to accelerate, turn and slow down when driving large vehicles or towing a trailer</td>
<td>C. Highway hypnosis</td>
</tr>
<tr>
<td>______4. A device, mounted on the rear of the vehicle, attaches a trailer to the tow vehicle, providing a connection to the vehicle</td>
<td>D. Increased following distance</td>
</tr>
<tr>
<td>______5. The period between one and five p.m., when drivers should plan to take a break when driving</td>
<td>E. Jackknife</td>
</tr>
<tr>
<td>______6. Forms a V-shape between the trailer and towing vehicle and may occur when backing a trailer</td>
<td>F. Large vehicle considerations</td>
</tr>
<tr>
<td>______7. Occurs when driving on rural expressways with little traffic and high speeds for long periods of time</td>
<td>G. Navigation system</td>
</tr>
<tr>
<td>______8. The process of pulling a trailer with a chain, line, bar or some other form of couplings</td>
<td>H. Tongue</td>
</tr>
<tr>
<td>______9. Connecting device mounted at the front of the trailer tongue that connects directly to the hitch ball on the car</td>
<td>I. Towing</td>
</tr>
<tr>
<td>_____10. Part of the trailer which extends forward from the trailer body and includes the coupler</td>
<td>J. Trailer hitch</td>
</tr>
</tbody>
</table>
### Unit A Words to Know Matchup

**Worksheet A.4**  
**ANSWER KEY**

Directions: Match the clues on the left with the words in the list on the right. Place the matching letter in the blank to the left of the number.

| ___G___1.  | Electronic device to help with directions while driving, which can be useful if the driver takes precautions to prevent driver distractions | A. Coupler |
| ___D___2.  | One second for each additional 10 feet beyond 15 feet of overall vehicle and trailer length | B. Down time |
| ___F___3.  | The effects of the driver’s ability to accelerate, turn and slow down when driving large vehicles or towing a trailer | C. Highway hypnosis |
| ___J___4.  | A device, mounted on the rear of the vehicle, attaches a trailer to the tow vehicle, providing a connection to the vehicle | D. Increased following distance |
| ___B___5.  | The period between one and five p.m., when drivers should plan to take a break when driving | E. Jackknife |
| ___E___6.  | Forms a V-shape between the trailer and towing vehicle and may occur when backing a trailer | F. Large vehicle considerations |
| ___C___7.  | Occurs when driving on rural expressways with little traffic and high speeds for long periods of time | G. Navigation system |
| ___I___8.  | The process of pulling a trailer with a chain, line, bar or some other form of couplings | H. Tongue |
| ___A___9.  | Connecting device mounted at the front of the trailer tongue that connects directly to the hitch ball on the car | I. Towing |
| ___H___10. | Part of the trailer which extends forward from the trailer body and includes the coupler | J. Trailer hitch |
### Unit Review and Test

#### Lesson Content

<table>
<thead>
<tr>
<th>Slide A.25</th>
</tr>
</thead>
<tbody>
<tr>
<td>Discuss what the students have learned by the end of this unit.</td>
</tr>
</tbody>
</table>

#### Unit A Test

<table>
<thead>
<tr>
<th>Slide A.25: Unit Review</th>
</tr>
</thead>
<tbody>
<tr>
<td>Slide A.25: Unit Review</td>
</tr>
<tr>
<td>In this unit, you learned:</td>
</tr>
<tr>
<td>- The preparation needed before taking trips and planning considerations of the vehicle</td>
</tr>
<tr>
<td>- The skills required for safety towing a boat or trailer and techniques to back a trailer</td>
</tr>
<tr>
<td>- The basic equipment needed to tow a trailer safely, how to connect a trailer and procedures for loading a trailer</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Unit A Test, page A-44</th>
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</thead>
<tbody>
<tr>
<td>Unit A Test, page A-44</td>
</tr>
<tr>
<td>Duplicate and distribute the Unit A Test.</td>
</tr>
<tr>
<td>Collect and grade the test.</td>
</tr>
<tr>
<td>After returning tests to the students, review the answers and clarify any confusion.</td>
</tr>
</tbody>
</table>
Unit A Review

In this unit, you learned:

- The preparation needed before taking trips and planning considerations of the vehicle, vehicle loading and equipment, and personal considerations when driving to a destination far away.

- The skills required for safely towing a boat or trailer and the techniques required to back a trailer successfully.

