Teacher Class Report

Strengths

This class shows a strong grasp of states of matter, routinely identifying the correct state from data and describing particle behavior, with a mean of 0.92/1 on these tasks. They also demonstrate solid connections between density and state descriptions, indicating a clear grasp of how properties relate to phases. In phase-change reasoning, they perform well on melting and boiling point concepts, including recognizing bulk bubble formation and labeled terms, with a mean of 0.84/1 on these tasks.

1C — class mean 0.92/1 (skills: identify state of matter from data; states of matter and particle behavior ; topics: identify correct state term from description; states of matter and density)

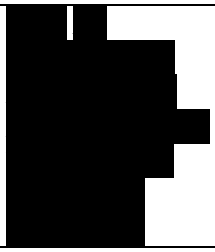
2A — class mean 0.84/1 (skills: boiling: bulk bubble formation; identify b labelled term ; topics: identify b labelled term; melting and boiling points determine state)

Weaknesses

This class struggles to connect diffusion and random particle motion to changes in state and bond strength, and to link crystal lattices with bonding forces. They show particular difficulty with metallic bonding, including why iron has more delocalised electrons and stronger bonds than silver, and how that relates to melting and boiling points. They also tend to misapply the particle model of melting, not consistently tying bond breakage to delocalised electrons and lattice structure.

3B — class mean 0.32/2 (skills: diffusion via random particle motion; iron bonds stronger than silver; iron has more delocalised electron; iron melting point and bond strength; role of delocalised electrons in metals ; topics: crystal lattices and bonding forces; delocalised electrons enable metallic bonding; iron has more delocalised electron; iron stronger metallic bonds than silver; melting and boiling points determine state; particle model melting when bonds break)

Star moments

Subquestion	Students
Q1::1a	

	[redacted]

Opportunities for intervention

Subquestion	Students
Q9::9a(i)	[redacted]

Class overview (sub-questions)

Sub	Mean	SD	Max	Avg %	Skills/Topics
1A	0.68	0.47	1	68.0%	identify state of matter from data; states of matter and particle behavior | states of matter and density
1B	0.28	0.45	1	28.0%	diffusion via random particle motion; intermolecular forces and gas behavior; kinetic theory basics and observation justification; states of matter and particle behavior | kinetic theory basic; kinetic theory: gas behavior, diffusion, evaporation; weak intermolecular forces in gases
1C	0.92	0.27	1	92.0%	identify state of matter from

					data; states of matter and particle behavior | identify correct state term from description; states of matter and density
2A	0.84	0.37	1	84.0%	boiling: bulk bubble formation; identify b labelled term | identify b labelled term; melting and boiling points determine state
2B	0.52	0.50	1	52.0%	condensation term; gas to liquid condensation; phase change naming | condensation term; gas to liquid condensation; phase change naming
3A	2.56	1.50	4	64.0%	confirm silver state from data; identify state of matter from data; iron melting point and bond strength; select the correct column; state relative to room temperature; states of matter and

					particle behavior; use data to mark | distinguish solid liquid ga; gas form at room temperature; identify state from mp and bp; iron solid at room temperature; melting and boiling points determine state; room temperature around twenty degree; room temperature used for state check; silver is solid at room temperature; water liquid at room temperature
3B	0.32	0.55	2	16.0%	diffusion via random particle motion; iron bonds stronger than silver; iron has more delocalised electron; iron melting point and bond strength; role of delocalised electrons in metals | crystal lattices and bonding forces; delocalised electrons enable

					metallic bonding; iron has more delocalised electron; iron stronger metallic bonds than silver; melting and boiling points determine state; particle model melting when bonds break
4A	2.00	1.02	3	66.7%	connect term with its definition; definition of mass; density relates mass to volume; mass equals amount of matter; matching keywords to definitions; volume is space occupied | definition of mass; density definition; heaviness relative to size; line match keywords to definition; link term to its definition; states of matter and density; volume
4B	1.00	0.63	2	50.0%	diffusion via random particle motion; justify

