

Particles explain the states

CHAPTER 01 / PREPARATION 01 周内课前使用 · 每次约 2-3 分钟

Use after the weekend webpage. Recall first; then discuss with a partner.
先回忆，再与同伴交流。提示卡不是完整预习，也不是答案页。

01 / RECALL THE MODEL

particle 粒子 · solid 固体

1. Sketch a solid and a liquid using the same number and size of particles.
2. Describe how the particles move in each state.

solid | liquid | gas

02 / EXPLAIN A CHANGE

liquid 液体 · gas 气体

1. Describe what changes when ice melts.
2. Does each water particle become bigger? Explain.

Say your method before your answer. 先说方法，再说答案。

03 / SAY IT IN ENGLISH

vibrate 振动 · compress 压缩

1. Why is a gas easily compressed?
2. A gas can be compressed because

Bring one question from your weekend task. 带着预习疑问来上课。

Choose a separation method

CHAPTER 02 / PREPARATION 01 周内课前使用 · 每次约 2-3 分钟

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01 / NAME THE PARTS

solute 溶质 · solvent 溶剂

1. What do solute and solvent mean in salt water?
2. Recall the words residue and filtrate.

sand + salt water | filter | salt solution

02 / CHOOSE A METHOD

insoluble 不溶的 · residue 滤渣

1. A mixture contains sand and salt water. What comes first?
2. Explain why the salt passes through the filter.

Say your method before your answer. 先说方法，再说答案。

03 / RECOVER THE CRYSTALS

filtrate 滤液 · crystal 晶体

1. Give the steps after filtering out sand.
2. Crystals form when

Bring one question from your weekend task. 带着预习疑问来上课。

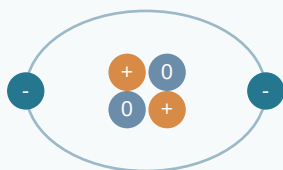
Meet the atom | Recall cards

CHAPTER 3 / PREPARATION 01 周内课前使用 · 每次约 2-3 分钟

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01 / RECALL THE MODEL

atom · nucleus · proton · neutron · electron



Helium schematic, not to scale. The oval is not a literal electron path.

1. Name each type of particle.
2. Which particles are in the nucleus?
3. Give the charge of each particle.

02 / READ THE NUMBERS

atomic number 原子序数 · mass number 质量数



A neutral sodium atom:

1. Which number tells you the protons?
2. How do you find the neutrons?
3. What tells you the electron count?

Say your method before giving the numbers. 先说方法，再说答案。

03 / SAY IT IN ENGLISH

neutral 中性的 · charge 电荷 · equal 相等的

Explain: Why is a helium atom neutral?

Sentence starter: “The atom is neutral because it has”

Partner check: Does “neutral” mean there are no charged particles?

Bring one question from your weekend preparation to class.

From atoms to ions

CHAPTER 04 / PREPARATION 01 周内课前使用 · 每次约 2-3 分钟

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01 / FOLLOW THE ELECTRON

ion 离子 · transfer 转移

1. Describe electron transfer from sodium to chlorine.
2. Which particle counts change?



02 / COUNT THE CHARGE

lose 失去 · gain 获得

1. Compare 12 protons with 10 electrons.
2. Explain the sign and size of the charge.

Say your method before your answer. 先说方法，再说答案。

03 / EXPLAIN THE BOND

attraction 吸引 · lattice 晶格

1. What is an ionic bond?
2. Oppositely charged ions are held together by

Bring one question from your weekend task. 带着预习疑问来上课。

Balance the atoms

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01 / READ THE NOTATION

formula 化学式 · subscript 下标

1. Explain the difference between $2\text{H}_2\text{O}$ and H_2O_2 .
2. Which number multiplies the entire formula?



02 / COUNT THE ATOMS

coefficient 系数 · reactant 反应物

1. Count H and O in $2\text{H}_2 + \text{O}_2 \rightarrow 2\text{H}_2\text{O}$.
2. Are both elements conserved?

Say your method before your answer. 先说方法，再说答案。

03 / EXPLAIN THE RULE

product 生成物 · balance 配平

1. Why must formula subscripts stay unchanged?
2. The equation is balanced because

Bring one question from your weekend task. 带着预习疑问来上课。

The mole as a counting unit

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01 / DEFINE THE UNIT

mole 摩尔 · molar mass 摩尔质量

1. What does one mole mean?
2. Specify the particles you are counting.

mass / g | $\div$ M / (g/mol) | amount / mol

02 / USE THE RELATIONSHIP

particle 粒子 · mass 质量

1. Recall $n = m/M$ and the units.
2. Explain how to find moles in 9 g of water, $M = 18 \text{ g/mol}$.

Say your method before your answer. 先说方法，再说答案。

03 / COMPARE TWO SAMPLES

amount 物质的量 · molecule 分子

1. Does the same number of moles mean the same mass?
2. The masses differ because

Bring one question from your weekend task. 带着预习疑问来上课。

Track oxygen and electrons

CHAPTER 07 / PREPARATION 01 周内课前使用 · 每次约 2-3 分钟

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01 / USE THE OXYGEN DEFINITION

oxidation 氧化 · reduction 还原

1. State oxidation and reduction in terms of oxygen.
2. Apply the definitions to $\text{CuO} + \text{H}_2 \rightarrow \text{Cu} + \text{H}_2\text{O}$.

