

MORNING READING

Grade 11 Word Lists

Weekly AS vocabulary lists • all 18 weeks.

AS , 18 .

A-Level subjects, AS topics • English and .

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Morning Reading

Grade 11 · AS · Week 1

Read each word aloud, then copy the English word three times.

。

Reading

Read the passage aloud twice.

。

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 :

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**

/ˈfɪzɪkl ˈkwɒntəti/

 **magnitude**

/ˈmæɡnɪtjuːd/

 **unit**

/ˈjuːnɪt/

 **estimate**

/ˈestɪmət/

 **mass**

/mæs/

 **weight**

/weɪt/

 **vacuum**

/ˈvækjuːm/

 **acceleration**

/ækˌseləˈreɪʃn/

 **free fall**

/friː fɔːl/

x² order of magnitude

/ˈɔːdə nv ˈmæɡnɪtjuːd/

 **SI units**

/es ˈaɪ ˈjuːnɪts/

 **base quantity**

/beɪs ˈkwɒntəti/

 **length**

/leŋθ/

 **current**

/ˈkʌrənt/

 **ampere**

/ˈæmpɪə/

 **temperature**
/'tempɪtʃə/

 **kelvin**
/'kelvɪn/

 **derived unit**
/dɪ'raɪvd 'ju:nɪt/

 **speed**
/spi:d/

 **velocity**
/və'lsɪti/

Chemistry

Topic 1 · Atomic structure

 **atom**
/'ætəm/

 **nucleus**
/'nju:klɪəs/

 **proton**
/'prəʊtɒn/

 **neutron**
/'nju:trɒn/

 **electron**
/ɪ'lektrɒn/

 **shell**
/ʃel/

 **relative charge**
/'relatɪv tʃɑ:dʒ/

 **relative mass**
/'relatɪv mæs/

 **neutral**
/'nju:trəl/

 **proton number**
/'prəʊtɒn 'nʌmbə/

 atomic number /ə'tɒmɪk 'nʌmbə/			
 nucleon number /'nju:klɪən 'nʌmbə/			
 mass number /mæs 'nʌmbə/			
 nucleon /'nju:klɪən/			
 ion /'aɪən/			
 electric field /ɪ'lektrɪk fi:ld/			
 deflection /dɪ'flekʃn/			
 atomic radius /ə'tɒmɪk 'reɪdiəs/			
 ionic radius /aɪ'ɒnɪk 'reɪdiəs/			

Biology

Topic 1 · Cell structure

 cell /sel/			
 microscope /'maɪkrəskəʊp/			
 light microscope /laɪt 'maɪkrəskəʊp/			
 specimen /'spesɪmən/			
 temporary preparation /'tempərəri ,prepə'reɪʃn/			
 slide /slaid/			

 stain /steɪn/			
 cover slip /'kʌvə slɪp/			
 magnification /ˌmæɡnɪfɪ'keɪʃn/			
 micrometre /'maɪkrəʊmi:tə/			
 nanometre /ˌnænəʊ'mi:tə/			
 chloroplast /'klɔ:rəʊplæst/			
 photomicrograph /ˌfəʊtəʊ'maɪkrəɡræf/			
 electron micrograph /ɪ'lektɹən 'maɪkrəɡræf/			
 eyepiece graticule /ˈaɪpi:s 'ɡrætɪkjʊ:l/			
 calibrate /'kælibreɪt/			
 stage micrometer /steɪdʒ maɪ'krɒmɪtə/			
 resolution /ˌrezə'lʊ:ʃn/			
 wavelength /'weɪvləŋθ/			
 electron microscope /ɪ'lektɹən 'maɪkrəskəʊp/			
 electron /ɪ'lektɹən/			

[] scanning

/ˈskæniŋ/

(t) transmission

/trænˈsmɪʃn/

Mathematics

Topic 1 · Pure Mathematics 1

Σ Pure Mathematics

/pjʊəˌmæθɪˈmætiks/

(x) algebra

/ˈældʒɪbrə/

∞ calculus

/ˈkælkjʊləs/

x² quadratic

/kwɒˈdrætɪk/

× coefficient

/ˌkəʊɪˈfɪʃənt/

□ complete the square

/kəmˈplɪt ðə skweə/

△ vertex

/ˈvɜːteks/

√ discriminant

/dɪˈskrɪmɪnənt/

• real roots

/rɪəl ruːts/

± distinct

/dɪˈstɪŋkt/

Further Mathematics

Topic 1 · Further Pure Mathematics 1

Σ Further Pure Mathematics

/ˈfɜːðə ˈpjʊə ,mæθɪˈmætiks/

$\sqrt{\quad}$ roots

/ruːts/

$\times$ coefficients

/ˌkəʊɪˈfɪjənts/

$\Rightarrow$ substitution

/ˌsʌbstɪˈtjuːʃn/

$\div$ rational function

/ˈræʃənəl ˈfʌŋkʃn/

Computer Science

Topic 1 · Information representation

$\boxplus$ number system

/ˈnʌmbə ˈsɪstəm/

$\boxtimes$ denary

/ˈdiːnəri/

$\boxdot$ binary

/ˈbaɪnəri/

$\boxtimes$ byte

/baɪt/

$\odot$ bit

/bɪt/

$\boxtimes$ hexadecimal

/ˌheksəˈdesɪml/

$\#$ digit

/ˈdɪdʒɪt/

$\boxtimes$ place value

/pleɪs ˈvæljuː/

 **nibble**

/ˈnɪbl/

 **overflow**

/ˌəʊvəˈfləʊ/

 **register**

/ˈredʒɪstə/

 **two's complement**

/tuːz ˈkɒmplɪmənt/

 **most significant bit**

/məʊst sɪɡˈnɪfɪkənt bɪt/

 **sign bit**

/saɪn bɪt/

 **signed integer**

/saɪnd ˈɪntɪdʒə/

 **unsigned**

/ʌnˈsaɪnd/

 **one's complement**

/wʌnz ˈkɒmplɪmənt/

 **BCD**

/ˌbiː siː ˈdiː/

 **7-segment display**

/ˈsevən ˈseɡmənt dɪˈspleɪ/

 **memory address**

/ˈmeməri əˈdres/

 **code point**

/kəʊd pɔɪnt/

 **character set**

/ˈkærɪktə set/

 **encoding**

/enˈkəʊdɪŋ/

 **bitmap**

/ˈbɪtmæp/

 pixel /'pɪksl/			
 file header /faɪl 'hedə/			
 image resolution /'ɪmɪdʒ ,rezə'luːʃn/			
 screen resolution /skriːn ,rezə'luːʃn/			
 colour depth /'kʌlə depθ/			

Economics

Topic 1 · Basic economic ideas and resource allocation

 scarcity /'skeəsiti/			
 resources /rɪ'zɔːsɪz/			
 finite /'faɪnaɪt/			
 scarce /skeəs/			
 goods /ɡʊdz/			
 services /'sɜːvɪsɪz/			
 wants /wɒnts/			
 economic problem /iːkə'nɒmɪk 'prɒbləm/			
 opportunity cost /ɒpə'tjuːnɪti kɒst/			

 **alternative**
/ɔ:l'tɜ:nətɪv/

 **consumer**
/kən'su:mə/

 **producer**
/prə'dju:sə/

 **firm**
/fɜ:m/

 **government**
/'gʌvənmənt/

 **social science**
/'səʊl 'saɪəns/

 **model**
/'mɒdl/

Morning Reading

Grade 11 · AS · Week 2

Read each word aloud, then copy the English word three times.

◦

Reading

Read the passage aloud twice.

◦

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 :

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

→ **force**

/fɔ:s/

🍏 **newton**

/'nju:tn/

🔧 **work**

/wɜ:k/

⚡ **energy**

/'enədʒi/

⚡ **joule**

/dʒu:l/

⚡ **power**

/'paʊə/

💡 **watt**

/wɒt/

↓ **pressure**

/'preʃə/

↕ **stress**

/stres/

🌀 **pascal**

/'pæskl/

= **homogeneous**

/'hɒmə'dʒi:niəs/

×₂ **prefix**

/'pri:fiks/

📏 **measurement**

/'meʒəmənt/

❓ **uncertainty**

/ʌn'sɜ:tənti/

↗ **systematic error**

/,sɪstə'mætɪk 'erə/

 **zero error**
/'ziərəʊ 'erə/

 **calibration**
/'kæli'tbreɪʃn/

 **parallax**
/'pærələks/

 **accuracy**
/'ækjʊrəsi/

 **precision**
/'pri:ʒɪzn/

Chemistry

Topic 1 · Atomic structure

 **period**
/'piəriəd/

 **nuclear charge**
/'nju:klɪə tʃɑ:dʒ/

 **shielding**
/'ʃi:ldɪŋ/

 **group**
/gru:p/

 **cation**
/'kætaɪən/

 **anion**
/'ænaɪən/

 **repulsion**
/'ri'pʌʃn/

 **isotope**
/'aɪsətaʊp/

 **chemical properties**
/'kemɪkl 'prɒpətɪz/

 **physical properties**

/ˈfɪzɪkl ˈprɒpətɪz/

 **density**

/ˈdensɪti/

principal quantum number

/ˈprɪnsɪpl ˈkwɒntəm ˈnʌmbə/

 **sub-shell**

/sʌb ʃel/

 **orbital**

/ˈɔːbɪtl/

 **electronic configuration**

/ɪlekˈtrɒnɪk kənˌfɪɡjəˈreɪʃn/

 **ground state**

/graʊnd steɪt/

 **noble gas**

/ˈnəʊbl gæs/

 **spin**

/spɪn/

Biology

Topic 1 · Cell structure

 **eukaryotic cell**

/juːkəriˈɒtɪk sel/

 **nucleus**

/ˈnjuːklɪəs/

 **organelle**

/ˈɔːgəˈnel/

 **cytoplasm**

/ˈsaɪtəplæzəm/

 **cell surface membrane**

/sel ˈsɜːfɪs ˈmembreɪn/

 **nuclear envelope**

/ˈnjuːkliə ˈenvələʊp/

 **nucleolus**

/ˈnjuːkliˈəʊləs/

 **rough endoplasmic reticulum**

/rʌf ˌendəʊˈplæzmɪk reˈtɪkjʊləm/

 **protein**

/ˈprəʊtiːn/

 **antibody**

/ˈæntɪbɒdi/

 **smooth endoplasmic reticulum**

/smuːð ˌendəʊˈplæzmɪk reˈtɪkjʊləm/

 **lipid**

/ˈlɪpɪd/

 **Golgi body**

/ˈgɒlɡɪ ˈbɒdi/

 **vesicle**

/ˈvesɪkl/

 **secretion**

/sɪˈkriːʃn/

 **mitochondria**

/ˌmaɪtəˈkɒndrɪə/

 **respiration**

/ˌrespiˈreɪʃn/

 **energy**

/ˈenədʒi/

 **ribosome**

/ˈriːbəʊsəʊm/

 **amino acid**

/əˈmiːnəʊ ˈæsɪd/

 **synthesise**

/ˈsɪnθəsaɪz/

⊙ lysosome
/'laɪsəʊsəʊm/

✂ enzyme
/'enzaim/

Mathematics

Topic 1 · Pure Mathematics 1

= quadratic equation
/kwɒ'drætɪk ɪ'kweɪzn/

<> quadratic inequality
/kwɒ'drætɪk ɪni:'kwɒlɪti/

↷ parabola
/pə'ræbələ/

≡ simultaneous equations
/sɪmə'lteɪniəs ɪ'kweɪznz/

☞ substitution
/sʌbstɪ'tju:ʃn/

ƒ function
/'fʌŋkʃn/

↔ domain
/də'mem/

↕ range
/reɪndʒ/

= one-one
/wʌn wʌn/

↔ inverse function
/ɪn'vɜ:s 'fʌŋkʃn/

Further Mathematics

Topic 1 · Further Pure Mathematics 1

↗ **oblique asymptote**

/ə'blɪk 'æsmptəʊt/

— **method of differences**

/'meθəd ov 'dɪfrənsɪz/

∞ **convergent**

/kən'vɜːdʒənt/

∞ **sum to infinity**

/sʌm tu ɪn'fɪnɪti/

▢ **matrix**

/'meɪtrɪks/

Computer Science

Topics 1–2 · Information representation, Communication

≡ **bit depth**

/bɪt depθ/

🖱 **vector graphic**

/'vektə 'græfɪk/

≡ **drawing list**

/'drɔːɪŋ lɪst/

△ **primitive**

/'prɪmɪtɪv/

🖼 **render**

/'rendə/

⚡ **analogue data**

/'ænəlɒg 'deɪtə/

💻 **digital data**

/'dɪdʒɪtl 'deɪtə/

⚡ **sampling**

/'sæmplɪŋ/

 sampling rate <i>/ˈsæmplɪŋ reɪt/</i>			
 sampling resolution <i>/ˈsæmplɪŋ ˌreʒəˈluːʃn/</i>			
 amplitude <i>/ˈæmplɪtjuːd/</i>			
 quantisation <i>/ˌkwɒntaɪˈzeɪʃn/</i>			
 compression <i>/kəmˈpreʃn/</i>			
 bandwidth <i>/ˈbændwɪðθ/</i>			
 lossless <i>/ˈlɒsləs/</i>			
 lossy <i>/ˈlɒsi/</i>			
 run-length encoding <i>/rʌn leŋθ enˈkəʊdɪŋ/</i>			
 dictionary methods <i>/ˈdɪkʃənəri ˈmeθədz/</i>			
 Huffman coding <i>/ˈhʌfmən ˈkəʊdɪŋ/</i>			
 entropy <i>/ˈentrəpi/</i>			
 spatial <i>/ˈspeɪʃl/</i>			
 temporal <i>/ˈtempərəl/</i>			
 network <i>/ˈnetwɜːk/</i>			

 **local area network**

/ˈləʊkl 'eəriə 'netwɜ:k/

 **latency**

/ˈleɪtənsi/

 **wide area network**

/waɪd 'eəriə 'netwɜ:k/

 **server**

/ˈsɜ:və/

 **client**

/ˈklaɪənt/

 **peer-to-peer**

/piə tə piə/

Economics

Topic 1 · Basic economic ideas and resource allocation

 **ceteris paribus**

/ˈsetəris 'pæribəs/

✓ **positive statement**

/ˈpɒzɪtɪv 'steɪtmənt/

 **normative statement**

/ˈnɔ:mətɪv 'steɪtmənt/

 **value judgement**

/ˈvælju: 'dʒʌdʒmənt/

 **microeconomics**

/ˌmaɪkrəʊ,i:kə'nɒmɪks/

 **macroeconomics**

/ˌmækrə,i:kə'nɒmɪks/

 **output**

/ˈaʊtpʊt/

 **factors of production**

/ˈfæktəz ɒv prəˈdʌkʃn/

 **reward**

/rɪˈwɔːd/

 **land**

/lənd/

 **rent**

/rent/

 **labour**

/ˈleɪbə/

 **wages**

/ˈweɪdʒɪz/

 **capital**

/ˈkæpɪtl/

% interest

/ˈɪntrest/

 **enterprise**

/ˈentəpraɪz/

Morning Reading

Grade 11 · AS · Week 3

Read each word aloud, then copy the English word three times.

◦

Reading

Read the passage aloud twice.

