
Morning Reading 晨读

Grade 11 · AS · 十一年级 · AS

Complete Volume · 18 Weeks

Morning Reading 晨读

Grade 11 · AS · Week 1

Read each word aloud, then copy the English word three times. 朗读每个单词，然后把英语单词抄写三遍。

Reading 阅读

Read the passage aloud twice. 把短文朗读两遍。

Physics begins with careful language. A **physical quantity** has two parts: a number, its **magnitude**, and a **unit**. Saying "the mass is 5" means nothing until you add "kilograms". Scientists across the world share the same **SI units**, so a result measured in Shanghai can be checked in London. Before an experiment, a good physicist will **estimate** the answer first, at least to the right **order of magnitude**, so a silly result is spotted at once.

Chemistry looks inside matter. Every **atom** has a tiny, dense **nucleus** of **protons** and **neutrons**, with **electrons** arranged in shells around it. The **proton number** defines the element: change it, and you have a different substance entirely.

Economics begins from one hard fact: **scarcity**. Our **wants** are unlimited, but **resources** are not. Every choice therefore has an **opportunity cost**, the next best thing you gave up. Choosing two hours of gaming costs you the two hours of revision you did not do.

Talk about it 说一说:

1. Estimate the mass of this worksheet, with a unit. How could you check?
2. What was the opportunity cost of coming to school today?

Physics

Topic 1 · Physical quantities and units

 **physical quantity** 物理量

 **magnitude** 大小

 **unit** 单位

 **estimate** 估算

 **mass** 质量

 weight 重力			
 vacuum 真空			
 acceleration 加速度			
 free fall 自由落体			
 order of magnitude 数量级			
 SI units 国际单位制			
 length 长度			
 current 电流			
 ampere 安培			
 temperature 温度			
 kelvin 开尔文			
 derived unit 导出单位			
 speed 速率			
 velocity 速度			
 force 力			

Chemistry

Topic 1 · Atomic structure

 atom 原子			
 nucleus 原子核			
 proton 质子			
 neutron 中子			
 electron 电子			
 shell 壳层			

 relative charge 相对电荷			
 relative mass 相对质量			
— neutral 中性			
# proton number 质子数			
 atomic number 原子序数			
 nucleon number 核子数			
 mass number 质量数			
 nucleon 核子			
± ion 离子			
 electric field 电场			
 deflection 偏转			
 atomic radius 原子半径			
 ionic radius 离子半径			

Biology

Topic 1 · Cell structure

 cell 细胞			
 microscope 显微镜			
 light microscope 光学显微镜			
 specimen 标本			
 temporary preparation 临时装片			
 slide 载玻片			
 stain 染色剂			

 cover slip 盖玻片			
 magnification 放大倍数			
 micrometre 微米			
 nanometre 纳米			
 chloroplast 叶绿体			
 photomicrograph 显微照片			
 electron micrograph 电子显微照片			
 eyepiece graticule 目镜测微尺			
 calibrate 校准			
 stage micrometer 载物台测微尺			
 resolution 分辨率			
 wavelength 波长			
 electron microscope 电子显微镜			
 electron 电子			
 scanning 扫描			
 transmission 透射			

Mathematics

Topic 1 · Pure Mathematics 1

 Pure Mathematics 纯数学			
 algebra 代数			

∞ calculus 微积分			
x^2 quadratic 二次式			
$\times$ coefficient 系数			
$\square$ complete the square 配方			
$\triangle$ vertex 顶点			
$\sqrt{}$ discriminant 判别式			
$\bullet$ real roots 实根			
$\pm$ distinct 相异			

Further Mathematics

Topic 1 · Further Pure Mathematics 1

Σ Further Pure Mathematics 进阶纯数学			
$\sqrt{}$ roots 根			
$\times$ coefficients 系数			
$\Rightarrow$ substitution 代换			
$\div$ rational function 有理函数			

Computer Science

Topics 1–4 · Information representation, Processor Fundamentals

$\square$ denary 十进制			
$\square$ binary 二进制			
$\square$ byte 字节			
$\odot$ bit 位			
$\square$ hexadecimal 十六进制			

# digit 数位			
▢ place value 位值			
⚠ Overflow 溢出			
🗄 register 寄存器			
↯ two's complement 补码			
← most significant bit 最高有效位			
± sign bit 符号位			
± signed integer 有符号整数			
+ unsigned 无符号			
[:] one's complement 反码			
🗄 BCD 二进制十进数			
🗄 7-segment display 七段显示器			
# code point 码点			
T character set 字符集			
🗄 bitmap 位图			
□ pixel 像素			
🗄 file header 文件头			
🗄 image resolution 图像分辨率			
🖥 screen resolution 屏幕分辨率			
🎨 colour depth 颜色深度			
🗄 bit depth 位深度			

 **vector graphic** 矢量图形

Economics

Topic 1 · Basic economic ideas and resource allocation

 **scarcity** 稀缺性

 **resources** 资源

 **finite** 有限的

 **scarce** 稀缺

 **goods** 物品

 **services** 服务

 **wants** 欲望

 **economic problem** 经济问题

 **opportunity cost** 机会成本

 **alternative** 替代选择

 **consumer** 消费者

 **producer** 生产者

 **firm** 企业

 **government** 政府

 **social science** 社会科学

Morning Reading 晨读

Grade 11 · AS · Week 2

Read each word aloud, then copy the English word three times. 朗读每个单词，然后把英语单词抄写三遍。

Reading 阅读

Read the passage aloud twice. 把短文朗读两遍。

Scientists and economists both build models. A **model** is a simplified picture of the world that keeps the important parts and drops the rest. A map is a model: it ignores every tree, and that is exactly why it is useful. Economists add the phrase **ceteris paribus**, "all other things equal", to study one change at a time. Be careful to separate a **positive statement**, which can be tested against facts, from a **normative statement**, which contains a **value judgement** about what ought to happen.

Mathematics gives models their shape. A **quadratic equation** draws a **parabola**, the curve a thrown ball follows. A **function** is a machine: for each input from its **domain**, it returns exactly one output.

In physics the model is often an equation linking quantities: **force** in **newtons**, **energy** in **joules**, **power** in **watts**, **pressure** in **pascals**. Each unit is built from the base units, and checking them catches many mistakes.

Talk about it 说一说:

1. "Petrol prices should be lower" and "petrol prices rose 5% last year": which is normative, which is positive?
2. A map ignores trees. What does a distance-time graph ignore about a real journey?

Physics

Topic 1 · Physical quantities and units

🍏 **newton** 牛顿

🔧 **work** 功

⚡ **energy** 能量

🔊 **joule** 焦耳

 power 功率			
 watt 瓦特			
 pressure 压强			
 stress 应力			
 pascal 帕斯卡			
= homogeneous 量纲一致			
$\times_2$ prefix 词头			
 measurement 测量			
 uncertainty 不确定度			
 systematic error 系统误差			
 zero error 零点误差			
 calibration 校准			
 parallax 视差			
 accuracy 准确度			
 precision 精密度			
 random error 随机误差			

Chemistry

Topic 1 · Atomic structure

 period 周期			
 nuclear charge 核电荷			
 shielding 屏蔽			
 group 族			
 cation 阳离子			

 anion 阴离子			
 repulsion 排斥			
 isotope 同位素			
 chemical properties 化学性质			
 physical properties 物理性质			
 density 密度			
 principal quantum number 主量子数			
 sub-shell 亚层			
 orbital 轨道			
 electronic configuration 电子排布			
 ground state 基态			
 noble gas 稀有气体			
 spin 自旋			

Biology

Topic 1 · Cell structure

 eukaryotic cell 真核细胞			
 nucleus 细胞核			
 organelle 细胞器			
 cytoplasm 细胞质			
 cell surface membrane 细胞膜			
 nuclear envelope 核膜			

⊙ nucleolus 核仁			
🌀 rough endoplasmic reticulum 粗面内质网			
✈ protein 蛋白质			
🛡 antibody 抗体			
🌀 smooth endoplasmic reticulum 滑面内质网			
💧 lipid 脂质			
📦 Golgi body 高尔基体			
⊙ vesicle 囊泡			
💧 secretion 分泌			
🔍 mitochondria 线粒体			
⇌ respiration 呼吸作用			
⚡ energy 能量			
⊙ ribosome 核糖体			
✈ amino acid 氨基酸			
🏭 synthesise 合成			
⊙ lysosome 溶酶体			
✂ enzyme 酶			

Mathematics

Topic 1 · Pure Mathematics 1

= quadratic equation 二次方程			
<> quadratic inequality 二次不等式			

 parabola 抛物线			
 simultaneous equations 联立方程			
 substitution 代入			
 function 函数			
 domain 定义域			
 range 值域			
 one-one 一一对应			
 inverse function 反函数			

Further Mathematics

Topic 1 · Further Pure Mathematics 1

 oblique asymptote 斜渐 近线			
 method of differences 差 分法			
 convergent 收敛			
 sum to infinity 无穷和			
 matrix 矩阵			

Computer Science

Topics 1-2 · Information representation, Communication

 drawing list 绘图列表			
 analogue data 模拟数据			
 digital data 数字数据			
 sampling 采样			

 sampling rate 采样率			
 sampling resolution 采样分辨率			
 amplitude 振幅			
 quantisation 量化			
 Compression 压缩			
 bandwidth 带宽			
 lossless 无损			
 lossy 有损			
 run-length encoding 行程编码			
 dictionary methods 字典编码			
 Huffman coding 霍夫曼编码			
 entropy 熵			
 spatial 空间			
 temporal 时间			
 network 网络			
 local area network 局域网			
 latency 延迟			
 wide area network 广域网			
 peer-to-peer 对等网络			
 thin client 瘦客户端			
 thick client 胖客户端			

 topology 拓扑

 bus 总线

Economics

Topic 1 · Basic economic ideas and resource allocation

 model 模型

 ceteris paribus 其他条件
不变

✓ positive statement 实证
表述

 normative statement 规
范表述

 value judgement 价值判
断

 microeconomics 微观经济
学

 macroeconomics 宏观经
济学

 output 产出

 factors of production 生
产要素

 reward 报酬

 land 土地

 rent 地租

 labour 劳动

 wages 工资

 capital 资本

Morning Reading 晨读

Grade 11 · AS · Week 3

Read each word aloud, then copy the English word three times. 朗读每个单词，然后把英语单词抄写三遍。

Reading 阅读

Read the passage aloud twice. 把短文朗读两遍。

Two students measure the same pencil. One writes 14.32 cm, the other 14.29 cm. Who is right? **Accuracy** means being close to the true value; **precision** means getting almost the same reading every time. A ruler read from an angle gives a **parallax** error, and tiny hand movements cause **random error**. Repeating the measurement and taking the **mean** reduces random error. Serious laboratories also do **calibration**: they check their instruments against a known standard, and they quote a **percentage uncertainty** with every result.

Networks have their own quality measures. A **server** answers requests from many **client** machines; the delay before data starts to arrive is the **latency**. A school **local area network** connects nearby rooms, while the internet is a **wide area network** spanning the planet.

Adam Smith noticed that a pin factory with ten specialised workers made far more pins than ten generalists. **Specialisation** and the **division of labour** raise output, but workers then depend on trade with each other.

Talk about it 说一说:

1. Your three readings are 2.1 s, 2.4 s and 2.2 s. What do you report, and why?
2. Which school tasks would go faster with a division of labour? Which would not?

