



# INSTRUCTIONS FOR SUBMITTING THIS DISTANCE LEARNING ASSIGNMENT BOOKLET

When you are registered for distance learning courses, you are expected to regularly submit completed assignments for correction. Try to submit each Assignment Booklet as soon as you complete it. Do not submit more than one Assignment Booklet in one subject at the same time. Before submitting your Assignment Booklet, please check the following:

- Are all the assignments completed? If not, explain why.
- Has your work been reread to ensure accuracy in spelling and details?
- Is the booklet cover filled out and the correct module label attached?

## MAILING

### 1. Postage Regulations

Do **not** enclose letters with your Assignment Booklets.

**Send all letters in a separate envelope.**

### 2. Postage Rates

Put your Assignment Booklet in an envelope and take it to the post office and have it weighed. Attach **sufficient postage** and seal the envelope.

## FAXING

1. Assignment Booklets may be faxed to the school with which you are registered. Contact your teacher for the appropriate fax number.
2. All faxing costs are the responsibility of the sender.

## E-MAILING

It may be possible to e-mail your completed Assignment Booklet to the school with which you are registered. Contact your teacher for the appropriate e-mail address.

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# SCIENCE 24

MODULE 2 ■ ASSIGNMENT BOOKLET 2A

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■ ASSIGNMENT BOOKLET 2A ■



Learning  
Technologies  
Branch



## FOR TEACHER'S USE ONLY

### Summary

	Total Possible Marks	Your Mark
Section 3 Assignment	23	
Section 4 Assignment	29	
	52	

### Teacher's Comments

Science 24  
 Module 2: Energy Transformations  
 Assignment Booklet 2A  
 Section 3 Assignment and Section 4 Assignment  
 Alberta Education  
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This document is intended for	
Students	✓
Teachers	✓
Administrators	
Home Instructors	
General Public	
Other	



You may find the following Internet sites useful:

- Alberta Education, <http://education.alberta.ca>
- LearnAlberta.ca, <http://www.learnalberta.ca>

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**ASSIGNMENT BOOKLET 2A**  
**SCIENCE 24: MODULE 2**  
**SECTION 1 ASSIGNMENT AND SECTION 2 ASSIGNMENT**

This Assignment Booklet is worth 52 marks out of the total 110 marks for the assignments in Module 2. The value of each assignment and each question is stated in the left margin.

Read all parts of your assignment carefully and record your answers in the appropriate places. If you have difficulty with an assignment, go back to your Student Module Booklet and review the appropriate lesson. Be sure to proofread your answers carefully before submitting your Assignment Booklet.

23

**Section 1 Assignment: Energy Conversions**

For questions 1 to 4, read each question carefully. Decide which of the choices BEST completes the statement or answers the question. Place your answer in the blank space given.

1

\_\_\_\_\_ 1. A car moving at a constant speed up a ramp

- A. gains potential energy
- B. loses potential energy
- C. gains kinetic energy
- D. loses kinetic energy

1

\_\_\_\_\_ 2. A book falling from a tabletop

- A. gains both potential energy and kinetic energy
- B. loses both potential energy and kinetic energy
- C. gains potential energy and loses kinetic energy
- D. loses potential energy and gains kinetic energy

1

\_\_\_\_\_ 3. Carlota's brother, Ramon, is swinging back and forth on a swing. Which of the following statements is correct?

- A. At the bottom of his swing, Ramon's potential energy is a maximum and his kinetic energy is zero.
- B. At the top of his swing, Ramon's potential energy is a maximum and his kinetic energy is zero.
- C. At the bottom of his swing, Ramon's potential energy is a minimum and his kinetic energy is zero.
- D. At the top of his swing, Ramon's potential energy is a minimum and his kinetic energy is zero.

- ① \_\_\_\_\_ 4. Think about the mousetrap car you built? Your car converted potential energy into kinetic energy. When is the potential energy of the trap zero?
- A. when the spring is fully loaded
  - B. immediately after you release the car
  - C. when the spring has returned to its original, not-set position
  - D. immediately before you release the car



Return to page 13 of the Student Module Booklet and begin Lesson 2.