◦

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 :

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

✂ random error

/ˈrændəm ˈerə/

🔧 instrument

/ˈɪnstrəmənt/

— mean

/mi:n/

± absolute uncertainty

/ˈæbsəlu:t ənˈsɜ:tənti/

% percentage uncertainty

/pəˈsentɪdʒ ənˈsɜ:tənti/

📏 derived quantity

/dɪˈraɪvd ˈkwɒntənti/

— diameter

/daɪˈæmɪtə/

📦 volume

/ˈvɒljʊ:m/

significant figures

/sɪɡˈnɪfɪkənt ˈfɪɡəz/

scalar

/ˈskeɪlə/

↗ vector

/ˈvektə/

📦 density

/ˈdensɪti/

⊕ electric charge

/ɪˈlektrɪk tʃɑ:dʒ/

→ displacement

/dɪˈspleɪsmənt/

⇒ momentum

/məʊˈmentəm/

□ coplanar

/ˌkəʊˈpleɪnə/

↗ resultant

/rɪˈzʌltənt/

+ perpendicular

/ˌpɜːpənˈdɪkjələ/

↗ component

/kəmˈpəʊnənt/

↔ horizontal

/ˌhɒrɪˈzɒntl/

Chemistry

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

○ sphere

/sfɪə/

✚ free radical

/friːˈrædɪkl/

⊙ unpaired electrons

/ʌnˈpeəd ɪˈlektɒnz/

⚡ first ionisation energy

/fɜːst ˌaɪənəɪˈzeɪʃn ˈenədʒi/

↗ successive ionisation energies

/səkˈsesɪv ˌaɪənəɪˈzeɪʃn ˈenədʒiz/

↵ spin-pair repulsion

/spɪn peə rɪˈpʌljən/

⚖ unified atomic mass unit

/ˈjuːnɪfaɪd əˈtɒmɪk mæs ˈjuːnɪt/

⚖ relative atomic mass

/ˈrelətɪv əˈtɒmɪk mæs/

 **relative isotopic mass**

/ˈrelatɪv ˌaɪsəˈtɒpɪk mæs/

 **relative molecular mass**

/ˈrelatɪv məˈlekjələ mæs/

 **molecule**

/ˈmɒlɪkjʊːl/

 **relative formula mass**

/ˈrelatɪv ˈfɔːmjələ mæs/

mole

/məʊl/

Σ Avogadro constant

/ˌævəˈɡædrəʊ ˈkɒnstənt/

 **molar mass**

/ˈməʊlə mæs/

 **compound**

/ˈkɒmpaʊnd/

± ionic compound

/aɪˈɒnɪk ˈkɒmpaʊnd/

oxidation number

/ˌɒksɪˈdeɪʃn ˈnʌmbə/

Biology

Topics 1–2 · Cell structure, Biological molecules

 **centriole**

/ˈsentriəʊl/

 **microtubule**

/ˌmaɪkrəʊˈtjuːbjʊːl/

 **cilia**

/ˈsɪliə/

⊙ **microvilli**

/ˈmaɪkrəʊvɪlaɪ/

⇓ **absorption**

/əb'sɔːpʃn/

☀ **photosynthesis**

/ˌfəʊtəʊ'sɪnθəsis/

▣ **cell wall**

/sel wɔːl/

▣ **cellulose**

/ˈseljuːləʊs/

☞ **plasmodesmata**

/ˌplæzməʊd'sma:tə/

💧 **vacuole**

/ˈvækjuːəl/

⊖ **tonoplast**

/ˈtɒnəplæst/

⊖ **prokaryotic cell**

/ˌprɒkəri'ɒtɪk sel/

🦠 **bacterium**

/bæk'tɪəriəm/

○ **unicellular**

/juːnɪ'seljələ/

▣ **peptidoglycan**

/ˈpeptɪdɒɡlɪkən/

🦠 **virus**

/ˈvaɪrəs/

⊖ **non-cellular**

/nɒn 'seljələ/

🧬 **nucleic acid**

/njuː'klɪk 'æsɪd/

🛡 **capsid**

/ˈkæpsɪd/

✉ **envelope**

/ˈenvələʊp/

 **phospholipid**
/'fɒsfəliːpɪd/

 **host**
/həʊst/

 **molecule**
/'mɒlɪkjʊːl/

Mathematics

Topic 1 · Pure Mathematics 1

 **composition**
/ˌkɒmpə'zɪʃn/

 **reflection**
/rɪ'flekʃn/

 **transformations**
/trænsfɔː'meɪʃnz/

 **translation**
/træn'sleɪʃn/

 **stretch**
/stretʃ/

 **Coordinate geometry**
/kəʊ'ɔːdɪnət dʒi'bɒmətri/

 **gradient**
/'ɡreɪdɪənt/

 **equation of a straight line**
/ɪ'kweɪʒn əvə streɪt laɪn/

 **parallel**
/'pærəlel/

 **perpendicular**
/ˌpɜːpən'dɪkjələ/

Further Mathematics

Topic 1 · Further Pure Mathematics 1

 **zero matrix**

/ˈziərəʊ ˈmeɪtrɪks/

 **identity matrix**

/aɪˈdentɪti ˈmeɪtrɪks/

 **determinant**

/dɪˈtɜːmɪnənt/

 **singular matrix**

/ˈsɪŋɡjələ ˈmeɪtrɪks/

 **inverse matrix**

/ɪnˈvɜːs ˈmeɪtrɪks/

Computer Science

Topic 2 · Communication

 **thin client**

/θɪn ˈklaɪənt/

 **thick client**

/θɪk ˈklaɪənt/

 **topology**

/təˈpɒlədʒi/

 **bus**

/bʌs/

 **star**

/stɑː/

 **mesh**

/meʃ/

 **fault-tolerant**

/fəʊlt ˈtɒlərənt/

 **cloud computing**

/klaʊd kəmˈpjʊːtɪŋ/

 **scalability**

/ˌskeɪləˈbɪlɪti/

 ethernet <i>/ˈiːθənet/</i>			
 twisted-pair <i>/ˈtwɪstɪd peə/</i>			
 fibre-optic <i>/ˈfaɪbə ˈɒptɪk/</i>			
 network interface card <i>/ˈnetwɜːk ˈɪntəfeɪs kɑːd/</i>			
 MAC address MAC <i>/mæk əˈdres/</i>			
 switch <i>/swɪtʃ/</i>			
 hub <i>/hʌb/</i>			
 wireless access point <i>/ˈwaɪələs ˈæksɪs pɔɪnt/</i>			
 router <i>/ˈruːtə/</i>			
 packet <i>/ˈpækɪt/</i>			
 IP address IP <i>/ˌaɪ ˈpiː əˈdres/</i>			
 routing table <i>/ˈraʊtɪŋ ˈteɪbl/</i>			
 network address translation <i>/ˈnetwɜːk əˈdres trænzˈleɪʃn/</i>			
 DHCP <i>/ˌdiː ɛrtʃ siː ˈpiː/</i>			
 firewall <i>/ˈfaɪəwɔːl/</i>			
 collision <i>/kəˈlɪʒn/</i>			

 **CSMA/CD**

/

/ˌsiː es em 'eɪ ˌsiː 'diː/

 **full-duplex**

/fʊl 'djuːpleks/

 **bit streaming**

/bɪt 'striːmɪŋ/

 **buffer**

/'bʌfə/

Economics

Topic 1 · Basic economic ideas and resource allocation

 **profit**

/'prɒfɪt/

 **non-renewable resources**

/nɒn rɪ'njuːəbl rɪ'zɔːsɪz/

 **entrepreneur**

/ˌɒntrɪprə'njuː/

 **specialisation**

/ˌspeʃəlaɪ'zeɪʃn/

 **division of labour**

/dɪ'vɪʒn ɒv 'leɪbə/

 **worker**

/'wɜːkə/

 **mobility**

/məʊ'bɪlɪti/

 **occupational mobility**

/ˌɒkjə'peɪʃənəl məʊ'bɪlɪti/

 **geographical mobility**

/ˌdʒɪə'græfɪkl məʊ'bɪlɪti/

 allocate /ˈæləkeɪt/			
 market economy /ˈmɑːkɪt ɪˈkɒnəmi/			
 planned economy /plænd ɪˈkɒnəmi/			
 command economy /kəˈmænd ɪˈkɒnəmi/			
 mixed economy /mɪkst ɪˈkɒnəmi/			
 private sector /ˈpraɪvət ˈsektə/			
 public sector /ˈpʌblɪk ˈsektə/			

Morning Reading

Grade 11 · AS · Week 4

Read each word aloud, then copy the English word three times.

。

Reading

Read the passage aloud twice.

。

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 :

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

 vertical /'vɜ:tɪkl/			
 inclined plane /'m'klaɪnd pleɪn/			
 kinematics /'kɪnɪ'mætiks/			
 distance /'dɪstəns/			
 deceleration /dɪ'selə'reɪʃn/			
 gradient /'greɪdɪənt/			
 tangent /'tændʒənt/			
 uniform acceleration /'ju:nɪfɔ:m ək'selə'reɪʃn/			
 trapezium /'trə'pi:ziəm/			
 gravity /'grævɪti/			
 air resistance /eə rɪ'zɪstəns/			
 symmetric /'sɪ'metɪk/			
 light gate /laɪt geɪt/			
 reaction-time /'rɪ'ækʃn taɪm/			
 range /reɪndʒ/			

 projectile <i>/prə'dʒektail/</i>			
 linear momentum <i>/'lɪniə məʊ'mentəm/</i>			
 resultant force <i>/rɪ'zʌltənt fɔ:s/</i>			
 collision <i>/kə'lɪʒn/</i>			
 impulse <i>/'ɪmpʊls/</i>			

Chemistry

Topic 2 · Atoms, molecules and stoichiometry

 balanced <i>/'bælənst/</i>			
 state symbols <i>/steɪt 'sɪmbʌlz/</i>			
 aqueous <i>/'eɪkwɪəs/</i>			
= ionic equation <i>/aɪ'ɒnɪk ɪ'kweɪʒn/</i>			
 spectator ions <i>/spek'tetə 'aɪənz/</i>			
÷ empirical formula <i>/em'pɪrɪkl 'fɔ:mjələ/</i>			
 molecular formula <i>/mə'lekjələ 'fɔ:mjələ/</i>			
 water of crystallisation <i>/'wɔ:tə ɒv ,krɪstəlaɪ'zeɪʃn/</i>			
 hydrated <i>/haɪ'dreɪtɪd/</i>			

 anhydrous /æn'haidrəs/			
 stoichiometry /ˌstəʊɪkɪ'ɒmətri/			
% percentage yield /pə'sentɪdʒ ji:ld/			
 limiting reagent /'lɪmɪtɪŋ rɪ'eɪdʒənt/			
+ excess reagent /ek'ses rɪ'eɪdʒənt/			
 hydrocarbons /'haɪdrəka:bənz/			
 concentration /ˌkɒnsən'treɪʃn/			
 solute /'sɒljʊ:t/			
 solution /sə'lʊ:ʃn/			

Biology

Topic 2 · Biological molecules

 carbohydrate /ˌkɑ:bəʊ'haidreɪt/			
 reducing sugar /rɪ'dju:sɪŋ 'ʃʊgə/			
 precipitate /prɪ'sɪpɪteɪt/			
 starch /sta:tʃ/			
 iodine /'aɪədi:n/			
 emulsion /ɪ'mʌlʃn/			

 biuret /'bi:u:rət/			
 semi-quantitative /'semi 'kwɒntɪtətɪv/			
 standardise /'stændədaɪz/			
 concentration /ˌkɒnsən'treɪʃn/			
 non-reducing sugar /nɒn rɪ'dju:sɪŋ 'ʃʊɡə/			
 hydrochloric acid /ˌhaɪdrə'klɔ:rɪk 'æsɪd/			
 neutralise /'nju:trəlaɪz/			
 monomer /'mɒnəʊmə/			
 polymer /'pɒlɪmə/			
 macromolecule /'mækrəmɒlɪkju:l/			
 monosaccharide /'mɒnəsækə:raɪd/			
 glucose /'glu:kəʊs/			
 disaccharide /ˌdɪsək'hɑ:raɪd/			
 polysaccharide /ˌpɒlɪ'sækə:raɪd/			
 fructose /'fraktəʊs/			
 maltose /'mɒltəʊs/			
 sucrose /'su:krəʊs/			

Mathematics

Topic 1 · Pure Mathematics 1

○ **circle**

/ˈsɜːkl/

• **centre**

/ˈsentə/

↗ **radius**

/ˈreɪdiəs/

↗ **tangent**

/ˈtændʒənt/

— **diameter**

/daɪˈæmɪtə/

⊙ **radian**

/ˈreɪdiən/

↪ **arc**

/ɑːk/

↻ **degrees**

/diˈɡriːz/

⌒ **sector**

/ˈsektə/

— **chord**

/kɔːd/

Further Mathematics

Topic 1 · Further Pure Mathematics 1

△ **geometric transformation**

/ˌdʒiːəvˈmetrɪk trənsfɔːˈmeɪʃn/

• **invariant points**

/ɪnˈveəriənt pɔɪnts/

— **invariant lines**

/ɪnˈveəriənt laɪnz/

 **polar coordinates** _____
/ˈpəʊlə kəʊˈɔːdɪnəts/

+ Cartesian coordinates _____
/kɑːˈtiːziən kəʊˈɔːdɪnəts/

Computer Science

Topics 2–3 · Communication, Hardware

 **internet** _____
/ˈɪntənət/

 **protocol** _____
/ˈprəʊtəkəl/

 **World Wide Web** _____
/wɜːld waɪd web/

 **subnets** _____
/ˈsʌbnets/

 **subnet mask** _____
/ˈsʌbnet mæsk/

 **ISP** _____
/ˌaɪ es ˈpiː/

 **URL** _____
/ˌjuː ɑː ˈel/

 **domain name** _____
/dəˈmeɪn neɪm/

 **Domain Name System** _____
/dəˈmeɪn neɪm ˈsɪstəm/

 **wireless network interface card** _____
/ˈwaɪələs ˈnetwɜːk ˈɪntəfeɪs kɑːd/

 **input devices** _____
/ˈɪnpʊt dɪˈvaɪsɪz/

 **output devices** _____
/ˈaʊtpʊt dɪˈvaɪsɪz/

 primary memory			
<i>/ˈpraɪməri ˈmeməri/</i>			
 processor			
<i>/ˈprəʊsesə/</i>			
 secondary storage			
<i>/ˈsekəndəri ˈstɔːrɪdʒ/</i>			
 embedded system			
<i>/emˈbedɪd ˈsɪstəm/</i>			
 firmware			
<i>/ˈfɜːmweə/</i>			
 laser printer			
<i>/ˈleɪzə ˈprɪntə/</i>			
 drum			
<i>/drʌm/</i>			
 toner			
<i>/ˈtəʊnə/</i>			
 3D printer 3D			
<i>/θriː ˈdiː ˈprɪntə/</i>			
 microphone			
<i>/ˈmaɪkrəfəʊn/</i>			
 capacitor			
<i>/kəˈpæsɪtə/</i>			
 analogue-to-digital converter			
<i>/ˈænəlɒg tə ˈdɪdʒɪtl kənˈvɜːtə/</i>			
 hard disk			
<i>/hɑːd disk/</i>			
 tracks			
<i>/træks/</i>			
 sectors			
<i>/ˈsektəz/</i>			
 read/write head			
<i>/riːd raɪt hed/</i>			

 **solid-state drive**

/ˈsɒlɪd steɪt draɪv/

Economics

Topic 1 · Basic economic ideas and resource allocation

 **price mechanism**

/praɪs ˈmekənɪzəm/

 **signalling**

/ˈsɪgnəlɪŋ/

 **incentive**

/ɪnˈsentɪv/

 **rationing**

/ˈræʃənɪŋ/

 **production possibility curve**

/prəˈdʌkʃn ˌpɒsəˈbɪlɪti kɜːv/

 **efficiency**

/ɪˈfɪjənsi/

 **unemployment**

/ʌnemˈplɔɪmənt/

 **trade-off**

/treɪd ɒf/

 **economic growth**

/ɪːkəˈnɒmɪk grəʊθ/

 **technology**

/tekˈnɒlədʒi/

 **economic decline**

/ɪːkəˈnɒmɪk dɪˈklaɪn/

 **capital goods**

/ˈkæpɪtl ɡʊdz/

 **consumer goods**
/kən'su:mə gudz/

 **free good**
/fri: gʊd/

 **economic good**
/i:kə'nɒmɪk gʊd/

 **private good**
/'praɪvət gʊd/

Morning Reading

Grade 11 · AS · Week 5

Read each word aloud, then copy the English word three times.

。

Reading

Read the passage aloud twice.