Physics

Topics 1-2 · Physical quantities and units, Kinematics

🔍 instrument 仪器

— mean 平均值

± absolute uncertainty 绝对不确定度

% percentage uncertainty 百分比不确定度

📏 derived quantity 导出量

— diameter 直径

📦 volume 体积

significant figures 有效数字

scalar 标量

↗ vector 矢量

📊 density 密度

⊕ electric charge 电荷

→ displacement 位移

⇨ momentum 动量

□ coplanar 共面

↗ resultant 合矢量

+ perpendicular 垂直

↗ component 分量

↔ horizontal 水平

↑ vertical 竖直

Chemistry

Topics 1-2 · Atomic structure, Atoms, molecules and stoichiometry

○ sphere 球形

✦ free radical 自由基

⊙ unpaired electrons 未成对电子

⚡ first ionisation energy 第一电离能

↗ successive ionisation energies 逐级电离能

↔ spin-pair repulsion 自旋成对排斥

⚖ unified atomic mass unit 统一原子质量单位

⚖ relative atomic mass 相对原子质量

⚖ relative isotopic mass 相对同位素质量

⚖ relative molecular mass 相对分子质量

⬡ molecule 分子

⚖ relative formula mass 相对式量

mole 摩尔

Σ Avogadro constant 阿伏伽德罗常量

⚖ molar mass 摩尔质量

☞ compound 化合物

± ionic compound 离子化合物

oxidation number 氧化数 _____

Biology

Topics 1-2 · Cell structure, Biological molecules

☛ centriole 中心粒 _____

⊙ microtubule 微管 _____

≡ cilia 纤毛 _____

⊙ microvilli 微绒毛 _____

⇓ absorption 吸收 _____

☀ photosynthesis 光合作用 _____

▣ cell wall 细胞壁 _____

▣ cellulose 纤维素 _____

∞ plasmodesmata 胞间连丝 _____

💧 vacuole 液泡 _____

⊖ tonoplast 液泡膜 _____

⊖ prokaryotic cell 原核细胞 _____

🦠 bacterium 细菌 _____

○ unicellular 单细胞 _____

▣ peptidoglycan 肽聚糖 _____

🦠 virus 病毒 _____

⊖ non-cellular 非细胞 _____

🧬 nucleic acid 核酸 _____

🛡 capsid 衣壳 _____

✉ envelope 包膜 _____

🔗 phospholipid 磷脂

🏠 host 宿主

📦 molecule 分子

Mathematics

Topic 1 · Pure Mathematics 1

📦 composition 复合

[↔] reflection 反射

🔄 transformations 变换

↔ translation 平移

↔ stretch 伸缩

📍 Coordinate geometry 坐标几何

↗ gradient 斜率

— equation of a straight line 直线方程

= parallel 平行

⊥ perpendicular 垂直

Further Mathematics

Topic 1 · Further Pure Mathematics 1

📦 zero matrix 零矩阵

📦 identity matrix 单位矩阵

[] determinant 行列式

⊗ singular matrix 奇异矩阵

📦 inverse matrix 逆矩阵

Computer Science

Topic 2 · Communication

☆ star 星形

📊 mesh 网状

🛡️ fault-tolerant 容错

☁️ Cloud computing 云计算

[] scalability 可扩展性

🌐 Ethernet 以太网

🌐 twisted-pair 双绞线

🌐 fibre-optic 光纤

🔌 network interface card
网络接口卡

🏠 MAC address MAC 地址

🔌 switch 交换机

🔌 hub 集线器

📶 wireless access point 无线接入点

📶 router 路由器

📦 packet 数据包

📍 IP address IP 地址

📊 routing table 路由表

↔️ network address
translation 网络地址转换

⚙️ DHCP 动态主机配置协议

📊 firewall 防火墙

 collision 冲突			
 CSMA/CD 载波侦听多路访问/冲突检测			
 full-duplex 全双工			
 Bit streaming 流式传输			
 buffer 缓冲			
 internet 互联网			
 protocol 协议			

Economics

Topic 1 · Basic economic ideas and resource allocation

 interest 利息			
 enterprise 企业家才能			
 profit 利润			
 non-renewable resources 不可再生资源			
 entrepreneur 企业家			
 specialisation 专业化			
 division of labour 劳动分工			
 worker 工人			
 mobility 流动性			
 occupational mobility 职业流动性			
 geographical mobility 地理流动性			
 allocate 配置			

 market economy 市场经 济	_____	_____	_____
 planned economy 计划经 济	_____	_____	_____
 command economy 指令 经济	_____	_____	_____

Morning Reading 晨读

Grade 11 · AS · Week 4

Read each word aloud, then copy the English word three times. 朗读每个单词，然后把英语单词抄写三遍。

Reading 阅读

Read the passage aloud twice. 把短文朗读两遍。

Send a message to a friend abroad and it may cross the ocean in a tenth of a second. The message is split into **packets**, each stamped with the destination **IP address**. Every **router** on the way reads the address, consults its **routing table**, and forwards the packet towards its goal. At your school's edge, a **firewall** inspects the traffic and blocks anything dangerous. No single computer controls the journey; the network finds the way by itself.

In mechanics, motion in two dimensions becomes simple when you split a vector into a horizontal and a vertical **component**. Combine forces by adding them as vectors to get the **resultant**; a moving object's mass times velocity is its **momentum**.

No real country runs on markets alone. In a **mixed economy**, the **private sector** and the **public sector** work side by side. Prices act as the **price mechanism**: a rising price is both a signal and an **incentive**, telling producers where resources are wanted.

Talk about it 说一说:

1. Trace a message from your phone to a server abroad. Name each device it passes.
2. Petrol prices double. What signals and incentives does this send, and to whom?

Physics

Topics 1–3 · Physical quantities and units, Kinematics, Dynamics

 **inclined plane** 斜面

 **kinematics** 运动学

 **distance** 距离

 **deceleration** 减速度

 **gradient** 斜率

 tangent 切线			
 uniform acceleration 匀加速			
 trapezium 梯形			
 gravity 重力			
 air resistance 空气阻力			
 symmetric 对称			
 reaction-time 反应时间			
 range 射程			
 projectile 抛体			
 Linear momentum 动量			
 resultant force 合力			
 collision 碰撞			
 impulse 冲量			
 kinetic energy 动能			
 external force 外力			

Chemistry

Topic 2 · Atoms, molecules and stoichiometry

 balanced 配平			
 state symbols 状态符号			
 aqueous 水溶液			
 ionic equation 离子方程式			
 spectator ions 旁观离子			

÷ empirical formula 实验式			
⬡ molecular formula 分子式			
💧 water of crystallisation 结晶水			
💧 hydrated 水合的			
🚫 anhydrous 无水的			
⚖️ stoichiometry 化学计量			
% percentage yield 产率			
⊖ limiting reagent 限量试剂			
+ excess reagent 过量试剂			
⬡ hydrocarbons 碳氢化合物			
💧 concentration 浓度			
⋮ solute 溶质			
🧂 solution 溶液			

Biology

Topic 2 · Biological molecules

🍷 carbohydrate 碳水化合物			
🍷 reducing sugar 还原糖			
☁️ precipitate 沉淀			
🍷 starch 淀粉			
🧂 iodine 碘			
🍷 emulsion 乳浊液			
🧂 biuret 双缩脲			

 semi-quantitative 半定量			
 standardise 标准化			
 concentration 浓度			
 non-reducing sugar 非还原糖			
 hydrochloric acid 盐酸			
 neutralise 中和			
 monomer 单体			
 polymer 聚合物			
 macromolecule 大分子			
 monosaccharide 单糖			
 glucose 葡萄糖			
 disaccharide 二糖			
 polysaccharide 多糖			
 fructose 果糖			
 maltose 麦芽糖			
 sucrose 蔗糖			

Mathematics

Topic 1 · Pure Mathematics 1

 circle 圆			
• centre 圆心			
 radius 半径			
 tangent 切线			
— diameter 直径			

 radian 弧度			
 arc 弧			
 degrees 度			
 sector 扇形			
 chord 弦			

Further Mathematics

Topic 1 · Further Pure Mathematics 1

 geometric transformation 几何变换			
• invariant points 不变点			
— invariant lines 不变直线			
 polar coordinates 极坐标			
+ Cartesian coordinates 直角坐标			

Computer Science

Topics 2–3 · Communication, Hardware

 World Wide Web 万维网			
 subnets 子网			
 subnet mask 子网掩码			
 ISP 互联网服务提供商			
 URL 统一资源定位符			
 domain name 域名			
 Domain Name System 域名系统			

 wireless network interface card 无线网络接口卡			
 input devices 输入设备			
 output devices 输出设备			
 primary memory 主存储器			
 processor 处理器			
 secondary storage 辅助存储器			
 embedded system 嵌入式系统			
 firmware 固件			
 laser printer 激光打印机			
 drum 感光鼓			
 Toner 墨粉			
 3D printer 3D 打印机			
 microphone 麦克风			
 capacitor 电容器			
 analogue-to-digital converter 模数转换器			
 hard disk 硬盘			
 tracks 磁道			
 sectors 扇区			
 read/write head 读写头			
 solid-state drive 固态硬盘			

Economics

Topic 1 · Basic economic ideas and resource allocation

 **mixed economy** 混合经济

 **private sector** 私营部门

 **public sector** 公共部门

 **price mechanism** 价格机制

 **signalling** 信号传递

 **incentive** 激励

 **rationing** 配给

 **production possibility curve** 生产可能性曲线

 **efficiency** 效率

 **unemployment** 失业

 **trade-off** 取舍

 **economic growth** 经济增长

 **technology** 技术

 **economic decline** 经济衰退

 **capital goods** 资本品

Morning Reading 晨读

Grade 11 · AS · Week 5

Read each word aloud, then copy the English word three times. 朗读每个单词，然后把英语单词抄写三遍。

Reading 阅读

Read the passage aloud twice. 把短文朗读两遍。

Who pays for the streetlight? When it shines, it shines for everyone: my using it takes nothing from you. Economists call this **non-rivalry**. And nobody can be stopped from using it: **non-excludability**. Goods with both properties are **public goods**, and they create the **free-rider problem**: since people benefit without paying, no private firm wants to supply them. That is why street lighting and **national defence** are paid for by the state. A **merit good** like education is different: markets do supply it, but less than society would like.

Meanwhile, tiny computers hide all around you. An **embedded system** is a small computer inside another machine: a rice cooker, a lift, a traffic light. Its program, the **firmware**, is written once into memory. It reads a **sensor**, decides, and acts, millions of times without a screen or keyboard.

In mechanics, a thrown basketball is a **projectile**: gravity curves its path into a parabola. When two players collide, the total momentum just before equals the total just after; each **collision** obeys this law.

Talk about it 说一说:

1. Is a park a public good? Test it: non-rivalry, non-excludability.
2. Count the embedded systems you met before school this morning.

Physics

Topics 2-3 · Kinematics, Dynamics

⚡ electrostatic 静电

↑ normal contact force 支持力

✈ thrust 推力

⊕ gravitational field 重力场

🔥 friction 摩擦力

💧 viscous 黏性

⇌ drag 阻力

💧 fluid 流体

× coefficient 系数

↓ terminal velocity 收尾速度

🪂 parachutist 跳伞者

⚖ gravitational potential energy 重力势能

🔥 thermal energy 热能

↔ conservation of momentum 动量守恒

🔫 recoil 反冲

🔪 elastic collision 弹性碰撞

🔄 relative speed 相对速率

🔪 inelastic collision 非弹性碰撞

✂ deformation 形变

↔ head-on 正面

Chemistry

Topics 2-3 · Atoms, molecules and stoichiometry, Chemical bonding

🧪 titration 滴定

significant figures 有效数字

⚡ electronegativity 电负性

⚡ Pauling electronegativity 鲍林电负性

🔄 ionic bonding 离子键

⚡ electrostatic attraction 静电引力

📊 lattice 晶格

⋮ metallic bonding 金属键

🔄 delocalised electrons 离域电子

🔗 covalent bonding 共价键

[] expand the octet 扩展八隅体

→ coordinate bond 配位键

— sigma bond σ 键

≡ overlap 重叠

= pi bond π 键

🔄 hybridisation 杂化

🔄 bond energy 键能

📏 bond length 键长

Biology

Topic 2 · Biological molecules

∞ covalent bond 共价键

∞ glycosidic bond 糖苷键

∞ condensation 缩合

∞ hydrolysis 水解

∞ amylose 直链淀粉

∞ amylopectin 支链淀粉

≡ glycogen 糖原

∞ insoluble 不溶

∞ water potential 水势

∞ osmosis 渗透

∞ hydrogen bond 氢键

∞ microfibril 微纤丝

∞ triglyceride 甘油三酯

∞ non-polar 非极性

∞ hydrophobic 疏水

∞ glycerol 甘油

∞ fatty acid 脂肪酸

∞ ester bond 酯键

○ saturated 饱和

= double bond 双键

∞ unsaturated 不饱和

∞ insulation 隔热

⊗ phosphate 磷酸

Mathematics

Topic 1 · Pure Mathematics 1

⊂ segment 弓形

∧ sine 正弦

∧ cosine 余弦

≈ tangent function 正切

⌕ principal value 主值

= identity 恒等式

∧ trigonometric equation
三角方程

[] binomial expansion 二项
展开式

⊞ binomial coefficient 二项
式系数

≡ progression 数列

Further Mathematics

Topic 1 · Further Pure Mathematics 1

⌒ polar curves 极坐标曲线

□ plane 平面

× vector product 向量积

↗ vectors 向量

∞ skew lines 异面直线

Computer Science

Topic 3 · Hardware

 **transistors** 晶体管

 **optical disc** 光盘

 **touchscreen** 触摸屏

 **Resistive** 电阻式

 **Capacitive** 电容式

 **virtual reality** 虚拟现实

 **accelerometer** 加速度计

 **gyroscope** 陀螺仪

 **RAM** 随机存取存储器

 **volatile** 易失性

 **ROM** 只读存储器

 **non-volatile** 非易失性

 **SRAM** 静态

 **flip-flop** 触发器

 **cache** 高速缓存

 **DRAM** 动态

 **refreshed** 刷新

 **monitoring** 监控

 **control system** 控制系统

 **sensor** 传感器

 **thermistor** 热敏电阻

 **actuator** 执行器

 feedback 反馈			
 logic gate 逻辑门			
 Boolean 布尔			
 truth table 真值表			
 logic circuit 逻辑电路			

