DATE: NAME: CLASS:

CHAPTER 2

Word Build

Activity 1

Goal • Use this activity to help you remember the symbols for 20 common elements.

What to Do

1. In the table below, record the symbol for each element.

2. Using these symbols construct as many different words as possible. For example, SiNK. You can use different colours for the element symbols in each word. You could display your work as a collage on a large sheet of paper.

3. View the work of other students. What words did they use that you didn't? Which words did you use that were the same?

Element	**Symbol**
Hydrogen	
Sodium	
Potassium	
Magnesium	
Calcium	
Iron	
Nickel	
Copper	
Zinc	
Carbon	

Element	**Symbol**
Nitrogen	
Oxygen	
Neon	
Helium	
Chlorine	
Silicon	
Silver	
Gold	
Mercury	
Lead	

DATE: NAME: CLASS:

CHAPTERS 1–3

Who Am I on the Periodic Table?

Activity 2

Goal • Use this activity to build your understanding of the periodic table.

What to Do

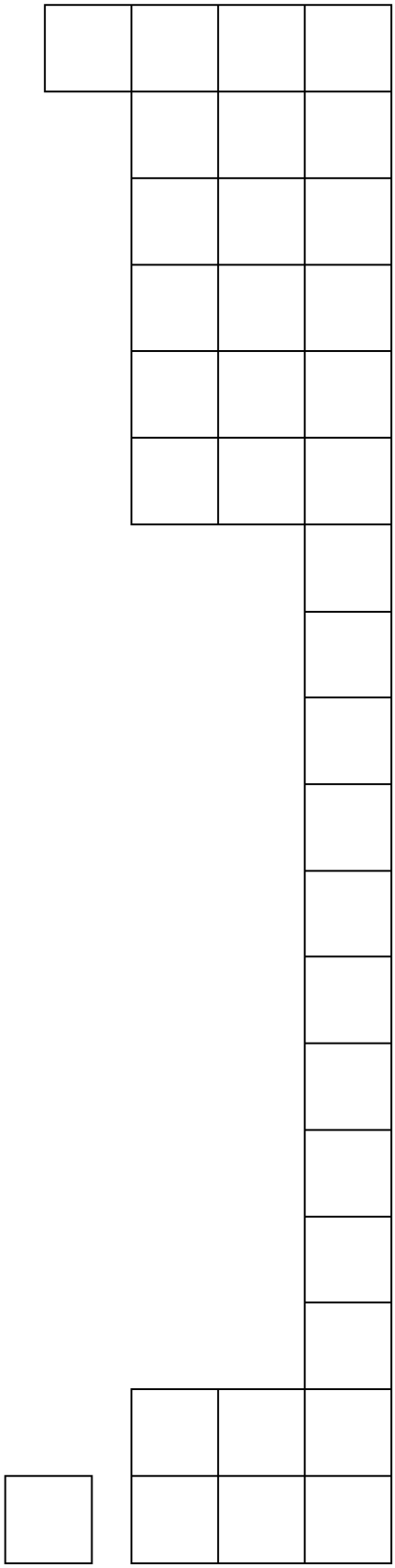
Use the clues below and the periodic table on page 50 of your textbook to complete the Element Identities table on the next page. Use those elements to fill in the periodic table on the same page.

Clues

1. **Element A** is a gas produced by photosynthesis and is necessary for life.
2. 2 atoms of **element B** combine with 1 atom of **element A** to produce a compound that covers approximately 70% of Earth's surface.
3. **Element C** has an atomic number twice as great as element A.
4. **Element D** is a halogen found in period 3.
5. **Element E** combines with **element D** to produce a compound often sprinkled on food to enhance taste.
6. 1 atom of **element F** combines with 2 atoms of **element A** to produce a compound that humans exhale.
7. **Element G** is a metalloid with 8 more electrons than **element F**.
8. **Element H** is an alkali metal found in period 2.
9. **Element I** has 3 times as many protons as **element H**.
10. In the energy level diagram for **element J**, there are 5 valence electrons and 2 levels occupied.
11. **Element K** is an alkaline earth found in the same period as **element E**.
12. **Element L** is a noble gas with 2 neutrons.
13. **Element M** has an atomic mass 27 numbers higher than the atomic mass of **element L**.
14. **Element N** is the only element in group 13 that is *not* a metal.
15. **Element O** is found in milk and is important for bone strength.
16. **Element P** is found in the same group as **element O** and has the lowest atomic number of all elements in the group.
17. **Element Q** is found in period 2 and group 18.
18. **Element R** has the same number of valence electrons as **element Q** with 1 additional energy level.
19. The chemical symbol for **element S** is the 11^{th} letter of the alphabet.
20. On the blank periodic table, fill in **elements A** through **S. Element T** is the only element left from elements 1 through 20.

