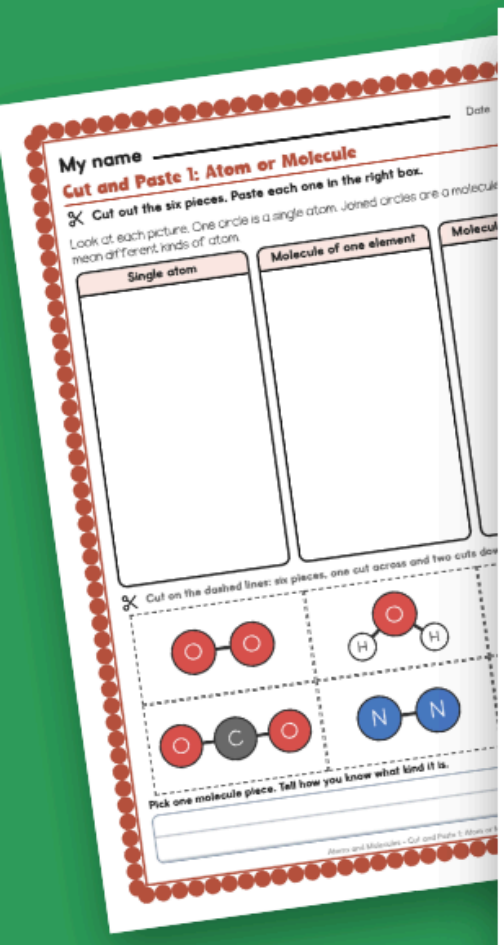
ATOMS AND MOLECULES

MODEL, SORT + COUNT


My name _____ Date _____

Cut and Paste 1: Atom or Molecule

Cut out the six pieces. Paste each one in the right box.

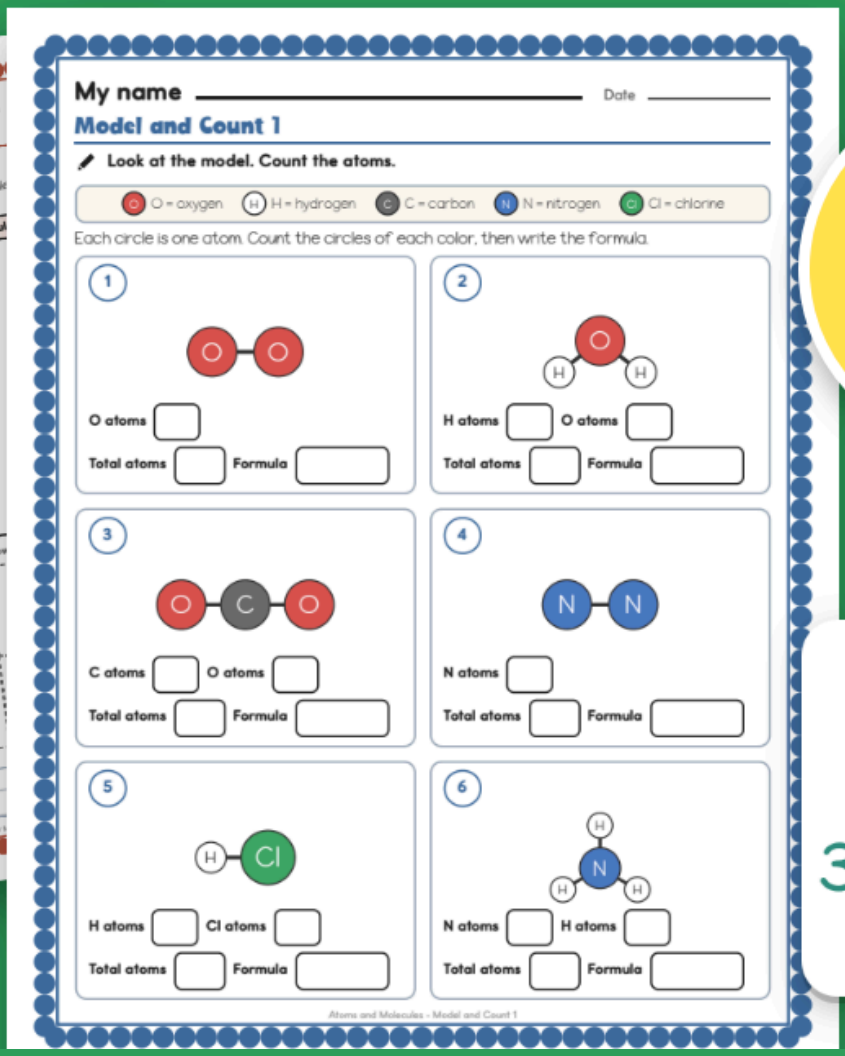
Look at each picture. One circle is a single atom. Joined circles are a molecule

mean different kinds of atom.