Economics

Topics 1–2 · Basic economic ideas and resource allocation, The price system and the microeconomy

 consumer goods 消费品			
 free good 免费物品			
 economic good 经济物品			
 private good 私人物品			
 rivalry 竞争性			
 excludability 排他性			
 public good 公共物品			
 non-rivalry 非竞争性			
 non-excludability 非排他性			
 free-rider problem 搭便车问题			
 national defence 国防			
 merit good 优值品			
 demerit good 劣值品			
 information failure 信息失灵			

👉 demand 需求

Morning Reading 晨读

Grade 11 · AS · Week 6

Read each word aloud, then copy the English word three times. 朗读每个单词，然后把英语单词抄写三遍。

Reading 阅读

Read the passage aloud twice. 把短文朗读两遍。

A skydiver 跳伞员 steps out of the plane. At first she accelerates: gravity wins. But as she speeds up, air resistance grows, until it exactly balances her weight. From then on she falls at a steady **terminal velocity**. Opening the parachute increases the air resistance enormously, so she slows to a new, safe terminal velocity. When she lands softly, bending her knees, she is using **deformation** to extend the stopping time and reduce the force.

Computers make a similar trade between speed and safety. **RAM** is fast but **volatile**: switch off the power and everything in it is gone. **ROM** is **non-volatile**, keeping its contents forever, so the start-up program lives there. The **cache** keeps the busiest data closest to the processor.

Why does the third slice of pizza taste worse than the first? Economists say the extra satisfaction from each unit, the **marginal utility**, falls as you consume more. This law of **diminishing marginal utility** helps explain why the **demand curve** slopes downwards.

Talk about it 说一说:

1. Why does a parachute have to be large? Explain using forces.
2. Give your own example of diminishing marginal utility from this week.

Physics

Topics 3-4 · Dynamics, Forces, density and pressure

 stationary 静止

 mass-flow rate 质量流率

 centre of gravity 重心

 centre of mass 质心

 free-body diagram 受力图

 moment 力矩

 perpendicular distance 垂直距离

 line of action 作用线

 lever arm 力臂

 pivot 支点

 clockwise 顺时针

 anticlockwise 逆时针

 couple 力偶

 torque 力偶矩

 translation 平动

 equilibrium 平衡

 angular acceleration 角加速度

 principle of moments 力矩原理

 vector triangle 矢量三角形

📐 sine rule 正弦定理

Chemistry

Topic 3 · Chemical bonding

📐 VSEPR theory 价层电子
对互斥理论

⊙ lone pair 孤对电子

↻ bonding pair 成键电子对

△ bond angle 键角

— linear 直线形

△ trigonal planar 平面三角
形

⬆ tetrahedral 四面体形

△ pyramidal 三角锥形

↷ bent 角形

◇ trigonal bipyramidal 三
角双锥形

⬡ octahedral 八面体形

↻ intermolecular forces 分
子间作用力

⚡ polarity 极性

↔ dipole 偶极

→ dipole moment 偶极矩

↻ van der Waals' forces 范
德华力

⚡ London dispersion
forces 伦敦色散力

⚡ instantaneous dipole 瞬时偶极

Biology

Topic 2 · Biological molecules

💧 hydrophilic 亲水

🌀 polar 极性

⊕ amino group 氨基

🧪 carboxyl group 羧基

🔗 side chain 侧链

🔗 peptide bond 肽键

🔗 polypeptide 多肽

— primary structure 一级结构

🌀 secondary structure 二级结构

🌀 helix 螺旋

📄 pleated sheet 折叠片

🧩 tertiary structure 三级结构

🧩 quaternary structure 四级结构

🔗 hydrophobic interactions 疏水作用

🔗 ionic bond 离子键

🔗 disulfide bond 二硫键

🔗 globular protein 球状蛋白质

 soluble 可溶			
 fibrous protein 纤维状蛋白质			
 haemoglobin 血红蛋白			
 oxygen 氧气			
 haem group 血红素			
 iron 铁			

Mathematics

Topic 1 · Pure Mathematics 1

+ arithmetic progression 等差数列			
— common difference 公差			
 term 项			
× geometric progression 等比数列			
÷ common ratio 公比			
 converges 收敛			
∞ sum to infinity 无穷和			
 Differentiation 微分			
 gradient of a curve 曲线斜率			
→ limit 极限			

Further Mathematics

Topic 1 · Further Pure Mathematics 1

🔑 **mathematical induction**
数学归纳法

💡 **conjecture** 猜想

✓ **inductive proof** 归纳证明

[:] **symmetric functions** 对称函数

√ **discriminant** 判别式

Computer Science

Topics 3–4 · Hardware, Processor Fundamentals

🏠 **Von Neumann architecture** 冯·诺依曼体系结构

📁 **stored program** 存储程序

⚙️ **control unit** 控制单元

🕒 **clock speed** 时钟频率

⏱️ **Program Counter** 程序计数器

📍 **Memory Address Register** 内存地址寄存器

📄 **Memory Data Register**
内存数据寄存器

📋 **Current Instruction Register** 当前指令寄存器

⊕ **Accumulator** 累加器

🚩 **Status Register** 状态寄存器

 flags 标志			
# Index Register 变址寄存器			
 General-purpose registers 通用寄存器			
 buses 总线			
 address bus 地址总线			
 data bus 数据总线			
 control bus 控制总线			
 cores 核心			
 word size 字长			
 page 页			
 port 端口			
 peripheral 外围设备			
 fetch-execute cycle 取指-执行周期			
 interrupt 中断			
 interrupt service routine 中断服务程序			
 machine code 机器码			
 Assembly language 汇编语言			

Economics

Topic 2 · The price system and the microeconomy

 price 价格			
# quantity demanded 需求量			

↘ demand curve 需求曲线			
↔ shift 移动			
≡ determinants 决定因素			
💰 income 收入			
↔ substitute 替代品			
🔗 complement 互补品			
👤 market demand 市场需求			
😊 utility 效用			
+ marginal utility 边际效用			
↘ diminishing marginal utility 边际效用递减			
📦 supply 供给			
# quantity supplied 供给量			
↗ supply curve 供给曲线			

Morning Reading 晨读

Grade 11 · AS · Week 7

Read each word aloud, then copy the English word three times. 朗读每个单词，然后把英语单词抄写三遍。

Reading 阅读

Read the passage aloud twice. 把短文朗读两遍。

Why is the door handle far from the hinge? Because a force turns an object more easily when it acts far from the **pivot**. The turning effect, the **moment**, equals the force times the **perpendicular distance** from the pivot to its **line of action**. Scissors, spanners and wheelbarrows are all machines built around this idea. Two equal and opposite forces that do not share a line form a **couple**, producing pure rotation, which is how you turn a steering wheel. A body at rest with no net force and no net moment is in **equilibrium**.

Inside the processor, special registers keep order. The **Program Counter** holds the address of the next instruction; the **Accumulator** holds the value being worked on. Instructions and data travel on the **address bus** and **data bus**, and the **clock speed** sets the rhythm.

Back in economics: if the metro fare rises 10% and passenger numbers barely change, demand is **inelastic**, and the operator's **total revenue** rises. For a **luxury** with many alternatives, the same rise would drive customers away.

Talk about it 说一说:

1. Why is it easier to open a door by pushing its edge, not its middle?
2. Metro fares rise 10%. Predict what happens to revenue, and explain.

Physics

Topics 1–5 · Physical quantities and units, Dynamics, Forces, density and pressure, Work, energy and power

∩ cosine rule 余弦定理

⊙ cross-sectional area 横截面积

⊖ hydrostatic pressure 流体静压强

↓ depth 深度

☁ atmospheric pressure 大气压强

👤 submerged 浸没

↑ upthrust 浮力

→ displaced 排开

⚖ Archimedes' principle 阿基米德原理

⚖ floating 漂浮

↕ tension 张力

⊖ newton meter 弹簧测力计

⊖ incompressible 不可压缩

⊖ closed system 封闭系统

⚡ conservation of energy 能量守恒

🔗 elastic potential energy 弹性势能

⚗ chemical energy 化学能

⚙ frictionless 无摩擦

△ ramp 斜坡

% efficiency 效率

Chemistry

Topics 3-4 · Chemical bonding, States of matter

✧ induced dipole 诱导偶极

☰ permanent dipole 永久偶极

☺ hydrogen bonding 氢键

🌡 boiling point 沸点

💧 surface tension 表面张力

⊞ dot-and-cross diagram
点叉图

⚡ collide 碰撞

↓ pressure 压强

⇌ ideal gas 理想气体

☁ real gas 实际气体

= ideal gas equation 理想
气体方程

🌡 kelvin 开尔文

☰ gas constant 气体常量

💎 crystalline solid 晶体

⊞ giant ionic 离子晶体

⬡ simple molecular 分子晶
体

⊙ fullerene 富勒烯

🏠 giant molecular 原子晶体

Biology

Topics 2–3 · Biological molecules, Enzymes

🔗 collagen 胶原蛋白

🏠 tendon 肌腱

🔗 fibre 纤维

💧 solvent 溶剂

🔗 specific heat capacity 比热容

☁ latent heat of vaporisation 汽化潜热

☁ evaporate 蒸发

⚡ catalyse 催化

🏠 intracellular 细胞内

✂ catalase 过氧化氢酶

🏠 extracellular 细胞外

💧 secrete 分泌

✂ amylase 淀粉酶

🍴 digest 消化

🔗 active site 活性位点

🔗 substrate 底物

🔗 enzyme–substrate complex 酶底物复合物

📦 product 产物

🔗 complementary 互补

🔑 specificity 专一性

🔑 lock-and-key hypothesis
锁钥学说

👉 induced-fit hypothesis
诱导契合学说

⚡ activation energy 活化能

Mathematics

Topic 1 · Pure Mathematics 1

↗ derivative 导数

🔗 chain rule 链式法则

↔ second derivative 二阶导数

⊥ normal 法线

↗ increasing function 增函数

↘ decreasing function 减函数

⚡ rate of change 变化率

⏏ stationary point 驻点

∨ minimum point 极小值点

∧ maximum point 极大值点

Further Mathematics

Topic 1 · Further Pure Mathematics 1

🔑 turning points 驻点

÷ partial fractions 部分分式

 rotation 旋转			
 reflection 反射			
 enlargement 放大			

Computer Science

Topics 4–5 · Processor Fundamentals, System Software

T mnemonics 助记符			
 assembler 汇编器			
 symbol table 符号表			
 label 标签			
→ forward references 前向引用			
 addressing mode 寻址方式			
 immediate addressing 立即寻址			
 direct addressing 直接寻址			
 indirect addressing 间接寻址			
# indexed addressing 变址寻址			
→ Relative addressing 相对寻址			
» logical shift 逻辑移位			
 mask 掩码			
 cache memory 高速缓存			
 Immediate Access Store 立即存取存储器			

 **special purpose registers** 专用寄存器

 **register transfer** 寄存器
传送

 **cyclic shift** 循环移位

 **operating system** 操作系统

 **process management** 进程管理

 **process** 进程

 **memory management** 内存管理

 **virtual memory** 虚拟内存

 **paging** 分页

 **device driver** 设备驱动

 **utility program** 实用程序

 **disk defragmenter** 碎片
整理

Economics

Topic 2 · The price system and the microeconomy

 **costs of production** 生产
成本

 **subsidy** 补贴

 **market supply** 市场供给

 **price elasticity of demand** 需求价格弹性

 **elastic** 富有弹性

 **inelastic** 缺乏弹性

= unit elastic 单位弹性			
— perfectly inelastic 完全无弹性			
↔ perfectly elastic 完全有弹性			
♥ necessity 必需品			
💎 luxury 奢侈品			
💰 total revenue 总收益			
↕ income elasticity of demand 需求收入弹性			
📦 normal good 正常品			
📦 inferior good 低档品			

Morning Reading 晨读

Grade 11 · AS · Week 8

Read each word aloud, then copy the English word three times. 朗读每个单词，然后把英语单词抄写三遍。

Reading 阅读

Read the passage aloud twice. 把短文朗读两遍。

A steel ship weighs thousands of tonnes. Why does it float when a steel coin sinks? A body in water feels an upward force, the **upthrust**, equal to the weight of the water it has **displaced**. This is **Archimedes' principle**. The ship's hull is shaped to push aside an enormous volume of water, so the upthrust can match its huge weight. The coin displaces almost nothing, so it sinks. Even the air pushes on us: **atmospheric pressure** at sea level is about 100,000 pascals, though we never notice it.