DATE: NAME: CLASS:

Activity 2
continued



Element Identities

Element A	Element K
Element B	Element L
Element C	Element M
Element D	Element N
Element E	Element O
Element F	Element P
Element G	Element Q
Element H	Element R
Element I	Element S
Element J	Element T

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CHAPTERS 1–3

Quiz-Quiz-Trade: Atoms, Elements, and Compounds

Activity 3

Goal • Use this quiz-quiz-trade activity to build your understanding of the concepts in Unit 1.

What to Do

1. **Quiz** Each card has a question at the top and an answer at the bottom. Take a card and choose a partner. Ask the question on your card. If your partner answers correctly, move to step 2. If your partner answers incorrectly, or doesn't know, share the answer, then move to step 2.

2. **Quiz** Repeat step 1 using your partner's card.

3. **Trade** Trade cards with your partner. Find a new partner and start the quiz-quiz-trade again.

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Activity 3 continued

Question: What term describes anything that has mass and volume? **Answer:** Matter Chapter 1	**Question:** Which is a physical property? • Combustibility • Luster • Reactivity with acid • Reactivity with water **Answer:** Luster Chapter 1
Question: Which is a chemical property? • Conductivity • Density • Reactivity • Texture **Answer:** Reactivity Chapter 1	**Question:** Which scientist believed the atom to be the same throughout and indivisible? **Answer:** John Dalton Chapter 1
Question: Which scientist believed negative charges were scattered throughout the positive area of an atom? **Answer:** Ernest Rutherford Chapter 1	**Question:** What term describes the smallest particle of an element and retains the properties of that element? **Answer:** Atom Chapter 1

Question: Which part(s) of the atom has (have) a negative charge? • Electron • Electron and neutron • Proton • Proton and neutron **Answer:** Electron Chapter 1	**Question:** Which part(s) of the atom make(s) up most of the mass of the atom? • Electron • Electron and neutron • Proton • Proton and neutron **Answer:** Proton and neutron Chapter 1
Question: What term is used to describe scientific descriptions of events, patterns, or relationships that have been observed over and over again? **Answer:** Law Chapter 1	**Question:** Which part(s) of the atom is (are) found outside of the atom's nucleus? • Electron • Electron and neutron • Proton • Proton and neutron **Answer:** Electron Chapter 1
Question: Which element has the chemical symbol Cu? **Answer:** Copper Chapter 2	**Question:** Which element has the chemical symbol N? **Answer:** Nitrogen Chapter 2

Question: Which element has the chemical symbol Hg? **Answer:** Mercury Chapter 2	**Question:** Which element has the chemical symbol Cl? **Answer:** Chlorine Chapter 2
Question: Which element has the chemical symbol Fe? **Answer:** Iron Chapter 2	**Question:** What is one of Mendeleev's two main contributions to the development of the periodic table? **Answer:** Either of: First individual to organize the known elements according to their properties and chemical characteristics; recognized that spaces needed to be held for elements that had not yet been discovered Chapter 2
Question: The atomic mass of aluminum is 27 and its atomic number is 13. How many electrons does it have? **Answer:** 13 Chapter 2	**Question:** The atomic mass of sodium is 23 and its atomic number is 11. How many neutrons does it have? **Answer:** 12 Chapter 2

Question: Which class of elements is the largest? • Halogens • Metals • Noble gases • Non-metals **Answer:** Metals Chapter 2	**Question:** Which is a property of non-metals? • Conducts heat • Conducts electricity • Ductile • Dull **Answer:** Dull Chapter 2
Question: What is a horizontal row on the periodic table called? **Answer:** Period Chapter 2	**Question:** What is the most stable and unreactive family of elements in the periodic table? **Answer:** Noble gases Chapter 2
Question: What term is used to describe electrons in the highest energy level of an atom? **Answer:** Valence electrons Chapter 2	**Question:** What term describes a pure substance made of more than one kind of element in which the atoms of the elements are joined together? **Answer:** Compound Chapter 3

