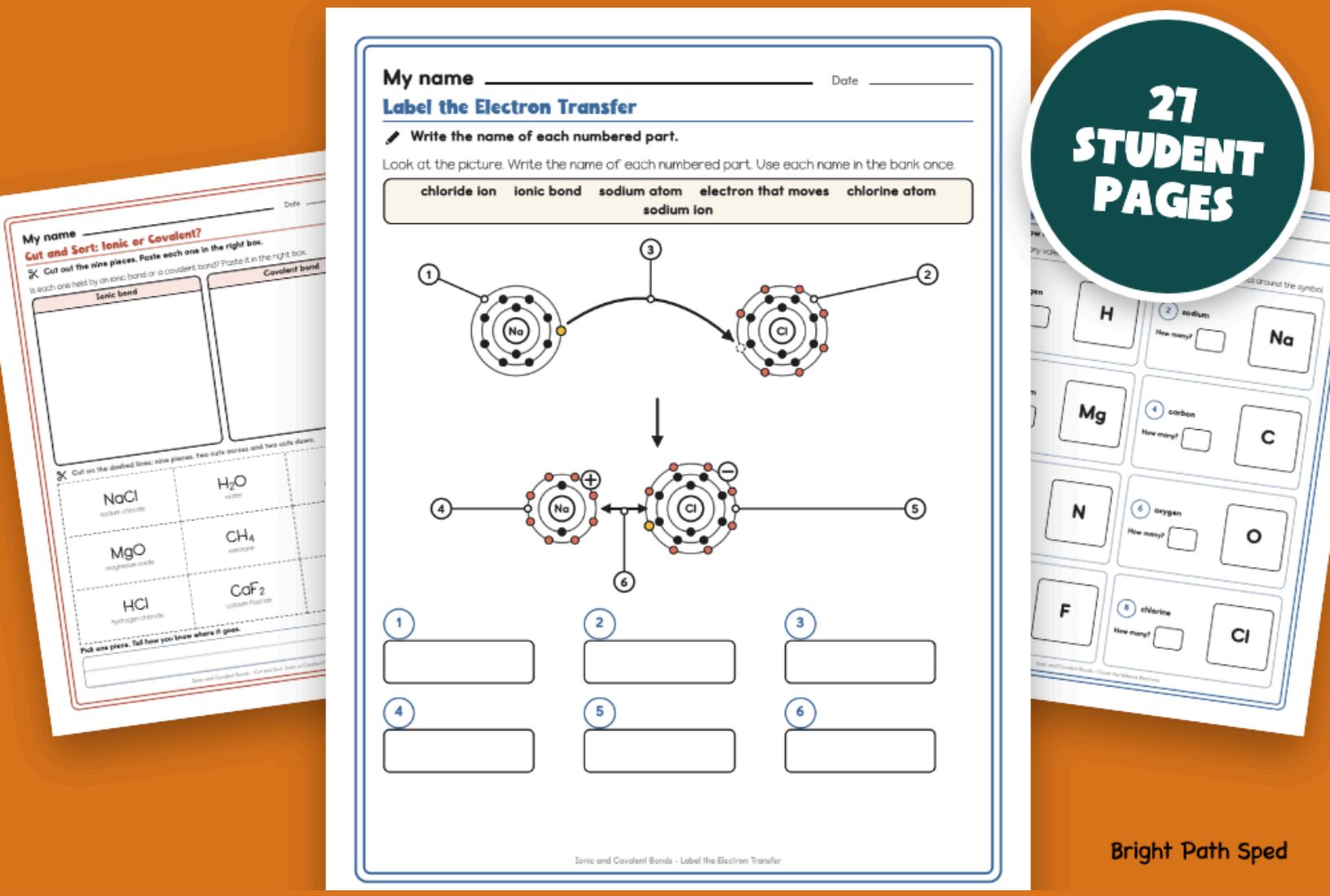
IONIC AND COVALENT BONDS

SORT AND LEWIS DOTS

GRADES 8-10



27 STUDENT PAGES

Bright Path Sped

Terms of Use

Please read before you print your first page.

One classroom license

- This file is for one classroom: one teacher, one group of students.
- Please do not share it, post it online, or sell it.
- Extra licenses for a team or a school are available on the product page.