Chemists this week met energy in reactions. An **exothermic** reaction releases heat, like the hand warmers 暖手宝 sold in winter; an **endothermic** one absorbs it, like the instant cold packs used for sports injuries. Every reaction must first climb over its **activation energy**.

In the market diagram, the crossing point of demand and supply gives the **equilibrium price**. Below it there is **excess demand**: a **shortage**, queues, and pressure for the price to rise.

Talk about it 说一说:

1. A ship floats but a coin sinks. Explain the difference in one sentence.
2. Ice-cream sellers cut prices every evening. What does this say about equilibrium?

Physics

Topics 5–7 · Work, energy and power, Deformation of solids, Waves

⚡ voltage 电压

🌀 spring 弹簧

✕ compression 压缩

🌀 spring constant 劲度系数

↕ tensile 拉伸

↕ extension 伸长量

📦 load 负载

🌀 Hooke's law 胡克定律

📈 limit of proportionality
比例极限

↗ elastic 弹性

✂ plastic 塑性

≡ Series 串联

= Parallel 并联

↕ Strain 应变

↗ Young modulus 杨氏模量

⊙ pulley 滑轮

📏 micrometer 螺旋测微器

⚠ elastic limit 弹性极限

▴ trapezia 梯形

≈ wave 波

Chemistry

Topics 4–5 · States of matter, Chemical energetics

 covalent bonds 共价键

 silicon(IV) oxide 二氧化硅

 graphite 石墨

 diamond 金刚石

 giant metallic 金属晶体

 melting point 熔点

 electrical conductivity
导电性

 solubility 溶解度

 enthalpy change 焓变

 exothermic 放热

 endothermic 吸热

 reaction pathway
diagram 反应路径图

 activation energy 活化能

 standard conditions 标准
条件

 enthalpy change of
reaction 反应焓变

 enthalpy change of
formation 生成焓变

 enthalpy change of
combustion 燃烧焓变

 enthalpy change of
neutralisation 中和焓变

Biology

Topics 3-4 · Enzymes, Cell membranes and transport

 temperature 温度			
 colorimeter 比色计			
 rate of reaction 反应速率			
 kinetic energy 动能			
 collide 碰撞			
 optimum temperature 最适温度			
 denature 变性			
 buffer solution 缓冲液			
 inhibitor 抑制剂			
 Michaelis-Menten constant 米氏常数			
 affinity 亲和力			
 reversible 可逆			
 competitive inhibitor 竞争性抑制剂			
 non-competitive inhibitor 非竞争性抑制剂			
 immobilised enzyme 固定化酶			
 alginate 海藻酸盐			
 fluid mosaic model 流动镶嵌模型			
 bilayer 双层			
 carrier protein 载体蛋白			

 channel protein 通道蛋白			
 cholesterol 胆固醇			
 fluidity 流动性			
 glycolipid 糖脂			

Mathematics

Topics 1–2 · Pure Mathematics 1, Pure Mathematics 2

 Integration 积分			
+ constant of integration 积分常数			
[] definite integral 定积分			
 region 区域			
 volume of revolution 旋转体体积			
 composition of functions 复合函数			
 logarithms 对数			
 exponential function 指数函数			
[] modulus 绝对值			
x² polynomial 多项式			

Further Mathematics

Topics 1–3 · Further Pure Mathematics 1, Further Mechanics

 stretch 拉伸			
 shear 切变			
 Further Mechanics 进阶力学			

↗ projectile 抛射体

↗ constant acceleration 匀加速

Computer Science

Topics 5–6 · System Software, Security, privacy and data integrity

💾 backup 备份

🛡️ antivirus 杀毒软件

📁 program library 程序库

📄 subroutines 子程序

🔒 static library 静态库

🔗 dynamic library 动态库

🔠 translator 翻译器

⚙️ compiler 编译器

▶️ executable 可执行文件

▶️ interpreter 解释器

🔢 bytecode 字节码

💻 virtual machine 虚拟机

⚡ just-in-time compilation 即时编译

<> integrated development environment 集成开发环境

🌈 syntax highlighting 语法高亮

✂️ auto-complete 自动补全

🔍 debugger 调试器

⊙ breakpoints 断点			
🔑 version control 版本控制			
🔧 refactoring 重构			
🧪 unit test 单元测试			
🛡 security 安全			
🚫 unauthorised 未授权			
🔒 privacy 隐私			
🛡 integrity 完整性			
🦠 malware 恶意软件			
🦠 virus 病毒			

Economics

Topic 2 · The price system and the microeconomy

↔ cross elasticity of demand 需求交叉弹性			
↑ price elasticity of supply 供给价格弹性			
📦 spare capacity 闲置产能			
📦 stocks 库存			
🕒 momentary 瞬时			
🕒 short run 短期			
📅 long run 长期			
⚖ equilibrium 均衡			
💰 equilibrium price 均衡价格			
# equilibrium quantity 均衡数量			

 disequilibrium 非均衡			
 excess demand 超额需求			
 shortage 短缺			
 excess supply 超额供给			
 product market 产品市场			

Morning Reading 晨读

Grade 11 · AS · Week 9

Read each word aloud, then copy the English word three times. 朗读每个单词，然后把英语单词抄写三遍。

Reading 阅读

Read the passage aloud twice. 把短文朗读两遍。

Stretch a spring gently and it returns to its original length when you let go: the behaviour is **elastic**. **Hooke's law** says the **extension** is proportional to the **load**, and the **spring constant** measures the stiffness. Pull too far, past the **limit of proportionality**, and finally the spring deforms permanently: it has become **plastic**. Springs hide everywhere: in pens, mattresses, keyboards and car suspensions.

A factory beside a river makes cheap paint but releases waste into the water. The firm counts only its **private cost**; the fishermen downstream carry the **external cost**. Economists call the fishermen a **third party**, and the pollution a **negative externality**. Add private and external together and you get the true **social cost** of the paint, which the market price ignores. This is why governments tax pollution.

Programmers met translators this week. A **compiler** converts the whole program into machine code once, producing a fast **executable**; an **interpreter** translates line by line, which is slower but easier for testing.

Talk about it 说一说:

1. Name three objects you used today that contain a spring.
2. A neighbour plays loud music at midnight. Explain this as an externality.

Physics

Topics 7-8 · Waves, Superposition

 **medium** 介质

 **oscillate** 振动

 **transverse wave** 横波

 **longitudinal wave** 纵波

 **progressive wave** 行波

 **amplitude** 振幅

 **wavelength** 波长

 **in phase** 同相

 **crest** 波峰

 **period** 周期

 **frequency** 频率

 **hertz** 赫兹

 **phase difference** 相位差

 **cathode-ray oscilloscope**
示波器

 **time-base** 时基

 **y-gain** 垂直增益

 **intensity** 强度

• **point source** 点源

 **sine curve** 正弦曲线

 **source** 波源

Chemistry

Topics 5-7 · Chemical energetics, Electrochemistry, Equilibria

 **specific heat capacity** 比热容

 **Hess's law** 盖斯定律

 **energy cycle** 能量循环

 **redox** 氧化还原

 **oxidation** 氧化

 **reduction** 还原

 **electron transfer** 电子转移

 **disproportionation** 歧化

 **oxidising agent** 氧化剂

 **reducing agent** 还原剂

 **reversible reaction** 可逆反应

 **forward reaction** 正反应

 **reverse reaction** 逆反应

 **closed system** 封闭系统

 **dynamic equilibrium** 动态平衡

 **Le Chatelier's principle** 勒夏特列原理

 **equilibrium** 平衡

 **catalyst** 催化剂

Biology

Topic 4 · Cell membranes and transport

 **glycoprotein** 糖蛋白

 **antigen** 抗原

 **stability** 稳定性

 **permeability** 通透性

 **partially permeable membrane** 半透膜

 **cell signalling** 细胞信号传递

 **ligand** 配体

 **hormone** 激素

 **target cell** 靶细胞

 **receptor** 受体

 **passive** 被动

 **diffusion** 扩散

 **simple diffusion** 简单扩散

 **concentration gradient**
浓度梯度

 **carbon dioxide** 二氧化碳

 **ion** 离子

 **facilitated diffusion** 易化扩散

 **active transport** 主动运输

 **endocytosis** 胞吞作用

↑ exocytosis 胞吐作用

📦 volume 体积

□ surface area 表面积

○ agar 琼脂

Mathematics

Topic 2 · Pure Mathematics 2

×² degree 次数

÷ quotient 商

% remainder 余数

% remainder theorem 余数定理

× factor theorem 因式定理

×² indices 指数

📖 laws of logarithms 对数定律

📖 natural logarithm 自然对数

— linear form 线性形式

↗ secant 正割

Further Mathematics

Topic 3 · Further Mechanics

+ Cartesian equation 直角坐标方程

↪ trajectory 轨迹

↻ moment 力矩

🎯 centre of mass 质心

📐 symmetry 对称

Computer Science

Topic 6 · Security, privacy and data integrity

🐛 worm 蠕虫

🌐 networks 网络

🐎 Trojan horse 木马

👁️ spyware 间谍软件

🔒 ransomware 勒索软件

📢 adware 广告软件

🐟 phishing 网络钓鱼

👤 hacking 黑客入侵

🚫 denial of service 拒绝服务

👂 eavesdropping 窃听

👤 man-in-the-middle 中间人攻击

👤 social engineering 社会工程

🔒 encryption 加密

📖 audit logs 审计日志

🛡️ VPN 虚拟专用网

🔑 authentication 身份验证

🛡️ two-factor authentication 双因素认证

 authorisation 授权			
 least-privilege 最小权限			
 plaintext 明文			
 ciphertext 密文			
 Symmetric encryption 对称加密			
 asymmetric encryption 非对称加密			
 public key 公钥			
 private key 私钥			
 access control 访问控制			
 Validation 验证			

Economics

Topics 2–3 · The price system and the microeconomy, Government microeconomic intervention

 factor market 要素市场			
 wage 工资			
 foreign exchange market 外汇市场			
 exchange rate 汇率			
 consumer surplus 消费者 剩余			
 producer surplus 生产者 剩余			
 welfare 福利			
 market failure 市场失灵			
 externality 外部性			

 third party 第三方			
 negative externality 负外部性			
 external cost 外部成本			
 social cost 社会成本			
 private cost 私人成本			
 positive externality 正外部性			

Morning Reading 晨读

Grade 11 · AS · Week 10

Read each word aloud, then copy the English word three times. 朗读每个单词，然后把英语单词抄写三遍。

Reading 阅读

Read the passage aloud twice. 把短文朗读两遍。

Pluck a guitar string and the sound you hear left the string as a **progressive wave** through the air. Its **frequency**, measured in **hertz**, sets the pitch; its **amplitude** sets the loudness. The air is pushed back and forth along the direction of travel, so sound is a **longitudinal wave**; light, vibrating across its direction of travel, is a **transverse wave**.

