

TIMSS 2019 - Restricted Use Items – Chemistry

Benchmark 2

Applying

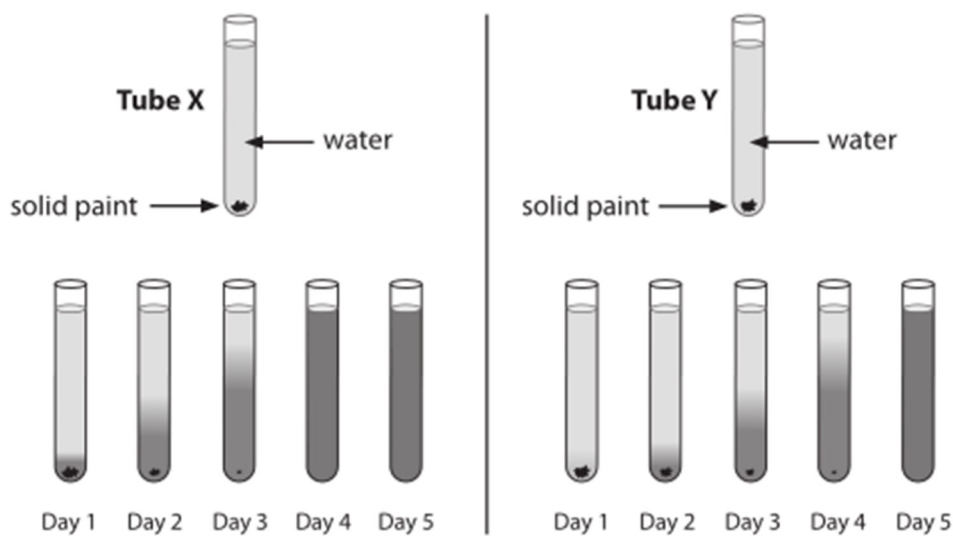
Fill in the circle to show whether each symbol or formula represents an element or a compound.

	Element	Compound
O	<input type="radio"/>	<input type="radio"/>
K	<input type="radio"/>	<input type="radio"/>
H ₂ SO ₄	<input type="radio"/>	<input type="radio"/>
NH ₃	<input type="radio"/>	<input type="radio"/>
CH ₄	<input type="radio"/>	<input type="radio"/>
Mg	<input type="radio"/>	<input type="radio"/>

Benchmark 3

Reasoning

Maria placed two identical pieces of solid paint at the bottom of two identical tubes, X and Y, filled with water. On Day 1 she put one tube in a refrigerator and left the other in the warm room. Maria took a picture of each tube at the same time for five days. The diagram shows Maria's pictures from each day.



Which tube was in the refrigerator?

(Check one box.)

Tube X

Tube Y

Explain your answer.

Benchmark 4

Applying

This is a portion of the periodic table of elements.

^1H							He
Li	Be	B	C	N	O	F	Ne
Na	Mg	Al	Si	P	S	Cl	Ar

Hydrogen (H) is the first element of the periodic table. The nucleus of a hydrogen atom contains one proton. The atomic number of hydrogen is 1.

Four elements from the periodic table are shown below. The elements are not ordered by their atomic numbers.

Write each element in the boxes to order them from smallest atomic number to largest atomic number.

Sodium (Na)

Fluorine (F)

Helium (He)

Carbon (C)

Smallest

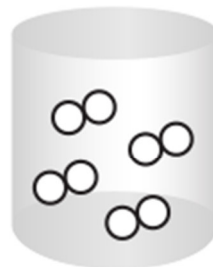
Largest

Reasoning

Hugo wants to illustrate a chemical reaction. He uses models of Substance 1 and Substance 2 as shown below. Circles represent atoms of each substance.



Substance 1



Substance 2

How should he illustrate the results of a chemical reaction after Substance 1 reacted with Substance 2?