This is a fillable PDF

- Open it in a PDF reader (Adobe Acrobat Reader, Preview, or your browser), click into a line or a box, type, and Save As.
- The name line, every answer box, every ruled work box and every check box on the student pages are type-in fields, and so are the tracker, class grid, team note and family page. You can also print any page and write by hand.
- It works offline. No account, no subscription, no internet connection needed after you download it.

Print at 100 percent

Turn off fit to page and shrink to fit so the ruled lines stay 0.34 inch apart. Every student page is black and white inside a colored border, so it still reads when copied in black and white.

Student work

A filled-in tracker, class grid or team note carries a real student's name. Keep it in the data folder, and use a first name only on any page that leaves your hands.

Need help?

If a field will not behave or a page will not print the way you expect, use Ask a Question on the product page before leaving a review. Every question is read, and a fix to the file ships as a free update: re-download it any time from My Purchases.

Credits and fonts

Fonts by KA Fonts (Kaitlynn Albani), used under their commercial license. The atom diagrams, the Lewis dot pictures, the structure-card pictures, the element tiles, borders, icons and ruled boxes are drawn by us. There is no clip art in this file. The credits page at the back lists the sources.

© Bright Path Sped. For single-classroom use by the original purchaser.

PREVIEW

How To Read a Page

The parts of a student page, then the kinds of sheet in the order they come.

The parts of a page

- **The answer box.** A bordered box for a letter, a number or a word. Click it to type, or print and write in it.
- **The ruled work box.** Lines 0.34 inch apart for sentences. Write one idea to a line.
- **The check box.** True or false, ionic or covalent, lose or gain: click or mark.
- **The word bank.** A box of words to use. Some words are used once, some not at all.
- **The cut line.** Nine pieces in a short grid, edge to edge: two straight cuts across and two down.

Kind of sheet	How many	What the student does
Readings and cards	4 sheets	Read, answer, and keep the structure cards to look things up.
Words and worked example	2 sheets, 6 items	Match six words, try a worked example.
Elements and electrons	3 sheets, 36 items	Metal or nonmetal, valence electrons, lose or gain and the ion charge.
Formulas	1 sheet, 18 items	Balance the charges and write six formulas.
Diagrams	3 sheets, 15 items	Label transfer and sharing; draw magnesium and oxygen.
Sort and compare	4 sheets, 40 items	Sort ten compounds, fill in a table, ionic / covalent / both, count pairs.
True or false, mistakes, writing	5 sheets	Check sentences, find Dev's mistakes, answer in sentences (6 questions).
Quizzes, exit tickets, cut and sort	12 items, 3 tickets, 18 pieces	Two quizzes, one exit sheet, two cut-and-sort pages.

Untimed, unscored on the page

No student page has a timer or a score on it. The keys and the tracker are for you. The answer keys are on pages 32 to 39.

Short answers

Their key (page 38) says what to look for, not one right sentence. Accept any answer that uses a fact from the readings or the structure cards.

Printing and the type-in fields

Every page prints clean in black and white. The name line, every answer box, every ruled box and every check box are type-in fields in any PDF reader: click one, type, then save. This is a fillable PDF, not a slideshow or a word-processor file.

Room to work

Short-answer boxes hold four lines. If a student needs more room, hand over one page a day, or let students write on scrap paper and copy their best sentences into the box.

PREVIEW

Preview · Bright Path Sped

My name _____ Date _____

Reading 1: Ionic Bonds

Read about ionic bonds. Then answer.

Electrons that move

Atoms have a nucleus with electrons moving around it. The electrons in the outermost shell are called **valence electrons**. Most atoms are steadier when the outer shell is full, and for many atoms that means eight electrons. In an **ionic bond**, one atom gives electrons to another atom. This usually happens between a **metal** and a **nonmetal**. Sodium is a metal with one valence electron. Chlorine is a nonmetal with seven. Sodium gives its electron to chlorine. The sodium atom becomes a positive **ion**, and the chlorine atom becomes a negative ion called a chloride ion. Opposite charges attract, and that attraction is the ionic bond. The compound is sodium chloride, NaCl.

Main idea: What is this reading mostly about?

Check what you read. Write the letter in the box.