Question: Which type of elements combines to form molecular compounds? **Answer:** Non-metals Chapter 3	**Question:** Which types of elements combine to form ionic compounds? **Answer:** Non-metals and metals Chapter 3
Question: What is the chemical formula for methane? **Answer:** CH_4 Chapter 3	**Question:** What the name for a change resulting in the production of new compounds? **Answer:** Chemical change Chapter 3
Question: Which is a chemical change? • Apple ripening • Sugar dissolving • Butter melting • Tomato being sliced **Answer:** Apple ripening Chapter 3	**Question:** Give any 3 of the 5 pieces of evidence that a chemical change may have occurred. **Answer:** Any 3 of the following: • Production or absorption of heat • Appearance of a new colour • Formation of a precipitate • Production of a gas • Process is difficult to reverse Chapter 3

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UNIT 2

Find Someone Who…

Activity 4

On a signal from your teacher, find someone in the classroom who can respond to one of the questions in the grid below. Make notes in the box and have the person sign. Repeat with other classmates. Complete as many answers as possible before your teacher signals the activity is over. Your teacher will review the answers to make sure you have a complete answer in each box.

Explain the difference between gene and chromosome.	Distinguish between mutation and mutagen.	What are the main phases in mitosis?
Name 4 methods of asexual reproduction.	What is one difference between haploid cells and diploid cells? What is one similarity?	What are the stages of complete metamorphosis?
What are the stages of incomplete metamorphosis?	Compare sexual and asexual reproduction in terms of the number of parent cells and the amount of variation between offspring.	What are 2 differences between mitosis and meiosis?

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CHAPTERS 4–6

Mix and Mingle Party

Activity 5

Goal • Use these mix and mingle cards to tell what you already know about the topics you will study in Unit 2.

What to Do

1. Work with a partner. Imagine you are meeting each other at a party and take turns telling your partner the information on your card. When you have both shared, move on to another partner and share your information with that person.

2. Continue until your teacher gives the signal, or until you have heard and read most of the cards.

3. Your teacher might leave your card with you. As you begin work on the unit, share your information to answer your teacher's questions.

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Activity 5 continued

A trait is a particular feature that can vary in size or form from one individual to another within a species. Chapter 4	The nucleus is responsible for heredity and for controlling the functions of a cell. Chapter 4
Heredity is the process through which patterns of traits are passed from an individual to its offspring. Chapter 4	Genetic instructions are carried on a molecule called DNA. Chapter 4
DNA stands for deoxyribonucleic acid (dee-ox-ee-ri-bo-new-clay-ic). Chapter 4	Chromosomes are made up of genes and genes are made up of DNA. Chapter 4
Every organism has a characteristic number of chromosomes. For example, humans have 46 chromosomes while cows have 60. Chapter 4	Some mutations are helpful to an organism, some are harmful, while others have no effect at all. Chapter 4
When the environment changes, a mutation that was once neutral may become harmful or helpful, depending on what the change was. Chapter 4	A mutagen is a substance that can cause mutations in DNA. Chapter 4

The cell cycle has 3 stages: interphase, mitosis, and cytokinesis. Chapter 5	Interphase is the longest stage of the cell cycle and is the time in which a cell carries out its various functions in an organism. Chapter 5
Before a cell divides, it must make a copy of its genetic material. The copying of DNA is called replication. Chapter 5	The DNA molecule consists of two strands which look like a ladder which is twisted. Chapter 5
Mitosis is the shortest stage of the cell cycle. There are four main phases to mitosis. Chapter 5	In prophase, the chromosomes form x-shaped structures and become attached to strands of protein. Chapter 5
In metaphase, the x-shaped chromosomes line up at the middle (or equator) of the cell. Chapter 5	During anaphase, the protein fibres contract and shorten. This pulls the x-shaped chromosomes apart. Chapter 5
Binary fission is a form of asexual reproduction that occurs in some single-celled organisms. It produces two identical offspring. Chapter 5	Fragmentation is a type of reproduction in which a piece of the parent organism breaks off and then develops into an identical copy of the parent. Chapter 5