。

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 :

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

↔ **kinetic energy**

/kɪˈnetɪk ˈenədʒi/

→ **external force**

/ekˈstɜːnl fɔːs/

⚡ **electrostatic**

/ɪˌlektərəʊˈstætɪk/

↑ **normal contact force**

/ˈnɔːml ˈkɒntækt fɔːs/

🚀 **thrust**

/θrʌst/

⊕ **gravitational field**

/ˌgrævɪˈteɪʃənl fiːld/

🔥 **friction**

/ˈfrɪkʃn/

💧 **viscous**

/ˈvɪskəs/

≡ **drag**

/dræg/

💧 **fluid**

/ˈfluːɪd/

× **coefficient**

/ˌkəʊɪˈfɪʃənt/

↓ **terminal velocity**

/ˈtɜːmɪnl vəˈləsɪti/

☂ **parachutist**

/ˈpærətʃuːtɪst/

⚖ **gravitational potential energy**

/ˌgrævɪˈteɪʃənl pəˈtenʃl ˈenədʒi/

 thermal energy <i>/ˈθɜːml 'enədʒi/</i>			
 conservation of momentum <i>/ˌkɒnsə'veɪʃn ɒv məʊ'mentəm/</i>			
 explosion <i>/ek'spləʊʒn/</i>			
 recoil <i>/rɪ'kɔɪl/</i>			
 elastic collision <i>/ɪ'læstɪk kə'liʒn/</i>			
 relative speed <i>/ˈrelatɪv spiːd/</i>			

Chemistry

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

 titration <i>/taɪ'treɪʃn/</i>			
 significant figures <i>/sɪg'nɪfɪkənt 'fɪɡəz/</i>			
 electronegativity <i>/ɪˌlektɹəŋɡə'tɪvɪti/</i>			
 Pauling electronegativity <i>/ˈpɔːlɪŋ ɪˌlektɹəŋɡə'tɪvɪti/</i>			
 ionic bonding <i>/aɪ'ɒnɪk 'bɒndɪŋ/</i>			
 electrostatic attraction <i>/ɪˌlektɹəʊ'stætɪk ə'trækʃn/</i>			
 lattice <i>/ˈlætɪs/</i>			
 metallic bonding <i>/mə'tælɪk 'bɒndɪŋ/</i>			

 **delocalised electrons**

/di'lokəlaɪzd ɪ'lektɹɒnz/

 **covalent bonding**

/'kəʊvələnt 'bɒndɪŋ/

 **expand the octet**

/ek'spænd ðɪ ɒk'tet/

 **coordinate bond**

/kəʊ'ɔːdɪnət bɒnd/

 **sigma bond σ**

/'sɪgmə bɒnd/

 **overlap**

/,əʊvə'leɪp/

 **pi bond π**

/paɪ bɒnd/

 **hybridisation**

/,haɪbrɪdaɪ'zeɪʃn/

 **bond energy**

/bɒnd 'enədʒi/

 **bond length**

/bɒnd leŋθ/

Biology

Topic 2 · Biological molecules

 **covalent bond**

/'kəʊvələnt bɒnd/

 **glycosidic bond**

/,glʌkə'sɪdɪk bɒnd/

 **condensation**

/kɒnden'seɪʃn/

 **hydrolysis**

/haɪ'drɒləsɪs/

 amylose /'æmɪləʊs/			
 amylopectin /'æmɪləʊpɪktɪn/			
 glycogen /'glʌɪkədʒɪn/			
 insoluble /ɪn'sɒljʊ:bl/			
 water potential /'wɔ:tə pə'tenʃl/			
 osmosis /ɒz'məʊsɪs/			
 hydrogen bond /'haɪdrədʒɪn bɒnd/			
 microfibril /'maɪkrəʊfɪbrəl/			
 triglyceride /'trɪglɪsəraɪd/			
 non-polar /nɒn 'pəʊlə/			
 hydrophobic /'haɪdrə'fəʊbɪk/			
 glycerol /'glɪsərol/			
 fatty acid /'fæti 'æsaɪd/			
 ester bond /'estə bɒnd/			
 saturated /'sætʃəreɪtɪd/			
 double bond /'dʌbl bɒnd/			
 unsaturated /ʌn'sætʃəreɪtɪd/			

 **insulation**

/ˌɪnsjuːˈleɪʃn/

 **phosphate**

/ˈfɒsfet/

Mathematics

Topic 1 · Pure Mathematics 1

 **segment**

/ˈseɡmənt/

 **sine**

/saɪn/

 **cosine**

/ˈkəʊsaɪn/

 **tangent function**

/ˈtændʒənt ˈfʌŋkʃn/

 **principal value**

/ˈprɪnsɪpl ˈvæljuː/

= identity

/aɪˈdentɪti/

 **trigonometric equation**

/ˌtrɪɡənəʊˈmetrɪk ɪˈkweɪʒn/

[] binomial expansion

/baɪˈnəʊmɪəl ɛkˈspænzən/

 **binomial coefficient**

/baɪˈnəʊmɪəl ˌkəʊɪˈfɪʃənt/

 **progression**

/prəˈɡreʃn/

Further Mathematics

Topic 1 · Further Pure Mathematics 1

 **polar curves**

/ˈpəʊlə kɜːvz/

 **plane**

/pleɪn/

 **vector product**

/ˈvektə ˈprɒdʌkt/

 **vectors**

/ˈvektəz/

 **skew lines**

/skjuː laɪnz/

Computer Science

Topics 3–4 · Hardware, Processor Fundamentals

 **transistors**

/trænˈzɪstəz/

 **optical disc**

/ˈɒptɪkl dɪsk/

 **touchscreen**

/ˈtʌtʃskriːn/

 **resistive**

/rɪˈzɪstɪv/

 **capacitive**

/kəˈpæsɪtɪv/

 **virtual reality**

/ˈvɜːtʃuəl rɪˈælɪti/

 **accelerometer**

/ækˌseləˈrɒmɪtə/

 **gyroscope**

/ˈdʒaɪrəskəʊp/

 **RAM**

/ræm/

 volatile /'vɒlətaɪl/			
 ROM /rɒm/			
 non-volatile /nɒn 'vɒlətaɪl/			
 SRAM /'esræm/			
 flip-flop /flɪp flɒp/			
 cache /kæʃ/			
 DRAM /'di:ræm/			
 refreshed /rɪ'freʃt/			
 monitoring /'mɒnɪtərɪŋ/			
 control system /kən'trəʊl 'sɪstəm/			
 sensor /'sensə/			
 thermistor /'θɜ:mɪstə/			
 actuator /'æktʃu:etə/			
 feedback /'fi:dbæk/			
 logic gate /'lɒdʒɪk geɪt/			
 Boolean /'bu:liən/			
 truth table /tru:θ 'teɪbl/			

 **logic circuit**

/ˈlɒdʒɪk ˈsɜːkɪt/

 **Von Neumann architecture**

/vɒn ˈnɔɪmən ˈɑːkɪtektʃə/

Economics

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

 **rivalry**

/ˈraɪvəlri/

 **excludability**

/eksˌkluːdəˈbɪlɪti/

 **public good**

/ˈpʌblɪk ɡʊd/

 **non-rivalry**

/nɒn ˈraɪvəlri/

 **non-excludability**

/nɒn eksˌkluːdəˈbɪlɪti/

 **free-rider problem**

/friː ˈraɪdə ˈprɒbləm/

 **national defence**

/ˈnæʃənl dɪˈfens/

 **merit good**

/ˈmerɪt ɡʊd/

 **demerit good**

/ˈdemərɪt ɡʊd/

 **information failure**

/ˌɪnfəˈmeɪʃn ˈfeɪlɪə/

 **demand**

/dɪˈmænd/



price

/praɪs/

quantity demanded

/ˈkwɒntəti dɪˈmændɪd/



demand curve

/dɪˈmænd kɜːv/

↔ shift

/ʃɪft/



determinants

/dɪˈtɜːmɪnənts/

Morning Reading

Grade 11 · AS · Week 6

Read each word aloud, then copy the English word three times.

◦

Reading

Read the passage aloud twice.

◦

A skydiver 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 :

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

 **inelastic collision**

/ɪnɪ'læstɪk kə'liʒn/

 **deformation**

/di:fo:'meɪʃn/

 **head-on**

/hed ɒn/

 **stationary**

/'steɪʃənəri/

 **mass-flow rate**

/mæs fləʊ reɪt/

 **centre of gravity**

/'sentə ɒv 'grævɪti/

 **centre of mass**

/'sentə ɒv mæs/

 **free-body diagram**

/fri: 'bɒdi 'daɪəgræm/

 **moment**

/'məʊmənt/

 **perpendicular distance**

/ˌpɜ:pən'dɪkjələ 'dɪstəns/

 **line of action**

/laɪn ɒv 'ækʃn/

 **lever arm**

/'li:və ɑ:m/

 **pivot**

/'pɪvət/

 **clockwise**

/'klɒkwaɪz/

 anticlockwise <i>/,æntɪ'klɒkwaɪz/</i>			
 couple <i>/'kʌpl/</i>			
 torque <i>/tɔːk/</i>			
 translation <i>/træn'sleɪʃn/</i>			
 equilibrium <i>/iːkwɪ'brɪəm/</i>			
 angular acceleration <i>/'æŋɡjʊlə ək'selə'reɪʃn/</i>			

Chemistry

Topic 3 · Chemical bonding

 VSEPR theory <i>/'vespə 'θɪəri/</i>			
 lone pair <i>/ləʊn peə/</i>			
 bonding pair <i>/'bɒndɪŋ peə/</i>			
 bond angle <i>/bɒnd 'æŋɡl/</i>			
 linear <i>/'liːnə/</i>			
 trigonal planar <i>/'trɪɡənəl 'pleɪnə/</i>			
 tetrahedral <i>/'tetrə'hiːdrəl/</i>			
 pyramidal <i>/pi'ræmɪdl/</i>			



bent

/bent/



trigonal bipyramidal

/'trɪɡənl baɪ'pɪrəmidl/



octahedral

/ɒktə'hi:drəl/



intermolecular forces

/,ɪntəmə'lekjʊlə 'fɔ:sɪz/



polarity

/pəʊ'lærɪti/



dipole

/'daɪpəʊl/



dipole moment

/'daɪpəʊl 'məʊmənt/



van der Waals' forces

/'vændɜ: wɑ:lz 'fɔ:sɪz/



London dispersion forces

/'lʌndn dɪ'spɜ:ʃn 'fɔ:sɪz/



instantaneous dipole

/,ɪnstən'teɪniəs 'daɪpəʊl/

Biology

Topic 2 · Biological molecules



hydrophilic

/,haɪdrə'fɪlɪk/



polar

/'pəʊlə/



amino group

/ə'mi:nəʊ gru:p/

 carboxyl group /'kɑ:bəksɪl gru:p/			
 side chain /saɪd tʃeɪn/			
 peptide bond /'peptaid bɒnd/			
 polypeptide /ˌpɒli'peptaid/			
— primary structure /'praɪməri 'strʌktʃə/			
 secondary structure /'sekəndəri 'strʌktʃə/			
 helix /'hi:lɪks/			
 pleated sheet /'pli:tɪd ʃi:t/			
 tertiary structure /'tɜ:ʃəri 'strʌktʃə/			
 quaternary structure /kwə'tɜ:nəri 'strʌktʃə/			
 hydrophobic interactions /ˌhaɪdrə'fəʊbɪk ˌɪntə'rækʃnz/			
 ionic bond /aɪ'ɒnɪk bɒnd/			
 disulfide bond /'daɪsʌlfaid bɒnd/			
 globular protein /'glɒbjələ 'prəʊtɪn/			
 soluble /'sɒljʊ:bl/			

 **fibrous protein**

/ˈfibrəs ˈprəʊtiːn/

 **haemoglobin**

/ˌhiːməˈgləʊbɪn/

 **oxygen**

/ˈɒksɪdʒɪn/

 **haem group**

/hiːm gruːp/

 **iron**

/ˈaɪən/

Mathematics

Topic 1 · Pure Mathematics 1

+ arithmetic progression

/əˈrɪθmətɪk prəˈɡresjən/

— common difference

/ˈkɒmən ˈdɪfrəns/

 **term**

/tɜːm/

× geometric progression

/ˌdʒiːəʊˈmetrɪk prəˈɡresjən/

÷ common ratio

/ˈkɒmən ˈreɪʃiəʊ/

 **converges**

/kənˈvɜːdʒɪz/

∞ sum to infinity

/sʌm to ɪnˈfɪnɪti/

 **Differentiation**

/ˌdɪfəˈrenʃiˈeɪʃən/

 **gradient of a curve**

/ˈɡreɪdɪənt əv ə kɜːv/

→| **limit**

/ˈlɪmɪt/

Further Mathematics

Topic 1 · Further Pure Mathematics 1

↪ **mathematical induction**

/ˌmæθɪˈmætɪkəl ɪnˈdʌkʃn/

💡 **conjecture**

/kənˈdʒektʃə/

✓ **inductive proof**

/ɪnˈdʌktɪv pruːf/

[:] **symmetric functions**

/sɪˈmetrɪk ˈfʌŋkʃnz/

√ **discriminant**

/dɪˈskrɪmɪnənt/

Computer Science

Topics 3–4 · Hardware, Processor Fundamentals

💾 **stored program**

/stoːd ˈprəʊgræm/

🧮 **arithmetic and logic unit**

/ˌæɪrɪθˈmetɪk ənd ˈlɒdʒɪk ˈjuːnɪt/

⚙️ **control unit**

/kənˈtrəʊl ˈjuːnɪt/

🕒 **clock speed**

/klɒk spiːd/

📊 **Program Counter**

/ˈprəʊgræm ˈkaʊntə/

📍 **Memory Address Register**

/ˈmeməri əˈdres ˈredʒɪstə/

Memory Data Register

/ˈmeməri ˈdeɪtə ˈredʒɪstə/

Current Instruction Register

/ˈkʌrənt ɪnˈstrʌkʃn ˈredʒɪstə/

+ accumulator

/əˈkjuːmjʊleɪtə/

Status Register

/ˈsteɪtəs ˈredʒɪstə/

flags

/flægz/

Index Register

/ˈɪndeks ˈredʒɪstə/

general-purpose registers

/ˈdʒenərəl ˈpɜːpəs ˈredʒɪstəz/

address bus

/əˈdres bʌs/

data bus

/ˈdeɪtə bʌs/

control bus

/kənˈtrəʊl bʌs/

cores

/kɔːz/

word size

/wɜːd saɪz/

page

/peɪdʒ/

port

/pɔːt/

peripheral

/pəˈrɪfərəl/

 **fetch-execute cycle**

-
/fetʃ'eksɪkjʊt'saɪkl/

 **interrupt**

/ɪntə'rupt/

 **interrupt service routine**

/ɪntə'rupt'sɜːvɪs ruː'tiːn/

 **machine code**

/mə'ʃiːn kəʊd/

 **assembly language**

/ə'sembli'læŋgwɪdʒ/

 **mnemonics**

/ni'mɒnɪks/

Economics

Topic 2 · The price system and the microeconomy

 **income**

/ɪŋ'kʌm/

 **substitute**

/sə'bstitjuːt/

 **complement**

/kəm'plɪmənt/

 **market demand**

/mɑːkɪt dɪ'mænd/

 **utility**

/juː'tɪlɪti/

 **marginal utility**

/mɑːdʒɪnl juː'tɪlɪti/

 **diminishing marginal utility**

/dɪ'mɪnɪʃɪŋ mɑːdʒɪnl juː'tɪlɪti/

 **supply**

/sə'plaɪ/

quantity supplied

/ˈkwɒntəti səˈplaɪd/

↗ supply curve

/səˈplaɪ kɜːv/

💰 costs of production

/kɒsts ɒv prəˈdʌkʃn/

📺 subsidy

/ˈsʌbsɪdi/

🗨️ market supply

/ˈmɑːkɪt səˈplaɪ/

↕ price elasticity of demand

/praɪs ɪləˈstɪsɪti ɒv dɪˈmænd/

↗ elastic

/ɪˈlæstɪk/

🔒 inelastic

/ɪnɪˈlæstɪk/

Morning Reading

Grade 11 · AS · Week 7

Read each word aloud, then copy the English word three times.

。

Reading

Read the passage aloud twice.