1. What do we call the electrons in the outermost shell?
   - **A** Valence electrons
   - **B** Nucleus electrons
   - **C** Ion electrons

2. What happens to the electron when sodium and chlorine form an ionic bond?
   - **A** Chlorine gives it to sodium
   - **B** Sodium gives it to chlorine
   - **C** The two atoms share it

3. Why do the sodium ion and the chloride ion stay together?
   - **A** They share electrons
   - **B** They have the same charge
   - **C** Opposite charges attract

PREVIEW

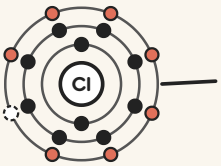
Preview · Bright Path Sped

My name _____ Date _____

Structure Cards 1

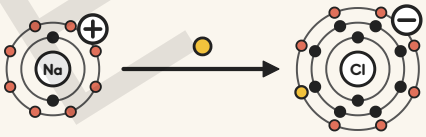
Read the cards. Keep them all week.

Valence electrons



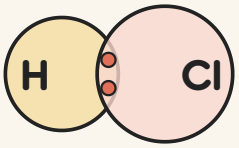
What	the electrons in the outermost shell of an atom
Where	on the outside of the atom, in the last shell
Why they matter	they are the electrons atoms give, take or share
The goal	a full outer shell: eight electrons for most atoms, two for hydrogen

The ionic bond



How	electrons move from one atom to another
Between	a metal and a nonmetal
Makes	ions: a positive ion and a negative ion, held by opposite charges
Melting point	usually high

The covalent bond



How	two atoms share pairs of electrons
Between	two nonmetals
Makes	molecules. A line between symbols is one shared pair
Melting point	usually lower than ionic

Pick one card. Tell what it says in your own words.

PREVIEW

Preview · Bright Path Sped

My name _____ Date _____

Worked Example: Ionic or Covalent?

Read the example. Then try one.

How to tell the kind of bond

Name the two elements. Is each one a metal or a nonmetal? Use the structure cards (pages 7 and 8). Then write the kind of bond. Then check with a different question.

Example. The question is made up for practice.

Start	Read the question: Is NaCl ionic or covalent?
Step 1	Na is sodium. Cl is chlorine. Name the two elements.
Step 2	Sodium is a metal. Chlorine is a nonmetal. Is each one a metal or a nonmetal?
Step 3	A metal and a nonmetal usually make an ionic bond. NaCl is ionic. Use the rule on the card.
Check	It gives it to chlorine, so ionic is right. Does sodium give its electron away or share it?

Your turn. Do the same steps.

Start	Read the question: Is CO_2 ionic or covalent?
Step 1	Write the name of each element. ☐
Step 2	Write metal or nonmetal for each one. ☐
Step 3	Write ionic or covalent. ☐
Check	Do the atoms give electrons away or share them? ☐ **give away** ☐ **share**

PREVIEW

My name _____ Date _____

Count the Valence Electrons

Write how many valence electrons. Then draw the dots.

Write how many valence electrons the atom has. Then draw that many dots around the symbol.