Malicious software comes in families, and the names matter. A **virus** attaches itself to a real program and spreads when the program runs; a **worm** travels through **networks** on its own. A **Trojan horse** pretends to be something useful. **Spyware** quietly watches what you type, and **ransomware** locks your files and demands payment. Most attacks still begin with **phishing**, a fake message that harvests passwords from busy people.

When one firm controls a market, it is a **monopoly**, and it may raise prices above the competitive level. Governments answer with **regulation** or, for essentials, a legal **maximum price**.

Talk about it 说一说:

1. Which is more dangerous: a virus or a phishing email? Argue your case.
2. Your city has one water company. Why might the government watch its prices?

Physics

Topics 7-8 · Waves, Superposition

👁 **observer** 观察者

🔊 **Doppler effect** 多普勒效应

📶 **electromagnetic spectrum** 电磁波谱

 **microwaves** 微波

 **infrared** 红外线

 **ultraviolet** 紫外线

 **X-rays** X 射线

 **Polarisation** 偏振

 **Plane-polarised** 平面偏振

 **polarising filter** 偏振片

 **transmission axis** 透光轴

 **Malus's law** 马吕斯定律

 **vector sum** 矢量和

 **superposition** 叠加

 **constructive interference** 相长干涉

 **trough** 波谷

 **destructive interference**
相消干涉

 **stationary wave** 驻波

 **reflected** 反射

Chemistry

Topic 7 · Equilibria

 **equilibrium constant** 平衡常数

 **partial pressure** 分压

 **mole fraction** 摩尔分数

 **Haber process** 哈伯法

⚙️ Contact process 接触法			
🧪 acid 酸			
+ proton donor 质子供体			
🧪 base 碱			
— proton acceptor 质子受体			
💧 strong acid 强酸			
🛡️ strong base 强碱			
🔪 dissociated 解离			
💧 weak acid 弱酸			
🌿 weak base 弱碱			
🌈 universal indicator 通用指示剂			
⚖️ Neutralisation 中和			
🧂 salt 盐			
📈 titration curve 滴定曲线			

Biology

Topics 4–5 · Cell membranes and transport, The mitotic cell cycle

🧴 dialysis tubing 透析袋			
🧂 solute 溶质			
💧 distilled water 蒸馏水			
🌊 turgid 膨胀			
✂️ plasmolysis 质壁分离			
💧 haemolysis 溶血			
🧬 chromosome 染色体			

⊙ histone 组蛋白			
☐ replication 复制			
☐ sister chromatids 姐妹染色单体			
• centromere 着丝粒			
⊙ telomere 端粒			
☐ mitosis 有丝分裂			
⊙ daughter cell 子细胞			
✎ gene 基因			
☐ multicellular 多细胞			
✎ organism 生物体			
☐ tissue 组织			
☐ asexual reproduction 无性生殖			
↔ cell cycle 细胞周期			
∞ interphase 间期			
↗ cytokinesis 胞质分裂			
♂ stem cell 干细胞			

Mathematics

Topic 2 · Pure Mathematics 2

∧ cosecant 余割			
∧ cotangent 余切			
= trigonometric identities 三角恒等式			
+ compound angle 复合角			

 double angle 二倍角			
 R-formula 辅助角公式			
× product rule 乘积法则			
÷ quotient rule 商法则			
(*) parametric equations 参数方程			
 implicitly 隐式			

Further Mathematics

Topic 3 · Further Mechanics

 equilibrium 平衡			
 toppling 翻倒			
→ sliding 滑动			
 angular speed 角速度			
 centripetal acceleration 向心加速度			

Computer Science

Topics 6–7 · Security, privacy and data integrity, Ethics and Ownership

 check digit 校验位			
 Verification 核对			
 parity check 奇偶校验			
Σ checksum 校验和			
 cyclic redundancy check 循环冗余校验			
 pharming 域名欺骗			
 hackers 黑客			

 user accounts 用户账户			
 digital signatures 数字签名			
 anti-spyware 反间谍软件			
 access rights 访问权限			
 biometrics 生物识别			
 ethics 伦理			
 confidentiality 保密性			
 conflicts of interest 利益冲突			
 intellectual property 知识产权			
 Copyright 版权			
 patent 专利			
 software licence 软件许可证			
 proprietary 专有			
 open-source 开源			
 copyleft 著佐权			
 freeware 免费软件			
 shareware 共享软件			
 Artificial intelligence 人工智能			
 machine learning 机器学习			
 Deep learning 深度学习			

Economics

Topic 3 · Government microeconomic intervention

✧ external benefit 外部收益

👑 monopoly 垄断

👑 monopoly power 垄断势力

⚖ inequality 不平等

🔍 asymmetric information 信息不对称

💰 indirect tax 间接税

↗ incidence of a tax 税收归宿

↓ maximum price 最高限价

↑ minimum price 最低限价

📦 buffer stock 缓冲库存

📋 regulation 管制

🏛 state provision 政府提供

🔄 tradable permits 可交易许可证

🏹 government failure 政府失灵

🕳 black market 黑市

Morning Reading 晨读

Grade 11 · AS · Week 11

Read each word aloud, then copy the English word three times. 朗读每个单词，然后把英语单词抄写三遍。

Reading 阅读

Read the passage aloud twice. 把短文朗读两遍。

How big is an economy? Add up the value of everything produced inside the country in a year and you get the **gross domestic product**. But be careful with rising prices: **nominal** GDP can grow while the country actually makes no more than before. **Real** GDP removes the effect of inflation, and dividing by the population gives GDP **per capita**, a rough measure of the average person's income. Rough, because it says nothing about how income is shared, or about unpaid work at home.

An ambulance races past and its siren drops in pitch as it passes. This is the **Doppler effect**: waves from an approaching **source** reach the **observer** squeezed together, at higher frequency; as the source leaves, the waves stretch out. Astronomers use exactly this to show distant galaxies rushing away from us.

To keep data honest on its journey, computers add checks: a **parity check** counts ones, a **checksum** sums the bytes, and **encryption** with a **public key** and a **private key** keeps the content secret.

Talk about it 说一说:

1. Nominal GDP rose 5%, inflation was 5%. Did the economy really grow?
2. Where else have you heard the Doppler effect? Describe the sound.

Physics

Topics 7-8 · Waves, Superposition

• node 波节			
○ antinode 波腹			
↔ antiphase 反相			
🗄 resonance tube 共鸣管			
— fundamental 基频			
▣ Diffraction 衍射			
□ obstacle 障碍物			
🌊 ripple tank 水波槽			
📶 Interference 干涉			
= coherent 相干			
= double-slit 双缝			
📏 path difference 路程差			
▤ fringe spacing 条纹间距			
▤ fringe 条纹			
^ maximum 极大			
v minimum 极小			
▣ diffraction grating 衍射光栅			
+ normal 法线			
▤ slit spacing 缝间距			

Chemistry

Topics 7-10 · Equilibria, Reaction kinetics, The Periodic Table: chemical periodicity, Group 2

 indicator 指示剂			
 rate of reaction 反应速率			
 collision frequency 碰撞频率			
 effective collision 有效碰撞			
 non-effective collision 无效碰撞			
 Boltzmann distribution 玻尔兹曼分布			
 catalysis 催化作用			
 reaction mechanism 反应机理			
 homogeneous catalyst 均相催化剂			
 heterogeneous catalyst 多相催化剂			
 periodicity 周期性			
 valence shell 价层			
 oxide 氧化物			
 amphoteric 两性			
 hydroxide 氢氧化物			
 hydrolysis 水解			
 reactivity 反应活性			
 sulfate 硫酸盐			

Biology

Topics 5–6 · The mitotic cell cycle, Nucleic acids and protein synthesis

🔗 differentiate 分化

⊙ tumour 肿瘤

○ prophase 前期

🌀 spindle 纺锤体

≡ metaphase 中期

— equator 赤道

↔ anaphase 后期

↗ telophase 末期

□ nucleotide 核苷酸

⊙ base 碱基

□ adenine 腺嘌呤

⬡ ribose 核糖

⬡ purine 嘌呤

□ guanine 鸟嘌呤

⊙ pyrimidine 嘧啶

□ cytosine 胞嘧啶

⊙ thymine 胸腺嘧啶

□ uracil 尿嘧啶

🌀 double helix 双螺旋

— strand 链

⬡ deoxyribose 脱氧核糖

🌀 phosphodiester bond 磷酸二酯键

☞ complementary base pairing 碱基互补配对

Mathematics

Topics 2–4 · Pure Mathematics 2, Mechanics

△ trapezium rule 梯形法则

√ root 根

↕ sign change 变号

↔ iteration 迭代

↔ iterative formula 迭代公式

∞ converge 收敛

∫ integration by substitution 换元积分

⚙ Mechanics 力学

→ force 力

↗ components 分量

Further Mathematics

Topic 3 · Further Mechanics

○ horizontal circle 水平圆

○ vertical circle 竖直圆

↔ Hooke's law 胡克定律

↗ modulus of elasticity 弹性模量

↗ elastic potential energy 弹性势能

Computer Science

Topics 7-8 · Ethics and Ownership, Databases

 **neural networks** 神经网络

 **speech recognition** 语音识别

 **image recognition** 图像识别

 **machine translation** 机器翻译

 **recommendation systems** 推荐系统

 **autonomous vehicles** 自动驾驶汽车

 **optical character recognition** 光学字符识别

 **text-to-speech** 文本转语音

 **bias** 偏见

 **flat files** 平面文件

 **data redundancy** 数据冗余

 **data inconsistency** 数据不一致

 **relational database** 关系数据库

 **table** 表

 **entity** 实体

 **record** 记录

 field 字段			
 primary key 主键			
 foreign key 外键			
 composite key 复合键			
 candidate key 候选键			
 referential integrity 参照完整性			
 entity-relationship diagram 实体关系图			
 cardinality 基数			
 one-to-many 一对多			
 link table 连接表			
 normalisation 规范化			

Economics

Topics 3-4 · Government microeconomic intervention, The macroeconomy

 flow 流量			
 wealth 财富			
 stock 存量			
 progressive tax 累进税			
 percentage 百分比			
 benefits 福利金			
 transfer payments 转移支付			
 redistribution 再分配			
 national income 国民收入			

④ gross domestic product 国内生产总值	_____	_____	_____
④ gross national income 国 民总收入	_____	_____	_____
④ nominal 名义	_____	_____	_____
④ real 实际	_____	_____	_____
④ per capita 人均	_____	_____	_____
④ standard of living 生活水 平	_____	_____	_____

Morning Reading 晨读

Grade 11 · AS · Week 12

Read each word aloud, then copy the English word three times. 朗读每个单词，然后把英语单词抄写三遍。

Reading 阅读

Read the passage aloud twice. 把短文朗读两遍。

A student asks an image generator for a painting "in the style of a famous artist", and in seconds it appears. **Artificial intelligence** systems learn patterns from millions of examples; this is **machine learning**, and the deepest versions use **neural networks** loosely inspired by the brain. But who owns the picture? The artists whose work trained the model were never asked. **Copyright** law protects creative work, and **intellectual property** in general, yet it was written long before **deep learning** existed. Some programmers choose **open-source** licences that invite sharing; others sell **proprietary** software and guard the code.

In physics, two waves meeting on a string add together: this is **superposition**. Send waves down a rope tied at one end and the reflections combine into a **stationary wave**, with still points called **nodes** and wildly moving points called **antinodes**, the physics behind every guitar note.

Economists picture money moving in a **circular flow of income** between households and firms. **Injections** such as **investment** enlarge the flow; **leakages** such as **saving** shrink it.

Talk about it 说一说:

1. Should an AI image trained on an artist's work need the artist's permission?
2. Press a guitar string at its middle. Predict what happens to the note.