。

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 :

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

 **principle of moments**

/ˈprɪnsɪpl ɒv 'məʊmənts/

 **vector triangle**

/ˈvektə 'traɪæŋɡl/

 **sine rule**

/saɪn ruːl/

 **cosine rule**

/ˈkəʊsaɪn ruːl/

 **cross-sectional area**

/krɒs 'sekʃənəl 'eəriə/

 **hydrostatic pressure**

/ˌhaɪdrə'stætɪk 'preʃə/

 **depth**

/depθ/

 **atmospheric pressure**

/ˌætməs'ferɪk 'preʃə/

 **submerged**

/səb'mɜːdʒd/

 **upthrust**

/ˌʌpθrʌst/

 **displaced**

/dɪ'spleɪst/

 **Archimedes' principle**

/ˌɑːkɪ'miːdiːz 'prɪnsɪpl/

 **floating**

/ˈfləʊtɪŋ/

 tension /'tenʃn/			
 newton meter /'nju:tn 'mi:tə/			
 incompressible /,ɪnkəm'presəbl/			
 closed system /kləʊzd 'sɪstəm/			
 conservation of energy /kɒnsə'veɪʃn ɒv 'enədʒi/			
 elastic potential energy /ɪ'læstɪk pə'tenʃl 'enədʒi/			
 electrical energy /ɪ'lektrɪkl 'enədʒi/			

Chemistry

Topics 3–4 · Chemical bonding, States of matter

 induced dipole /ɪn'dju:st 'daɪpəl/			
 permanent dipole /'pɜ:mənənt 'daɪpəl/			
 hydrogen bonding /'haɪdrədʒn 'bɒndɪŋ/			
 boiling point /'bɔɪlɪŋ pɔɪnt/			
 surface tension /'sɜ:fɪs 'tenʃn/			
 dot-and-cross diagram /dɒt ænd krɒs 'daɪəgræm/			
 collide /kə'laid/			

↓ pressure /'preʃə/			
≡ ideal gas /aɪ'diəl gæs/			
☁ real gas /riəl gæs/			
= ideal gas equation /aɪ'diəl gæs i'kweɪʃn/			
♾ kelvin /'kelvɪn/			
🔒 gas constant /gæs 'kɒnstənt/			
💎 crystalline solid /'krɪstəlɪn 'sɒlɪd/			
🏠 giant ionic /'dʒaɪənt aɪ'ɒnɪk/			
⬡ simple molecular /'sɪmpl mə'lekjʊlə/			
⊙ fullerene /'fʊləren/			
🏠 giant molecular /'dʒaɪənt mə'lekjʊlə/			

Biology

Topics 2–3 · Biological molecules, Enzymes

🍖 collagen /'kɒlədʒɪn/			
🦵 tendon /'tendn/			
🍖 fibre /'faɪbə/			

	solvent			
	/ˈsɒlvənt/			
	specific heat capacity			
	/spəˈsɪfɪk hi:t kəˈpæsɪti/			
	latent heat of vaporisation			
	/ˈleɪtənt hi:t ɒv ˌveɪpəraɪˈzeɪʃn/			
	evaporate			
	/ɪˈvæpəreɪt/			
	catalyse			
	/ˈkætəlaɪz/			
	intracellular			
	/ˌɪntrəˈseljələ/			
	catalase			
	/ˈkætəleɪz/			
	extracellular			
	/ˌekstrəˈseljələ/			
	secrete			
	/sɪˈkri:t/			
	amylase			
	/ˈæmɪleɪz/			
	digest			
	/ˈdaɪdʒest/			
	active site			
	/ˈæktɪv saɪt/			
	substrate			
	/ˈsʌbstreɪt/			
	enzyme-substrate complex			
	/ˈenzaim ˈsʌbstreɪt ˈkɒmpleks/			
	product			
	/ˈprɒdʌkt/			
	complementary			
	/ˌkɒmplɪˈmentəri/			

🔑 **specificity** _____
/ˌspeʃɪˈfɪsɪti/

🔑 **lock-and-key hypothesis** _____
/lɒk ænd kiː haɪˈpɒθəʊsɪs/

👉 **induced-fit hypothesis** _____
/ɪnˈdʒuːst fɪt haɪˈpɒθəʊsɪs/

⚡ **activation energy** _____
/ˌæktɪˈveɪʃn ˈenədʒi/

Mathematics

Topic 1 · Pure Mathematics 1

↗ **derivative** _____
/dɪˈrɪvətɪv/

🔗 **chain rule** _____
/tʃeɪn ruːl/

↗ **second derivative** _____
/ˈsekənd dɪˈrɪvətɪv/

⊥ **normal** _____
/ˈnɔːml/

↗ **increasing function** _____
/ɪnˈkriːsɪŋ ˈfʌŋkʃn/

↘ **decreasing function** _____
/ˈdiːkriːsɪŋ ˈfʌŋkʃn/

⚡ **rate of change** _____
/reɪt ɒv tʃeɪndʒ/

🚶 **stationary point** _____
/ˈsteɪʃənəri pɔɪnt/

✓ **minimum point** _____
/ˈmɪnɪməm pɔɪnt/

^ **maximum point**

/ˈmæksɪmə pɔɪnt/

Further Mathematics

Topic 1 · Further Pure Mathematics 1

↻ **turning points**

/ˈtɜːnɪŋ pɔɪnts/

÷ **partial fractions**

/ˈpɑːʃl ˈfrækʃnz/

↻ **rotation**

/rəʊˈteɪʃn/

[:] **reflection**

/rɪˈflekʃn/

[] **enlargement**

/enˈlɑːdʒmənt/

Computer Science

Topics 4–5 · Processor Fundamentals, System Software

🔑 **assembler**

/əˈsemblə/

📊 **symbol table**

/ˈsɪmbl ˈteɪbl/

🏷️ **label**

/ˈleɪbl/

→ **forward references**

/ˈfɔːwəd ˈrefrənsɪz/

📍 **addressing mode**

/əˈdresɪŋ məʊd/

⚡ **immediate addressing**

/ɪˈmiːdiət əˈdresɪŋ/

 direct addressing			
/daɪ'rekt ə'dresɪŋ/			
 indirect addressing			
/ɪndaɪ'rekt ə'dresɪŋ/			
# indexed addressing			
/'ɪndekst ə'dresɪŋ/			
→ relative addressing			
/'relatɪv ə'dresɪŋ/			
» logical shift			
/'lɒdʒɪkl ʃɪft/			
 mask			
/mæsk/			
 cache memory			
/kæʃ 'meməri/			
 Immediate Access Store			
/ɪ'mɪ:diət 'ækses stɔː/			
 special purpose registers			
/'speʃl 'pɜːpəs 'redʒɪstəz/			
 register transfer			
/'redʒɪstə 'trænsfɜː/			
 cyclic shift			
/'saɪklɪk ʃɪft/			
 operating system			
/'ɒperetɪŋ 'sɪstəm/			
 process management			
/'prəʊses 'mænɪdʒmənt/			
 process			
/'prəʊses/			

 **memory management**

/ˈmeməri ˈmænidʒmənt/

 **virtual memory**

/ˈvɜːtʃuəl ˈmeməri/

 **paging**

/ˈpeɪdʒɪŋ/

 **device driver**

/dɪˈvaɪs ˈdraɪvə/

 **utility program**

/juːˈtɪlɪti ˈprəʊɡræm/

 **disk defragmenter**

/dɪsk ˌdiːˈfræɡməntə/

 **backup**

/ˈbækʌp/

 **antivirus**

/ˌæntɪˈvaɪrəs/

Economics

Topic 2 · The price system and the microeconomy

= unit elastic

/ˈjuːnɪt ɪˈlæstɪk/

— perfectly inelastic

/ˈpɜːfektli ɪnˈlæstɪk/

↔ perfectly elastic

/ˈpɜːfektli ɪˈlæstɪk/

 **necessity**

/nəˈsesɪti/

 **luxury**

/ˈlʌkjəri/

 **total revenue**

/ˈtəʊtl ˈrevənjuː/

↕ **income elasticity of demand**

/ˈɪŋkʌm ɪləˈstɪsɪti ɒv dɪˈmænd/

📦 **normal good**

/ˈnɔːml ɡʊd/

📦 **inferior good**

/ɪnˈfɪəriə ɡʊd/

↔ **cross elasticity of demand**

/krɒs ɪləˈstɪsɪti ɒv dɪˈmænd/

↕ **price elasticity of supply**

/praɪs ɪləˈstɪsɪti ɒv səˈplaɪ/

📦 **spare capacity**

/speə kəˈpæsɪti/

📦 **stocks**

/stɒks/

🕒 **momentary**

/ˈməʊməntəri/

🕒 **short run**

/ʃɔːt rʌn/

📅 **long run**

/lɒŋ rʌn/

Morning Reading

Grade 11 · AS · Week 8

Read each word aloud, then copy the English word three times.

◦

Reading

Read the passage aloud twice.

◦

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 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 :

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



chemical energy

/ˈkemɪkl ˈenədʒi/



frictionless

/ˈfrɪkʃənləs/



ramp

/ræmp/



efficiency

/ɪˈfɪʃənsi/



voltage

/ˈvəʊltɪdʒ/



spring

/sprɪŋ/



compression

/kəmˈpreʃn/



spring constant

/sprɪŋ ˈkɒnstənt/



tensile

/ˈtensəl/



extension

/ekˈstɛnʃn/



load

/ləʊd/



Hooke's law

/hʊks lɔː/



limit of proportionality

/ˈlɪmɪt ɒv prəˌpɔːʃəˈnælɪti/



elastic

/ɪˈlæstɪk/



plastic

/ˈplæstɪk/

 series /'sɪəri:z/			
= parallel /'pærəlel/			
 strain /streɪn/			
 Young modulus /jʌŋ 'mɒdjʊləs/			
 pulley /'pʊli/			

Chemistry

Topics 4–5 · States of matter, Chemical energetics

 covalent bonds /'kəʊvələnt bɒndz/			
 silicon(IV) oxide /'sɪlɪkən 'ɒksaɪd/			
 graphite /'græfaɪt/			
 diamond /'daɪəmənd/			
 giant metallic /'dʒaɪənt mə'tælk/			
 melting point /'meltɪŋ pɔɪnt/			
 electrical conductivity /ɪ'lektrɪkl kɒndəktɪvɪti/			
 solubility /,sɒljʊ:'bɪlɪti/			
 enthalpy change /en'θælpɪ tʃeɪndʒ/			

 exothermic <i>/egzə'tɜ:mɪk/</i>			
 endothermic <i>/,endəʊ'tɜ:mɪk/</i>			
 reaction pathway diagram <i>/rɪ'ækʃn 'pæθweɪ 'daɪəgræm/</i>			
 activation energy <i>/,æktɪ'veɪʃn 'enədʒi/</i>			
 standard conditions <i>/'stændəd kən'dɪʃnz/</i>			
 enthalpy change of reaction <i>/en'tʰælpi tʃeɪndʒ ɒv rɪ'ækʃn/</i>			
 enthalpy change of formation <i>/en'tʰælpi tʃeɪndʒ ɒv fɔ:'meɪʃn/</i>			
 enthalpy change of combustion <i>/en'tʰælpi tʃeɪndʒ ɒv kəm'bastʃn/</i>			
 enthalpy change of neutralisation <i>/en'tʰælpi tʃeɪndʒ ɒv ,nju:trəlaɪ'zeɪʃn/</i>			

Biology

Topics 3–4 · Enzymes, Cell membranes and transport

 temperature <i>/'tempərɪtʃə/</i>			
 colorimeter <i>/,kɒlə'rɪmɪtə/</i>			
 rate of reaction <i>/reɪt ɒv rɪ'ækʃn/</i>			
 kinetic energy <i>/kɪ'netɪk 'enədʒi/</i>			

 collide /kə'laɪd/			
 optimum temperature /'ɒptɪməəm 'temprɪtʃə/			
 denature /'denətʃə/			
 buffer solution /'bʌfə sə'lu:ʃn/			
 inhibitor /ɪn'hɪbɪtə/			
 Michaelis–Menten constant /'maɪkəlɪz 'mentn 'kɒnstənt/			
 affinity /'æfɪnɪti/			
 reversible /rɪ'vɜ:sɪbl/			
 competitive inhibitor /kəm'petɪtɪv ɪn'hɪbɪtə/			
 non-competitive inhibitor /nɒn kəm'petɪtɪv ɪn'hɪbɪtə/			
 immobilised enzyme /ɪ'məʊbəlaɪzd 'enzaɪm/			
 alginate /'ældʒɪneɪt/			
 fluid mosaic model /'flu:ɪd mə'seɪk 'mɒdl/			
 bilayer /'bɪleɪə/			
 carrier protein /'kæriə 'prəʊtɪn/			

 **channel protein**

/ˈtʃænl ˈprəʊtiːn/

 **cholesterol**

/kəˈlestərol/

 **fluidity**

/fluːˈɪdɪti/

 **glycolipid**

/ˈglʌkəlɪpɪd/

Mathematics

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

 **Integration**

/ˌɪntɪˈɡreɪʃn/

+ constant of integration

/ˈkɒnstənt ɒv ˌɪntɪˈɡreɪʃn/

 **definite integral**

/ˈdefɪnət ˈɪntɪgrəl/

 **region**

/ˈriːdʒn/

 **volume of revolution**

/ˈvɒljʊːm ɒv ˌrevəˈluːʃn/

 **composition of functions**

/ˌkɒmpəˈzɪʃn ɒv ˈfʌŋkʃnz/

 **logarithms**

/ˈlɒɡərɪθənz/

 **exponential function**

/ˌekspəˈnenʃl ˈfʌŋkʃn/

 **modulus**

/ˈmɒdjʊləs/

 **polynomial**

/ˌpɒliˈnəʊmɪəl/

Further Mathematics

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

↔ **stretch**

/stretʃ/

↗ **shear**

/ʃiə/

⚙ **Further Mechanics**

/ˈfɜːðə miˈkæniks/

↗ **projectile**

/prəˈdʒektail/

↔ **constant acceleration**

/ˈkɒnstənt əkˌseləˈreɪʃn/

Computer Science

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

||| **program library**

/ˈprəʊgræm ˈlaɪbrəri/

ƒ **subroutines**

/ˈsʌbruːtiːnz/

🔒 **static library**

/ˈstætɪk ˈlaɪbrəri/

🔄 **dynamic library**

/daɪˈnæmɪk ˈlaɪbrəri/

✎ **translator**

/trænˈsleɪtə/

⚙ **compiler**

/kəmˈpaɪlə/

▶ **executable**

/ɪɡˈzekjʊtəbl/

▶ **interpreter**

/ɪnˈtɜːprɪtə/

 bytecode /'baɪtkəʊd/			
 virtual machine /'vɜ:tʃu:əl mə'ʃi:n/			
 just-in-time compilation /dʒʌst ɪn taɪm ˌkɒmpɪ'leɪʃn/			
<> integrated development environment /'ɪntɪɡreɪtɪd dɪ'veləpmənt en'vaɪrənmənt/			
 syntax highlighting /'sɪntæks 'haɪlaɪtɪŋ/			
 auto-complete /'ɔ:təʊ kəm'pli:t/			
 debugger /'di:bʌgə/			
 breakpoints /'breɪkpɔɪnts/			
 version control /'vɜ:ʃn kən'trəʊl/			
 refactoring /'rɪ'fæktərɪŋ/			
 unit test /'ju:nɪt test/			
 security /sɪ'kjʊərɪti/			
 unauthorised /ʌn'ɔ:θəraɪzd/			
 privacy /'prɪvəsi/			
 integrity /ɪn'tegriti/			
 malware /'mælweə/			

 virus /'vaɪrəs/			
 worm /wɜ:m/			
 Trojan horse /'trəʊdʒn hə:s/			

Economics

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

 equilibrium /i:kwi'libriəm/			
 equilibrium price /i:kwi'libriəm prais/			
 equilibrium quantity /i:kwi'libriəm 'kwɒntəti/			
 disequilibrium /di:kwɪ'libriəm/			
 excess demand /ek'ses di'mænd/			
 shortage /'ʃɔ:tɪdʒ/			
 excess supply /ek'ses sə'plai/			
 product market /'prɒdʌkt 'mɑ:kɪt/			
 factor market /'fæktə 'mɑ:kɪt/			
 foreign exchange market /'fɒrən eks'tʃeɪndʒ 'mɑ:kɪt/			
 exchange rate /eks'tʃeɪndʒ reɪt/			

😊 **consumer surplus**

/kən'su:mə 'sɜ:pəlʌs/

↗ **producer surplus**

/prə'dju:sə 'sɜ:pəlʌs/

♡ **welfare**

/'welfeə/

↘ **market failure**

/'mɑ:kɪt 'feɪlɪə/

Morning Reading

Grade 11 · AS · Week 9

Read each word aloud, then copy the English word three times.

