

CHAPTER 14 Natural Laws and Driving

STUDY GUIDE FOR CHAPTER 14 LESSON 1

Natural Laws and the Movement of Your Vehicle

A. Match the following terms by placing the letter of the definition or a description of what the item does to the left of the item.

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|----------------------------|---|
| _____ 1. inertia | a. friction between your tires and the road |
| _____ 2. friction | b. energy of motion |
| _____ 3. traction | c. causes objects to continue moving in a straight line |
| _____ 4. momentum | d. the point about which weight is evenly distributed |
| _____ 5. kinetic energy | e. force between two surfaces that resists the movement of one surface across the other |
| _____ 6. center of gravity | f. the product of weight and speed |

B. Complete the following sentences by writing in the natural law each sentence is describing.

1. When you brake quickly and your books and packages on the backseat fall onto the floor, the force at work is _____
2. The force that makes your tires “stick” to the surface of the road is called _____
3. Two vehicles going at the same speed hit the same brick wall, but the one that weighs more sustains much more damage. This is an example of _____
4. The faster a vehicle moves, the more _____ energy it has.
5. The force that slows your vehicle going uphill is called _____

C. FIND OUT MORE. What is kinetic energy? Look in your library and find out more about what the effects of kinetic energy are. Summarize your findings below.

STUDY GUIDE FOR CHAPTER 14 LESSON 2

Natural Laws and Steering and Braking

A. For each sentence below, circle T if the statement is true and F if it is false. Correct each false statement in the space below.

1. Perception distance, reaction distance, and braking distance make up total stopping distance.
T F

2. Braking is a result of friction between the brake linings and your foot. T F

3. Braking distance is greater on a smooth road. T F

4. Your braking distance decreases if you are going downhill. T F

5. Your ability to steer a vehicle depends partly upon the condition of the vehicle's suspension.
T F

6. Directional control is a vehicle's ability to hold a straight line. T F

7. A banked road is higher on the inside of curves than on the outside. T F

8. A crowned road is higher in the center of the road than on the edges. T F

B. FIND OUT MORE. Go to the library. Look up centrifugal force and centripetal force. What are they, and what are the differences between them?

STUDY GUIDE FOR CHAPTER 14 LESSON 3

Using Natural Laws to Manage Skids

A. Complete the following sentences.

1. A _____ skid occurs when a tire suddenly loses pressure.
2. A _____ skid occurs when you apply the brakes so hard that one or more wheels lock.
3. When driving on slick roads, you should make _____ and smooth changes in your speed.
4. When _____ is reduced, your tires lose their grip on the road's surface.
5. The kind of skid in which you lose steering control while making a turn is called a _____ skid.
6. A _____ skid occurs when you press on the accelerator suddenly, too hard.

B. What is the correct and safe way to steer out of a skid?

C. FIND OUT MORE. Talk with someone whose job involves a lot of driving. Ask this person to describe what happens when a driver brakes in a skid. Diagram what happens in the space below.

STUDY GUIDE FOR CHAPTER 14 LESSON 4

Natural Laws, Risk Management, and Collisions

A. For each pair of vehicles, put an X next to the one that would experience the greater force of impact in a collision.

- _____ 1. Vehicle A is moving at 35 mph.
_____ Vehicle B is moving at 45 mph.
- _____ 2. Truck X hits a tree.
_____ Truck Y hits a wooden fence.
- _____ 3. Vehicle Y is carrying five passengers.
_____ Vehicle C is carrying only the driver.
- _____ 4. Motorcycle A runs into a haystack.
_____ Motorcycle B runs into a concrete divider.

B. With a ruler, measure the tread depth of some tires in your neighborhood or at school. Make sure that you have the permission of the owners to do this. What percentage of cars had all four tires with a tread depth of at least $\frac{1}{16}$ inch? How many cars had tread depths of between $\frac{1}{16}$ and $\frac{1}{8}$ inch?

C. FIND OUT MORE. The chapter briefly discusses what an antilock brake system (ABS) is. Use any resource that you can find, such as a mechanic, literature from the library, or an advertisement. Find out as much as you can about an antilock brake system. How does it work? How much extra does it cost? Would you want one in your vehicle?