Physics

Topics 8-9 · Superposition, Electricity

≡ order 级次

⚡ electric current 电流

⊕ charge carrier 载流子

⓪ electron 电子

Ⓐ electrolyte 电解质

± ion 离子

Ⓜ semiconductor 半导体

⦿ hole 空穴

→ conventional current 常规电流

田 quantised 量子化

⊕ elementary charge 基本电荷

⊕ coulomb 库仑

⋮ number density 数密度

→ drift velocity 漂移速度

⚡ potential difference 电势差

Ⓜ volt 伏特

Ⓜ electromotive force 电动势

Ⓜ resistance 电阻

Ω ohm 欧姆

Chemistry

Topics 10–12 · Group 2, Group 17, Nitrogen and sulfur

 carbonate 碳酸盐

 thermal decomposition
热分解

 nitrate 硝酸盐

 thermal stability 热稳定性

 halogen 卤素

 volatility 挥发性

 hydrogen halide 卤化氢

 halide ion 卤离子

 ammonia 氨

 precipitate 沉淀

 water purification 水净化

 bacteria 细菌

 triple bond 三键

 basicity 碱性

 ammonium ion 铵离子

 displacement 置换

 internal combustion
engine 内燃机

 catalytic converter 催化
转化器

Biology

Topics 6–7 · Nucleic acids and protein synthesis, Transport in plants

 base pair 碱基对			
 antiparallel 反平行			
 semi-conservative replication 半保留复制			
 polymerase 聚合酶			
 leading strand 前导链			
 lagging strand 后随链			
 ligase 连接酶			
 triplet 三联体			
 codon 密码子			
 transcription 转录			
 template strand 模板链			
 non-transcribed strand 非转录链			
 primary transcript 初级 转录本			
 exon 外显子			
 intron 内含子			
 translation 翻译			
 anticodon 反密码子			
 mutation 突变			
 substitution 替换			
 deletion 缺失			

+ insertion 插入

↑ xylem 木质部

💎 mineral ion 矿物离子

Mathematics

Topic 4 · Mechanics

↗ resultant 合力

⚖ equilibrium 平衡

↑ contact force 接触力

↑ normal reaction 法向反作用力

🔥 friction 摩擦力

⚠ limiting friction 最大静摩擦力

× coefficient of friction 摩擦系数

↔ Newton's third law 牛顿第三定律

📏 distance 距离

🏎 speed 速率

Further Mathematics

Topic 3 · Further Mechanics

📈 differential equation 微分方程

⚙ variable force 变力

↔ conservation of momentum 动量守恒

🔗 Newton's experimental
law 牛顿实验定律

% coefficient of restitution
恢复系数

Computer Science

Topics 8–9 · Databases, Algorithm Design and Problem-solving

≡ normal forms 范式

⊗ atomic 原子

→ transitive dependency
传递依赖

🗄 DBMS 数据库管理系统

📖 data dictionary 数据字典

👥 concurrent access 并发访问

↔ transactions 事务

👁 views 视图

🗄 SQL 结构化查询语言

📖 Data Definition
Language 数据定义语言

🔑 Data Manipulation
Language 数据操纵语言

🔍 query 查询

🔗 join 连接

Σ aggregate functions 聚合
函数

📋 tuple 元组

📋 attribute 属性

🔑 secondary key 次键

📖 indexing 索引

🗄 data management 数据管理

🏠 data modelling 数据建模

🔑 logical schema 逻辑模式

🛡 data integrity 数据完整性

🛡 data security 数据安全

🔍 query processor 查询处理器

🔗 developer interface 开发者接口

🧠 Computational thinking 计算思维

📦 Abstraction 抽象

Economics

Topic 4 · The macroeconomy

📊 distribution 分配

🔄 informal economy 非正规经济

🔄 circular flow of income 收入循环流

🏠 household 家庭

💧 leakages 漏出

🐷 saving 储蓄

💰 taxation 税收

 imports 进口			
 injections 注入			
 investment 投资			
 government spending 政府支出			
 exports 出口			
 closed economy 封闭经济			
 open economy 开放经济			
 aggregate demand 总需求			

Morning Reading 晨读

Grade 11 · AS · Week 13

Read each word aloud, then copy the English word three times. 朗读每个单词，然后把英语单词抄写三遍。

Reading 阅读

Read the passage aloud twice. 把短文朗读两遍。

Your school runs on a **relational database**, even if you never see it. One **table** stores students, another stores classes. Each row is a **record**; each column, such as name or birthday, is a **field**. Every student has a unique **primary key**, and the class table points to it with a **foreign key**. That link is what makes the database relational: information is stored once and connected, never copied. When the office prints your timetable, a query joins the tables in milliseconds.

Physics this week showed light behaving strangely. Shine one small light through two narrow slits and the screen shows dark and bright stripes. The waves from the two slits show **interference**: where crest meets crest the light is bright; where crest meets trough, darkness. This **double-slit** experiment convinced physicists that light travels as a wave.

Economies swing through the **business cycle**. In a **boom**, jobs are easy to find and firms invest; then demand cools and growth slows, until a **recovery** starts the cycle again.

Talk about it 说一说:

1. Why store a student's name once, in one table, instead of in every class list?
2. Two waves meet and produce darkness. Explain how this is possible.

Physics

Topics 9–10 · Electricity, D.C. circuits

⚡ **Ohm's law** 欧姆定律

💡 **filament lamp** 灯丝灯泡

⚡ **diode** 二极管

⚡ **resistivity** 电阻率

 insulator 绝缘体			
 lattice vibration 晶格振动			
 scatters 散射			
 light-dependent resistor 光敏电阻			
 light intensity 光强			
 thermistor 热敏电阻			
 negative temperature coefficient 负温度系数			
 potential divider 分压器			
 breadboard 面包板			
 multimeter 万用表			
 internal resistance 内阻			
 cell 电池			
 terminal p.d. 端电压			
 open circuit 开路			
 short circuit 短路			

Chemistry

Topics 12–13 · Nitrogen and sulfur, An introduction to AS Level organic chemistry

 exhaust gases 尾气			
 photochemical smog 光化学烟雾			
 acid rain 酸雨			
 sulfur dioxide 二氧化硫			

 hydrocarbon 碳氢化合物			
 alkane 烷烃			
 functional group 官能团			
Σ general formula 通式			
 structural formula 结构式			
 displayed formula 展开式			
 skeletal formula 骨架式			
T nomenclature 命名法			
 homologous series 同系列			
 saturated 饱和			
 unsaturated 不饱和			
 homolytic fission 均裂			
 heterolytic fission 异裂			
 nucleophile 亲核试剂			

Biology

Topic 7 · Transport in plants

 phloem 韧皮部			
 assimilate 同化物			
 transverse section 横切面			
 dicotyledonous plant 双子叶植物			
 vessel 导管			
 lignin 木质素			

 sieve tube 筛管			
 sieve plate 筛板			
 companion cell 伴胞			
 vascular bundle 维管束			
 root hair cell 根毛细胞			
 apoplast pathway 质外体途径			
 symplast pathway 共质体途径			
 endodermis 内皮层			
 Casparian strip 凯氏带			
 suberin 木栓质			
 transpiration 蒸腾作用			
 evaporation 蒸发			
 water vapour 水蒸气			
 diffuse 扩散			
 stomata 气孔			
 atmosphere 大气			

Mathematics

Topic 4 · Mechanics

 displacement 位移			
 velocity 速度			
 acceleration 加速度			
 velocity-time graph 速度时间图			

↔ constant acceleration 匀加速

⇒ momentum 动量

↔ conservation of momentum 动量守恒

🍏 Newton's laws of motion 牛顿运动定律

🍊 mass 质量

🍋 weight 重力

Further Mathematics

Topic 3 · Further Mechanics

🍌 bounding parabola 包络抛物线

🍌 lamina 薄片

↔ coplanar forces 共面力

🍌 conical pendulum 圆锥摆

↑ normal contact force 法向接触力

Computer Science

Topics 9–10 · Algorithm Design and Problem-solving, Data Types and Structures

↗ Decomposition 分解

🍌 algorithm 算法

✓ unambiguous 无歧义

✓ deterministic 确定性

🍌 identifier table 标识符表

(x) variable 变量

 data type 数据类型			
 Pseudocode 伪代码			
 sequence 顺序			
 selection 选择			
 iteration 迭代			
 loop 循环			
= assignment 赋值			
 concatenation 拼接			
 structured English 结构化英语			
 flowchart 流程图			
 Stepwise refinement 逐步求精			
() logic statement 逻辑语句			
 Precedence 优先级			
 De Morgan's law 德摩根定律			
 procedure 过程			
[] array 数组			
# index 索引			
• element 元素			
[] bounds 边界			
 dimension 维度			
→ linear search 线性查找			

Economics

Topic 4 · The macroeconomy

 **consumption** 消费

 **net exports** 净出口

 **aggregate supply** 总供给

 **short-run aggregate supply** 短期总供给

 **long-run aggregate supply** 长期总供给

 **productive capacity** 生产能力

 **macroeconomic equilibrium** 宏观经济均衡

 **price level** 价格水平

 **real output** 实际产出

 **actual growth** 实际增长

 **potential growth** 潜在增长

 **productivity** 生产率

 **business cycle** 经济周期

 **boom** 繁荣

 **recession** 衰退

Morning Reading 晨读

Grade 11 · AS · Week 14

Read each word aloud, then copy the English word three times. 朗读每个单词，然后把英语单词抄写三遍。

Reading 阅读

Read the passage aloud twice. 把短文朗读两遍。

What actually flows in a wire? Electrons, each carrying a tiny negative charge. Charge is measured in **coulombs**, and one ampere of current means one coulomb passing every second. Surprisingly, the electrons themselves creep along at a **drift velocity** of less than a millimetre per second; the electric field that pushes them, however, spreads at nearly the speed of light, which is why the lamp lights instantly. A battery provides the push: its **electromotive force** drives charge around the circuit, and the **potential difference** across a component, in **volts**, tells you the energy transferred per coulomb. A **semiconductor** sits between conductor and insulator, and its special behaviour built the modern world.

The labour market has its own flow. **Frictional unemployment** is people between jobs; **structural unemployment** follows when whole industries change and skills no longer match; **seasonal unemployment** comes and goes with harvests and holidays. Meanwhile **inflation** eats quietly at the **purchasing power** of every yuan saved.

Talk about it 说一说:

1. The light comes on instantly, yet electrons crawl. Explain the difference.
2. Which type of unemployment worries you most for your own future? Why?

Physics

Topic 10 · D.C. circuits

⌚ ammeter 电流表

⌚ voltmeter 电压表

💡 LED 发光二极管

⌚ capacitor 电容器

 fuse 保险丝			
 junction 节点			
 conservation of charge 电荷守恒			
 loop 回路			
 Kirchhoff's first law 基尔 霍夫第一定律			
 Kirchhoff's second law 基尔霍夫第二定律			
 rheostat 变阻器			
 sensor 传感器			
 transistor 晶体管			
 comparator 比较器			
 threshold 阈值			
 potentiometer 电位差计			
 jockey 滑动触头			
 galvanometer 检流计			
 null method 零点法			

Chemistry

Topic 13 · An introduction to AS Level organic chemistry

 electrophile 亲电试剂			
 addition 加成			
 substitution 取代			
 elimination 消去			
 condensation 缩合			

▷ initiation 引发			
∞ propagation 增长			
□ termination 终止			
✦ free-radical substitution 自由基取代			
+ electrophilic addition 亲 电加成			
⚡ nucleophilic substitution 亲核取代			
+ nucleophilic addition 亲 核加成			
↪ curly arrow 弯箭头			
⦿ cyclic 环状			
□ planar 平面			
🔄 isomerism 异构			
🔗 structural isomerism 结 构异构			
🔗 chain isomerism 链异构			

Biology

Topics 7–8 · Transport in plants, Transport in mammals

🔗 cohesion 内聚力			
↕ tension 张力			
🔗 adhesion 附着力			
☀ xerophyte 旱生植物			
🔄 adapted 适应			
🛡 cuticle 角质层			

 source 源			
 sink 库			
 proton pump 质子泵			
 cotransporter protein 协同运输蛋白			
 hydrostatic pressure 静水压			
 mass flow 集流			
 blood vessel 血管			
 heart 心脏			
 double circulation 双循环			
 circulatory system 循环系统			
 pulmonary circulation 肺循环			
 systemic circulation 体循环			
 artery 动脉			
 arteriole 小动脉			
 capillary 毛细血管			
 venule 小静脉			