For questions 5 and 6, read each question carefully. Decide which of the choices BEST answers the question. Place your answer in the blank space given.

- ① \_\_\_\_\_ 5. Which of the following is an example of kinetic energy?
- A. chemical energy
  - B. nuclear energy
  - C. radiant energy
  - D. gravitational energy

- ① \_\_\_\_\_ 6. Which of the following is not like the others?
- A. nuclear energy
  - B. electric energy
  - C. sound energy
  - D. thermal energy

- ③ 7. Three common sources of energy found in nature are \_\_\_\_\_,  
\_\_\_\_\_, and \_\_\_\_\_.



Return to page 18 of the Student Module Booklet and begin Lesson 3.

For questions 8 to 10, read each question carefully. Decide which of the choices BEST completes the statement. Place your answer in the blank space given.

- ① \_\_\_\_\_ 8. The system where energy is changed from one form to another is called
- A. input energy
  - B. a converter
  - C. output energy
  - D. a transfer

- ① \_\_\_\_\_ 9. When concrete hardens, it gives off thermal energy. The concrete's temperature should
- A. stay the same
  - B. decrease
  - C. increase
  - D. be impossible to determine
- ① \_\_\_\_\_ 10. Chemists call a chemical reaction that releases thermal energy exothermic. They call a chemical reaction that absorbs thermal energy endothermic. The reaction between citric acid and baking soda is
- A. exothermic because the temperature of the mixture fell
  - B. exothermic because the temperature of the mixture rose
  - C. endothermic because the temperature of the mixture rose
  - D. endothermic because the temperature of the mixture fell

11. A cooking element on an electric stove glows red.

- ① a. What is the input energy?

\_\_\_\_\_

- ① b. What is the output energy?

\_\_\_\_\_

- ① c. What is the converter?

\_\_\_\_\_

- ② 12. Trace the energy conversions involved when a cat hits a small bell with its paw.

\_\_\_\_\_

\_\_\_\_\_

\_\_\_\_\_



Return to page 26 of the Student Module Booklet and begin Lesson 4.

Read question 13 carefully. Decide which of the choices BEST completes the statement. Place your answer in the blank space given.

①

\_\_\_\_\_ 13. The Law of Conservation of Energy states that

- A. input energy equals output energy
- B. input energy exceeds output energy
- C. input energy is less than output energy
- D. input energy is not equal to output energy

②

14. Jacki’s friend claims that future improvements in engine design will allow vehicles to travel any distance engineers want on just 1 L of gasoline. Is Jacki’s friend correct? Why or why not?

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Return to page 29 of the Student Module Booklet and begin Lesson 5.

Read question 15 carefully. Decide which of the choices BEST answers the question. Place your answer in the blank space given.

①

\_\_\_\_\_ 15. According to the Law of Conservation of Energy, which of the following is correct?

- A. input energy = waste energy
- B. input energy = output energy – waste energy
- C. input energy = output energy + waste energy
- D. input energy = useful output energy + waste energy

②

16. For an electric toothbrush, is input energy equal to useful output energy? Explain your answer.

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Return to page 31 of the Student Module Booklet and begin the Section 1 Review.



29

**Section 2 Assignment: Electric Energy at Home**

For questions 1 and 2, read each question carefully. Decide which of the choices BEST completes the statement or answers the question. Place your answer in the blank space given.

1

\_\_\_\_\_ 1. An electric current is generated when a coil of wire passes through a magnetic field. A device for detecting this current is a

- A. galvanometer
- B. calorimeter
- C. generator
- D. turbine

1

\_\_\_\_\_ 2. Which of the following would **not** produce more electricity when a magnet is moved back and forth through a coil of wire?