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Sexual reproduction produces offspring that are genetically different from each other. Chapter 6	The variation or inherited genetic differences between members of a species is called genetic diversity. Chapter 6
When an egg and sperm combine, the act is called fertilization. Chapter 6	Eggs and sperm are haploid (have half the amount of genetic materials as members of their species). When they join, they form a zygote which is diploid (has the normal amount of genetic material). Chapter 6
A zygote is formed by the union of a sperm and an egg. The zygote divides by mitosis and forms an embryo. Chapter 6	External fertilization occurs when the egg and sperm combine outside the organism's body. External fertilization often occurs in organisms, such as fish, that live in water. Chapter 6
With internal fertilization the egg and sperm combine inside the female's body. Birds, mammals, and reptiles reproduce by internal fertilization. Chapter 6	In flowering plants, the male gamete is called pollen. The transfer of pollen to the female part of a plant is called pollination. Chapter 6
There are three main stages in incomplete metamorphosis: egg, nymph, adult. Chapter 6	In complete metamorphosis there are four stages: egg, larva, pupa, adult. Chapter 6

DATE: NAME: CLASS:

CHAPTERS 4–6

A Science Write Around

Activity 6

Goal • To share what you know about a given topic of study.

What to Do

In the space below, begin to write a paragraph in which you tell everything you know about the topic that your teacher designates. When your teacher signals, stop writing and pass your paper to the student to your right. You will receive another student's beginning paragraph. Read the paragraph and continue writing where it ends. When your teacher signals, stop writing, and pass the paper to the right. Continue until you receive the paper with the paragraph you started writing. Read the complete paragraph and await your teacher's directions.

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Teacher Notes, A Science Write Around

Arrange students in a group of 4 or 5 and identify a topic from the upcoming unit. Give a signal and have each student begin writing what they know about that topic. After 1 to 2 minutes, signal for them to stop writing, even if they are the middle of a sentence or the middle of a word.

Students hand their paper to their immediate right. At the signal, students read what was written and continue from where the previous student left off. Students write until you signal to stop again (about 2 minutes.)

Students again pass their papers to the right, continuing the exercise until each group member gets his or her original paper back. Give a little more time for each subsequent writing, as students will need to read the previous paragraphs.

Have students read their entire finished page to one another. Ask the group to discuss the content of each paper and choose one paper to represent the group's collective idea on the topic. One member from each group reads the chosen paper to the class.

DATE: NAME: CLASS:

CHAPTERS 6

Meiosis – Important Points of Note

Activity 7

Goal • Use this organizer to review and reinforce your understanding of meiosis.

What to Do

In each box, draw an event of meiosis. On the lines below each box, explain what is happening in the drawing. Share your ideas with a classmate as directed by your teacher.

1. _____	2. _____	3. _____
_____	_____	_____
_____	_____	_____
_____	_____	_____

4. _____	5. _____	6. _____
_____	_____	_____
_____	_____	_____
_____	_____	_____

7. _____	8. _____	9. _____
_____	_____	_____
_____	_____	_____
_____	_____	_____

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CHAPTER 8

Scientific Symbols Game

Activity 8

Goal • Use this activity to help reinforce your understanding of circuit element symbols and how they are connected.

What to Do

1. Scientists use a standard set of symbols and units for several reasons, including improved communication. Record the common or accepted symbol for each circuit element in column 2 of the chart.

2. In column 3, record your own symbol for the circuit element.

3. On a separate sheet of paper, use your symbols to draw at least 4 circuit diagrams.

4. Pass your circuit diagrams to a partner. Challenge your partner to figure out which circuit elements your symbols represent. Provide additional clues if necessary.

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Activity 8 continued

Circuit Element	Accepted Symbol	My Symbol
Bulb		
Cell		
Battery		
Conducting wire		
Resistor		
Ammeter		
Voltmeter		
Open switch		
Closed switch		

DATE: NAME: CLASS:

CHAPTERS 7–9

What Does that Word Mean?

Activity 9

Goal • Use this activity to examine the terminology used throughout Unit 3.

What to Do

1. Several terms used throughout the Electricity unit have different meanings when used in other contexts. For each word below, give the meaning as used in Unit 3.

