

MORNING READING 晨读

Grade 11 Word Lists

Weekly AS vocabulary lists • all 18 weeks.

每周 AS 词汇表，共 18 周。

A-Level subjects, AS topics • English and 中文.

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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			

Morning Reading 晨读 · Grade 11 · AS · Week 1

 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			
 base quantity 基本量			
 length 长度			
 current 电流			
 ampere 安培			
 temperature 温度			
 kelvin 开尔文			
 derived unit 导出单位			

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			

Morning Reading 晨读 · Grade 11 · AS · Week 1

— neutral 中性			
# proton number 质子数			
≡ atomic number 原子序数			
Σ nucleon number 核子数			
𐀀 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

Σ Pure Mathematics 纯数学			
(x) algebra 代数			
∞ calculus 微积分			
× ² quadratic 二次式			

×	coefficient	系数			
☐	complete the square	配方			
△	vertex	顶点			
√	discriminant	判别式			
·	real roots	实根			
±	distinct	相异			

Further Mathematics

Topic 1 · Further Pure Mathematics 1

Σ	Further Pure Mathematics	进阶纯数学			
√	roots	根			
×	coefficients	系数			
↔	substitution	代换			
÷	rational function	有理函数			

Computer Science

Topic 1 · Information representation

田	number system	数制			
田	denary	十进制			
11	binary	二进制			
byte	byte	字节			
bit	bit	位			
hexadecimal	hexadecimal	十六进制			
#	digit	数位			

Morning Reading 晨读 · Grade 11 · AS · Week 1

田	place value	位值			
nibble	nibble	半字节			
overflow	overflow	溢出			
register	register	寄存器			
two's complement	two's complement	补码			
←	most significant bit	最高有效位			
sign bit	sign bit	符号位			
signed integer	signed integer	有符号整数			
+	unsigned	无符号			
one's complement	one's complement	反码			
BCD	BCD	二进制十进数			
7-segment display	7-segment display	七段显示器			
memory address	memory address	内存地址			
#	code point	码点			
character set	character set	字符集			
encoding	encoding	编码			
bitmap	bitmap	位图			
pixel	pixel	像素			

Morning Reading 晨读 · Grade 11 · AS · Week 1

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:

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

Physics

Topic 1 · Physical quantities and units

 speed 速率			
 velocity 速度			
 force 力			
 newton 牛顿			

Morning Reading 晨读 · Grade 11 · AS · Week 2

 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			
 prefix 词头			
 measurement 测量			
 uncertainty 不确定度			
 systematic error 系统误差			
 zero error 零点误差			

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			

Morning Reading 晨读 · Grade 11 · AS · Week 2

 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			

Morning Reading 晨读 · Grade 11 · AS · Week 2

 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			

Morning Reading 晨读 · Grade 11 · AS · Week 2

 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

Topic 1 · Information representation

 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			

 drawing list 绘图列表			
 drawing object 绘图对象			
 primitive 图元			
 property 属性			
 render 渲染			
 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			

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

Topic 1 · Physical quantities and units

≡ calibration 校准			
📏 parallax 视差			
📏 accuracy 准确度			

Morning Reading 晨读 · Grade 11 · AS · Week 3

📏 precision 精密度			
📏 random error 随机误差			
📏 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			

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			

Morning Reading 晨读 · Grade 11 · AS · Week 3

↗ 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

Topics 1–2 · Information representation, Communication

 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			
 server 服务器			
 client 客户端			
 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			
 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			

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			
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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 1-2 · Physical quantities and units, Kinematics

⇨ momentum 动量			
□ coplanar 共面			
↗ resultant 合矢量			
⊥ perpendicular 垂直			
↗ component 分量			

Morning Reading 晨读 · Grade 11 · AS · Week 4

↔ horizontal 水平			
↑ vertical 竖直			
∠ 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			

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			

Morning Reading 晨读 · Grade 11 · AS · Week 4

 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

Topic 2 · Communication

 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			
 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			
 PSTN 公共交换电话网			
 wireless network interface card 无线网络接口卡			

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

⌈ ⌋ light gate 光电门	_____	_____	_____
⌚ reaction-time 反应时间	_____	_____	_____
↕ range 射程	_____	_____	_____

