Gas Law Simulation A Criteria

I. Data Collection

A. 1=m, 2=n, 3=o, 4=p. [Particles, atoms, molecules], [collisions, crash], [velocity, speed], [energy, force].

_____a. particles are moving in straight lines
_____b. particles are colliding with walls
_____c. particles are colliding with each other
_____d. particles collide or crash
_____e. speeds of particles are not the same
_____f. speed(s) of particle(s) change(s)
_____g. force or energy of collision influences speed of particles.

B.
OBSERVATION (graph)
_____a. straight line (between collisions)
_____b. angle of collision with walls
EXPLANATION:
_____c. speed changes as a result of collision with other particles
_____d. direction changes
MISCONCEPTION:
_____e. speed changes as a result of collision with wall

C.
_____a. organized
LABELS (incl. correct units)
_____b. 1.01 atm (pressure)
_____c. 22.4 L (volume)
_____d. 275.25 K (temp.)

D. (pt. 1)
_____a. different particles have different speeds
_____b. speed(s) of particle(s) change(s)
_____c. average speed is constant

D. (pt. 2)
_____a. draw graph
_____b. label axis (x: speed, y: number of particles)
_____c. label line (average speed)
_____d. label blocks (number of particles in a particular speed)

E.
OBSERVATION
_____a. as pressure increases, volume decreases, or vice versa
_____b. no changes in velocity distribution or average velocity
_____c. number of collision increases or velocity changes more often when

volume decreases.

EXPLANATION

_____d. pressure increases because collision with walls increases

_____e. pressure increases because collision increases

MISCONCEPTION

_____f. average speed changes

_____g. pressure increases because collision between particles increases

II. Data Analysis

_____a. correct graph

_____b. pressure and volume are inversely proportional (in word)

_____c. pV=constant or p 1/V

MISCONCEPTION

_____d. wrong graph

_____e. p= 1/V

_____f. y=ax + b

III. Interpretation and Conclusions

A.

_____a. pressure and volume are inversely proportional, or PV= c or p 1/V

B.

_____a. show two situations with different volumes and same number of particles

_____b. explain that the collisions in a unit time are different

_____c. (because) average speeds are the same but volumes are different

_____d. two situations with different volumes and different number of particles

C.

_____a. correct answer (e.g. 0.226 atm and 275 K) extrapolated from graph that pV=c=22.6

_____b. correct answer from pV=nRT or p_1V_1=p_2V_2

_____c. correct answer only