

## Skills Worksheet

# Chapter Review

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**USING KEY TERMS**

For each pair of terms, explain how the meanings of the terms differ.

1. *work* and *power*

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2. *lever* and *inclined plane*

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3. *wheel and axle* and *pulley*

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**UNDERSTANDING KEY IDEAS****Multiple Choice**

- \_\_\_\_\_ 4. Work is being done when
- a. you apply a force to an object.
  - b. an object is moving after you applied a force to it.
  - c. you exert a force that moves an object in the direction of the force.
  - d. you do something that is difficult.
- \_\_\_\_\_ 5. What is the unit for work?
- a. joule
  - b. joule per second
  - c. newton
  - d. watt
- \_\_\_\_\_ 6. Which of the following is a simple machine?
- a. a bicycle
  - b. a jar lid
  - c. a pair of scissors
  - d. a can opener
- \_\_\_\_\_ 7. A machine can increase
- a. distance by decreasing force.
  - b. force by decreasing distance.
  - c. neither distance nor force.
  - d. Either (a) or (b)

Chapter Review *continued*

- \_\_\_\_\_ 8. What is power?
- a. the strength of someone or something
  - b. the force that is used
  - c. the work that is done
  - d. the rate at which work is done
- \_\_\_\_\_ 9. What is the unit for power?
- a. newton
  - b. kilogram
  - c. watt
  - d. joule

### Short Answer

10. Identify the two simple machines that make up a pair of scissors.  

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11. Explain why you do work on a bag of groceries when you pick it up but not when you carry it.  

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12. Using a wheelbarrow to move firewood, you input 500 J of work, but only 425 J of work is output. Why is the work output of a machine always less than the work input?  

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13. What does the mechanical advantage of a first-class lever depend upon? Describe how it can be changed.  

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## Math Skills

14. You and a friend together apply a force of 1,000 N to a car, which makes the car roll 10 m in 1 min and 40 s.
- a. How much work did you and your friend do together? Show your work below.
- b. What was the power output? Show your work below.

**Chapter Review** *continued*

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15. A lever allows a 35 N load to be lifted with a force of 7 N. What is the mechanical advantage of the lever? Show your work below.

**CRITICAL THINKING**

16. **Concept Mapping** Use the following terms to create a concept map: work, *force*, *distance*, *machine*, and *mechanical advantage*.

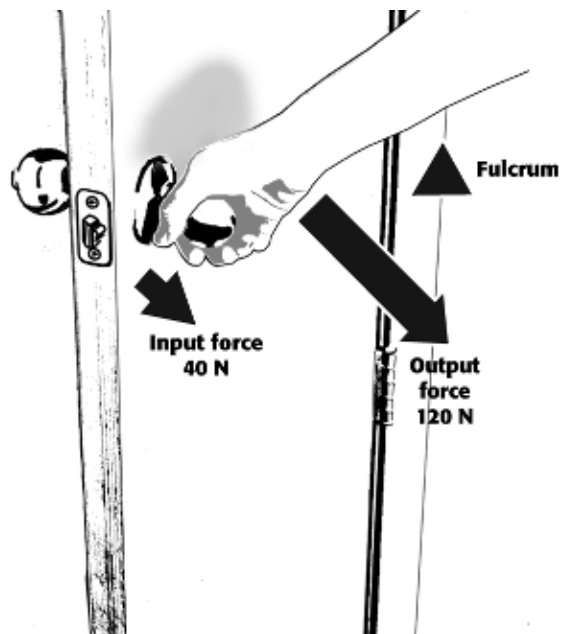
**Chapter Review** *continued*

17. **Analyzing Ideas** Using a lever to do work, you calculated the efficiency to be 98%. You then use a pulley to do the same work, and the efficiency is 87%. Explain why levers usually have a greater mechanical efficiency than other simple machines do.  
  
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18. **Making Inferences** The amount of work done on a machine is 300 J, and the machine does 50 J of work. What can you say about the amount of friction that the machine has while operating?  
  
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19. **Applying Concepts** A winding road is a series of inclined planes. Describe how a winding road makes it easier for vehicles to travel up a hill.  
  
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20. **Predicting Consequences** Why wouldn't you want to reduce the friction involved in using a winding road?  
  
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21. **Making Comparisons** How does the way that a wedge's mechanical advantage is determined differ from the way that a screw's mechanical advantage is determined?  
  
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22. The mechanical advantage of a certain simple machine is greater than 1. What does this tell you about how the input force and distance relate to the output force and distance? Design a method to explain your answer for a machine of your choice.  
  
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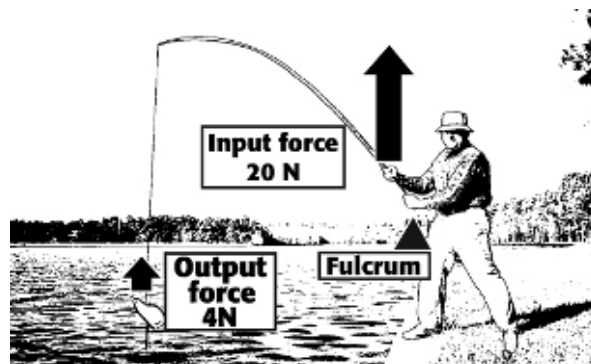
Chapter Review *continued*

### INTERPRETING GRAPHICS

For each of the images below, identify the class of lever used and calculate the mechanical advantage of the lever.



23. \_\_\_\_\_



24. \_\_\_\_\_