Mathematics

Topic 4 · Mechanics

 tension 张力			
 inclined plane 斜面			

 **connected particles** 连接
质点

 **work done** 功

 **kinetic energy** 动能

 **gravitational potential
energy** 重力势能

 **conservation of energy**
能量守恒

 **power** 功率

 **limiting equilibrium** 极
限平衡

 **deceleration** 减速度

Further Mathematics

Topics 3–4 · Further Mechanics, Further Probability & Statistics

 **oblique impact** 斜碰撞

 **Further Probability &
Statistics** 进阶概率统计

 **probability density
function** 概率密度函数

 **cumulative distribution
function** 累积分布函数

Computer Science

Topics 4–11 · Processor Fundamentals, Data Types and Structures, Programming

 **file** 文件

 **text file** 文本文件

 **end of file** 文件结束

≡ abstract data type 抽象数据类型

≡ stack 栈

↑ LIFO 后进先出

↓ push 入栈

↑ pop 出栈

≡ queue 队列

→ FIFO 先进先出

→] enqueue 入队

[→ dequeue 出队

↻ linked list 链表

⊙ node 节点

↖ pointer 指针

→ traverse 遍历

⌵ underflow 下溢

↻ circular array 循环数组

≡ free list 空闲列表

≡ record structure 记录结构

↕ bubble sort 冒泡排序

(×) variables 变量

◇ data types 数据类型

🔒 constant 常量

+ operators 运算符

||| library routines 库例程

›≡ nested 嵌套

Economics

Topic 4 · The macroeconomy

↓ slump 萧条

↗ recovery 复苏

📄 claimant count 申领救济人数

📄 labour force survey 劳动力调查

👥 labour force 劳动力

↔ frictional unemployment 摩擦性失业

🏠 structural unemployment 结构性失业

↺ cyclical unemployment 周期性失业

☀ seasonal unemployment 季节性失业

↗ inflation 通货膨胀

📄 purchasing power 购买力

↘ deflation 通货紧缩

↘ disinflation 反通货膨胀

🛒 consumer price index 消费者价格指数

⚖ weight 权重

Morning Reading 晨读

Grade 11 · AS · Week 15

Read each word aloud, then copy the English word three times. 朗读每个单词，然后把英语单词抄写三遍。

Reading 阅读

Read the passage aloud twice. 把短文朗读两遍。

Before writing code, a programmer writes a plan. **Pseudocode** looks like simple English but has the shape of a program: INPUT the marks, IF a mark is over 50 THEN count it, OUTPUT the total. Every program is built from just three shapes: **sequence** (one step after another), **selection** (choosing a path), and **iteration** (a **loop** repeating steps). Complex problems are cut into smaller pieces first, a method called **stepwise refinement**: plan the trip, then plan each day, then each morning. Choosing the right **data type** matters too: whole numbers, decimals, text, or true/false.

In the electronics lab you built a **potential divider**: two resistors sharing a voltage. Replace one with a **thermistor** and the output voltage changes with temperature, the heart of a thermostat. Replace it with a **light-dependent resistor** and you have built the sensor that switches streetlights on at dusk.

Governments plan too. **Fiscal policy** sets taxes and spending; spend more than you collect and there is a **budget deficit**, which adds to the **national debt**.

Talk about it 说一说:

1. Write pseudocode, three lines or more, for making instant noodles.
2. A streetlight turns on at dusk by itself. Explain the chain: light, sensor, switch.

Physics

Topics 3–11 · Dynamics, Particle physics

⊙ alpha particle α 粒子

↷ deflection 偏转

⊙ nucleus 原子核

+ proton 质子

○ neutron 中子

⊗ nuclide 核素

proton number 质子数

Σ nucleon number 核子数

⊙ nucleon 核子

∞ isotope 同位素

⚖ unified atomic mass
unit 统一原子质量单位

☞ radiation 辐射

☞ radioactive 放射性

⚡ ionising 电离

⊞ discrete 分立

☁ cloud chamber 云室

— beta particle β 粒子

+ positron 正电子

— continuous 连续

Chemistry

Topics 13–14 · An introduction to AS Level organic chemistry, Hydrocarbons

 **positional isomerism** 位置异构

 **functional group isomerism** 官能团异构

 **stereoisomerism** 立体异构

 **geometrical isomerism** 几何异构

 **restricted rotation** 受限旋转

↑ **cis** 顺式

↑↓ **trans** 反式

 **optical isomerism** 旋光异构

 **chiral** 手性

 **chiral centre** 手性中心

 **enantiomers** 对映体

⊕ **hydrogenation** 氢化

 **alkene** 烯烃

 **cracking** 裂化

 **combustion** 燃烧

 **complete combustion** 完全燃烧

 **incomplete combustion** 不完全燃烧

 **carbon monoxide** 一氧化碳

Biology

Topic 8 · Transport in mammals

🩸 vein 静脉

🩸 pulmonary artery 肺动脉

🩸 pulmonary vein 肺静脉

❤ aorta 主动脉

🩸 vena cava 腔静脉

💪 muscle 肌肉

↗ elastic 弹性

○ lumen 管腔

🚪 valve 瓣膜

○ red blood cell 红细胞

🛡 monocyte 单核细胞

🛡 neutrophil 中性粒细胞

🛡 lymphocyte 淋巴细胞

💧 plasma 血浆

💧 tissue fluid 组织液

📈 oxygen dissociation curve 氧解离曲线

📈 saturation 饱和度

📈 partial pressure 分压

→ Bohr shift 波尔位移

✂ carbonic anhydrase 碳酸酐酶

± hydrogencarbonate ion 碳酸氢根离子

± chloride ion 氯离子

Mathematics

Topics 4–5 · Mechanics, Probability & Statistics 1

✈ thrust 推力

⇐ air resistance 空气阻力

📊 Probability & Statistics
概率统计

🌳 stem-and-leaf diagram
茎叶图

📦 box-and-whisker plot 箱线图

📊 histogram 直方图

↗ cumulative frequency 累积频数

≡ central tendency 集中趋势

— mean 平均数

≡ median 中位数

Further Mathematics

Topic 4 · Further Probability & Statistics

% percentiles 百分位数

≡ median 中位数

⚖ hypothesis test 假设检验

[] confidence interval 置信区间

Computer Science

Topics 9–12 · Algorithm Design and Problem-solving, Programming, Software Development

↺ **count-controlled loop** 计数循环

↑ **pre-condition loop** 前测循环

↓ **post-condition loop** 后测循环

≡ **Structured programming** 结构化编程

() **parameters** 参数

f **function** 函数

() **arguments** 实参

☐ **pass by value** 传值

↻ **pass by reference** 传引用

☐ **local variable** 局部变量

⊕ **global variable** 全局变量

⌚ **scope** 作用域

✍ **signature** 签名

🔒 **invariant** 不变量

↺ **development life cycle**
开发生命周期

📋 **requirements** 需求

✂ **waterfall** 瀑布模型

↺ **iterative model** 迭代模型

⚡ **rapid application development**
快速应用开发

 prototype 原型			
 agile 敏捷			
 implementation 实现			
 maintenance 维护			
 structure chart 结构图			
 state-transition diagram 状态转换图			
 states 状态			
 syntax error 语法错误			

Economics

Topics 4–5 · The macroeconomy, Government macroeconomic intervention

 demand-pull inflation 需求拉动型通货膨胀			
 cost-push inflation 成本推动型通货膨胀			
 price stability 物价稳定			
 full employment 充分就业			
 balance of payments 国际收支			
 redistribution of income 收入再分配			
 conflict 冲突			
 demand-side policies 需求侧政策			
 fiscal policy 财政政策			
 budget 预算			

↘ budget deficit 预算赤字			
☞ national debt 国债			
↗ budget surplus 预算盈余			
💵 direct tax 直接税			
= proportional tax 比例税			

Morning Reading 晨读

Grade 11 · AS · Week 16

Read each word aloud, then copy the English word three times. 朗读每个单词，然后把英语单词抄写三遍。

Reading 阅读

Read the passage aloud twice. 把短文朗读两遍。

Look at the canteen at noon: the first student in the line is served first. Computer scientists call this structure a **queue**: first in, first out, or **FIFO**. New people **enqueue** at the back; the server **dequeues** from the front. Now look at the clean plates: the last plate placed on the pile is the first one taken. That is a **stack**: last in, first out, **LIFO**. You **push** a plate on top and **pop** it off again. Your browser's back button is a stack of pages; a printer's waiting list is a queue. Choosing the right structure is half of programming.

In the circuits lab you used **Kirchhoff's first law**: the current flowing into a **junction** equals the current flowing out, because charge is never lost. A **capacitor** stores charge briefly, smoothing the flow.

When inflation rises, the **central bank** tightens **monetary policy**: a higher **interest rate** makes borrowing dearer, cooling spending. **Supply-side policy** works slower but deeper, through training, technology and **infrastructure**.

Talk about it 说一说:

1. Find two queues and two stacks in your daily life.
2. Why does raising the interest rate slow down price rises? Trace the steps.

Physics

Topics 1-11 · Physical quantities and units, Particle physics

✦ photon 光子

↘ attenuated 衰减

☸ gamma ray γ 射线

☒ daughter nucleus 子核

⚡ excited state 激发态

± antiparticle 反粒子

⊖ antineutrino 反中微子

○ neutrino 中微子

☒ quark 夸克

☺ flavours 味

☒ antiquark 反夸克

⊙ hadrons 强子

⊙ baryons 重子

○ mesons 介子

✦ leptons 轻子

🔑 base quantities 基本量

⌚ intercept 截距

÷ division 分度

⌚ reaction time 反应时间

Chemistry

Topics 14–15 · Hydrocarbons, Halogen compounds

☼ **ultraviolet light** 紫外线

🛢 **crude oil** 原油

📦 **fraction** 馏分

📦 **halogenoalkane** 卤代烷

🔪 **dehydration** 脱水

🍷 **alcohol** 醇

☁ **steam** 水蒸气

🍷 **diol** 二醇

🍷 **bromine water** 溴水

🔗 **addition polymerisation**
加成聚合

🔗 **polymer** 聚合物

⊕ **carbocation** 碳正离子

→ **inductive effect** 诱导效应

🏠 **Markovnikov's rule** 马氏
规则

⊙ **primary** 伯

⊙ **secondary** 仲

○ **tertiary** 叔

📦 **nitrile** 腈

Biology

Topics 8–9 · Transport in mammals, Gas exchange

↔ chloride shift 氯转移

⬇ haemoglobinic acid 血红蛋白酸

⬇ carbaminohaemoglobin
氨基酰血红蛋白

▮ atrium 心房

♥ ventricle 心室

↺ cardiac cycle 心动周期

✂ systole 收缩期

[] diastole 舒张期

⚡ sinoatrial node 窦房结

⚡ atrioventricular node 房室结

⚡ Purkyne tissue 浦肯野组织

↔ gas exchange 气体交换

≡ trachea 气管

⊗ bronchus 支气管

⊗ bronchiole 细支气管

⋮ alveoli 肺泡

≡ lungs 肺

≡ cartilage 软骨

≡ ciliated epithelium 纤毛上皮

💧 mucus 黏液			
💧 goblet cell 杯状细胞			
💧 mucous gland 黏液腺			

Mathematics

Topic 5 · Probability & Statistics 1

↗ mode 众数			
↕ variation 离散程度			
↔ range (of data) 极差			
[] interquartile range 四分位距			
🔔 standard deviation 标准差			
↕ variance 方差			
↔ permutation 排列			
🔗 combination 组合			
⊖ mutually exclusive events 互斥事件			
🔄 independent events 独立事件			

Further Mathematics

Topic 4 · Further Probability & Statistics

🔗 pooled estimate 合并估计			
✕ chi-squared test 卡方检验			
🔔 theoretical distribution 理论分布			

↕ degrees of freedom 自由度

Computer Science

Topics 1–12 · Information representation, Communication, Processor Fundamentals, Programming, Software Development