Single atom	Molecule of one element	Molecul

Cut on the dashed lines: six pieces, one cut across and two cuts do

Pick one molecule piece. Tell how you know what kind it is.


My name _____ Date _____

Model and Count 1

Look at the model. Count the atoms.

O = oxygen H = hydrogen C = carbon N = nitrogen Cl = chlorine

Each circle is one atom. Count the circles of each color, then write the formula.

1 — O atoms ____ Total atoms ____ Formula ____

2 — H atoms ____ O atoms ____ Total atoms ____ Formula ____

3 — C atoms ____ O atoms ____ Total atoms ____ Formula ____

4 — N atoms ____ Total atoms ____ Formula ____

5 — H atoms ____ Cl atoms ____ Total atoms ____ Formula ____

6 — N atoms ____ H atoms ____ Total atoms ____ Formula ____

Atoms and Molecules - Model and Count 1

GRADES 6-8

H_2O

3 atoms

Bright Path Sped

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- 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.

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PREVIEW

How To Read a Page

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

The parts of a page

- **The answer box.** A bordered box for a count or a formula. Click it to type, or print and write in it.
- **The ruled work box.** Lines 0.34 inch apart for showing work.
- **The check box.** TRUE or FALSE, yes or not yet, or which kind: click or mark.
- **The models.** One circle is one atom. A symbol inside names the element and a color goes with each element. Lines are bonds. The models are flat pictures, not scale drawings.
- **The cut line.** Six pieces in a 3 by 2 grid, each 2.4 by 1.25 inches, edge to edge: one cut across and two down.

Page type	What it looks like	What the student does
Words and reading	3 pages	Four words with pictures, a short reading with four questions, and one worked example.
Model and draw	3 pages, 16 items	Count atoms in a model and write its formula. Draw a molecule from its formula.
Count and name	5 pages	Formula tables, what is it (atom, element molecule, compound), match the total.
Check and fix	2 pages	True or false, and 4 mistakes in an invented student's count.
Sort and assess	3 sorts, quizzes	Three cut-and-paste sorts, short answer, make your own, quizzes, exit tickets.

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 29 to 33.

Checked by computer

Every count in the keys was computed from its formula by program, and every model was drawn from its formula. A note on NaCl: its formula shows a 1 to 1 ratio of atoms, and the pages ask only for the atoms and kinds written in the formula.

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.

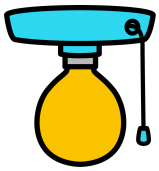
Room to work

Work boxes hold a line or two of steps. If a student needs more room, hand over one page a day, or let students work on scrap paper and copy the answer into the box.

PREVIEW

Preview - Bright Path Sped

My name _____ Date _____



How to Read a Formula

Read each card. Try the blank.

A formula tells you which atoms are in a molecule and how many. Keep this page next to you.

Symbol

One or two letters name an element. Count the different symbols to find the kinds of atom.

CO_2

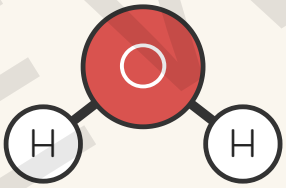


Kinds of atom in CO_2 = ____

Subscript

A small number after a symbol tells how many atoms of that element.

H_2O

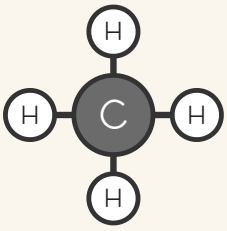


H atoms in H_2O = ____

No number

A symbol with no number counts as one atom.

CH_4

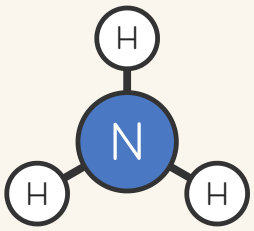


C atoms in CH_4 = ____

Total

Add the atoms of every element to get the total.

NH_3



Total atoms in NH_3 = ____

PREVIEW

Preview - Bright Path Sped

My name _____ Date _____

Read and Answer

Read the story. Then answer.