2. In your own words, give another meaning. Write a sentence using this meaning.

3. If possible, explain how the two meanings of the word are similar.

Terms

1. potential

"Electrical" meaning:_____

_____

Alternative meaning:_____

_____

Sentence:_____

_____

Similarity:_____

_____

2. current

"Electrical" meaning:_____

_____

Alternative meaning:_____

_____

Sentence:_____

_____

Similarity:_____

_____

3. resistance

"Electrical" meaning:_____

_____

Alternative meaning:_____

_____

Sentence:_____

_____

Similarity:_____

_____

4. parallel

"Electrical" meaning:_____

_____

Alternative meaning:_____

_____

Sentence:_____

_____

Similarity:_____

_____

5. cell

"Electrical" meaning:_____

_____

Alternative meaning:_____

_____

Sentence:_____

_____

Similarity:_____

_____

6. load

"Electrical" meaning:_____

_____

Alternative meaning:_____

_____

Sentence:_____

_____

Similarity:_____

_____

7. ground

"Electrical" meaning:_____

_____

Alternative meaning:_____

_____

Sentence:_____

_____

Similarity:_____

_____

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CHAPTERS 7–9

Dominoes: Electricity

Activity 10

Goal • Use this domino activity to build your understanding of the concepts in Unit 3.

What to Do

1. Get a domino card from your teacher. Each card has a question on one side and an answer on the other, but they don't match. Ask the question on your card to the class. The person in the class who believes he or she has the correct answer says it aloud. Decide as a class if the answer is correct.

2. The person with the correct answer reads his or her question aloud.

3. Continue until all dominoes are read.

4. As an alternative, divide the dominoes among a group of four players. One player places a card down. The player with either the matching question or the matching answer then plays his or her card with the related ends touching. The next player can match the question on either open end of the dominoes. Continue until all the cards are played.

Domino Cards

Which term describes electric charge that can be held in one place?	Efficiency
What type of charge does an object with more protons than electrons possess?	Decreases
Object A is attracted to a neutral object. What do we know about the type of charge on object A?	Parallel
What is the unit of electric charge called?	Load
Object A is attracted to a positively charged object. What do we know about the type of charge on object A?	Joule
What device is used to protect against the dangers of static electricity?	Thermal
Which term describes the amount of electric potential energy per one coulomb of charge?	Power
What is the SI unit for potential difference?	Ammeter
What is the SI unit for electrical current?	Switch
What term is used to describe the property of any material that slows down the flow of electrons?	EnerGuide label

Which term describes a device that can turn a circuit on or off by closing or opening the circuit?	Volt
As the temperature of a piece of wire increases, how does its resistance change?	Transformer
An aluminum wire has a greater resistance than a copper wire that is identical in size. Which factor affecting the resistance of a wire accounts for this?	Voltmeter
Electrical resistance is the ratio of the voltage to the current. What term is used to describe this statement?	Magnets
When one bulb in a string of lights burns out, none of the other bulbs lights. How must these bulbs be connected?	Fuel cell
As the resistance of a circuit increases, how does the current in the circuit change?	Fuse
A battery consists of three cells, each 1.5 V. If the effective voltage of the battery is 1.5 V, how are the cells connected?	Static electricity
What term is used to describe a device that transforms electrical energy into other forms of energy?	Resistance
What unit is used to measure energy?	Positive
What unit is used to measure power?	Ampere

What term is used to describe the rate of change in energy?	Positive or negative
What device is used to measure the flow of current in a circuit?	Lightning rod
What is an example of a protective device used in an electric circuit?	Coulomb
What tells you how much energy an appliance uses in a typical year of use?	Potential difference
Which device can be used to measure the potential drop across a resistor?	Neutral or negative
Along with a coil of wire, what else can be found in an electrical generator?	Increases
What is an example of an alternative source of electrical energy?	Nature of material
Which electrical device is used to change voltage?	Series
Which type of generating station burns fossil fuels?	Ohm's law
What term is used to describe the percentage of energy converted into a useful form?	Watt

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UNIT 4

The ABCs of Space

Activity 11

Goal • Use this alphabet grid to record what you already know about the concepts in Unit 4.

What to Do

In each box, record words or phrases about the topic of space that begin with the letter in the box. When your teacher signals, share your words with your classmates. Record any new or interesting words or phrases on your sheet. Write a summary paragraph using as many words or phrases as you can. Add to your grid after your study of this unit.

A	B	C	D
E	F	G	H
I	J	K	L
M	N	O	P
Q	R	S	T
U	V	W	XYZ

DATE: NAME: CLASS:

CHAPTERS 10–12

Space Bingo

Activity 12

Goal • Play this Bingo game to review and consolidate your understanding of terms you studied in this unit.