1 **hydrogen**

How many? ☐

H

2 **sodium**

How many? ☐

Na

3 **magnesium**

How many? ☐

Mg

4 **carbon**

How many? ☐

C

5 **nitrogen**

How many? ☐

N

6 **oxygen**

How many? ☐

O

7 **fluorine**

How many? ☐

F

8 **chlorine**

How many? ☐

Cl

PREVIEW

Preview · Bright Path Sped

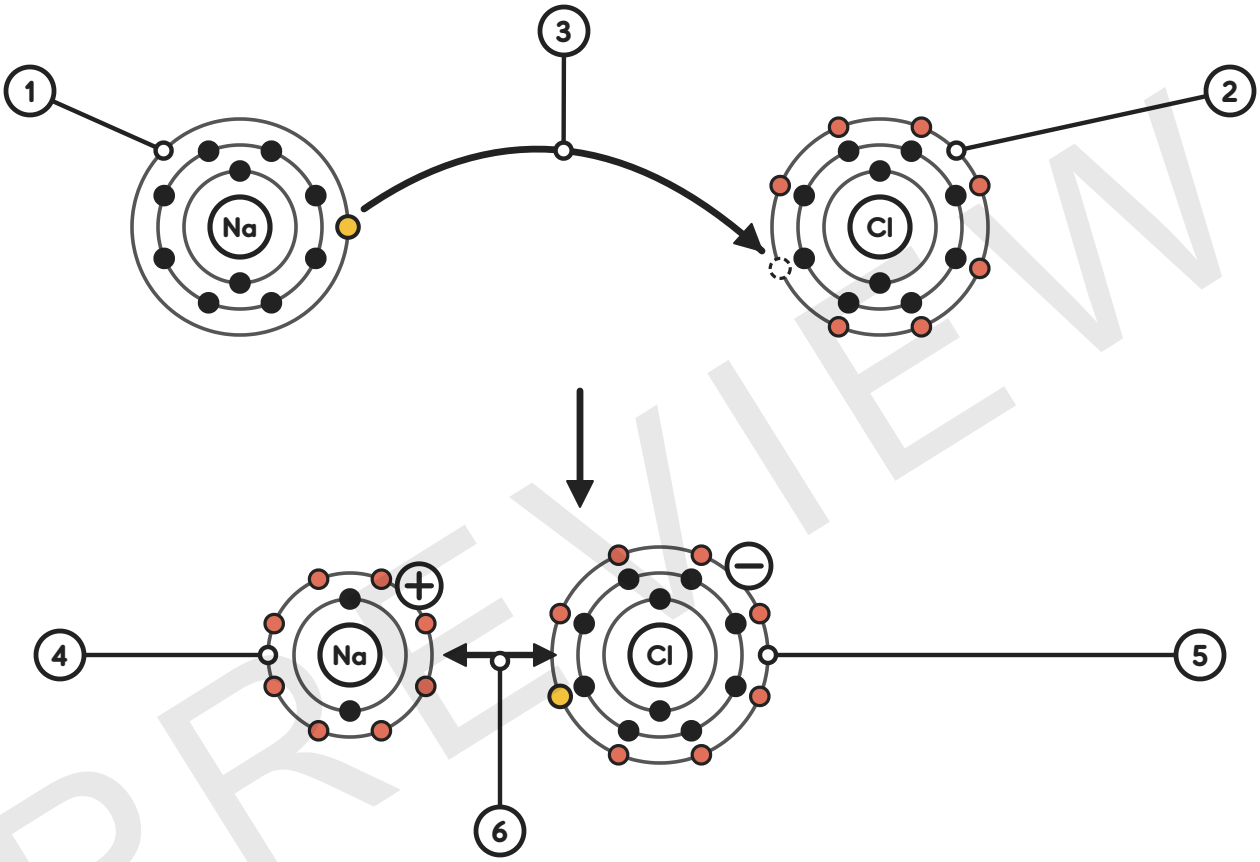
My name _____ Date _____

Label the Electron Transfer

Write the name of each numbered part.

Look at the picture. Write the name of each numbered part. Use each name in the bank once.

chloride ion **ionic bond** **sodium atom** **electron that moves** **chlorine atom** **sodium ion**



1 _____

2 _____

3 _____

4 _____

5 _____

6 _____

PREVIEW

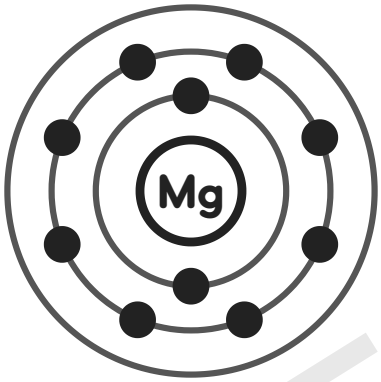
My name _____ Date _____

Draw the Transfer: Magnesium and Oxygen

Draw the outer electrons. Draw an arrow to show where they go.

Do these in order

1. Magnesium has 2 valence electrons and oxygen has 6. Draw them as dots on the outer ring of each atom.
2. Magnesium gives its electrons to oxygen. Draw an arrow for each electron that moves.
3. Fill in the three boxes.





magnesium ion _____

oxide ion _____

formula of the compound _____

Tell why the electrons move from magnesium to oxygen.

PREVIEW

Preview · Bright Path Sped

My name _____ Date _____

Ionic, Covalent or Both?

Check ionic, covalent or both.

Some sentences are true for only one kind of bond. Some are true for both.