Everything you can touch is made of atoms. An atom is the smallest unit of an element, and it is far too small to see with your eyes.

An element is matter made of only one kind of atom. Hydrogen, oxygen and carbon are elements. Each element has a symbol of one or two letters: H, O and C.

Atoms often join together. When two or more atoms bond, they form a molecule. Two oxygen atoms bond to make an oxygen molecule, written O_2. The small number is a subscript. It tells how many atoms of that element are in the molecule.

A compound is made of two or more kinds of atom bonded together. A water molecule has two hydrogen atoms and one oxygen atom, so its formula is H_2O. Water is a compound. O_2 is a molecule, but it is not a compound, because it has only one kind of atom.

1. What is an atom?

2. What does the small number in O2 tell you?

3. How many atoms are in one water molecule? Name them.

4. Why is water a compound but O2 is not?

PREVIEW

Preview - Bright Path Shed

My name _____ Date _____

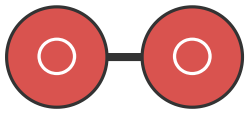
Model and Count 1

Look at the model. Count the atoms.

O = oxygen | H = hydrogen | C = carbon | N = nitrogen | Cl = chlorine

Each circle is one atom. Count the circles of each color, then write the formula.

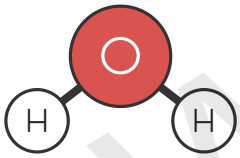
1



O atoms ☐

Total atoms ☐ **Formula** ☐

2



H atoms ☐ **O atoms** ☐

Total atoms ☐ **Formula** ☐

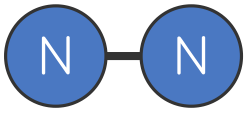
3



C atoms ☐ **O atoms** ☐

Total atoms ☐ **Formula** ☐

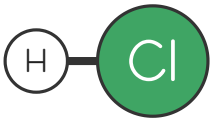
4



N atoms ☐

Total atoms ☐ **Formula** ☐

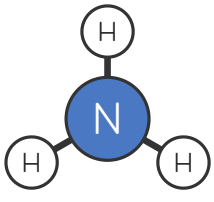
5



H atoms ☐ **Cl atoms** ☐

Total atoms ☐ **Formula** ☐

6



N atoms ☐ **H atoms** ☐

Total atoms ☐ **Formula** ☐

PREVIEW

Preview - Bright Path Shed

My name _____ Date _____

Draw the Molecule

Draw each molecule. Then count.

H = hydrogen O = oxygen C = carbon N = nitrogen

Draw one circle for each atom. Write the symbol inside. Join the atoms with lines.

1 H_2O water

Atoms in all ☐ Kinds ☐

2 CH_4 methane

Atoms in all ☐ Kinds ☐

3 NH_3 ammonia

Atoms in all ☐ Kinds ☐

4 O_2 oxygen gas

Atoms in all ☐ Kinds ☐

PREVIEW

Preview - Bright Path Shed

My name _____ Date _____

Formula Table 2

Count the atoms in each formula.

Count each element. Then add them up. Count the different symbols to find the kinds of atom.

1 $C_6H_{12}O_6$ glucose

C = ☐ H = ☐ O = ☐

Total atoms ☐ Kinds of atom ☐

2 H_2SO_4 sulfuric acid

H = ☐ S = ☐ O = ☐

Total atoms ☐ Kinds of atom ☐

3 C_2H_6 ethane

C = ☐ H = ☐

Total atoms ☐ Kinds of atom ☐

4 HCl hydrogen chloride

H = ☐ Cl = ☐

Total atoms ☐ Kinds of atom ☐

5 C_3H_8 propane

C = ☐ H = ☐

Total atoms ☐ Kinds of atom ☐

6 N_2 nitrogen gas

N = ☐

Total atoms ☐ Kinds of atom ☐

PREVIEW

Preview - Bright Path Shed

My name _____ Date _____

What Is It? 2

Check what each one is.

Count the atoms and the kinds of atom. Check one box in each row.

		single atom	molecule of one element	molecule of a compound
1	CO_2	☐	☐	☐
2	Ne	☐	☐	☐
3	H_2	☐	☐	☐
4	HCl	☐	☐	☐
5	O_3	☐	☐	☐
6	CH_4	☐	☐	☐
7	He	☐	☐	☐
8	H_2S	☐	☐	☐

PREVIEW

My name _____ Date _____

True or False

Check TRUE or FALSE for each one.