◦

Reading

Read the passage aloud twice.

◦

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 :

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 6–7 · Deformation of solids, Waves



micrometer

/maɪˈkrɒmɪtə/



elastic limit

/ɪˈlæstɪk ˈlɪmɪt/



wave

/weɪv/



medium

/ˈmiːdiəm/



oscillate

/ˈɒsɪleɪt/



transverse wave

/trænsˈvɜːs weɪv/



longitudinal wave

/ˌlɒŋɡɪˈtʃuːdɪnl weɪv/



progressive wave

/prəˈɡresɪv weɪv/



amplitude

/ˈæmplɪtjuːd/



wavelength

/ˈweɪvləŋθ/



in phase

/ɪn feɪz/



crest

/krest/



period

/ˈpɪəriəd/



frequency

/ˈfriːkwənsi/



hertz

/hɜːts/



phase difference

/feɪz ˈdɪfrəns/

⊙ **radian**

/ˈreɪdiən/

⊞ **propagate**

/ˈprɒpəgeɪt/

⌚ **cathode-ray oscilloscope**

/ˈkæθəʊd reɪ vˈsɪləskəʊp/

Chemistry

Topics 5–7 · Chemical energetics, Electrochemistry, Equilibria

⚡ **specific heat capacity**

/spəˈsɪfɪk hi:t kəˈpæsɪti/

⚖ **Hess's law**

/ˈhesɪz lɔ:/

↔ **energy cycle**

/ˈenədʒi ˈsaɪkl/

↑↓ **redox**

/rɪˈdɒks/

↑ **oxidation**

/ˌɒksɪˈdeɪʃn/

↓ **reduction**

/rɪˈdʌkʃn/

↔ **electron transfer**

/ɪˈlektɹən ˈtrænsfɜ:/

↗ **disproportionation**

/ˌdɪsprəˈpɔːʃəneɪʃn/

↑ **oxidising agent**

/ˌɒksɪdaɪzɪŋ ˈeɪdʒənt/

↓ **reducing agent**

/rɪˈdjuːsɪŋ ˈeɪdʒənt/

↔ **reversible reaction**

/rɪˈvɜːsɪbl rɪˈækʃn/

→ **forward reaction**

/ˈfɔːwəd rɪˈækʃn/

← **reverse reaction**

/rɪˈvɜːs rɪˈækʃn/

🔒 **closed system**

/kləʊzd ˈsɪstəm/

⚖️ **dynamic equilibrium**

/daɪˈnæmɪk ˌɪːkwɪˈlɪbrɪəm/

⚖️ **Le Chatelier's principle**

/lə ˈtʃetliəz ˈprɪnsɪpl/

⚖️ **equilibrium**

/ˌɪːkwɪˈlɪbrɪəm/

⚡ **catalyst**

/ˈkætəlist/

Biology

Topic 4 · Cell membranes and transport

🔗 **glycoprotein**

/ˈglɑːkəprəʊtiːn/

🚩 **antigen**

/ˈæntɪdʒen/

🛡️ **stability**

/stəˈbɪlɪti/

🚰 **permeability**

/ˌpɜːməˈbɪlɪti/

🚰 **partially permeable membrane**

/ˈpɑːʃəli ˈpɜːməbl ˈmembreɪn/

📡 **cell signalling**

/sel ˈsɪgnəlɪŋ/

🔑 **ligand**

/ˈlɪgænd/

 hormone /'hɔ:məʊn/			
 target cell /'tɑ:ɡɪt sel/			
 receptor /'rɪ'septə/			
 passive /'pæsɪv/			
 diffusion /dɪ'fju:ʒn/			
 simple diffusion /'sɪmpl dɪ'fju:ʒn/			
 concentration gradient /ˌkɒnsən'treɪʃn 'ɡreɪdɪənt/			
 carbon dioxide /'kɑ:bən daɪ'ɒksaɪd/			
 ion /'aɪən/			
 facilitated diffusion /fə'sɪlɪteɪtɪd dɪ'fju:ʒn/			
 active transport /'æktɪv 'trænspɔ:t/			
 endocytosis /ˌendəʊsɪ'təʊsɪs/			
 exocytosis /eg,zəʊsɪ'təʊsɪs/			
 volume /'vɒljʊ:m/			
 surface area /'sɜ:fɪs 'eəriə/			
 agar /'eɪɡɑ:/			

Mathematics

Topic 2 · Pure Mathematics 2

x² degree

/di'gri:/

÷ quotient

/'kwəʃjənt/

% remainder

/rɪ'meɪndə/

% remainder theorem

/rɪ'meɪndə 'θɪərəm/

× factor theorem

/'fæktə 'θɪərəm/

x² indices

/'ɪndɪsɪz/

📖 laws of logarithms

/lɔːz ov 'lɒɡərɪθəmz/

📖 natural logarithm

/'nætʃərəl 'lɒɡərɪθəm/

— linear form

/'lɪniə fɔːm/

⤴ secant

/'siːkənt/

Further Mathematics

Topic 3 · Further Mechanics

+ Cartesian equation

/kɑː'tiːziən ɪ'kweɪʃn/

📍 trajectory

/trə'dʒektəri/

 moment /'məʊmənt/			
 centre of mass /'sentə ɒv mæs/			
 symmetry /'sɪmətri/			

Computer Science

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

 spyware /'spaɪweə/			
 ransomware /'rænsəmweə/			
 adware /'ædweə/			
 phishing /'fɪʃɪŋ/			
 hacking /'hækɪŋ/			
 denial of service /dɪ'naɪəl ɒv 'sɜːvɪs/			
 eavesdropping /'iːvzdrɒpɪŋ/			
 man-in-the-middle /mæn ɪnðə 'mɪdl/			
 social engineering /'səʊʃl ˌendʒɪ'niəriŋ/			
 encryption /en'krɪpʃn/			
 audit logs /'ɔːdɪt lɒgz/			

 VPN <i>/ˌviː piː ˈen/</i>			
 authentication <i>/ɔːθentiˈkeɪʃn/</i>			
 two-factor authentication <i>/tuː ˈfæktə ɔːθentiˈkeɪʃn/</i>			
 authorisation <i>/ˌɔːθəraɪˈzeɪʃn/</i>			
 least-privilege <i>/liːst ˈprɪvɪlɪdʒ/</i>			
 plaintext <i>/ˈpleɪntekst/</i>			
 ciphertext <i>/ˈsaɪfətekst/</i>			
 Symmetric encryption <i>/sɪˈmetrɪk enˈkrɪpʃn/</i>			
 asymmetric encryption <i>/eɪsɪˈmetrɪk enˈkrɪpʃn/</i>			
 public key <i>/ˈpʌblɪk kiː/</i>			
 private key <i>/ˈpraɪvət kiː/</i>			
 access control <i>/ˈækses kənˈtrəʊl/</i>			
 validation <i>/ˌvælɪˈdeɪʃn/</i>			
 check digit <i>/tʃek ˈdɪdʒɪt/</i>			
 verification <i>/ˌverɪfɪˈkeɪʃn/</i>			
 parity check <i>/ˈpærɪti tʃek/</i>			

Σ **checksum**
/'tʃeksəm/

Economics

Topic 3 · Government microeconomic intervention

🏠 **externality**
/ek'stɜːnælɪti/

👤 **third party**
/θɜːd 'pɑːti/

🏠 **negative externality**
/'negətɪv ek'stɜːnælɪti/

💰 **external cost**
/ek'stɜːnl kɒst/

👤 **social cost**
/'səʊʃl kɒst/

💰 **private cost**
/'praɪvət kɒst/

✳️ **positive externality**
/'pɒzɪtɪv ek'stɜːnælɪti/

✳️ **external benefit**
/ek'stɜːnl 'benɪfɪt/

👑 **monopoly**
/mə'nɒpəli/

👑 **monopoly power**
/mə'nɒpəli 'paʊə/

⚖️ **inequality**
/ɪni:'kwɒləti/

🔍 **asymmetric information**
/eɪsɪ'metrɪk ɪnfə'meɪʃn/

💰 **indirect tax**
/ɪndaɪ'rekt tæks/

↗ **incidence of a tax**

/ˈɪnsɪdəns əvə təks/

↓ **maximum price**

/ˈmæksɪməm praɪs/

↖ **minimum price**

/ˈmɪnɪməm praɪs/

Morning Reading

Grade 11 · AS · Week 10

Read each word aloud, then copy the English word three times.

。

Reading

Read the passage aloud twice.

。

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 :

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

Topic 7 · Waves



time-base

/taɪm beɪs/



y-gain

/waɪ geɪn/



intensity

/ɪn'tensɪti/

• **point source**

/pɔɪnt sɔːs/



wavefront

/'weɪvfrʌnt/



rarefaction

/,reəri'fækʃn/



sine curve

/saɪn kɜːv/



source

/sɔːs/



observer

/əb'zɜːvə/

(☉) **Doppler effect**

/'dɒplə ɪ'fekt/

(☉) **electromagnetic wave**

/ɪ,lektɹəmæg'netɪk weɪv/



electromagnetic spectrum

/ɪ,lektɹəmæg'netɪk 'spektrəm/



microwaves

/'maɪkrəweɪvz/



infrared

/ɪnfrə'red/

 **ultraviolet**
/ʊltrə'vaɪəlit/

 **X-rays X**
/eks reɪz/

 **gamma-rays γ**
/'gæmə reɪz/

 **polarisation**
/ˌpəʊləraɪ'zeɪʃn/

 **plane-polarised**
/pleɪn 'pəʊləraɪzd/

 **polarising filter**
/'pəʊləraɪzɪŋ 'fɪltə/

Chemistry

Topic 7 · Equilibria

 **equilibrium constant**
/ˌiːkwɪ'libriəm 'kɒnstənt/

 **partial pressure**
/'paːʃl 'preʃə/

 **mole fraction**
/məʊl 'frækʃn/

 **Haber process**
/'heɪbə 'prəʊses/

 **Contact process**
/'kɒntækt 'prəʊses/

 **acid**
/'æsɪd/

 **proton donor**
/'prəʊtɒn 'dɒnə/

 **base**
/beɪs/

 **proton acceptor**
/'prəʊtɒn ək'septə/

 strong acid <i>/strɒŋ 'æsɪd/</i>			
 strong base <i>/strɒŋ beɪs/</i>			
 dissociated <i>/dɪ'səʊʃiətɪd/</i>			
 weak acid <i>/wi:k 'æsɪd/</i>			
 weak base <i>/wi:k beɪs/</i>			
 universal indicator <i>/ju:ni'vɜ:sl 'ɪndɪkeɪtə/</i>			
 Neutralisation <i>/,nju:trəlaɪ'zeɪʃn/</i>			
 salt <i>/sɒlt/</i>			
 titration curve <i>/taɪ'treɪʃn kɜ:v/</i>			

Biology

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

 dialysis tubing <i>/daɪ'æləsis 'tju:bɪŋ/</i>			
 solute <i>/'sɒljʊ:t/</i>			
 distilled water <i>/dɪ'stɪld 'wɔ:tə/</i>			
 turgid <i>/'tɜ:dʒɪd/</i>			
 plasmolysis <i>/plæz'mɒləsɪs/</i>			
 haemolysis <i>/hi:'mɒləsɪs/</i>			

 chromosome /'krəʊməsəʊm/			
 histone /'hɪstəʊn/			
 replication /ˌreplɪ'keɪʃn/			
 sister chromatids /'sɪstə 'krəʊmətɪdz/			
• centromere /'sentrəʊmə/			
 telomere /'teləʊmə/			
 mitosis /maɪ'təʊsɪs/			
 daughter cell /'dɔ:tə sel/			
 gene /dʒiːn/			
 multicellular /ˌmʌltɪ'seljələ/			
 organism /'ɔ:gənɪzəm/			
 tissue /'tɪʃuː/			
 asexual reproduction /eɪ'sekʃu:əl rɪprə'dʌkʃn/			
 cell cycle /sel 'saɪkl/			
 interphase /ˌɪntə'feɪz/			
 cytokinesis /ˌsaɪtəkə'niːsɪs/			

 **stem cell**
/stem sel/

Mathematics

Topic 2 · Pure Mathematics 2

 **cosecant**
/'kəusekənt/

 **cotangent**
/'kəutændʒənt/

= trigonometric identities
/ˌtrɪɡənəv'metrik aɪ'dentɪtɪz/

+ compound angle
/'kɒmpaʊnd 'æŋɡl/

 **double angle**
/'dʌbl 'æŋɡl/

 **R-formula**
/ɑː 'fɔːmjʊlə/

× product rule
/'prɒdʌkt ruːl/

÷ quotient rule
/'kwɒʃjənt ruːl/

(×) parametric equations
/ˌpærə'metrik ɪ'kweɪznz/

 **implicitly**
/ɪm'plɪsɪtli/

Further Mathematics

Topic 3 · Further Mechanics

 **equilibrium**
/iːkwɪ'brɪəm/

 **toppling**
/'tɒplɪŋ/

→ sliding			
/ˈslaɪdɪŋ/			
↻ angular speed			
/ˈæŋɡjʊlə spiːd/			
⊙ centripetal acceleration			
/senˈtrɪpɪtl əkˌseləˈreɪʃn/			

Computer Science

Topics 5–7 · System Software, Security, privacy and data integrity, Ethics and Ownership

↻ cyclic redundancy check			
/ˈsaɪklɪk rɪˈdʌndənsi tʃek/			
💊 pharming			
/ˈfɑːmɪŋ/			
🧑 hackers			
/ˈhækəz/			
👤 user accounts			
/ˈjuːzə əˈkaʊnts/			
✍ digital signatures			
/ˈdɪdʒɪtl ˈsɪɡnɪtʃəz/			
🕵 anti-spyware			
/ˈænti ˈspaɪweə/			
🔑 access rights			
/ˈækses raɪts/			
👤 biometrics			
/ˈbaɪəʊˈmetrɪks/			
⚖ ethics			
/ˈeθɪks/			
🔒 confidentiality			
/ˌkɒnfɪˌdɛnʃiˈæləti/			
⚔ conflicts of interest			
/ˈkɒnflikt əv ˈɪntrest/			

© intellectual property

/ˌɪntəˈlektʃuəl ˈprɒpəti/

© copyright

/'kɒprɪraɪt/

🔑 patent

/'peɪtənt/

📄 software licence

/'sɒftweə ˈlaɪsəns/

🔒 proprietary

/prəˈpraɪətəri/

🔒 open-source

/'əʊpən sɔːs/

© copyleft

/'kɒpɪleft/

📁 freeware

/'friːweə/

🔗 shareware

/'ʃeəweə/

🧠 artificial intelligence

/ˌɑːtɪˈfɪʃl ɪnˈtelɪdʒəns/

🧠 machine learning

/məˈʃiːn ˈlɜːnɪŋ/

🧠 Deep learning

/diːp ˈlɜːnɪŋ/

🧠 neural networks

/'njuːrəl ˈnetwɜːks/

🗣️ speech recognition

/spiːtʃ ˌrekəɡˈnɪʃn/

🖼️ image recognition

/'ɪmɪdʒ ˌrekəɡˈnɪʃn/

🗨️ machine translation

/məʃiːn trænsˈleɪʃn/

👍 recommendation
systems

/ˌrekəmenˈdeɪʃn ˈsɪstəmz/

Economics

Topics 3–4 · Government microeconomic intervention, The macroeconomy

📦 buffer stock

/ˈbʌfə stɒk/

📋 regulation

/ˌregjʊˈleɪʃn/

🏛️ state provision

/steɪt prəˈvɪʒn/

🔄 tradable permits

/ˈtreɪdəbl ˈpɜːmits/

📉 government failure

/ˈɡʌvənmənt ˈfeɪlɪə/

🌑 black market

/blæk ˈmɑːkɪt/

🌊 flow

/fləʊ/

💎 wealth

/welθ/

📦 stock

/stɒk/

📈 progressive tax

/prəˈɡresɪv tæks/

% percentage

/pəˈsentɪdʒ/

👤 benefits

/ˈbenɪfɪts/

↔ **transfer payments**

/ˈtrænsfɜː ˈpeɪmənts/

↕ **redistribution**

/ˌrɪːdɪstrɪˈbjʊːʃn/

🏠 **national income**

/ˈnæʃənl ˈɪŋkʌm/

🌐 **gross domestic product**

/grəʊs dəˈmestɪk ˈprɒdʌkt/

Morning Reading

Grade 11 · AS · Week 11

Read each word aloud, then copy the English word three times.