Morning Reading 晨读 · Grade 11 · AS · Week 5

↗ 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	_____	_____	_____
⚡ 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	_____	_____	_____

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	_____	_____	_____

Morning Reading 晨读 · Grade 11 · AS · Week 5

 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

 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			
 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			

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

×	coefficient 系数			
↓	terminal velocity 收尾速度			
☞	parachutist 跳伞者			

Morning Reading 晨读 · Grade 11 · AS · Week 6

Δ	gravitational potential energy 重力势能			
🔥	thermal energy 热能			
↔	conservation of momentum 动量守恒			
💣	explosion 爆炸			
↩	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			
🛑	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			

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			

Morning Reading 晨读 · Grade 11 · AS · Week 6

— 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

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 RAM			
flip-flop 触发器			
cache 高速缓存			
DRAM 动态 RAM			
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			

 Von Neumann architecture 冯·诺依曼体系结构			
 stored program 存储程序			
 arithmetic and logic unit 算术逻辑单元			
 control unit 控制单元			

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

Topic 4 · Forces, density and pressure

 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			
 cosine rule 余弦定理			
 cross-sectional area 横截 面积			
 hydrostatic pressure 流 体静压强			

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

Topic 4 · Processor Fundamentals

 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	_____	_____	_____
T mnemonics 助记符	_____	_____	_____

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 4-5 · Forces, density and pressure, Work, energy and power

↓ 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			
🔌 electrical energy 电能			
🧪 chemical energy 化学能			
⚙ frictionless 无摩擦			
📐 ramp 斜坡			
⚡ efficiency 效率			

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 4–5 · Processor Fundamentals, System Software

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			

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 5-6 · Work, energy and power, Deformation of solids

⚡ 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

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

$\times^2$ degree 次数			
$\div$ quotient 商			
% remainder 余数			
% remainder theorem 余数定理			
$\times$ factor theorem 因式定理			
$\times^2$ indices 指数			
 laws of logarithms 对数定律			
 natural logarithm 自然对数			
— linear form 线性形式			
$\wedge$ 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

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

 disk defragmenter 碎片整理			
 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			

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 6-7 · Deformation of solids, Waves

⬢ trapezia 梯形

≈ wave 波

≡ 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

⊙ radian 弧度

⊗ propagate 传播

∧ cathode-ray oscilloscope
示波器

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

Topic 6 · Security, privacy and data integrity

 privacy 隐私			
 integrity 完整性			
 malware 恶意软件			
 virus 病毒			
 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			

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			
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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

Topic 7 · Waves

 **time-base** 时基

 **y-gain** 垂直增益

 **intensity** 强度

• **point source** 点源

» **wavefront** 波前

<> **rarefaction** 稀疏

≈ **sine curve** 正弦曲线

↑ **source** 波源

👁 **observer** 观察者

🔊 **Doppler effect** 多普勒效应

📶 **electromagnetic wave** 电磁波

📡 **electromagnetic spectrum** 电磁波谱

📡 **microwaves** 微波

🔴 **infrared** 红外线

🟡 **ultraviolet** 紫外线

☞ **X-rays** X 射线

☞ **gamma-rays** γ 射线

≡ **polarisation** 偏振

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			

Morning Reading 晨读 · Grade 11 · AS · Week 11

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			

Morning Reading 晨读 · Grade 11 · AS · Week 11

 **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 6-7 · Security, privacy and data integrity, Ethics and Ownership

 **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

 **check digit** 校验位

 **Verification** 核对

 **parity check** 奇偶校验

 **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	_____	_____	_____

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	_____	_____	_____
 gross domestic product 国内生产总值	_____	_____	_____
 gross national income 国民总收入	_____	_____	_____
 nominal 名义	_____	_____	_____
 real 实际	_____	_____	_____
 per capita 人均	_____	_____	_____
 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 7-8 · Waves, Superposition

≡ 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

• node 波节

○ antinode 波腹

↔ antiphase 反相

☞ resonance tube 共鸣管

— fundamental 基频

田 diffraction 衍射

□ obstacle 障碍物

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			

Morning Reading 晨读 · Grade 11 · AS · Week 12

🔬 Newton's experimental law 牛顿实验定律			
% coefficient of restitution 恢复系数			

Computer Science

Topics 7-8 · Ethics and Ownership, Databases

📄 patent 专利			
🔑 software licence 软件许可证			
🔒 proprietary 专有			
📄 open-source 开源			
© copyleft 著作权			
📁 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			
🧠 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			