Read each statement. Count the atoms yourself, then check TRUE or FALSE.

1. H_2O has 3 atoms in total. ☐ TRUE ☐ FALSE

2. CO_2 has 1 kind of atom. ☐ TRUE ☐ FALSE

3. NH_3 has 3 H atoms. ☐ TRUE ☐ FALSE

4. O_2 has 1 kind of atom. ☐ TRUE ☐ FALSE

5. CH_4 has 4 atoms in total. ☐ TRUE ☐ FALSE

6. N_2 has 3 atoms in total. ☐ TRUE ☐ FALSE

PREVIEW

Preview - Bright Path Sped

My name _____ Date _____

Cut and Paste 1: Atom or Molecule

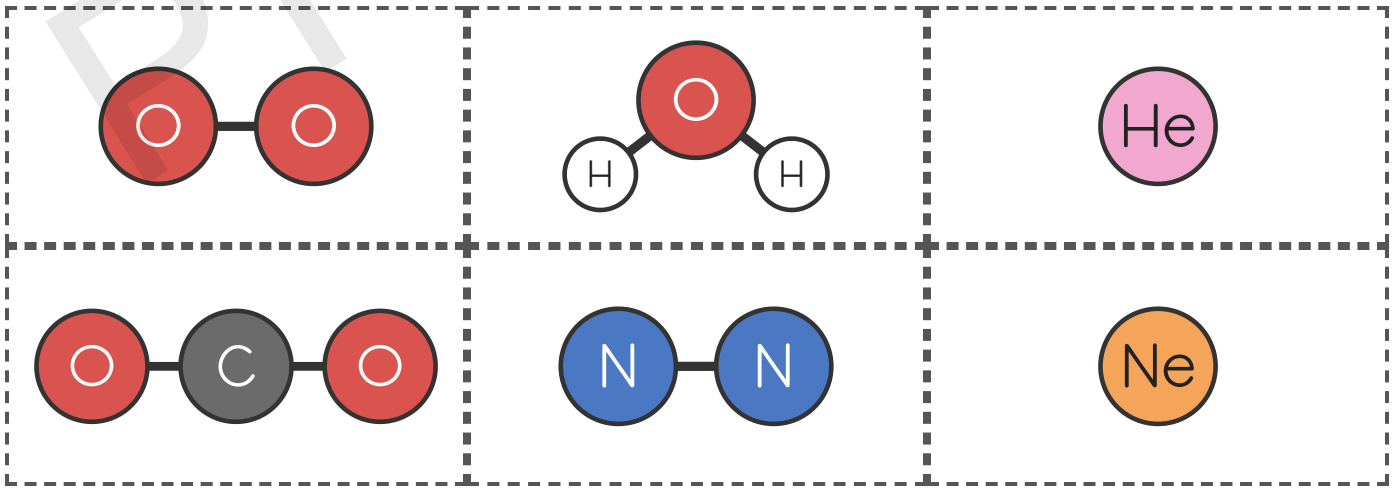
Cut out the six pieces. Paste each one in the right box.

Look at each picture. One circle is a single atom. Joined circles are a molecule. Different colors mean different kinds of atom.

Single atom	Molecule of one element	Molecule of a compound

PREVIEW

Cut on the dashed lines: six pieces, one cut across and two cuts down.



Pick one molecule piece. Tell how you know what kind it is.

My name _____ Date _____

Short Answer

Write your answer in the box.

Explain in your own words. Use a number to check.

1. What is the difference between an atom and a molecule? Use O_2 as your example.

2. Is H_2O an element, a molecule, a compound, or more than one of these? Explain how you know.

3. A model shows 1 C atom bonded to 4 H atoms. Write its formula. Tell how many atoms and how many kinds of atom it has.

PREVIEW

Preview - Bright Path Sped

My name _____ Date _____

Quiz 1

Count. Write the answer.

1. How many atoms are in H_2O? **Answer** ____

2. How many O atoms are in CO_2? **Answer** ____

3. How many kinds of atom are in NH_3? **Answer** ____

4. How many H atoms are in CH_4? **Answer** ____

5. How many atoms are in O_2? **Answer** ____

6. How many kinds of atom are in NaCl? **Answer** ____

PREVIEW

Preview - Bright Path Sped

My name _____ Date _____

Exit Tickets 1

Count. Then tell how sure you are.

Exit ticket 1 How many H atoms are in H_2O?

