

CHEMICAL REACTIONS

Grade 7 Science | Free One Page Study Guide



Read | Annotate | Find evidence | Analyze | Eliminate and justify

1 Compare before and after properties

LA 7-MS-PS1-2
NGSS MS-PS1-2

Hypothetical property model

Reactants A/B: soluble
Melt at 80°C / 120°C

Isolated P: insoluble
Melts at 210°C

What we did. We sorted evidence and compared property patterns.

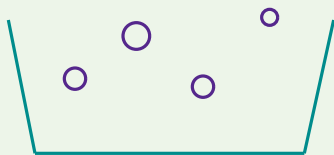
Why it works. Different properties of an isolated product support a new substance formed; one color clue alone is insufficient.

Apply what you know. Which TWO before/after comparisons strengthen a reaction claim?

2 Observe and qualify reaction evidence

LA 7-MS-PS1-2
NGSS MS-PS1-2

Vinegar + baking soda



Bubbles are observations.
A reference identifies expected products.

What we did. We compared two open cups or used supplied records.

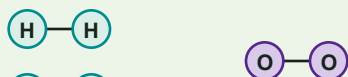
Why it works. Vinegar acid and baking soda form carbon dioxide, water and dissolved sodium acetate; gas is not identified by sight.

Apply what you know. What extra context would you need for bubbles in an unknown liquid?

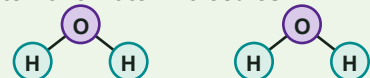
3 Rearrange atoms without losing any

LA 7-MS-PS1-5
NGSS MS-PS1-5

Before



After: two water molecules



Each side: 4 H + 2 O; not to scale.

What we did. We built groups, rearranged the same cards and recounted.

Why it works. Four H and two O stay four H and two O. New groupings can have different properties without creating atoms.

Apply what you know. How would you repair a product model missing one O?

4 Track matter across a boundary

LA 7-MS-PS1-5
NGSS MS-PS1-5

Supplied mass model

OPEN: 60.0 g before
57.5 g remains + 2.5 g gas out

CLOSED: 60.0 g before
60.0 g after; all gas stays inside

What we did. We moved mass tokens out of an open boundary, then reset and kept all inside a closed one.

Why it works. Gas has mass. Matter outside the measured part still exists; no atoms were destroyed.

Apply what you know. Why does constant closed-system mass not prove a physical change?