What Is in Air?

Identify the elements and compounds that share the air around you.

6.7.a "air is a mixture of gaseous elements and compounds;"

NAME _____ DATE _____

1 READ AND MARK

Read it twice

YOUR JOB Underline every named gaseous element and circle every named gaseous compound. Number the sentence that explains why air is a mixture.

A Shared Space of Gases

1. Air may look empty, but it is made of several gases sharing the same space. In a classroom, the largest part of dry air is nitrogen, N_2. Nitrogen is an element because each of its particles contains only nitrogen atoms. Oxygen, O_2, is another element in air. Its particles contain only oxygen atoms. These gases are spread throughout the room, even though you cannot see them. A sample of air can contain both nitrogen and oxygen at the same time.

2. Air also includes gases whose particles contain more than one kind of atom. Carbon dioxide, CO_2, has carbon atoms joined to oxygen atoms, so it is a compound. Plants use carbon dioxide during photosynthesis, and people and animals release it when they breathe out. Water vapor, H_2O, is also a compound in air because each water particle has hydrogen and oxygen atoms. The amount of water vapor changes. Humid air has more water vapor than dry air, while carbon dioxide is present in much smaller amounts than nitrogen or oxygen.

3. Because air is a mixture, its gases are not all changed into a single new substance. Nitrogen remains nitrogen, and oxygen remains oxygen, even while they mix. The composition of air can vary from place to place or day to day, especially when water vapor changes. Near a busy road, air may also contain added gases from fuel burning. Scientists study air samples to identify the gases present and to compare their amounts. Clean air still contains a mixture of gaseous elements and compounds.

2 ANSWER WITH EVIDENCE

Use the passage

1. Name the two gaseous elements identified in the first paragraph. What do their particles have in common?

2. Why is carbon dioxide, CO_2, a compound instead of an element?

3. How does the amount of water vapor differ between humid air and dry air?

4. According to the passage, what happens to nitrogen and oxygen when they mix in air?

3 YOUR TURN

Your own words

Create a four-row air-mixture note. List two gaseous elements and two gaseous compounds that can be present in Earth's atmosphere, then give evidence from each formula that supports your classification.

GAS AND FORMULA	ELEMENT OR COMPOUND?	FORMULA EVIDENCE

ANSWER KEY

What Is in Air?

GRADE 6 · 6.7.a

PART 1 · READ AND MARK

Underline every named gaseous element and circle every named gaseous compound. Number the sentence that explains why air is a mixture. Accept any marking that follows this job and points at the right text.

PART 2 · ANSWERS

#	QUESTION	ANSWER
1	Name the two gaseous elements identified in the first paragraph. What do their particles have in common?	**Nitrogen, N_2, and oxygen, O_2. Each particle contains only one kind of atom.**
2	Why is carbon dioxide, CO_2, a compound instead of an element?	**Its particles contain carbon atoms joined to oxygen atoms, so they have more than one kind of atom.**
3	How does the amount of water vapor differ between humid air and dry air?	**Humid air has more water vapor than dry air.**
4	According to the passage, what happens to nitrogen and oxygen when they mix in air?	**They are not changed into one new substance. Nitrogen remains nitrogen, and oxygen remains oxygen.**

PART 3 · YOUR TURN (SAMPLE ANSWER)

GAS AND FORMULA	ELEMENT OR COMPOUND?	FORMULA EVIDENCE
Argon, Ar	Element	Ar has only argon atoms.
Helium, He	Element	He has only helium atoms.
Methane, CH_4	Compound	CH_4 has carbon and hydrogen atoms.
Nitrous oxide, N_2O	Compound	N_2O has nitrogen and oxygen atoms.

Accept any accurate gaseous elements and compounds that can occur in Earth's atmosphere, including trace gases. For the open task, the evidence must correctly identify whether the formula has one kind of atom or more than one kind of atom.