Answer

How sure am I? ☐ **sure** ☐ **kind of sure** ☐ **not sure**

Exit ticket 2 How many atoms are in CO_2?

Answer

How sure am I? ☐ **sure** ☐ **kind of sure** ☐ **not sure**

Exit ticket 3 How many kinds of atom are in CH_4?

Answer

How sure am I? ☐ **sure** ☐ **kind of sure** ☐ **not sure**

PREVIEW

Preview · Bright Path Sped

My name _____ Date _____

Check My Own Work

Check your own work. Mark yes or not yet.

1	I can tell an atom from a molecule.	☐ yes	☐ not yet
2	I can tell what a symbol and a subscript mean.	☐ yes	☐ not yet
3	I count each kind of atom in a formula.	☐ yes	☐ not yet
4	I add the atoms to find the total.	☐ yes	☐ not yet
5	I count the kinds of atom.	☐ yes	☐ not yet
6	I can read a model and write its formula.	☐ yes	☐ not yet
7	I can draw a molecule from its formula.	☐ yes	☐ not yet
8	I can tell a compound from a molecule of one element.	☐ yes	☐ not yet

The kind of molecule I can count now is...

The part I still need help with is...

PREVIEW

Preview · Bright Path Sped

Answer Key: Models and Drawings

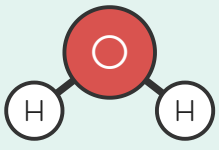
Pages 9 and 10: the count of each kind of atom, the total, and the formula the student writes. Page 11: any correct drawing is fine; the models below show one correct picture for each.

Item	Problem	Answer
p9 #1	O_2	O 2; total 2; 1 kind; formula O_2
p9 #2	H_2O	H 2, O 1; total 3; 2 kinds; formula H_2O
p9 #3	CO_2	C 1, O 2; total 3; 2 kinds; formula CO_2
p9 #4	N_2	N 2; total 2; 1 kind; formula N_2
p9 #5	HCl	H 1, Cl 1; total 2; 2 kinds; formula HCl
p9 #6	NH_3	N 1, H 3; total 4; 2 kinds; formula NH_3

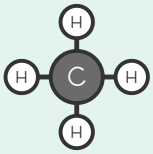
Item	Problem	Answer
p10 #1	CH_4	C 1, H 4; total 5; 2 kinds; formula CH_4
p10 #2	Cl_2	Cl 2; total 2; 1 kind; formula Cl_2
p10 #3	CO	C 1, O 1; total 2; 2 kinds; formula CO
p10 #4	H_2S	H 2, S 1; total 3; 2 kinds; formula H_2S
p10 #5	H_2	H 2; total 2; 1 kind; formula H_2
p10 #6	O_3	O 3; total 3; 1 kind; formula O_3

Item	Formula	Counts
p11 #1	H_2O	H 2, O 1; total 3; 2 kinds
p11 #2	CH_4	C 1, H 4; total 5; 2 kinds
p11 #3	NH_3	N 1, H 3; total 4; 2 kinds
p11 #4	O_2	O 2; total 2; 1 kind

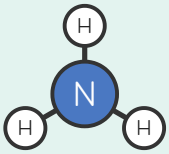
One correct drawing for each, page 11



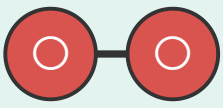
H_2O



CH_4



NH_3



O_2

PREVIEW

Answer Key: Mistakes, True or False, Writing

The student in each Find the Mistake problem is invented. Line numbers count the first thing Sam wrote as line 1.

Item	Problem	Mistake	What went wrong	Right count
p18 #1	H_2O	Line 2	Sam skipped the O atom because it had no number. The right count is 3, not 2.	3
p18 #2	CO_2	Line 2	Sam ignored the subscript 2 after the O. The right count is 2, not 1.	2
p18 #3	CH_4	Line 2	Sam counted every symbol as one atom and ignored the 4. The right count is 4, not 1.	4
p18 #4	NH_3	Line 2	Sam added up the atoms instead of counting the different elements. The right count is 2, not 4.	2

Item	Problem	Answer
p17 #1	H_2O has 3 atoms in total.	TRUE
p17 #2	CO_2 has 1 kind of atom.	FALSE
p17 #3	NH_3 has 3 H atoms.	TRUE

Item	Problem	Answer
p17 #4	O_2 has 1 kind of atom.	TRUE
p17 #5	CH_4 has 4 atoms in total.	FALSE
p17 #6	N_2 has 3 atoms in total.	FALSE

Sample answers, short answer page 22

- An atom is one single particle of an element. A molecule is two or more atoms bonded together. O_2 is a molecule of two oxygen atoms.
- H_2O is a molecule, because its atoms are bonded, and a compound, because it has two kinds of atom. It is not an element.
- CH_4. It has 5 atoms in all (1 C and 4 H) and 2 kinds of atom.