- A. adding more coils
- B. using a stronger magnet
- C. moving the magnet faster
- D. using longer wire

2

3. Moving a magnet through a coil of wire converts \_\_\_\_\_ energy into \_\_\_\_\_ energy.

2

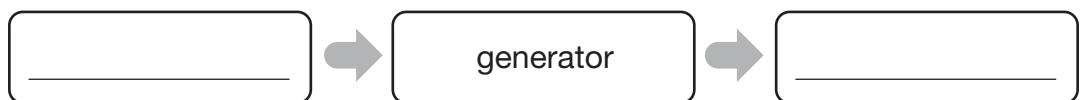
4. A toy electric motor can be used to generate electricity. If this is the case, what two components must a toy electric motor contain?

\_\_\_\_\_

\_\_\_\_\_

2

5. a. Complete the following.



1

b. Name the converter in the above system.

\_\_\_\_\_



Return to page 43 of the Student Module Booklet and begin Lesson 2.

For questions 6 to 9, read each question carefully. Decide which of the choices BEST answers the question. Place your answer in the blank space given.

- \_\_\_\_\_ 6. What is the main resource used to generate electricity in Alberta?
- ①
- A. coal
  - B. water
  - C. natural gas
  - D. nuclear energy
- \_\_\_\_\_ 7. Which of the following is the primary difference between generating electricity in a coal-fired plant compared to a nuclear plant?
- ①
- A. A nuclear plant uses thermal energy.
  - B. A coal-fired plant uses thermal energy.
  - C. A nuclear plant uses chemical energy.
  - D. A coal-fired plant uses chemical energy.
- \_\_\_\_\_ 8. The power that comes to your home is a 60-cycle-per-second alternating current. Who is credited with the idea of alternating current and its transmission?
- ①
- A. Alexander Graham Bell
  - B. Benjamin Franklin
  - C. Nicola Tesla
  - D. James Joule
- \_\_\_\_\_ 9. Approximately what percent of the power generated is lost when it is transmitted from the power plant to your home?
- ①
- A. 10%
  - B. 40%
  - C. 60%
  - D. 90%



Return to page 52 of the Student Module Booklet and begin Lesson 3.

For questions 10 and 11, read each question carefully. Decide which of the choices BEST answers the question. Place your answer in the blank space given.

- \_\_\_\_\_ 10. How much energy does a 100-W light bulb use in 10 s?
- ①
- A. 10 J
  - B. 100 J
  - C. 1000 J
  - D. 10 000 J

- ① \_\_\_\_\_ 11. A hair dryer is rated at 1500 W. In one year it was used for 100 h. How much energy did it use in kilowatt hours?
- A. 1.5 kW•h  
B. 15 kW•h  
C. 150 kW•h  
D. 1500 kW•h
- ② 12. A generator produces 60 000 J of electric energy every minute. How many watts does it produce? **Show your work.**
13. An old refrigerator is rated at 500 W.
- ③ a. How many kilowatt hours of electric energy would this refrigerator use in 30 days? Assume the refrigerator is running 12 h per day. **Show your work.**
- ② b. What would the 30-day cost be if the power company charged 13.1¢/KW•h? **Show your work, and express your answer in dollars.**



Return to page 58 of the Student Module Booklet and begin Lesson 4.

Read question 14 carefully. Decide which of the choices BEST completes the statement. Place your answer in the blank space given.

①

\_\_\_\_\_ 14. A 25-W fluorescent bulb emits the same amount of light as a 100-W incandescent bulb. Therefore, the fluorescent bulb is about

- A. one-quarter as efficient
- B. one-half as efficient
- C. twice as efficient
- D. four times as efficient

③

15. A vacuum uses input energy of 200 000 J to clean a carpet. If 140 000 J of output energy is waste energy, what is the efficiency of the vacuum? **Show your work.**

③

16. List **three** things you can do in your bedroom to reduce the use of electricity and save money on the utility bill.

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**Submit your completed Assignment Booklet 2A to your teacher for assessment.** Then return to page 62 of the Student Module Booklet and begin the Section 2 Review.