Zn loses 2e^- | electron transfer | Cu^{2+} gains 2e^-

02 / USE THE ELECTRON DEFINITION

electron 电子 · gain 获得

1. What happens in $\text{Zn} \rightarrow \text{Zn}^{2+} + 2\text{e}^-$?
2. Explain where the electrons go.

Say your method before your answer. 先说方法，再说答案。

03 / LINK THE CHANGES

loss 失去 · redox 氧化还原

1. Why do oxidation and reduction happen together?
2. One substance loses electrons while

Bring one question from your weekend task. 带着预习疑问来上课。

Who carries the charge?

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01 / NAME THE CARRIERS

electrolyte 电解质 · electrode 电极

1. What carries charge in a wire? In an electrolyte?
2. Explain why these are different.

anode (+) | mobile ions | cathode (-)

02 / LABEL THE ELECTRODES

cathode 阴极 · anode 阳极

1. For electrolysis, label cathode and anode signs.
2. Which electrode attracts a negative ion?

Say your method before your answer. 先说方法，再说答案。

03 / EXPLAIN CONDUCTION

molten 熔融的 · mobile 可移动的

1. Compare solid and molten sodium chloride.
2. The molten compound conducts because

Bring one question from your weekend task. 带着预习疑问来上课。

Where does the energy go?

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01 / FOLLOW THE ENERGY

system 体系 · surroundings 环境

1. Draw an arrow for an exothermic reaction.
2. Name the system and surroundings.

reacting system | energy transfer | surroundings

02 / READ A TEMPERATURE CHANGE

exothermic 放热的 · endothermic 吸热的

1. A mixture cools from 25°C to 19°C . What might this show?
2. Explain the direction of energy transfer.

Say your method before your answer. 先说方法，再说答案。

03 / RECALL THE BOND RULE

absorb 吸收 · release 释放

1. Which process absorbs energy: breaking or forming bonds?
2. A reaction is exothermic overall when

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Make collisions count

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01 / DEFINE A SUCCESSFUL COLLISION

rate 速率 · collision 碰撞

1. Name the two requirements for reaction after a collision.
2. Does every collision cause reaction?

particles collide | enough energy? | successful reaction

02 / CALCULATE A RATE

successful 有效的 · activation energy 活化能

1. Explain the units in $\text{volume} \div \text{time}$.
2. Find the average rate for 30 cm^3 in 20 s.

Say your method before your answer. 先说方法，再说答案。

03 / COMPARE THE CAUSES

concentration 浓度 · frequency 频率

1. How do temperature and concentration affect rate differently?
2. A higher concentration increases

Bring one question from your weekend task. 带着预习疑问来上课。

Acids, alkalis and neutralisation

CHAPTER 11 / PREPARATION 01 周内课前使用 · 每次约 2-3 分钟

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01 / USE PH

acid 酸 · base 碱

1. Classify pH 3, 7 and 11 at room temperature.
2. Which ion does an acid supply?

H^+ from acid | $\text{H}^+ + \text{OH}^- \rightarrow \text{H}_2\text{O}$ | OH^- from alkali