Make your own, page 23

Check each answer against the student's own formula: count each element, add, and count the different symbols. Example answers: H_2O (3 atoms, 2 kinds); N_2 or O_2 (one kind of atom, drawn as two bonded circles); CO_2 and H_2O both have 3 atoms in all.

PREVIEW

Atoms and Molecules Tracker

One student, every scored page. 108 items on 21 pages. Blank means not tried yet, never wrong. Keys: pages 29 to 33. Filled example: page 38.

Student _____ Teacher _____ Month _____

Page	Page type and set	Items	Right	Date	Notes
5	How to Read a Formula	4			
6	Words to Know	4			
7	Read and Answer	4			
8	Worked Examples: Count	2			
9	Model and Count 1	6			
10	Model and Count 2	6			
11	Draw the Molecule	4			
12	Formula Table 1	6			
13	Formula Table 2	6			
14	What Is It? 1	6			
15	What Is It? 2	8			
16	Match the Total	6			
17	True or False	6			
18	Find the Mistake	4			
19	Cut and Paste 1: Atom or Molecule	6			
20	Cut and Paste 2: Kinds of Atom	6			
21	Cut and Paste 3: Total Atoms	6			
24	Quiz 1	6			
25	Quiz 2	6			
26	Exit Tickets 1	3			
27	Exit Tickets 2	3			

This month we are working on (your own standard or wording)

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 _____

Page type	Covered since last note (Y/N)	Items right	Still blank
Words and reading			
Models and drawings			
Formula tables			
What is it			
Match			
True or false			
Mistakes			
Sorts			
Quizzes and exits			

What I saw (observable, not a conclusion)

- Counted ___ of ___ atoms in models correctly without a prompt.
- Filled in ___ of ___ formula tables (pages 12 and 13).
- Sorted ___ of ___ pieces into the right box (pages 19 to 21).
- Checked a count by counting again: 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

"Counted 5 of 6 formulas on 10/15. Next step: use the models on page 9 and circle each kind of atom with a different color." That is the detail this page is built for. It matches the filled example on page 38.

PREVIEW

Riley's Tracker (Invented Student)

Riley T. is invented; nothing on this page describes a real student. The blank tracker is on page 34.

Student: Riley T. (an invented student)

Teacher: Ms. Adeyemi (invented)

Month: October

Page	Page type and set	Items	Right	Date	Notes
5	How to Read a Formula	4	3	10/6	Missed the symbol card
6	Words to Know	4	4	10/7	-
7	Read and Answer	4	3	10/8	Missed the compound question
8	Worked Examples: Count	2	2	10/9	-
9	Model and Count 1	6	5	10/10	Counted O2 as 1 atom
10	Model and Count 2	6	4	10/13	Missed the formula for CO
11	Draw the Molecule	4	3	10/14	Left out a bond line
12	Formula Table 1	6	5	10/15	Counted NaCl as 1 atom
13	Formula Table 2	6	-	-	-
14	What Is It? 1	6	4	10/16	Mixed up two molecule types
15	What Is It? 2	8	-	-	-
16	Match the Total	6	5	10/17	Matched one total wrong
17	True or False	6	4	10/20	Missed two false statements
18	Find the Mistake	4	3	10/21	Fixed three of the four
19	Cut and Paste 1: Atom or Molecule	6	6	10/22	-
20	Cut and Paste 2: Kinds of Atom	6	-	-	-
21	Cut and Paste 3: Total Atoms	6	-	-	-
24	Quiz 1	6	5	10/23	Counted kinds as atoms
25	Quiz 2	6	-	-	-
26	Exit Tickets 1	3	-	-	-
27	Exit Tickets 2	3	-	-	-

How to read it

Riley T. has done **14 of 21** scored pages and got **56 of 70** items right with no prompt. **3** pages were all right and **11** carry a note. Every number comes from the table.

What the table points to

The lowest page is Model and Count 2 (4 of 6) and What Is It? 1 (4 of 6) and True or False (4 of 6). That is where the next practice goes. The 7 pages left blank are not tried yet, never wrong.

PREVIEW