					higher density for tin; states of matter and particle behavior; tin atoms heavier than helium | helium is a ga; kinetic theory: gas behavior, diffusion, evaporation; states of matter and density; tin is a solid
5A	0.52	0.50	1	52.0%	skillexplain using particle flow; states of matter and particle behavior | gravity acts on liquid; states of matter and density
5B	0.60	0.49	1	60.0%	describe space between molecule; diffusion via random particle motion; justify uniform filling by spread; link motion to filling container | gas fills container by spreading; kinetic theory: gas behavior, diffusion, evaporation; there is empty space between molecule
5C	0.40	0.49	1	40.0%	explain vibrational motion

					around lattice point; lattice spacing determines volume; states of matter and particle behavior | crystal lattices and bonding forces; particles arranged in a lattice; states of matter and density; volume determined by lattice spacing
6	0.68	0.55	2	34.0%	assess lack of bubbles as evidence; boiling: bulk bubble formation; evaporation vs boiling: definitions and distinctions; justify puddle disappearance by evaporation; temperature dependence of evaporation rate; use surface escape concept | boiling happens at boiling point; kinetic theory: gas behavior, diffusion, evaporation; no bubbles in evaporation; puddle

					disappears by evaporation; vaporization of surface particles
7A	0.56	0.75	2	28.0%	diffusion along concentration gradient; diffusion depends on size and temperature; diffusion via random particle motion | diffusion driven by concentration gradient; kinetic theory: gas behavior, diffusion, evaporation
7B	0.40	0.49	1	40.0%	compare particle speed by state; diffusion depends on size and temperature; diffusion via random particle motion; intermolecular forces and gas behavior; use state differences to justify rate | crystal lattices and bonding forces; kinetic theory: gas behavior, diffusion, evaporation; weak

					intermolecular forces in gases
7C	1.00	0.80	2	50.0%	diffusion depends on size and temperature; evaporation of odor increases with temperature; kinetic theory basics and observation justification; link faster motion to odor strength; molecules have higher kinetic energy | kinetic theory: gas behavior, diffusion, evaporation; molecules have higher kinetic energy; odor molecules diffuse through air; smell travels via gas molecule
8	1.88	1.48	4	47.0%	iron melting point and bond strength; states of matter and particle behavior | crystal lattices and bonding forces; melting requires energy input; states of matter and density

9A(I)	3.16	1.19	4	79.0%	air temperature measurement units; choose correct quantity; explain why the link is wrong; identify incorrect pairings; link instruments to measurements and units | air temperature measurement units; balance measures mass; equipment to measurement link; gram is unit of mass; length uses length unit; measuring length with a ruler; quantity must match instrument; states of matter and density; thermometer measures temperature; time measured by stopwatch; time uses time unit
9B	0.68	0.47	1	68.0%	evaluate and select accurate measuring containers; identify proper scale for amount; read correct

					graduation | cm3 equals ml concept; graduation spacing shows precision; read scale accurately; select container by volume

Per-student marks by subquestion

Student	1A	1B	1C	2A	2B	3A	3B	4A	4B	5A	5B	5C	6	7A	7B	7C	8	9A(I)	9B	Total
[redacted]	1	0	1	1	1	4	0	3	1	1	1	1	1	0	1	2	4	2	1	26
[redacted]	0	1	1	1	1	4	0	3	1	1	1	1	1	2	0	2	3	4	1	28
[redacted]	1	1	1	1	0	0	0	1	0	0	1	1	0	0	0	0	1	4	0	12
[redacted]	1	0	1	1	0	3	1	1	1	0	1	0	1	1	0	1	1	4	1	19
[redacted]	1	0	1	1	1	1	1	1	1	0	1	1	0	1	1	2	2	4	0	20
[redacted]	1	0	1	1	0	1	0	1	1	0	0	0	1	0	0	0	0	4	1	12
[redacted]	1	0	1	1	1	4	1	3	1	1	1	1	0	0	1	2	3	4	1	27
[redacted]	1	0	1	1	1	4	1	3	2	1	1	1	1	1	1	2	4	2	1	29
[redacted]	1	0	1	0	0	0	1	1	0	1	1	0	1	0	1	1	1	1	0	11
[redacted]	1	0	1	1	1	2	1	3	2	1	1	1	1	0	1	2	4	0	0	23
[redacted]	0	1	1	1	0	2	0	0	1	0	1	0	1	2	0	1	0	4	1	16
[redacted]	1	0	1	1	0	4	0	3	1	0	1	0	0	0	0	1	2	4	1	20
[redacted]	0	1	1	1	1	4	2	3	1	0	1	0	1	0	1	1	3	2	1	24
[redacted]	0	1	1	1	1	0	0	1	1	1	1	1	0	2	0	1	4	4	1	21
[redacted]	1	1	1	1	0	2	0	1	0	0	0	0	0	0	0	1	0	4	0	12
[redacted]	1	0	1	0	0	1	0	2	1	0	0	0	1	0	0	2	2	4	1	16
[redacted]	0	0	1	1	1	3	0	3	0	0	0	0	0	0	0	0	0	2	1	12