- The basic equipment needed to tow a trailer safely and the procedures for distributing weight when loading a trailer.

- Key words associated with the unit objectives.
Select the best answer and place the appropriate letter (A, B, C, or D) on the line provided.

_______ 1. When driving on long trips how often should the driver take breaks?
   A. Every 2 or 3 hours
   B. Every 4 or 5 hours
   C. Every 5 or 6 hours
   D. Every 7 or 8 hours

_______ 2. If one person will be doing all of the driving during long trips, the driver should not drive more than _________ hours in a day.
   A. 2 to 4 hours
   B. 6 to 8 hours
   C. 10 to 12 hours
   D. 12 to 14 hours

_______ 3. When driving a vehicle with a trailer, a driver will need to:
   A. Accelerate quickly to get up to speed
   B. Slow down in advance of turns
   C. Leave less room between vehicles
   D. All of the above

_______ 4. When turning right while towing a trailer, the driver should:
   A. Start making the turn sooner
   B. Move closer to the curb or edge of the pavement
   C. Move farther from the curb or edge of the pavement
   D. Move to the right of the lane

_______ 5. When turning left while towing a trailer, the driver should:
   A. Start making the turn sooner
   B. Proceed further into the intersection than normal
   C. Move to the left of the lane
   D. Move farther from the curb or edge of the pavement
<table>
<thead>
<tr>
<th>Travel Planning, Loading, Towing and Driving Special Vehicles</th>
<th>Unit A Test Page 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>______ 6. When driving a large vehicle or towing a trailer, a driver should:</td>
<td></td>
</tr>
<tr>
<td>A. Increase their following distance two seconds for each additional 10 feet</td>
<td></td>
</tr>
<tr>
<td>B. Maintain the same following distance as a passenger vehicle</td>
<td></td>
</tr>
<tr>
<td>C. Decrease their following distance one second for each additional 10 feet</td>
<td></td>
</tr>
<tr>
<td>D. Increase their following distance one second for each additional 10 feet</td>
<td></td>
</tr>
<tr>
<td>______ 7. While backing a trailer and the trailer starts to jackknife, what should a driver do?</td>
<td></td>
</tr>
<tr>
<td>A. Stop, pull ahead to straighten out and begin again</td>
<td></td>
</tr>
<tr>
<td>B. Keep backing the vehicle until it straightens</td>
<td></td>
</tr>
<tr>
<td>C. Stop, turn the steering wheel in the opposite direction and begin again</td>
<td></td>
</tr>
<tr>
<td>D. Keep backing the vehicle and turn the steering wheel in the opposite direction</td>
<td></td>
</tr>
<tr>
<td>______ 8. What type of equipment is <strong>not</strong> needed to safely tow a trailer?</td>
<td></td>
</tr>
<tr>
<td>A. Increased-capacity cooling system</td>
<td></td>
</tr>
<tr>
<td>B. Heavy-duty suspension</td>
<td></td>
</tr>
<tr>
<td>C. High intensity headlights</td>
<td></td>
</tr>
<tr>
<td>D. Oversize mirrors</td>
<td></td>
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<tr>
<td>______ 9. When loading a trailer, what percent of the weight should be in the front?</td>
<td></td>
</tr>
<tr>
<td>A. 20%</td>
<td></td>
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<tr>
<td>B. 40%</td>
<td></td>
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<tr>
<td>C. 50%</td>
<td></td>
</tr>
<tr>
<td>D. 60%</td>
<td></td>
</tr>
<tr>
<td>______ 10. When towing a trailer and driving with passengers, the heaviest passenger should sit in the:</td>
<td></td>
</tr>
<tr>
<td>A. Middle back seat</td>
<td></td>
</tr>
<tr>
<td>B. Front passenger seat</td>
<td></td>
</tr>
<tr>
<td>C. Driver side back seat</td>
<td></td>
</tr>
<tr>
<td>D. Passenger side back seat</td>
<td></td>
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</tbody>
</table>
### Unit A ANSWER KEY

<p>| | | | |</p>
<table>
<thead>
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<tr>
<td>1</td>
<td>A</td>
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<td>D</td>
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<td>2</td>
<td>B</td>
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<td>3</td>
<td>B</td>
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<td>C</td>
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<td>4</td>
<td>C</td>
<td>9</td>
<td>D</td>
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<td>5</td>
<td>B</td>
<td>10</td>
<td>B</td>
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</table>