◦

Reading

Read the passage aloud twice.

◦

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 :

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

— **transmission axis**

/træn'smɪʃn 'æksɪs/

% **Malus's law**

/'mæləsɪz lɔː/

↗ **vector sum**

/'vektə sʌm/

≡ **superposition**

/,suːpəpə'zɪʃn/

+ **constructive interference**

/kən'strʌktɪv ,ɪntə'fɪərəns/

∨ **trough**

/trɒf/

— **destructive interference**

/dɪ'strʌktɪv ,ɪntə'fɪərəns/

Λ **stationary wave**

/'steɪʃənəri weɪv/

[:] **reflected**

/rɪ'flektɪd/

• **node**

/nəʊd/

○ **antinode**

/,æntɪ'nəʊd/

↔ **antiphase**

/,æntɪ'feɪz/

□ **resonance tube**

/'rezənəns tjuːb/

— **fundamental**

/ˌfʌndə'mentl/

⊞ **diffraction**

/dɪ'frækʃn/

□ **obstacle**

/ˈɒbstəkl/

🌊 **ripple tank**

/ˈrɪpl tæŋk/

📶 **interference**

/ˌɪntəˈfɪərəns/

= **coherent**

/kəʊˈhiərənt/

— **slit**

/slɪt/

Chemistry

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

🧪 **indicator**

/ˈɪndɪkeɪtə/

🕒 **rate of reaction**

/reɪt ɒv rɪˈækʃn/

⚡ **collision frequency**

/kəˈlɪʒn ˈfriːkwənsi/

✓ **effective collision**

/ɪˈfektɪv kəˈlɪʒn/

✗ **non-effective collision**

/nɒn ɪˈfektɪv kəˈlɪʒn/

📊 **Boltzmann distribution**

/ˈbɒltzmən ˌdɪstrɪˈbjʊːʃn/

⚡ **catalysis**

/kæˈtæləsɪs/

⚙️ **reaction mechanism**

/rɪˈækʃn ˈmekənɪzəm/

 homogeneous catalyst			
/hə'məʊdʒɪniəs 'kætəlist/			
 heterogeneous catalyst			
/,hetrə'dʒiːniəs 'kætəlist/			
 periodicity			
/ˌpɪərɪˌɒ'disɪti/			
 valence shell			
/'veɪləns ʃel/			
 oxide			
/'ɒksaɪd/			
 amphoteric			
/ˌæmfəʊ'terɪk/			
 hydroxide			
/haɪ'drɒksaɪd/			
 hydrolysis			
/haɪ'drɒləsɪs/			
 reactivity			
/rɪæk'tɪvɪti/			
 sulfate			
/'sʌlfeɪt/			

Biology

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

 differentiate			
/ˌdɪfə'renʃieɪt/			
 tumour			
/'tjuːmə/			
 prophase			
/'prəʊfeɪz/			
 spindle			
/'spɪndl/			

≡ **metaphase**

/ˌmetəˈfeɪz/

— **equator**

/ɪˈkweɪtə/

↵ **anaphase**

/ˈænəfeɪz/

↶ **telophase**

/ˈteləfeɪz/

□ **nucleotide**

/ˈnjuːklɒtɪd/

⊙ **base**

/beɪs/

□ **adenine**

/ˈædəniːn/

⬠ **ribose**

/ˈriboʊs/

⬠ **purine**

/ˈpjʊəriːn/

□ **guanine**

/ˈgwaːnaɪn/

⊙ **pyrimidine**

/ˈpɪrɪmɪdiːn/

□ **cytosine**

/ˈsaɪtəsaɪn/

⊙ **thymine**

/ˈθaɪmaɪn/

□ **uracil**

/ˈjʊərəsɪl/

↻ **double helix**

/ˈdʌbl ˈhiːlɪks/

— **strand**

/strænd/

⬠ **deoxyribose**

/diːˈɒksɪrɪboʊs/

 **phosphodiester bond**

/ˈfɒsfəʊdɪstə bɒnd/

 **complementary base pairing**

/ˌkɒmplɪˈmentəri beɪs ˈpeərɪŋ/

Mathematics

Topics 2–4 · Pure Mathematics 2, Mechanics

 **trapezium rule**

/trəˈpiːziəm ruːl/

 **root**

/ruːt/

 **sign change**

/saɪn tʃeɪndʒ/

 **iteration**

/ˌɪtəˈreɪʃn/

 **iterative formula**

/ˌɪtəɹətɪv ˈfɔːmjʊlə/

 **integration by substitution**

/ˌɪntɪˈɡreɪʃn baɪ ˌsʌbstɪˈtjuːʃn/

 **Mechanics**

/miˈkæniks/

 **force**

/fɔːs/

 **components**

/kəmˈpəʊnənts/

Further Mathematics

Topic 3 · Further Mechanics

○ horizontal circle

/ˈhɒrɪˈzɒntl 'sɜːkl/

○ vertical circle

/ˈvɜːtɪkl 'sɜːkl/

↺ Hooke's law

/hʊks lɔː/

↗ modulus of elasticity

/ˈmɒdʒələs ɒv ɪləˈstɪsɪti/

↺ elastic potential energy

/ɪˈlæstɪk pəˈtenʃl 'enədʒi/

Computer Science

Topics 7–8 · Ethics and Ownership, Databases

🚗 autonomous vehicles

/ɔːˈtɒnəməs ˈviəkɪlz/

📷 optical character recognition

/ˈɒptɪkl ˈkærɪktə ˌrekəɡˈnɪʃn/

🗣️ text-to-speech

/tekst tə spiːtʃ/

⚖️ bias

/ˈbaɪəs/

📁 flat files

/flæt faɪlz/

📂 data redundancy

/ˈdeɪtə rɪˈdʌndənsi/

 **data inconsistency**

/ˈdeɪtə ˌɪnkənˈsɪstənsi/

 **relational database**

/rɪˈleɪʃənəl ˈdeɪtəbeɪs/

 **table**

/'teɪbl/

 **entity**

/'entɪti/

 **record**

/'rekɔːd/

 **field**

/fiːld/

 **primary key**

/'praɪməri kiː/

 **foreign key**

/'fɔːrən kiː/

 **composite key**

/'kɒmpəzɪt kiː/

 **candidate key**

/'kændɪdɪt kiː/

 **referential integrity**

/ˌrefə'renʃl mɪ'tegriti/

 **entity-relationship diagram**

/'entɪti rɪˈleɪʃənʃɪp ˈdaɪəgræm/

 **cardinality**

/ˌkɑːdɪ'nælɪti/

 **one-to-many**

/wʌn tə 'meni/

 **link table**

/lɪŋk 'teɪbl/

 **normalisation**

/ˌnɔːməlaɪ'zeɪʃn/

 **normal forms**

/ˈnɔːml fɔːmz/

 **atomic**

/əˈtɒmɪk/

→ **transitive dependency**

/ˈtrænsɪtɪv dɪˈpendənsi/

 **DBMS**

/ˌdiː biː em ˈes/

 **data dictionary**

/ˈdeɪtə ˈdɪkʃənəri/

 **concurrent access**

/kənˈkʌrənt ˈækses/

Economics

Topic 4 · The macroeconomy

 **gross national income**

/grəʊs ˈnæʃənl ˈɪŋkʌm/

 **nominal**

/ˈnɒmɪnl/

 **real**

/rɪəl/

 **per capita**

/pɜː ˈkæpɪtə/

 **standard of living**

/ˈstændəd ɒv ˈlɪvɪŋ/

 **distribution**

/ˌdɪstrɪˈbjʊːʃn/

 **informal economy**

/ɪnˈfɔːml ɪˈkɒnəmi/

 **circular flow of income**

/ˈsɜːkjʊlə fləʊ ɒv ˈɪŋkʌm/

 **household**

/ˈhaʊshəʊld/

 **leakages**

/ˈliːkɪdʒɪz/

 **saving**

/ˈseɪvɪŋ/

 **taxation**

/tækˈseɪʃn/

 **imports**

/ɪmˈpɔːts/

 **injections**

/ɪnˈdʒekʃnz/

 **investment**

/ɪnˈvestmənt/

 **government spending**

/ˈgʌvənmənt ˈspendɪŋ/

Morning Reading

Grade 11 · AS · Week 12

Read each word aloud, then copy the English word three times.

◦

Reading

Read the passage aloud twice.

◦

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 :

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

= **double-slit**

/ˈdʌbl slɪt/



path difference

/pæθ ˈdɪfrəns/

 **fringe spacing**

/frɪndʒ 'speɪsɪŋ/

 **fringe**

/frɪndʒ/

 **maximum**

/'mæksɪmə/

 **minimum**

/'mɪnɪmə/

 **diffraction grating**

/dɪ'frækʃn 'ɡreɪtɪŋ/

 **normal**

/'nɔːml/

 **slit spacing**

/slɪt 'speɪsɪŋ/

 **order**

/'ɔːdə/

 **electric current**

/ɪ'lektrɪk 'kʌrənt/

 **charge carrier**

/tʃɑːdʒ 'kæriə/

 **electron**

/ɪ'lektrɒn/

 **electrolyte**

/ɪ'lektrolaɪt/

 **ion**

/'aɪɒn/

 **semiconductor**

/ˌsemɪkən'dʌktə/

 **hole**

/həʊl/

 **conventional current**

/kən'venʃənl 'kʌrənt/

 **quantised**

/ˈkwɒntaɪzd/

 **elementary charge**

/ˌelɪˈmentəri tʃɑːdʒ/

Chemistry

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

 **carbonate**

/ˈkɑːbəneɪt/

 **thermal decomposition**

/ˈθɜːml ˌdɪkɒmpəˈzɪʃn/

 **nitrate**

/ˈnaɪtreɪt/

 **thermal stability**

/ˈθɜːml stəˈbɪlɪti/

 **halogen**

/ˈhælədʒɪn/

 **volatility**

/ˌvɒləˈtɪlɪti/

 **hydrogen halide**

/ˈhaɪdrədʒɪn ˈhælaɪd/

 **halide ion**

/ˈhælaɪd ˈaɪɒn/

 **ammonia**

/æˈmɒniə/

 **precipitate**

/ˈpriːsɪpɪteɪt/

 **water purification**

/ˈwɔːtə ˌpjʊərɪfɪˈkeɪʃn/

 **bacteria**

/bækˈtɪəriə/

= triple bond

/ˈtrɪpl bɒnd/

🧪 basicity

/beɪˈsɪsɪti/

⊕ ammonium ion

/æˈmɒniəm ˈaɪən/

→ displacement

/dɪˈspleɪsmənt/

⚙ internal combustion engine

/ɪnˈtɜːnl kəmˈbʌstʃn ˈendʒɪn/

🏠 catalytic converter

/ˌkætəˈlɪtɪk kənˈvɜːtə/

Biology

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

🔄 base pair

/beɪs peə/

↕ antiparallel

/ˌæntɪˈpærəlel/

📄 semi-conservative replication

/ˈsemi kənˈsɜːvətɪv ˌreplɪˈkeɪʃn/

🧬 polymerase

/ˌpɒlɪməˈreɪz/

→ leading strand

/ˈliːdɪŋ strænd/

← lagging strand

/ˈlæɡɪŋ strænd/

🔄 ligase

/ˈlɪgeɪs/

{ } triplet

/ˈtrɪplɪt/

{ } codon	_____	_____	_____
/ˈkəʊdɒn/			
□ transcription	_____	_____	_____
/trænˈskripʃn/			
≡ template strand	_____	_____	_____
/ˈtempleɪt strænd/			
✕ non-transcribed strand	_____	_____	_____
/nɒn trænˈskraɪbd strænd/			
≡ primary transcript	_____	_____	_____
/ˈpraɪməri ˈtrænskɪpt/			
✓ exon	_____	_____	_____
/egˈzɒn/			
✂ intron	_____	_____	_____
/ɪnˈtrɒn/			
↕ translation	_____	_____	_____
/trænˈsleɪʃn/			
{ } anticodon	_____	_____	_____
/æntɪˈkəʊdɒn/			
↯ mutation	_____	_____	_____
/mjuːˈteɪʃn/			
↯ substitution	_____	_____	_____
/ˌsʌbstɪˈtjuːʃn/			
☒ deletion	_____	_____	_____
/dɪˈliːʃn/			
+ insertion	_____	_____	_____
/ɪnˈsɜːʃn/			
↑ xylem	_____	_____	_____
/ˈzaɪləm/			
💎 mineral ion	_____	_____	_____
/ˈmɪnərəl ˈaɪɒn/			

Mathematics

Topic 4 · Mechanics

 **resultant**

/rɪ'zʌltənt/

 **equilibrium**

/iːkwɪ'brɪəm/

 **contact force**

/'kɒntækt fɔːs/

 **normal reaction**

/'nɔːml rɪ'ækʃn/

 **friction**

/'frɪkʃn/

 **limiting friction**

/'lɪmɪtɪŋ 'frɪkʃn/

 **coefficient of friction**

/ˌkəʊɪ'fɪʃənt ɒv 'frɪkʃn/

 **Newton's third law**

/'njuːtntz θɜːd lɔː/

 **distance**

/'dɪstəns/

 **speed**

/spiːd/

Further Mathematics

Topic 3 · Further Mechanics

 **differential equation**

/ˌdɪfə'renʃl rɪ'kweɪʒn/

 **variable force**

/'veəriəbl fɔːs/

 conservation of momentum <i>/ˌkɒnsə'veɪʃn ɒv məʊ'mentəm/</i>			
 Newton's experimental law <i>/'njuːtnz ɛk'sperɪ'mentl lɔː/</i>			
% coefficient of restitution <i>/ˌkəʊ'fɪʃənt ɒv rɪstɪ'tjuːʃn/</i>			

Computer Science

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

 transactions <i>/træn'sækʃnz/</i>			
 views <i>/vjuːz/</i>			
 SQL <i>/ˌes kjuː 'el/</i>			
 Data Definition Language <i>/'deɪtə ,defɪ'nɪʃn 'læŋgwɪdʒ/</i>			
 Data Manipulation Language <i>/'deɪtə mə,nɪpjʊ'leɪʃn 'læŋgwɪdʒ/</i>			
 query <i>/'kwɪəri/</i>			
 join <i>/dʒɔɪn/</i>			
Σ aggregate functions <i>/'ægrɪgeɪt 'fʌŋkʃnz/</i>			
 tuple <i>/'tuːpl/</i>			
 attribute <i>/'ætrɪbjʊːt/</i>			

 secondary key /'sekəndəri ki:/			
 indexing /'indeksɪŋ/			
 data management /'deɪtə 'mænɪdʒmənt/			
 data modelling /'deɪtə 'mɒdəlɪŋ/			
 logical schema /'lɒdʒɪkl 'ski:mə/			
 data integrity /'deɪtə ɪn'tegriti/			
 data security /'deɪtə sɪ'kjʊərɪti/			
 query processor /'kwɪəri 'prəʊsesə/			
 developer interface /dɪ'veləpə 'ɪntəfeɪs/			
 computational thinking /ˌkɒmpjuː'teɪʃənəl 'θɪŋkɪŋ/			
 abstraction /əb'strækʃn/			
 decomposition /ˌdiːkɒmpə'zɪʃn/			
 algorithm /'ælgərɪθəm/			
 unambiguous /ʌnæm'bɪɡjuːəs/			
 deterministic /dɪ'tɜːmɪ'nɪstɪk/			

 **identifier table**

/aɪ'dentɪfaɪə 'teɪbl/

 **variable**

/'veəriəbl/

 **data type**

/'deɪtə taɪp/

Economics

Topic 4 · The macroeconomy

 **exports**

/'ekspɔ:ts/

 **closed economy**

/kləʊzd i'kɒnəmi/

 **open economy**

/'əʊpən i'kɒnəmi/

 **aggregate demand**

/'ægrɪgeɪt dɪ'mænd/

 **consumption**

/kən'sʌmpʃn/

 **net exports**

/net 'ekspɔ:ts/

 **aggregate supply**

/'ægrɪgeɪt sə'plaɪ/

 **short-run aggregate supply**

/ʃɔ:t rʌn 'ægrɪgeɪt sə'plaɪ/

 **long-run aggregate supply**

/lɒŋ rʌn 'ægrɪgeɪt sə'plaɪ/

 **productive capacity**

/prə'dʌktɪv kə'pæsɪti/

 **macroeconomic
equilibrium**
/ˌmækroʊrɪːkəˈnɒmɪk ˌiːkwɪˈlɪbrɪəm/

 **price level**
/praɪs ˈlevl/

 **real output**
/rɪəl ˈaʊtpʊt/

 **actual growth**
/ˈæktʃuəl grəʊθ/

 **potential growth**
/pəˈtenʃl grəʊθ/

 **productivity**
/ˌprɒdækˈtɪvɪti/

Morning Reading

Grade 11 · AS · Week 13

Read each word aloud, then copy the English word three times.