[redacted]	1	0	1	1	1	4	0	3	1	1	0	0	1	0	0	0	4	2	1	21
[redacted]	0	0	0	1	0	3	0	1	2	0	0	0	2	1	0	0	3	4	0	17
[redacted]	0	1	1	0	0	4	0	1	1	1	1	1	1	0	0	2	0	2	0	16
[redacted]	0	0	0	0	0	0	0	3	1	1	0	0	1	0	0	0	0	4	0	10
[redacted]	1	0	1	1	1	3	0	3	2	1	0	0	0	1	1	1	2	2	1	21
[redacted]	1	0	1	1	1	4	0	3	2	1	0	0	1	1	1	0	2	4	1	24
[redacted]	1	0	1	1	1	3	0	1	1	1	1	1	0	2	1	1	2	4	1	23
[redacted]	1	0	1	1	0	4	0	2	0	0	0	0	1	0	0	0	0	4	1	15

Skills and topics summary

Skills

Skill	Max Marks (total)	Class Average Marks	Class Average %
air temperature measurement units	1	0.64	66.7%
assess lack of bubbles as evidence	1	0.08	8.3%
boiling: bulk bubble formation	2	0.88	45.8%
choose correct quantity	1	0.64	66.7%
compare particle speed by state	1	0.36	37.5%
condensation term	1	0.48	50.0%
confirm silver state from data	1	0.52	54.2%
connect term with its definition	2	1.36	70.8%
definition of mass	1	0.72	75.0%
density relates mass to volume	1	0.52	54.2%

describe space between molecule	1	0.56	58.3%
diffusion along concentration gradient	2	0.56	29.2%
diffusion depends on size and temperature	5	1.84	38.3%
diffusion via random particle motion	6	2.08	36.1%
evaluate and select accurate measuring containers	1	0.64	66.7%
evaporation of odor increases with temperature	1	0.40	41.7%
evaporation vs boiling: definitions and distinctions	2	0.64	33.3%
explain vibrational motion around lattice point	1	0.36	37.5%
explain why the link is wrong	2	1.52	79.2%
gas to liquid condensation	1	0.48	50.0%
identify b labelled term	1	0.80	83.3%
identify incorrect pairings	2	1.52	79.2%
identify proper scale for amount	1	0.64	66.7%
identify state of matter from data	4	2.64	68.8%
intermolecular forces and gas behavior	2	0.64	33.3%
iron bonds stronger than silver	1	0.20	20.8%
iron has more delocalised electron	1	0.20	20.8%
iron melting point and bond strength	7	3.00	44.6%
justify higher density for tin	1	0.36	37.5%
justify puddle disappearance by evaporation	2	0.64	33.3%

justify uniform filling by spread	1	0.56	58.3%
kinetic theory basics and observation justification	2	0.80	41.7%
lattice spacing determines volume	1	0.36	37.5%
link faster motion to odor strength	1	0.52	54.2%
link instruments to measurements and units	4	3.08	80.2%
link motion to filling container	1	0.56	58.3%
mass equals amount of matter	1	0.72	75.0%
matching keywords to definitions	2	1.16	60.4%
molecules have higher kinetic energy	1	0.40	41.7%
phase change naming	1	0.48	50.0%
read correct graduation	1	0.64	66.7%
role of delocalised electrons in metals	2	0.32	16.7%
select the correct column	3	1.84	63.9%
skillexplain using particle flow	1	0.48	50.0%
state relative to room temperature	2	1.32	68.8%
states of matter and particle behavior	14	7.00	52.1%
temperature dependence of evaporation rate	2	0.64	33.3%
tin atoms heavier than helium	1	0.60	62.5%
use data to mark	1	0.60	62.5%
use state differences to justify rate	1	0.36	37.5%
use surface escape concept	1	0.08	8.3%