1	Electrons move from one atom to another.	☐ ionic	☐ covalent	☐ both
2	Atoms end up with a full outer shell.	☐ ionic	☐ covalent	☐ both
3	It forms between two nonmetals.	☐ ionic	☐ covalent	☐ both
4	It makes a positive ion and a negative ion.	☐ ionic	☐ covalent	☐ both
5	Atoms share pairs of electrons.	☐ ionic	☐ covalent	☐ both
6	It uses valence electrons.	☐ ionic	☐ covalent	☐ both
7	It forms between a metal and a nonmetal.	☐ ionic	☐ covalent	☐ both
8	It makes molecules.	☐ ionic	☐ covalent	☐ both

Pick one sentence you checked both for. Tell why it is true for both.

PREVIEW

Preview · Bright Path Sped

My name _____ Date _____

True or False 1

Is it true or false? Check one.

Check true or false for each sentence.

1. In an ionic bond, electrons move from one atom to another. ☐ true ☐ false

2. Valence electrons are in the nucleus of an atom. ☐ true ☐ false

3. A covalent bond forms when two atoms share electrons. ☐ true ☐ false

4. Water, H_2O, is held together by ionic bonds. ☐ true ☐ false

5. An atom that loses electrons becomes a negative ion. ☐ true ☐ false

6. Sodium chloride is made of a metal and a nonmetal. ☐ true ☐ false

Pick one false sentence. Fix it so it is true.

PREVIEW

Preview · Bright Path Sped

My name _____ Date _____

Short Answers 2

Answer each question in sentences.

Use facts from the readings and the structure cards. Write in sentences.

4 Tell what happens to the electrons in a covalent bond. Name one molecule that has covalent bonds.

5 Compare an ionic bond and a covalent bond. Tell one way they are alike and one way they are different.

6 A compound is made of magnesium (a metal) and oxygen (a nonmetal). Tell which kind of bond it has and how you know.

PREVIEW

Preview · Bright Path Sped

My name _____ Date _____

Quiz A

Pick the best answer. Write its letter.

Take your time. Guess if you are not sure.

1. Which kind of bond has electrons that move from one atom to another?
   - **A** Ionic
   - **B** Covalent
   - **C** Neither kind

2. Which pair of atoms usually forms a covalent bond?
   - **A** A metal and a nonmetal
   - **B** Two metals
   - **C** Two nonmetals

3. Which compound has an ionic bond?
   - **A** CH_4
   - **B** KBr
   - **C** HCl

4. What kind of ion does a metal atom usually form?
   - **A** A negative ion
   - **B** A positive ion
   - **C** A molecule

5. How many valence electrons does a chlorine atom have?
   - **A** One
   - **B** Eight
   - **C** Seven

6. What is a group of atoms joined by covalent bonds?
   - **A** An ion
   - **B** A molecule
   - **C** A metal

PREVIEW

Preview · Bright Path Sped

My name _____ Date _____

Exit Tickets

Answer each ticket before you go.

Each ticket takes about two minutes. Your teacher may collect them at the door.

1 Tell one way an ionic bond and a covalent bond are different.

2 Write one ionic compound and one covalent compound.

3 What is one question about bonds that you still have?

PREVIEW

Preview · Bright Path Sped

Answer Key: Readings, Words, Elements

Every letter is the position of the right option in the printed list.

Readings pages 5, 6

Item	Letter	Answer
5.1	A	Valence electrons
5.2	B	Sodium gives it to chlorine
5.3	C	Opposite charges attract
6.1	B	They share electrons
6.2	A	Two nonmetals
6.3	C	A molecule

Bond Words page 9

Word	Letter	Meaning
1. valence electron	B	an electron in the outermost shell of an atom
2. ion	F	an atom that has a charge because it gained or lost electrons
3. ionic bond	D	the attraction between a positive ion and a negative ion
4. covalent bond	A	a bond made when two atoms share electrons
5. molecule	E	a group of atoms joined by covalent bonds
6. compound	C	a substance made of two or more kinds of atoms joined together

Worked Example: your turn page 10

Step	Answer
Step 1 name the elements	carbon and oxygen
Step 2 metal or nonmetal	both are nonmetals
Step 3 kind of bond	covalent
Check	share