。

Reading

Read the passage aloud twice.

。

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 :

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

Topic 9 · Electricity

⊕ **coulomb**

/ˈkuːlɒm/

⋮ **number density**

/ˈnʌmbə ˈdensɪti/

→ **drift velocity**

/drɪft vəˈlɒsɪti/

 **potential difference**

/pə'tenʃl 'dɪfrəns/

 **volt**

/vəʊlt/

 **electromotive force**

/ɪˌlektərəʊ'məʊtɪv fɔːs/

 **resistance**

/rɪ'zɪstəns/

 **ohm**

/əʊm/

 **Ohm's law**

/əʊmz lɔː/

 **filament lamp**

/ˈfɪləmənt læmp/

 **diode**

/ˈdaɪəʊd/

 **resistivity**

/ˌrɪːzɪ'stɪvəti/

 **insulator**

/ˈɪnsjuːlətə/

 **lattice vibration**

/ˈlætɪs vaɪˈbreɪʃn/

 **scatters**

/ˈskætəz/

 **light-dependent resistor**

/laɪt dɪˈpendənt rɪˈzɪstə/

 **light intensity**

/laɪt ɪnˈtensɪti/

 **thermistor**

/ˈθɜːmɪstə/

↘ **negative temperature coefficient**

/ˈnegətɪv ˈtemprɪtʃə ,kəʊɪˈfɪʃənt/

↗ **potential divider**

/pəˈtenʃl dɪˈvaɪdə/

Chemistry

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

☁ **exhaust gases**

/egˈzɔːst ˈɡæsɪz/

☁ **photochemical smog**

/ˌfəʊtəʊˈkemɪkl smɒɡ/

☁ **acid rain**

/ˈæsɪd reɪn/

☁ **sulfur dioxide**

/ˈsʌlfəː daɪˈɒksaɪd/

⬡ **alkane**

/ˈælkəɪn/

🏷 **functional group**

/ˈfʌŋkʃənəl gruːp/

Σ **general formula**

/ˈdʒenərəl ˈfɔːmjələ/

⬡ **structural formula**

/ˈstrʌktʃərəl ˈfɔːmjələ/

⬡ **displayed formula**

/dɪˈspleɪd ˈfɔːmjələ/

🦴 **skeletal formula**

/ˈskelɪtl ˈfɔːmjələ/

T **nomenclature**

/nəˈmeɪŋklatʃə/

≡ **homologous series**

/həˈmɒləgəs ˈsɪəriːz/

○	saturated /'sætʃəreɪtɪd/			
∞	unsaturated /ʌn'sætʃəreɪtɪd/			
↗	homolytic fission /həmə'litik 'fɪʃn/			
✂	heterolytic fission /hetrə'litik 'fɪʃn/			
⊕	nucleophile /'nju:klɒfaɪl/			

Biology

Topic 7 · Transport in plants

↕	phloem /'fləʊm/			
↕	assimilate /ə'sɪmɪleɪt/			
✂	transverse section /træns'vɜ:s 'sekʃn/			
🌿	dicotyledonous plant /dɪkə'tɪ'li:dənəs plænt/			
🚰	vessel /'vesl/			
🏠	lignin /'lɪgnɪn/			
🚰	sieve tube /sɪv tju:b/			
🚰	sieve plate /sɪv pleɪt/			
🏠	companion cell /kəm'pæniən sel/			
🚰	vascular bundle /'væskjələ 'bændl/			

 **root hair cell**

/ru:t heə sel/

 **apoplast pathway**

/'æpəpləst 'pæθweɪ/

 **symplast pathway**

/'sɪmpləst 'pæθweɪ/

 **endodermis**

/'endədəməɪs/

 **Casparian strip**

/kæ'speəriən stri:p/

 **suberin**

/'sʌbəɪn/

 **transpiration**

/trænspeɪ'reɪʃn/

 **evaporation**

/ɪvəpeɪ'reɪʃn/

 **water vapour**

/'wɔ:tə 'veɪpə/

 **diffuse**

/dɪ'fju:z/

 **stomata**

/'stəʊmətə/

 **atmosphere**

/'ætməsfiə/

Mathematics

Topic 4 · Mechanics

→ **displacement**

/di'spleismənt/

↻ **velocity**

/və'lɒsiti/

↻ **acceleration**

/ək'selə'reɪʃn/

⌒ **velocity-time graph**

/və'lɒsiti taɪm græf/

↻ **constant acceleration**

/'kɒnstənt ək'selə'reɪʃn/

⇒ **momentum**

/məʊ'mentəm/

↔ **conservation of momentum**

/,kɒnsə'veɪʃn ɒv məʊ'mentəm/

🍏 **Newton's laws of motion**

/'nju:tnz lɔ:z ɒv 'məʊʃn/

🏋️ **mass**

/mæs/

⚖️ **weight**

/weɪt/

Further Mathematics

Topic 3 · Further Mechanics

🌀 **bounding parabola**

/'baʊndɪŋ pə'ræbələ/

□ **lamina**

/'læmɪnə/

↕ **coplanar forces**

/ˌkəʊˈpleɪnə ˈfɔːsɪz/

△ **conical pendulum**

/ˈkɒnɪkl ˈpendjələm/

↑ **normal contact force**

/ˈnɔːml ˈkɒntækt fɔːs/

Computer Science

Topics 4–10 · Processor Fundamentals, Algorithm Design and Problem-solving, Data Types and Structures

📄 **pseudocode**

/ˈsuːdəʊkəʊd/

≡ **sequence**

/ˈsiːkwəns/

⌘ **selection**

/sɪˈlekʃn/

↺ **iteration**

/ˌɪtəˈreɪʃn/

↻ **loop**

/luːp/

= **assignment**

/əˈsainmənt/

∞ **concatenation**

/kənˌkætəˈneɪʃn/

📄 **structured English**

/ˈstrʌktʃəd ˈɪŋɡlɪʃ/

⌘ **flowchart**

/ˈfləʊtʃɑːt/

≡ **stepwise refinement**

/ˈstepwaɪz rɪˈfaɪnmənt/

() **logic statement**

/ˈlɒdʒɪk ˈsteɪtmənt/

 precedence /'presɪdəns/			
 De Morgan's law /də 'mɔːgənz lɔː/			
 procedure /prə'siːdʒə/			
 array /ə'rei/			
 index /'ɪndeks/			
 element /'elɪmənt/			
 bounds /baʊndz/			
 dimension /daɪ'menʃn/			
 linear search /'lɪniə sɜːtʃ/			
 file /faɪl/			
 text file /tekst faɪl/			
 end of file /end ɒv faɪl/			
 Abstract Data Type /'æbstrækt 'deɪtə taɪp/			
 stack /stæk/			
 LIFO /'laɪfəʊ/			
 push /pʊʃ/			

↑ **pop**
/pɒp/

Economics

Topic 4 · The macroeconomy

↺ **business cycle**
/'biznəs 'saɪkl/

↗ **boom**
/bu:m/

↘ **recession**
/rɪ'seʃn/

↓ **slump**
/slʌmp/

↗ **recovery**
/rɪ'kʌvəri/

📋 **claimant count**
/'kleɪmənt kaʊnt/

📋 **labour force survey**
/'leɪbə fɔ:s 'sɜ:vɪ/

👥 **labour force**
/'leɪbə fɔ:s/

↔ **frictional unemployment**
/'frɪkʃənl ʌnem'plɔɪmənt/

🏢 **structural unemployment**
/'strʌktʃərəl ʌnem'plɔɪmənt/

↺ **cyclical unemployment**
/'saɪklɪkl ʌnem'plɔɪmənt/

🌞 **seasonal unemployment**
/'si:zənl ʌnem'plɔɪmənt/

 **inflation**

/ɪnˈfleɪʃn/

 **purchasing power**

/ˈpɜːtʃɪsɪŋ ˈpaʊə/

 **deflation**

/diːˈfleɪʃn/

 **disinflation**

/ˌdɪsɪnˈfleɪʃn/

Morning Reading

Grade 11 · AS · Week 14

Read each word aloud, then copy the English word three times.

。

Reading

Read the passage aloud twice.

。

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 :

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

 **breadboard**

/ˈbredbɔːd/

 **multimeter**

/ˌmʌltɪˈmiːtə/

 **internal resistance**

/ɪnˈtɜːnl rɪˈzɪstəns/

 cell /sel/			
 terminal p.d. /'tɜ:mɪnl pi: 'di:/			
 open circuit /'əʊpən 'sɜ:kɪt/			
 short circuit /'ʃɔ:t 'sɜ:kɪt/			
 ammeter /'æmi:tə/			
 voltmeter /'vəʊltmi:tə/			
 LED /,el i: 'di:/			
 capacitor /kə'pæsɪtə/			
 fuse /'fju:z/			
 junction /'dʒʌŋkʃn/			
 conservation of charge /,kɒnsə'veɪʃn ɒv tʃɑ:dʒ/			
 loop /lu:p/			
 Kirchhoff's first law /'kɜ:khɒfs fɜ:st lɔ:/			
 Kirchhoff's second law /'kɜ:khɒfs 'sekənd lɔ:/			
 rheostat /'ri:əstæt/			
 sensor /'sensə/			

 **transistor**
/træn'zistə/

Chemistry

Topic 13 · An introduction to AS Level organic chemistry

 **electrophile**
/ɪˌlektərəʃfaɪl/

+ **addition**
/ə'dɪʃn/

 **substitution**
/ˌsʌbstɪ'tjuːʃn/

— **elimination**
/ɪˌlɪmɪ'neɪʃn/

 **condensation**
/kɒnden'seɪʃn/

 **initiation**
/ɪˌnɪʃɪ'eɪʃn/

 **propagation**
/ˌprɒpə'geɪʃn/

 **termination**
/ˌtɜːmɪ'neɪʃn/

 **free-radical substitution**
/friː 'rædɪkl ˌsʌbstɪ'tjuːʃn/

+ **electrophilic addition**
/ɪˌlektərəʃfɪlɪk ə'dɪʃn/

 **nucleophilic substitution**
/ˌnjuːkliəʃfɪlɪk ˌsʌbstɪ'tjuːʃn/

+ **nucleophilic addition**
/ˌnjuːkliəʃfɪlɪk ə'dɪʃn/

 **curly arrow**
/'kɜːli 'æəʊ/

 **cyclic**
/'saɪklɪk/

 **planar**
/'pleɪnə/

 **isomerism**
/'aɪsəməraɪzəm/

 **structural isomerism**
/'strʌktʃərəl 'aɪsəməraɪzəm/

 **chain isomerism**
/'tʃeɪn 'aɪsəməraɪzəm/

Biology

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

 **cohesion**
/'kəʊ'hiːʒn/

 **tension**
/'tenʃn/

 **adhesion**
/'əd'hiːʒn/

 **xerophyte**
/'zɪərəʊfaɪt/

 **adapted**
/'ə'dæptɪd/

 **cuticle**
/'kjuːtɪkl/

 **source**
/sɔːs/

 **sink**
/sɪŋk/

 **proton pump**
/'prəʊtɒn pʌmp/

 **cotransporter protein**

/ˈkɒtrənsˌpɔːtə ˈprəʊtiːn/

 **hydrostatic pressure**

/ˌhaɪdrəˈstætɪk ˈpreʃə/

 **mass flow**

/mæs fləʊ/

 **blood vessel**

/blʌd ˈvesl/

 **heart**

/hɑːt/

 **double circulation**

/ˈdʌbl ˌsɜːkjʊˈleɪʃn/

 **circulatory system**

/ˌsɜːkjʊˈleɪtəri ˈsɪstəm/

 **pulmonary circulation**

/ˈpʌlmənəri ˌsɜːkjʊˈleɪʃn/

 **systemic circulation**

/sɪˈstemɪk ˌsɜːkjʊˈleɪʃn/

 **artery**

/ˈɑːtəri/

 **arteriole**

/ɑːˈtɪəriəʊl/

 **capillary**

/kəˈpɪləri/

 **venule**

/ˈvenjuːl/

Mathematics

Topic 4 · Mechanics

 tension <i>/ˈtɛnʃn/</i>			
 inclined plane <i>/ɪnˈklaɪnd pleɪn/</i>			
 connected particles <i>/kəˈnektɪd ˈpɑːtɪklz/</i>			
 work done <i>/wɜːk dʌn/</i>			
 kinetic energy <i>/kɪˈnetɪk ˈenədʒi/</i>			
 gravitational potential energy <i>/ˌɡrævɪˈteɪʃənəl pəˈtenʃl ˈenədʒi/</i>			
 conservation of energy <i>/ˌkɒnsəˈveɪʃn ɒv ˈenədʒi/</i>			
 power <i>/ˈpaʊə/</i>			
 limiting equilibrium <i>/ˈlɪmɪtɪŋ ˌɪkwɪˈlɪbrɪəm/</i>			
 deceleration <i>/dɪˌseləˈreɪʃn/</i>			

Further Mathematics

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

 oblique impact <i>/əˈblɪk ˈɪmpækt/</i>			
 Further Probability & Statistics <i>/ˈfɜːðə ˌprɒbəˈbɪlɪti ænd stəˈtɪstɪks/</i>			

 **probability density function**

/ˌprɒbəˈbɪlɪti ˈdensɪti ˈfʌŋkʃn/

 **cumulative distribution function**

/'kjuːmjələtɪv ˌdɪstrɪˈbjʊːʃn ˈfʌŋkʃn/

Computer Science

Topics 5–11 · System Software, Algorithm Design and Problem-solving, Data Types and Structures, Programming

 **queue**

/kjuː/

 **FIFO**

/'faɪfəʊ/

 **enqueue**

/enˈkjuː/

 **dequeue**

/diːˈkjuː/

 **linked list**

/lɪŋkt list/

 **node**

/nəʊd/

 **pointer**

/'pɔɪntə/

 **traverse**

/trəˈvɜːs/

 **underflow**

/ˌʌndəˈfləʊ/

 **circular array**

/'sɜːkjʊlə ə'reɪ/

 **free list**

/friː list/

 **record structure**

/'rekɔːd ˈstrʌktʃə/

↕ bubble sort /'bʌbl sɔ:t/			
🔒 constant /'kɒnstənt/			
+ operators /'ɒpəreɪtəz/			
📖 library routines /'laɪbrəri ru:'ti:nz/			
>≡ nested /'nestɪd/			
↺ count-controlled loop /kaʊnt kən'trəʊld lu:p/			
↑ pre-condition loop /pri: kən'dɪʃn lu:p/			
↓ post-condition loop /pəʊst kən'dɪʃn lu:p/			
≡ structured programming /'strʌktʃəd 'prəʊgræmɪŋ/			
() parameters /pə'ræmɪtəz/			
ƒ function /'fʌŋkʃn/			
() arguments /'ɑ:gju:mənts/			
📄 pass by value /pæs baɪ 'vælju:/			
🔗 pass by reference /pæs baɪ 'refrəns/			

Economics

Topics 4–5 · The macroeconomy, Government macroeconomic intervention

 **consumer price index**

/kən'su:mə prais 'indeks/

 **weight**

/weit/

 **demand-pull inflation**

/di'mænd pʊl m'fleɪʃn/

 **cost-push inflation**

/kɒst pʊʃ m'fleɪʃn/

 **price stability**

/prais stə'bɪlɪti/

 **full employment**

/fʊl em'plɔɪmənt/

 **balance of payments**

/'bæləns ɒv 'peɪmənts/

 **redistribution of income**

/,riːdɪstrɪ'bjuːʃn ɒv 'ɪŋkʌm/

 **conflict**

/'kɒnflikt/

 **demand-side policies**

/di'mænd saɪd 'pɒlɪsɪz/

 **fiscal policy**

/'fɪskl 'pɒlɪsi/

 **budget**

/'bʌdʒɪt/

 **budget deficit**

/'bʌdʒɪt 'defɪsɪt/

 **national debt**

/ˈnæʃənl det/

 **budget surplus**

/ˈbʌdʒɪt ˈsɜːpləs/

 **direct tax**

/daɪˈrekt tæks/

Morning Reading

Grade 11 · AS · Week 15

Read each word aloud, then copy the English word three times.