⚠ run-time error 运行时错误

✖ logic error 逻辑错误

🔍 dry run 手工跟踪

🔍 walkthrough 走查

📦 white-box testing 白盒测试

📦 black-box testing 黑盒测试

🔗 integration testing 集成测试

🔍 alpha testing α 测试

🔍 beta testing β 测试

✓ acceptance testing 验收测试

🔗 stub 桩

📋 test strategy 测试策略

📋 test plan 测试计划

✓ normal data 正常数据

⚠ abnormal data 异常数据

[] boundary data 边界数据

✦ perfective maintenance 完善性维护

 **adaptive maintenance** 适应性维护

 **corrective maintenance** 纠正性维护

 **regression testing** 回归测试

 **extreme data** 极端数据

 **packet switching** 分组交换

 **registers** 寄存器

 **modem** 调制解调器

 **ALU** 算术逻辑单元

**memory addresses** 内存地址

 **properties** 属性

Economics

Topics 5–6 · Government macroeconomic intervention, International economic issues

 **regressive tax** 累退税

 **expansionary** 扩张性

 **contractionary** 紧缩性

 **crowding out** 挤出效应

 **monetary policy** 货币政策

 **central bank** 中央银行

% **interest rate** 利率

 **money supply** 货币供给

 **transmission mechanism** 传导机制

 **supply-side policy** 供给侧政策

 **privatisation** 私有化

 **deregulation** 放松管制

 **training** 培训

 **infrastructure** 基础设施

 **international trade** 国际贸易

Morning Reading 晨读

Grade 11 · AS · Week 17

Read each word aloud, then copy the English word three times. 朗读每个单词，然后把英语单词抄写三遍。

Reading 阅读

Read the passage aloud twice. 把短文朗读两遍。

Why does China build high-speed trains while another country grows coffee? Because countries, like people, gain when they **specialise**. A country has an **absolute advantage** when it can make something using fewer resources than others. But the deeper idea is **comparative advantage**: even a country that is worse at everything should make what it gives up least to produce, and trade for the rest. Trade makes both sides better off, which is why economists frown when **protectionism** returns: a **tariff** taxes imports, a **quota** limits them, and consumers quietly pay the bill. Defenders reply that a young **infant industry** may need shelter before it can compete.

Programmers use the same principle: divide the work. A **function** is a small, named piece of a program that does one job well. You call it with **arguments**, it works with its own **local variables**, and it hands back a result. Big programs are built from small functions, each written once and reused everywhere, the code version of specialisation.

Talk about it 说一说:

1. Your friend is faster than you at both maths and English homework. Can trading tasks still help you both?
2. Name three things a function and a factory worker have in common.

Physics

Topics 1–4 · Physical quantities and units, Kinematics, Dynamics, Forces, density and pressure

↔ **half the range** 极差的一半 _____

% **percentage difference** 百分比差异 _____

same number of significant figures 有效数字 _____

⊙ error bar 误差棒			
↗ line of best fit 最佳拟合 直线			
↘ worst acceptable line 最差可接受直线			
⊗ scale drawing 按比例作图			
↗ components 分量			
↓ acceleration of free fall 自由落体加速度			
↪ parabola 抛物线			
→ driving force 驱动力			
uniform gravitational field 匀强重力场			
negligible 可忽略的			
graphical methods 图像 法			
light gates 光电门			
viscosity 黏度			
explosions 爆炸			
plumb line 铅垂线			
non-uniform 非均匀			

Chemistry

Topics 14–18 · Hydrocarbons, Halogen compounds, Hydroxy compounds, Carbonyl compounds, Carboxylic acids and derivatives

⬡ amine 胺			
⬢ silver nitrate 硝酸银			
⬣ transition state 过渡态			

↳ aldehyde 醛			
≡ ketone 酮			
⚗ carboxylic acid 羧酸			
⊞ ester 酯			
🔍 distillation 蒸馏			
↺ reflux 回流			
⚗ tri-iodomethane 三碘甲烷			
⚗ acidity 酸性			
⬡ carbonyl compound 羰基化合物			
⬡ carbonyl 羰基			
☠ hydrogen cyanide 氰化氢			
⬡ hydroxynitrile 羟基腈			
⚗ Fehling's reagent 斐林试剂			
✱ Tollens' reagent 托伦试剂			
⊞ esterification 酯化			

Biology

Topics 9-10 · Gas exchange, Infectious diseases

🦠 microbe 微生物			
🌀 smooth muscle 平滑肌			
🌀 elastic fibre 弹性纤维			
📄 squamous epithelium 扁平上皮			

 **infectious disease** 传染病

 **pathogen** 病原体

 **transmit** 传播

 **cholera** 霍乱

 **contaminated** 污染

 **faeces** 粪便

 **malaria** 疟疾

 **protocist** 原生生物

 **mosquito** 蚊子

 **vector** 媒介

 **tuberculosis** 结核病

 **droplet** 飞沫

 **AIDS** 艾滋病

 **immune system** 免疫系统

 **vaccine** 疫苗

 **insecticide** 杀虫剂

 **antibiotic** 抗生素

 **penicillin** 青霉素

Mathematics

Topic 5 · Probability & Statistics 1

 **conditional probability**
条件概率

 **discrete random variable**
离散型随机变量

 **probability distribution**
table 概率分布表

 **expectation** 期望

 **binomial distribution** 二
项分布

 **geometric distribution**
几何分布

 **normal distribution** 正态
分布

 **continuous random**
variable 连续型随机变量

 **approximation** 近似

Further Mathematics

Topic 4 · Further Probability & Statistics

 **goodness of fit** 拟合优度

 **independence** 独立性

 **contingency table** 列联表

 **non-parametric test** 非参
数检验

Computer Science

Topics 1–3 · Information representation, Communication, Hardware

number systems 数制

bits 位

nibbles 半字节

register width 寄存器宽
度

arithmetic shift 算术移位

encodings 编码			
frame 帧			
frame rate 帧率			
drawing objects 绘图对象			
primitives 图元			
renders 渲染			
Public Switched Telephone Network 公共交换电话网			
servers 服务器			
clients 客户端			
public cloud 公有云			
private cloud 私有云			
bridge 网桥			
repeater 中继器			
bit rate 比特率			
dedicated line 专线			
cell phone network 蜂窝网络			
fuser 定影器			
filament 塑料丝			
diaphragm 膜片			
digital-to-analogue converter 数模转换器			
actuator arms 磁头臂			

Economics

Topic 6 · International economic issues

🕒 **specialise** 专业化

🏆 **absolute advantage** 绝对优势

🏆 **comparative advantage** 比较优势

↔ **terms of trade** 贸易条件

🛡 **protectionism** 贸易保护主义

💰 **tariff** 关税

🔒 **quota** 配额

🚫 **embargo** 禁运

🏢 **administrative barriers** 行政壁垒

👶 **infant industry** 幼稚产业

📉 **dumping** 倾销

⚔ **retaliation** 报复

👥 **stakeholder** 利益相关者

📁 **current account** 经常账户

Morning Reading 晨读

Grade 11 · AS · Week 18

Read each word aloud, then copy the English word three times. 朗读每个单词，然后把英语单词抄写三遍。

Reading 阅读

Read the passage aloud twice. 把短文朗读两遍。

How do you know your program is correct? You hunt for errors, and they come in kinds. A **syntax error** breaks the language rules, and the translator refuses to run at all. A **run-time error** appears while the program runs, like dividing by zero. The most dangerous is the **logic error**: the program runs happily and gives the wrong answer. To catch them, testers do a **dry run** on paper, use **white-box testing** to exercise every path inside the code, and **black-box testing** to check inputs against expected outputs without looking inside. Before release come **alpha testing** in the company and **beta testing** with real users.

Chemists identify unknown substances with the same detective spirit. **Infrared spectroscopy** shines light through a sample: each bond absorbs its own frequencies, leaving a fingerprint. **Mass spectrometry** weighs the fragments of a molecule.

One last economic idea for the term: under a **floating exchange rate**, a currency's **appreciation** makes imports cheaper but exports harder to sell. The whole year connects: measure, model, test, and question everything.

Talk about it 说一说:

1. Find the logic error: a program to average two numbers computes $a + b / 2$.
2. Which subject taught you the most surprising idea this term? Explain it in two sentences.

Physics

Topics 4–8 · Forces, density and pressure, Work, energy and power, Deformation of solids, Waves, Superposition

closed vector triangle 矢量三角形

electrical 电能

bungee jumper 蹦极者

rubber band 橡皮筋

elastic hysteresis 弹性滞后

propagates 传播

Wave motion 波动

crests 波峰

radians 弧度

wavefronts 波前

compressions 压缩

rarefactions 稀疏

electromagnetic waves
电磁波

γ -rays γ 射线

waves 波

principle of superposition 叠加

progressive waves 行波

wavelengths 波长

slits 狭缝

Chemistry

Topics 20–22 · Polymerisation, Organic synthesis, Analytical techniques

○ monomer 单体			
↔ repeat unit 重复单元			
↻ poly(ethene) 聚乙烯			
↻ poly(chloroethene) 聚氯乙烯			
⊖ non-biodegradable 不可生物降解			
∞ synthetic route 合成路线			
⚗ reagent 试剂			
☞ by-product 副产物			
🔍 infrared spectroscopy 红外光谱			
⬇ absorption 吸收			
λ wavenumber 波数			
📊 mass spectrometry 质谱			
÷ mass-to-charge ratio 质荷比			
📊 isotopic abundance 同位素丰度			
⊕ molecular ion 分子离子			
📊 molecular ion peak 分子离子峰			
🔪 fragmentation 碎裂			
🧩 fragment 碎片			

Biology

Topics 10–11 · Infectious diseases, Immunity

 resistance 耐药性			
 phagocyte 吞噬细胞			
 macrophage 巨噬细胞			
 phagocytosis 吞噬作用			
 self antigen 自身抗原			
 non-self antigen 非自身抗原			
 immune response 免疫反应			
 T-helper cell 辅助性 T 细胞			
 plasma cell 浆细胞			
 memory cell 记忆细胞			
 T-killer cell 杀伤性 T 细胞			
 antigen-binding site 抗原结合位点			
 variable region 可变区			
 monoclonal antibody 单克隆抗体			
 hybridoma 杂交瘤			
 diagnosis 诊断			
 active immunity 主动免疫			
 passive immunity 被动免疫			

 **natural immunity** 天然免疫

 **artificial immunity** 人工免疫

 **vaccination** 疫苗接种

 **herd immunity** 群体免疫

Mathematics

Topics 1–5 · Pure Mathematics 1, Probability & Statistics 1

 **continuity correction** 连续性校正

 **standardisation** 标准化

coefficients 系数

point of inflexion 拐点

improper integral 广义积分

back-to-back 背靠背

measure of central tendency 集中趋势

Coding 编码

assumed mean 假定平均数

Further Mathematics

Topic 4 · Further Probability & Statistics

 **sign test** 符号检验

 **Wilcoxon signed-rank test** 威尔科克森符号秩检验

Σ Wilcoxon rank-sum test
威尔科克森秩和检验

f probability generating function 概率母函数

Computer Science

Topics 3–11 · Hardware, Processor Fundamentals, Security, privacy and data integrity, Ethics and Ownership, Algorithm Design and Problem-solving, Programming

floating-gate transistor
浮栅晶体管

pits 凹坑

lands 平台

preset value 预设值

number of cores 核心

amount of RAM 随机存取存储器

register transfer notation 寄存器传送记法

interrupt register 中断寄存器

opcode 操作码

operand 操作数

1. Malware 恶意软件

parity block check 奇偶块校验

avoid conflicts of interest 利益冲突

code of conduct 行为准则

sub-problem 子问题

modules 模块			
identifier 标识符			
initialise 初始化			
counter 计数器			
insert 附页			
trace table 跟踪表			
return value 返回值			
format 格式			
IDE 集成开发环境			
breakpoint 断点			
single stepping 单步执行			

Economics

Topic 6 · International economic issues

 trade in goods 货物贸易			
 trade in services 服务贸易			
 primary income 初次收入			
 secondary income 二次收入			
 current account deficit 经常账户赤字			
 current account surplus 经常账户盈余			
 floating exchange rate 浮动汇率			
 fixed exchange rate 固定汇率			

 managed exchange rate 管理浮动汇率			
 appreciation 升值			
 depreciation 贬值			
 expenditure-reducing 支出减少			
 expenditure-switching 支出转换			
 competitiveness 竞争力			