Metal or Nonmetal? page 11

Element	Kind
1. Na (sodium)	Metal
2. Cl (chlorine)	Nonmetal
3. Mg (magnesium)	Metal
4. O (oxygen)	Nonmetal
5. K (potassium)	Metal
6. Br (bromine)	Nonmetal
7. Ca (calcium)	Metal
8. F (fluorine)	Nonmetal
9. C (carbon)	Nonmetal
10. H (hydrogen)	Nonmetal
11. N (nitrogen)	Nonmetal
12. Li (lithium)	Metal

PREVIEW

Answer Key: Diagrams

The numbered parts are the same on the diagram and in the bank. The picture below is the finished draw-it page.

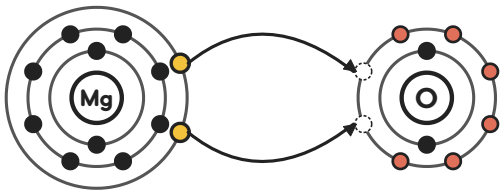
Label the Electron Transfer page 15

Number	Part
1	sodium atom
2	chlorine atom
3	electron that moves
4	sodium ion
5	chloride ion
6	ionic bond

Label the Electron Sharing page 16

Number	Part
1	hydrogen atom
2	chlorine atom
3	valence electron
4	shared pair
5	lone pair
6	molecule

Draw the Transfer: finished



Draw the Transfer page 17

Box	Answer
magnesium ion	2+
oxide ion	2-
formula of the compound	MgO

What to look for

- Magnesium: two dots on its outer ring, and two arrows to oxygen.
- Oxygen: six dots on its outer ring before the transfer, eight after.
- Mg gives up 2 electrons, so it is 2+. O gains 2, so it is 2-. One of each makes MgO.

PREVIEW

Answer Key: Quizzes, Exit Tickets

Every letter is the position of the right option in the printed list.

Quizzes pages 27, 28

Item	Letter	Answer
27.1	A	Ionic
27.2	C	Two nonmetals
27.3	B	KBr
27.4	B	A positive ion
27.5	C	Seven
27.6	B	A molecule
28.1	C	H_2O
28.2	A	The attraction between opposite charges
28.3	B	A shared pair of electrons
28.4	A	MgO
28.5	A	Two
28.6	B	Atoms end with a full outer shell

PREVIEW

Exit tickets

- Exit tickets (page 29): ticket 1 says electrons move in an ionic bond and are shared in a covalent bond; ticket 2 names one ionic compound (NaCl, MgO, KBr or CaF2) and one covalent compound (H2O, CO2, CH4, HCl, O2 or NH3); ticket 3 is open.

Using the quiz keys

The two quizzes cover the same skills in a different order, so a student who misses an item on Quiz A can show it on Quiz B. Record the number right on the tracker, and note the kind of item missed (the kind of bond, the ion charge or the pairs) so the next practice goes to the right card.

Answer Key: Cut and Sort

Pieces are named by their row and column in the cutting grid, left to right and top to bottom.

Cut and Sort: Ionic or Covalent? page 30

Piece (row, column)	Box
r1 c1: NaCl (sodium chloride)	Ionic bond
r1 c2: H_2O (water)	Covalent bond
r1 c3: CO_2 (carbon dioxide)	Covalent bond
r2 c1: MgO (magnesium oxide)	Ionic bond
r2 c2: CH_4 (methane)	Covalent bond
r2 c3: KBr (potassium bromide)	Ionic bond
r3 c1: HCl (hydrogen chloride)	Covalent bond
r3 c2: CaF_2 (calcium fluoride)	Ionic bond
r3 c3: NH_3 (ammonia)	Covalent bond

Cut and Sort: Positive or Negative Ion? page 31

Piece (row, column)	Box
r1 c1: Mg^{2+}	Positive ion
r1 c2: A sodium atom that lost 1 electron	Positive ion
r1 c3: O^{2-}	Negative ion
r2 c1: A calcium atom that lost 2 electrons	Positive ion
r2 c2: F^-	Negative ion
r2 c3: A chlorine atom that gained 1 electron	Negative ion
r3 c1: K^+	Positive ion
r3 c2: A bromine atom that gained 1 electron	Negative ion
r3 c3: Li^+	Positive ion

A note on the cut and sort pages

On the first page, a compound with a metal and a nonmetal goes in the ionic box and a compound of two nonmetals goes in the covalent box. On the second page, an atom that lost electrons is a positive ion and an atom that gained electrons is a negative ion. Pieces pasted in the wrong box are a chance to look at the structure cards again.