What to Do

Write each term your teacher lists in one of the boxes below, in any order. Enter each term once and do not leave any blanks. Your teacher will read definitions and give each one a number. When you have a term that matches the definition, write the number in the matching box on your card. When you complete a line based on your teacher's instructions, shout "Bingo." If your Bingo is incomplete, you are out of that round.

Teacher Notes, Space Bingo

Provide students with a Bingo card and a list of 24 terms. Choose any vocabulary from the unit of study. Students enter 12 of the terms on their card in any order they choose. Each term can be entered only once, and no spaces may be left blank.

Place all 24 terms in a bag and draw them out, one at a time. Do not read the term aloud, but for each term, read a corresponding definition from the textbook. Number each definition in the order it is drawn. Students check their cards for the term that matches the definition. If they have it on their card, they write the number in pencil in the corresponding box.

You can have students complete a straight line, the letter T, an upside-down T, a window frame (all outside boxes), four corners, or the full card. When students have the required pattern they shout "Bingo!" Check, or have a student helper check, the card with the terms against the definitions called. Students who call in with incomplete bingos may be disqualified that round.

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CHAPTERS 10–12

Hide and Seek

Activity 13

Goal • Use this game to test your recall of content you have studied.

What to Do

1. Use the blank deck of 12 or 24 cards your teacher gives you. On one side, write a term, formula, diagram, or other item that is important to know about the chapter or unit.

2. On the reverse side of the card, write the definition, description, or explanation.

3. Work with a partner. Sit facing each other with your deck of cards, definition side down, in front of you.

4. When your teacher signals, choose and read a card to your partner. Your partner should identify the correct term for the definition. (You can also play with the terms face down by reading the term and asking your partner for the definition; or by pulling a card from your partner's deck and asking for the term or definition.)

5. Take turns, continuing until you have gone through both decks of cards.

DATE: NAME: CLASS:

Activity 13
continued

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CHAPTERS 10–12 # Memory Board Activity 14

Goal • Use this game to help remember science terms.

What to Do

Your teacher will show you a list of words related to the topic you have just covered. In the time given, memorize as many of them as possible. After the list is taken away, write definitions of as many terms as you can remember; one definition per box.

Teacher Notes, Memory Board

Write or project a dozen or more terms from the current chapter or unit on the board. Give students one minute to memorize the list, and then remove or erase the list. Ask students to write the definitions to as many of the terms as they can remember. Limit the time for this to 3 to 5 minutes, depending on the complexity of the definitions required.

When time is up, review the terms and the definitions by having students volunteer their definitions.

Students can generate their own "challenge list" of terms to try to stump their classmates; or you might ask students to make sketches to accompany the definitions or to replace the definition.

DATE: NAME: CLASS:

CHAPTERS 10–12

Why It's Important

Activity 15

Goal • Use this tool to clarify what you know, and identify the importance of, a given topic.

Topic _____

What to Do

Working with a partner, list the top 10 reasons why it is important to learn about the topic your teacher has named. After you have completed your list, join with another pair and share your reasons. Copy any new reasons from the other pair's list.

1. _____
   _____
2. _____
   _____
3. _____
   _____
4. _____
   _____
5. _____
   _____
6. _____
   _____
7. _____
   _____
8. _____
   _____
9. _____
   _____
10. _____
    _____

DATE: NAME: CLASS:

CHAPTERS 10–12

Active Reading – Active Learning

Activity 16

Goal • Use this table to develop your understanding of a given topic.

What to Do

Use the following strategies before, during, and after you read to make you a better reader. Your teacher will assign a section of your textbook. Use the prompts in the table below to help you organize your reading time.

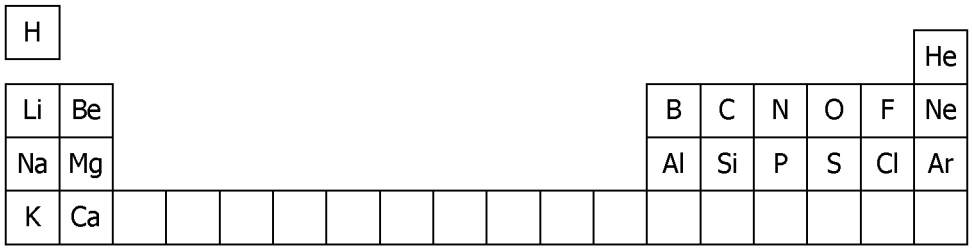
Before You Read	While You Read	After You Read
Prepare	Question and Comment	Summarize
• List: ▪ chapter title ▪ headers ▪ subheading ▪ words to know ▪ questions to answer	• This is important because . . . • I wonder why . . . • This topic is similar to . . . • Words I had problems with are . . . • What this means . . . • What I find confusing is . . .	• The important points/ideas are . . . • These are important because . . . • Things I don't understand are . . . • Something that I found really interesting was . . .