Morning Reading 晨读 · Grade 11 · AS · Week 12

 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			

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 8-9 · Superposition, Electricity

 ripple tank 水波槽			
 interference 干涉			
 coherent 相干			
 slit 狭缝			

 double-slit 双缝			
 path difference 路程差			
 fringe spacing 条纹间距			
 fringe 条纹			
 maximum 极大			
 minimum 极小			
 diffraction grating 衍射光栅			
 normal 法线			
 slit spacing 缝间距			
 order 级次			
 electric current 电流			
 charge carrier 载流子			
 electron 电子			
 electrolyte 电解质			

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			
$\equiv$	homologous series 同系列			
$\bigcirc$	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

$\updownarrow$	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			
$\rightleftharpoons$	diffuse 扩散			
	stomata 气孔			
	atmosphere 大气			

Mathematics

Topic 4 · Mechanics

$\rightarrow$	displacement 位移			
$\curvearrowright$	velocity 速度			
$\bowtie$	acceleration 加速度			
	velocity-time graph 速度时间图			
$\bowtie$	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

Topic 8 · Databases

📦 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			
📋 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			

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 9 · Electricity

± 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

Ⓜ Ohm's law 欧姆定律

💡 filament lamp 灯丝灯泡

△ diode 二极管

♢ resistivity 电阻率

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			
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Computer Science

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

 query 查询			
 join 连接			
 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			
 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			

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 9–10 · Electricity, D.C. circuits

 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			
 ammeter 电流表			
 voltmeter 电压表			

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

 sequence 顺序			
 selection 选择			
 iteration 迭代			
 loop 循环			
 assignment 赋值			
 concatenation 拼接			

Morning Reading 晨读 · Grade 11 · AS · Week 15

 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			
 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			

Morning Reading 晨读 · Grade 11 · AS · Week 15

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

Topic 10 · D.C. circuits

💡 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

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			
 haemoglobin 血红蛋白			
 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			
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Computer Science

Topics 10–11 · Data Types and Structures, Programming

↑ 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			
(x) variables 变量			
📁 data types 数据类型			
📄 constant 常量			

 operators 运算符			
 library routines 库例程			
 nested 嵌套			
 count-controlled loop 计数循环			
 pre-condition loop 前测循环			

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			
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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

Topic 11 · Particle physics

- ⊙ **alpha particle** α 粒子
- ↗ **deflection** 偏转
- ⊙ **nucleus** 原子核
- + **proton** 质子

Morning Reading 晨读 · Grade 11 · AS · Week 17

- **neutron** 中子
- ⊗ **nuclide** 核素
- # **proton number** 质子数
- Σ **nucleon number** 核子数
- ⊙ **nucleon** 核子
- ℓ **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
- 田 **discrete** 分立
- ☁ **cloud chamber** 云室
- **beta particle** β 粒子

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

Morning Reading 晨读 · Grade 11 · AS · Week 17

 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 11–12 · Programming, Software Development

 post-condition loop 后测循环			
 structured programming 结构化编程			
 parameters 参数			
 function 函数			
 arguments 实参			
 pass by value 传值			
 pass by reference 传引用			
 local variable 局部变量			

Morning Reading 晨读 · Grade 11 · AS · Week 17

 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			

Economics

Topic 6 · International economic issues

 specialise 专业化			
 absolute advantage 绝对优势			
 comparative advantage 比较优势			

Morning Reading 晨读 · Grade 11 · AS · Week 17

↔ 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

Topic 11 · Particle physics

+ **positron** 正电子

— **continuous** 连续

✦ **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

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			
 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

∑ Wilcoxon rank-sum test 威尔科克森秩和检验

📄 probability generating function 概率母函数

Computer Science

Topics 6–12 · Security, privacy and data integrity, Software Development

⊗ syntax error 语法错误

⚠ 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

1. **Malware** 恶意软件

parity block check 奇偶块校验

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