Before students paste

- Have students cut the whole grid on the dashed lines first, then lay the nine pieces out and read them before gluing.
- On the first page, read a finished pair aloud: the formula, then the kind of bond.
- Keep a spare copy of each cut and sort page for a student who wants to try again.

PREVIEW

Team Note

Use this page between team meetings or when a student moves classes, to hand off what changed without writing a note from scratch. Everything below is observable, with a blank for the number or the wording your team already uses.

Student _____ Team member _____ Date _____

Kind of sheet	Covered since last note (Y/N)	Items right	Still blank
Readings and words			
Elements and electrons			
Formulas			
Diagrams			
Sort and compare			
True or false			
Quizzes			
Cut and sort			

What I saw (observable, not a conclusion)

- Sorted ___ of 10 compounds by bond type (page 18).
- Labeled ___ of 12 parts on the two diagrams (pages 15, 16).
- Wrote ___ of 18 answers correctly on Balance the Charges (page 14).
- Got ___ of 12 true or false sentences right (pages 22, 23).
- Explained the difference between transfer and sharing in a complete sentence: yes / no / with a reminder.

Next step

- Next page or set: ___, because ___ (what you saw).
- What to try in another class or at home: ___.
- What to keep doing because it is working: ___.
- Anything for the team meeting to decide: ___ (this page records what happened, never a label or a plan).

Summary, in one or two sentences, for whoever reads this next

A filled-in line, for reference

"Got 5 of 6 true or false sentences right on 10/22. Next step: reread Reading 2 and ask what two nonmetals do with their electrons." That is the level of detail this page is built for. It matches the filled example on page 44.

PREVIEW

Riley's Tracker (Invented Student)

Riley M. is invented; nothing on this page describes a real student. The blank tracker is on page 40.

Student: Riley M. (an invented student)

Teacher: Ms. Patel (invented)

Month: October

Page	Page type and set	Items	Right	Date	Notes
5	Reading 1: Ionic Bonds	3	3	10/6	-
6	Reading 2: Covalent Bonds	3	3	10/7	-
9	Bond Words	6	5	10/8	Mixed up ion and valence electron
11	Metal or Nonmetal?	12	11	10/9	Called hydrogen a metal
12	Count the Valence Electrons	8	7	10/10	Counted 5 for oxygen
13	Lose or Gain? Name the Ion	16	14	10/13	Wrote 1+ for magnesium
14	Balance the Charges	18	15	10/14	Used one fluoride for calcium
15	Label the Electron Transfer	6	5	10/15	Swapped the two ions
16	Label the Electron Sharing	6	6	10/15	-
17	Draw the Transfer: Magnesium and Oxygen	3	2	10/16	Wrote MgO with a 2 on oxygen
18	Sort the Compounds by Bond Type	10	9	10/17	Called O_2 ionic
19	Compare the Two Bonds	10	8	10/20	Wrote ions for covalent
20	Ionic, Covalent or Both?	8	8	10/20	-
21	Count the Pairs	12	9	10/21	Counted a double bond as one pair
22	True or False 1	6	5	10/22	Thought water is ionic
23	True or False 2	6	6	10/22	-
26	Find the Mistake	4	3	10/23	Missed the valence sentence
27	Quiz A	6	6	10/24	-
28	Quiz B	6	5	10/24	Missed the shared pairs item
30	Cut and Sort: Ionic or Covalent?	9	8	10/27	Pasted H_2O in the ionic box
31	Cut and Sort: Positive or Negative Ion?	9	-	-	-

PREVIEW

How to read it

Riley M. has done **20 of 21** scored sheets and got **138 of 158** items right with no prompt. **6** sheets were all right and **14** carry a note. Every number comes from the table.

What the table points to

The lowest sheet is Draw the Transfer: Magnesium and Oxygen (2 of 3). That is where the next practice goes. The 1 sheet left blank is not tried yet, never wrong.