volume is space occupied	1	0.52	54.2%

Topics

Topic	Max Marks (total)	Class Average Marks	Class Average %
air temperature measurement units	1	0.64	66.7%
balance measures mass	1	0.88	91.7%
boiling happens at boiling point	1	0.56	58.3%
cm3 equals ml concept	1	0.64	66.7%
condensation term	1	0.48	50.0%
crystal lattices and bonding forces	4	1.08	28.1%
definition of mass	1	0.72	75.0%
delocalised electrons enable metallic bonding	2	0.32	16.7%
density definition	1	0.64	66.7%
diffusion driven by concentration gradient	2	0.56	29.2%
distinguish solid liquid ga	2	1.16	60.4%
equipment to measurement link	1	0.64	66.7%
gas fills container by spreading	1	0.56	58.3%
gas form at room temperature	1	0.72	75.0%
gas to liquid condensation	1	0.48	50.0%
graduation spacing shows precision	1	0.64	66.7%
gram is unit of mass	1	0.92	95.8%
gravity acts on liquid	1	0.48	50.0%
heaviness relative to size	1	0.64	66.7%
helium is a ga	1	0.36	37.5%
identify b labelled term	1	0.80	83.3%

identify correct state term from description	1	0.88	91.7%
identify state from mp and bp	1	0.72	75.0%
iron has more delocalised electron	1	0.20	20.8%
iron solid at room temperature	1	0.56	58.3%
iron stronger metallic bonds than silver	2	0.32	16.7%
kinetic theory basic	1	0.28	29.2%
kinetic theory: gas behavior, diffusion, evaporation	11	4.28	40.5%
length uses length unit	1	0.88	91.7%
line match keywords to definition	1	0.52	54.2%
link term to its definition	1	0.72	75.0%
measuring length with a ruler	2	1.52	79.2%
melting and boiling points determine state	7	3.52	52.4%
melting requires energy input	1	0.64	66.7%
molecules have higher kinetic energy	1	0.40	41.7%
no bubbles in evaporation	1	0.08	8.3%
odor molecules diffuse through air	1	0.52	54.2%
particle model melting when bonds break	1	0.12	12.5%
particles arranged in a lattice	1	0.36	37.5%
phase change naming	1	0.48	50.0%
puddle disappears by evaporation	2	0.64	33.3%
quantity must match instrument	1	0.64	66.7%
read scale accurately	1	0.64	66.7%

room temperature around twenty degree	1	0.60	62.5%
room temperature used for state check	1	0.52	54.2%
select container by volume	1	0.64	66.7%
silver is solid at room temperature	1	0.52	54.2%
smell travels via gas molecule	1	0.52	54.2%
states of matter and density	14	7.84	58.3%
there is empty space between molecule	1	0.56	58.3%
thermometer measures temperature	1	0.64	66.7%
time measured by stopwatch	1	0.64	66.7%
time uses time unit	1	0.88	91.7%
tin is a solid	1	0.36	37.5%
vaporization of surface particles	1	0.08	8.3%
volume	1	0.64	66.7%
volume determined by lattice spacing	1	0.36	37.5%
water liquid at room temperature	1	0.60	62.5%
weak intermolecular forces in gases	2	0.64	33.3%

Student–source mapping

Student ID	Name	Source file
student_1	[redacted]	[redacted]
student_10	[redacted]	[redacted]
student_11	[redacted]	[redacted]
student_12	[redacted]	[redacted]
student_13	[redacted]	[redacted]
student_14	[redacted]	[redacted]
student_15	[redacted]	[redacted]
student_16	[redacted]	[redacted]
student_17	[redacted]	[redacted]
student_18	[redacted]	[redacted]
student_19	[redacted]	[redacted]
student_2	[redacted]	[redacted]
student_20	[redacted]	[redacted]
student_21	[redacted]	[redacted]
student_22	[redacted]	[redacted]
student_23	[redacted]	[redacted]

student_24	[redacted]	[redacted]
student_25	[redacted]	[redacted]
student_3	[redacted]	[redacted]
student_4	[redacted]	[redacted]
student_5	[redacted]	[redacted]
student_6	[redacted]	[redacted]
student_7	[redacted]	[redacted]
student_8	[redacted]	[redacted]
student_9	[redacted]	[redacted]