Additional Answers

Word Build

Possible words include: ago, auk, cache, café, can, cane, canine, casino, cask, check, clock, clone, cook, con, conch, cosine, cuckoo, hen, knife, knock, on, nacho, nan, neon, nine, no, none, sin, sine, sink. No words were found that included magnesium (Mg), zinc (Zn), mercury (Hg), and lead (Pb).

Who Am I on the Periodic Table?



Element Identities

Element A	oxygen	Element K	magnesium
Element B	hydrogen	Element L	helium
Element C	sulphur	Element M	phosphorus
Element D	chlorine	Element N	boron
Element E	sodium	Element O	calcium
Element F	carbon	Element P	beryllium
Element G	silicon	Element Q	neon
Element H	lithium	Element R	argon
Element I	fluorine	Element S	potassium
Element J	nitrogen	Element T	aluminum

Find Someone Who…

• Chromosomes are the structures in the nucleus that you can see; genes are much smaller. • Chromosomes are made up of genes; genes are made up of DNA. • Chromosomes carry all the genetic information about the organism; a gene is a specific section of DNA that carries specific information to produce a specific trait.	• A mutagen is a substance or factor that can cause a mutation; a mutation is a change in the genetic material (either the amount or the order) in a chromosome or gene.	• Prophase, metaphase, anaphase, telophase
• Binary fission • Budding • Fragmentation • Spores	• Diploid cells contain the total amount of genetic information for the organism; haploid cells contain only half the amount of genetic information. • Only egg and sperm cells are haploid; all the rest of the organism's cells are diploid.	• Adult • Egg • Larva • Pupa

• Adult • Egg • Nymph	• In sexual reproduction there are two parent cells (egg and sperm); in asexual reproduction there is only one parent involved. • Sexual reproduction produces greater variation in the offspring than does asexual reproduction.	• Meiosis only occurs in sex cells whereas mitosis occurs in any body cell. • Meiosis results in cells that have half the genetic material of the parent cell; mitosis produces cells that have the same amount of genetic materials as the parent. • Meiosis result in the formation of 4 haploid cells; mitosis results in the formation of 2 diploid cells.

A Science Write Around

Answers will vary depending on each student's background knowledge. Encourage students to write as much as is comfortable without worrying about spelling and grammar. This activity is intended to activate prior knowledge and should not be formally assessed.

Meiosis — Important Points of Note

Answers will vary but should reflect the information contained on pages 176 and 177 of the student text. Students should include information on the following 9 events of meiosis: Prophase I, Metaphase I, Anaphase I, Telophase I, Interkinesis, Prophase II, Metaphase II, Anaphase II, Telophase II).

Scientific Symbols Game

The connection of the alternative symbols must follow the same principles as would the accepted symbols. Principles to be followed include:

- A voltmeter must be connected in parallel across a circuit element, where as an ammeter must be connected in series.
- A battery is a combination of cells.
- Conducting wires must allow for a path of electrical current to flow from the negative terminal and back to the positive terminal of the source.
- Every circuit must contain a source of electrical energy; that is, a cell or battery.
- Every circuit must contain an electrical load; that is, a bulb and/or resistor.

What Does that Word Mean?

1. potential

   Electrical meaning: Potential difference is the amount of electric potential energy per one coulomb of charge at one point in a circuit compared to the potential energy per one coulomb of charge at another point in the circuit.

   Alternative meaning: Possible answer: Potential means capable of being or becoming.

   Sentence: An icy sidewalk is a potential danger.

   Similarity: There is little similarity as these definitions are given. However, in electricity, potential energy/potential difference can possibly be used to do work or be converted into other forms of energy.

2. current

   Electrical meaning: Current electricity is the continuous flow of charge in a complete circuit.

   Alternative meaning: Possible answer: Current means something that flows.

   Sentence: The river's current can help move objects downstream.