02 / RECALL NEUTRALISATION

alkali 可溶性碱 · aqueous 水溶液中的

1. Write $\text{H}^+ + \text{OH}^- \rightarrow \text{H}_2\text{O}$ from memory.
2. Name the salt from HCl and NaOH.

Say your method before your answer. 先说方法，再说答案。

03 / CHECK A MISCONCEPTION

neutralisation 中和 · salt 盐

1. Does any amount of alkali added to acid give pH 7?
2. The final pH depends on

Bring one question from your weekend task. 带着预习疑问来上课。

Read an element's position

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01 / READ THE SHELLS

shell 电子层 · outer 最外层的

1. Read 2,8,1 aloud as electron counts.

2. How many shells are occupied?

2,8,1 | 3 occupied shells | Group I / Period 3

02 / USE GROUP AND PERIOD

group 族 · period 周期

1. Find the group and period for 2,8,2.

2. Which feature tells you each one?

Say your method before your answer. 先说方法，再说答案。

03 / EXPLAIN A PATTERN

configuration 电子排布 · noble gas 稀有气体

1. Compare lithium 2,1 with sodium 2,8,1.

2. They have similar properties because

Bring one question from your weekend task. 带着预习疑问来上课。

Compare metal reactivity

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01 / RECALL THE ORDER

reactivity 反应活性 · displace 置换

1. Read $Mg > Zn > H > Cu$.
2. Why is hydrogen included even though it is not a metal?

$Mg > Zn > H > Cu$ | Zn replaces Cu | Cu cannot replace Zn

02 / PREDICT DISPLACEMENT

metal 金属 · ion 离子

1. Compare zinc + copper(II) sulfate with copper + zinc sulfate.
2. Which combination reacts?

Say your method before your answer. 先说方法，再说答案。

03 / EXPLAIN THE EVIDENCE

dilute 稀的 · hydrogen 氢气

1. What might you observe when zinc displaces copper?
2. Zinc displaces copper because

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Choose an extraction route

CHAPTER 14 / PREPARATION 01 周内课前使用 · 每次约 2-3 分钟

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01 / NAME THE STARTING MATERIAL

ore 矿石 · extract 提取

1. What is an ore?
2. How is an ore different from the free metal?

Al > carbon > Fe | Fe: CO reduction | Al: electrolysis

02 / CHOOSE A ROUTE

reduce 还原 · oxide 氧化物

1. Use Al > carbon > Fe to choose extraction methods.
2. Which one uses carbon monoxide?

Say your method before your answer. 先说方法，再说答案。

03 / EXPLAIN REDUCTION

carbon 碳 · electrolysis 电解

1. Read $\text{Fe}_2\text{O}_3 + 3\text{CO} \rightarrow 2\text{Fe} + 3\text{CO}_2$.
2. Iron oxide is reduced because

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Clean water, pure water

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01 / IDENTIFY THE CONTENTS

suspended 悬浮的 · dissolved 溶解的

1. Distinguish suspended mud, dissolved salt and microorganisms.
2. Which can filtration remove?

untreated water | settle + filter | chlorinate

02 / MATCH THE TREATMENT

filtration 过滤 · chlorination 氯化消毒

1. What does chlorination do?
2. Why might dissolved minerals remain?

Say your method before your answer. 先说方法，再说答案。

03 / USE PRECISE LANGUAGE

microorganism 微生物 · pure 纯的

1. Explain “safe to drink” versus “chemically pure” .
2. Treated water may still contain

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Recognise hydrogen and ammonia

CHAPTER 16 / PREPARATION 01 周内课前使用 · 每次约 2-3 分钟

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01 / READ THE FORMULAE

hydrogen 氢气 · ammonia 氨气

1. Compare H_2 and NH_3 .
2. Which is an element and which is a compound?

H_2 : one element | NH_3 : a compound | damp red → blue

02 / RECALL THE OBSERVATIONS

splint 木条 · litmus 石蕊

1. What supports identification of hydrogen? Of ammonia?
2. Describe the observations without carrying out a test.

Say your method before your answer. 先说方法，再说答案。

03 / EXPLAIN THE MOISTURE

damp 湿润的 · alkaline 碱性的

1. Why use damp red litmus for ammonia?
2. The paper is damp so that

Bring one question from your weekend task. 带着预习疑问来上课。

Single or double?

CHAPTER 17 / PREPARATION 01 周内课前使用 · 每次约 2-3 分钟

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01 / DEFINE THE FAMILY

hydrocarbon 烃 · alkane 烷烃

1. What does hydrocarbon mean?
2. Would an oxygen-containing molecule be a hydrocarbon?

ethane: C_2H_6 | C-C vs C=C | ethene: C_2H_4

02 / READ THE BONDS

alkene 烯烃 · saturated 饱和的

1. Sketch C-C and C=C.
2. Which appears in ethane? In ethene?

Say your method before your answer. 先说方法，再说答案。

03 / USE THE FORMULA RULE

unsaturated 不饱和的 · double bond 双键

1. Recall the two open-chain general formulae.
2. Ethene is unsaturated because

Bring one question from your weekend task. 带着预习疑问来上课。

From small molecules to a chain

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01 / NAME THE BUILDING BLOCKS

monomer 单体 · polymer 聚合物

1. Distinguish monomer, polymer and repeat unit.
2. Give the monomer for poly(ethene).

$\text{CH}_2=\text{CH}_2$ | many monomers join | $[-\text{CH}_2-\text{CH}_2-]$

02 / FOLLOW THE BOND CHANGE

repeat unit 重复单元 · addition 加成

1. Sketch $\text{CH}_2=\text{CH}_2$ becoming part of $-\text{CH}_2-\text{CH}_2-$.
2. Which bonds connect neighbouring units?

Say your method before your answer. 先说方法，再说答案。

03 / READ THE BRACKETS

polymerisation 聚合 · chain 链

1. What does n mean outside the brackets?
2. The end bonds show that

Bring one question from your weekend task. 带着预习疑问来上课。