   Similarity: Both definitions refer to flow or motion.

3. resistance
   Electrical meaning: The property of any material that slows down the flow of electrons and converts electrical energy into other forms of energy
   Alternative meaning: Possible answer: Resistance is the opposition offered by one thing to another.
   Sentence: When he went for a walk, the wind offered a lot of resistance to his motion.
   Similarity: Both definitions focus on opposition.

4. parallel
   Electrical meaning: A parallel circuit is an electrical circuit that has more than one path.
   Alternative meaning: Possible answer: Parallel means extending in the same direction and never converging or diverging.
   Sentence: Dragsters run along parallel drag strips.
   Similarity: Both reference more than one path.

5. cell
   Electrical meaning: An electrochemical cell is a device that converts chemical energy into electrical energy.
   Alternative meaning: Possible answer: A cell is a small group forming part of a whole.
   Sentence: In science class we looked at a skin cell using the microscope.
   Similarity: There is little similarity as these definitions are given. However, a similarity exists when an electrochemical cell is considered a small part of a battery.

6. load
   Electrical meaning: An electric load is any device that transforms electrical energy into other forms of energy.
   Alternative meaning: Possible answer: A load is freight or cargo.
   Sentence: The truck carried a load of vegetables.
   Similarity: There is little similarity between these definitions as given unless an electrical load is viewed as the part of the circuit using energy similar to energy being needed to transport cargo.

7. ground
   Electrical meaning: Ground refers to connecting a conductor so that electric charge flows into Earth's surface.
   Alternative meaning: Possible answer: Ground is the solid surface of Earth.
   Sentence: Leaves fall to the ground in autumn.
   Similarity: Both definitions refer to Earth.

Dominoes: Electricity

Question	Answer
Which term describes electric charge that can be held in one place?	Static electricity
What type of charge does an object with more protons than electrons possess?	Positive
Object A is attracted to a neutral object. What do we know about the type of charge on object A?	Positive or negative
What is the unit of electric charge called?	Coulomb

Object A is attracted to a positively charged object. What do we know about the type of charge on object A?	Neutral or negative
What device is used to protect against the dangers of static electricity?	Lightning rod
Which term describes the amount of electric potential energy per one coulomb of charge?	Potential difference
What is the SI unit for potential difference?	Volt
What is the SI unit for electrical current?	Ampere
What term is used to describe the property of any material that slows down the flow of electrons?	Resistance
Which term describes a device that can turn a circuit on or off by closing or opening the circuit?	Switch
As the temperature of a piece of wire increases, how does its resistance change?	Increases
An aluminum wire identical in size to a copper wire has a greater resistance. Which factor affecting the resistance of a wire accounts for this?	Nature of material
Electrical resistance is the ratio of the voltage to the current. What term is used to describe this statement?	Ohm's law
When one bulb in a string of lights burns out, none of the other bulbs lights. How must these bulbs be connected?	Series
As the resistance of a circuit increases, how does the current in the circuit change?	Decreases
A battery consists of three cells, each 1.5 V. If the effective voltage of the battery is 1.5 V, how are the cells connected?	Parallel
What term is used to describe a device that transforms electrical energy into other forms of energy?	Load
What unit is used to measure energy?	Joule

What unit is used to measure power?	Watt
What term is used to describe the rate of change in energy?	Power
What device is used to measure the flow of current in a circuit?	Ammeter
What is an example of a protective device used in an electric circuit?	Fuse
What tells you how much energy an appliance uses in a typical year of use?	EnerGuide label
Which device can be used to measure the potential drop across a resistor?	Voltmeter
Along with a coil of wire, what else can be found in an electrical generator?	Magnets
What is an example of an alternative source of electrical energy?	Fuel cell
Which electrical device is used to change voltage?	Transformer
Which type of generating station burns fossil fuels?	Thermal
What term is used to describe the percentage of energy converted into a useful form?	Efficiency

The ABCs of Space
Answers will vary depending on background knowledge. You might ask students to clarify why they feel certain words or phrases are related to space.

Memory Board
Answers will vary depending on the content and terms presented. Accept point-form responses, examples, and sketches as long as they align with the definition. Students should be encouraged to write in their own words.

Why It's Important
Answers will vary and be related to students' familiarity with the topic. You might ask students to clarify why they think a point is important.

Active Reading — Active Learning
Answers will vary.