◦

Reading

Read the passage aloud twice.

◦

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 :

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, D.C. circuits, Particle physics

 **comparator**

/kəm'pæreɪtə/

— **threshold**

/'θrefəʊld/

 **potentiometer**

/pə'tenti'bɪmɪtə/

↔ **jockey**

/'dʒɒki/

 **galvanometer**

/ˌgælvə'nɒmɪtə/

⊖ **null method**

/nʌl 'meθəd/

⊙ **alpha particle α**

/'ælfə 'pɑ:tɪkl/

↗ **deflection**

/dɪ'flekʃn/

⊙ **nucleus**

/'nju:klɪəs/

⊕ **proton**

/'prəʊtɒn/

○ **neutron**

/'nju:trɒn/

⊗ **nuclide**

/'nju:klɪd/

proton number

/'prəʊtɒn 'nʌmbə/

Σ **nucleon number**

/'nju:klɪən 'nʌmbə/

⊙ **nucleon**

/'nju:klɪən/

 **isotope**

/ˈaɪsəʊtəʊp/

 **unified atomic mass unit**

/ˈjuːnɪfaɪd əˈtɒmɪk məs ˈjuːnɪt/

 **radiation**

/ˌreɪdɪˈeɪʃn/

 **radioactive**

/ˌreɪdɪəʊˈæktɪv/

 **ionising**

/ˈaɪənaɪzɪŋ/

Chemistry

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

 **positional isomerism**

/pəˈzɪʃənl ˈaɪsəməraɪzəm/

 **functional group isomerism**

/ˈfʌŋkʃənl gruːp ˈaɪsəməraɪzəm/

 **stereoisomerism**

/ˈsteriəʊaɪsəməraɪzəm/

 **geometrical isomerism**

/ˌdʒiːəʊˈmetrɪkl ˈaɪsəməraɪzəm/

 **restricted rotation**

/rɪˈstrɪktɪd rəʊˈteɪʃn/

 **cis**

/sɪs/

 **trans**

/trænz/

 **optical isomerism**

/ˈɒptɪkl ˈaɪsəməraɪzəm/

 chiral /'kairəl/			
 chiral centre /'kairəl 'sentə/			
 enantiomers /e'næntiəməz/			
+ hydrogenation /haɪ'drədʒəneɪʃn/			
 alkene /'ælkɪn/			
 cracking /'krækɪŋ/			
 combustion /kəm'bʌstʃn/			
 complete combustion /kəm'pli:t kəm'bʌstʃn/			
 incomplete combustion /ɪŋkəm'pli:t kəm'bʌstʃn/			
 carbon monoxide /'kɑ:bən mʌ'nɒksaɪd/			

Biology

Topic 8 · Transport in mammals

 vein /veɪn/			
 pulmonary artery /'pʌlmənəri 'ɑ:təri/			
 pulmonary vein /'pʌlmənəri veɪn/			
 aorta /eɪ'ɔ:tə/			

 vena cava /'vi:nə 'kɑ:və/			
 muscle /'mʌsl/			
 elastic /'læstɪk/			
 lumen /'lu:men/			
 valve /vælv/			
 red blood cell /red blʌd sel/			
 monocyte /'mɒnəʊsaɪt/			
 neutrophil /'nju:trəfɪl/			
 lymphocyte /'lɪmfəsaɪt/			
 plasma /'plæzmə/			
 tissue fluid /'tɪʃu: 'flu:ɪd/			
 oxygen dissociation curve /'ɒksɪdʒn dɪ'səʊsi'eɪʃn kɜ:v/			
 saturation /sætʃə'reɪʃn/			
 partial pressure /'pɑ:ʃl 'preʃə/			
 Bohr shift /'bəʊə ʃɪft/			
 carbonic anhydrase /kɑ:'bɒnɪk 'ænhɑɪdreɪz/			

± **hydrogencarbonate ion**

/ˈhaɪdrədʒɛŋkɑːbɒneɪt ˈaɪɒn/

± **chloride ion**

/ˈklɔːraɪd ˈaɪɒn/

Mathematics

Topics 4–5 · Mechanics, Probability & Statistics 1

✈ **thrust**

/θrʌst/

≡ **air resistance**

/eə rɪˈzɪstəns/

📊 **Probability & Statistics**

/ˌprɒbəˈbɪlɪtɪ ænd stəˈtɪstɪks/

📊 **stem-and-leaf diagram**

/stem ænd liːf ˈdaɪəgræm/

📊 **box-and-whisker plot**

/bɒks ænd ˈwɪskə plɒt/

📊 **histogram**

/ˈhɪstəgræm/

📈 **cumulative frequency**

/ˈkjuːmjʊlətɪv ˈfriːkwənsi/

≡ **central tendency**

/ˈsentrəl ˈtendənsi/

— **mean**

/miːn/

≡ **median**

/ˈmiːdiən/

Further Mathematics

Topic 4 · Further Probability & Statistics

% percentiles

/pə'sentailz/

≡ median

/'mi:di:ən/

⚗ hypothesis test

/haɪ'pəθəsis test/

[] confidence interval

/'kɒnfɪdəns 'ɪntəvl/

Computer Science

Topics 11–12 · Programming, Software Development

□ local variable

/'ləʊkl 'veəriəbl/

⊕ global variable

/'gləʊbl 'veəriəbl/

⌚ scope

/skəʊp/

✍ signature

/'sɪɡnɪtʃə/

🔒 invariant

/ɪn'veəriənt/

↺ development life cycle

/dɪ'veləpmənt laɪf 'saɪkl/

📋 requirements

/rɪ'kwaɪəmənts/

✚ waterfall

/'wɔ:təfɔ:l/

↺ iterative model

/'ɪtərətɪv 'mɒdl/

Rapid Application Development

/ˈræpɪd ˌæplɪˈkeɪʃn dɪˈveləpmənt/

prototype

/ˈprəʊtəʊtaɪp/

Agile

/ˈædʒaɪl/

implementation

/ˌɪmplɪmənˈteɪʃn/

maintenance

/ˈmeɪntənəns/

structure chart

/ˈstrʌktʃə tʃɑ:t/

state-transition diagram

/steɪt trænsɪʃn ˈdaɪəgræm/

states

/steɪts/

syntax error

/ˈsɪntæks ˈerə/

run-time error

/rʌn taɪm ˈerə/

logic error

/ˈlɒdʒɪk ˈerə/

dry run

/draɪ rʌn/

walkthrough

/ˈwɔ:kθruː/

white-box testing

/waɪt bɒks ˈtestɪŋ/

black-box testing

/blæk bɒks ˈtestɪŋ/

 **integration testing**

/ˌɪntɪˈɡreɪʃn ˈtestɪŋ/

 **alpha testing** α

/ˈælfə ˈtestɪŋ/

 **beta testing** β

/ˈbi:tə ˈtestɪŋ/

 **acceptance testing**

/əkˈseptəns ˈtestɪŋ/

Economics

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

 **proportional tax**

/prəˈpɔːʃənl tæks/

 **regressive tax**

/rɪˈɡresɪv tæks/

 **expansionary**

/ekˈspænjənəri/

 **contractionary**

/kənˈtrækʃənəri/

 **crowding out**

/ˈkraʊdɪŋ aʊt/

 **monetary policy**

/ˈmʌnɪtəri ˈpɒlɪsi/

 **central bank**

/ˈsentrəl bæŋk/

 **interest rate**

/ˈɪntrest reɪt/

 **money supply**

/ˈmʌni səˈplaɪ/

 **transmission mechanism**

/trænˈsmɪʃn ˈmekənɪzəm/

 **supply-side policy**

/sə'plaɪ saɪd 'pɒlɪsi/

 **privatisation**

/ˌpraɪvətəɪ'zeɪʃn/

 **deregulation**

/diːˌregjʊ'leɪʃn/

 **training**

/'treɪnɪŋ/

 **infrastructure**

/'ɪnfəstrʌktʃə/

 **international trade**

/ˌɪntə'næʃənl treɪd/

Morning Reading

Grade 11 · AS · Week 16

Read each word aloud, then copy the English word three times.

。

Reading

Read the passage aloud twice.

。

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 :

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 11 · Particle physics

▣ discrete

/di'skri:t/

☁ cloud chamber

/klaʊd 'tʃeɪmbə/

— beta particle β

/'bi:tə 'pɑ:tɪkl/

⊕ positron

/'pɒzɪtrɒn/

— continuous

/kən'tɪnju:əs/

✚ photon

/'fəʊtɒn/

↘ attenuated

/ə'tenju:etɪd/

☸ gamma ray γ

/'gæmə reɪ/

☒ daughter nucleus

/'dɔ:tə 'nju:klɪəs/

⚡ excited state

/ek'saɪtɪd steɪt/

± antiparticle

/'æntɪ'pɑ:tɪkl/

⦿ antineutrino

/'æntɪnju:'tri:nəʊ/

○ neutrino

/'nju:'tri:nəʊ/

☒ quark

/kwɑ:k/

☺ flavours

/'fleɪvəz/

 **antiquark**

/ˈæntɪkwɑːk/

 **hadrons**

/ˈhædrɒnz/

 **baryons**

/ˈbæriɒnz/

 **mesons**

/ˈmiːzɒnz/

 **leptons**

/ˈleptɒnz/

Chemistry

Topics 14–15 · Hydrocarbons, Halogen compounds

 **ultraviolet light**

/ˌʊltrəˈvaɪəlit laɪt/

 **crude oil**

/kruːd ɔɪl/

 **fraction**

/ˈfrækʃn/

 **halogenoalkane**

/ˈheɪlədʒnəʊlkeɪn/

 **dehydration**

/ˌdiːhaɪˈdreɪʃn/

 **alcohol**

/ˈælkəhɒl/

 **steam**

/stiːm/

 **diol**

/diˈɒl/

 **bromine water**

/ˈbrəʊmaɪn ˈwɔːtə/

 **addition polymerisation**

/əˈdɪʃn ˌpɒlɪməraɪˈzeɪʃn/

 polymer /'pɒlɪmə/			
 carbocation /ˌkɑːbəˈkeɪʃn/			
 inductive effect /ɪnˈdʌktɪv ɪˈfekt/			
 Markovnikov's rule /'mɑːkəvnikəvz ruːl/			
 primary /'praɪməri/			
 secondary /'sekəndəri/			
 tertiary /'tɜːʃjəri/			
 nitrile /'naɪtraɪl/			

Biology

Topics 8–9 · Transport in mammals, Gas exchange

 chloride shift /'klɔːraɪd ʃɪft/			
 haemoglobin /ˌhiːməˈgləʊˈbɪnɪk 'æsɪd/			
 carbaminohaemoglobin /ˌkɑːbəˈmɪnəsˌhiːməˈgləʊbɪn/			
 atrium /'eɪtriəm/			
 ventricle /'ventrɪkl/			
 cardiac cycle /'kɑːdiæk 'saɪkl/			

✂ systole

/ˈsɪstəʊl/

[] diastole

/ˈdaɪəstəʊl/

⚡ sinoatrial node

/sɪˈnəʊtriəl nɒd/

⚡ atrioventricular node

/ˌeɪtri,əʊvənˈtrɪkjələ nɒd/

🌀 Purkyne tissue

/ˈpɜːkain ˈtɪʃuː/

↔ gas exchange

/gæs eksˈtʃeɪndʒ/

≡ trachea

/trəˈkiə/

🌿 bronchus

/ˈbrɒŋkəs/

🌿 bronchiole

/ˈbrɒŋkiəʊl/

⋮ alveoli

/ˈælvɪəli/

≡ lungs

/lʌŋz/

≡ cartilage

/ˈkɑːtɪlɪdʒ/

≡ ciliated epithelium

/ˈsɪliətɪd ˌepɪˈθiːliəm/

💧 mucus

/ˈmjuːkəs/

💧 goblet cell

/ˈɡɒblət sel/

💧 mucous gland

/ˈmjuːkəs glænd/

Mathematics

Topic 5 · Probability & Statistics 1

↗ **mode**

/məʊd/

↕ **variation**

/ˌveəri'eɪʃn/

↔ **range (of data)**

/reɪndʒ/

[] **interquartile range**

/ˌɪntə'kwɔːtaɪl reɪndʒ/

🔔 **standard deviation**

/ˈstændəd ˌdiːvɪ'eɪʃn/

↕ **variance**

/ˈveəriəns/

↔ **permutation**

/ˌpɜːmjʊ:'teɪʃn/

🔗 **combination**

/ˌkɒmbɪ'neɪʃn/

⊖ **mutually exclusive events**

/ˈmjuːtʃu:əli eks'kluːsɪv r'vents/

↔ **independent events**

/ˌɪndɪ'pendənt r'vents/

Further Mathematics

Topic 4 · Further Probability & Statistics

 **pooled estimate**

/puːld 'estɪmət/

 **chi-squared test**

/kaɪ skweəd test/

 **theoretical distribution**

/θɪə'retɪkl dɪstrɪ'bjuːʃn/

 **degrees of freedom**

/di'griːz ov 'friːdəm/

Computer Science

Topics 1–12 · Information representation, Communication, Hardware, System Software, Algorithm Design and Problem-solving, Data Types and Structures, Programming, Software Development

 **stub**

/stʌb/

 **test strategy**

/test 'strætədʒi/

 **test plan**

/test plæn/

 **normal data**

/ˈnɔːml 'deɪtə/

 **abnormal data**

/əbˈnɔːml 'deɪtə/

 **boundary data**

/ˈbaʊndəri 'deɪtə/

 **perfective maintenance**

/pə'fektɪv 'meɪntənəns/

 **adaptive maintenance**

/ə'dæptɪv 'meɪntənəns/

 **corrective maintenance**

/kə'rektɪv 'meɪntənəns/

 **regression testing**

/rɪ'ɡresjən 'testɪŋ/

 **extreme data**

/ek'stri:m 'deɪtə/

 **drawing objects**

/'drɔ:ɪŋ 'ɒbdʒekts/

 **sample resolution**

/'sæmpl ,rezə'lu:ʃn/

 **bridge**

/brɪdʒ/

 **filament**

/'fɪləmənt/

 **diaphragm**

/'daɪəfræm/

 **lands**

/lændz/

 **multitasking**

/'mʌltɪtæskɪŋ/

 **portable**

/'pɔ:təbl/

 **counter**

/'kaʊntə/

 **lower bound**

/'ləʊə baʊnd/

 **upper bound**

/'ʌpə baʊnd/

 **insert**

/'ɪnsɜ:t/

 **trace table**

/treɪs 'teɪbl/

Economics

Topic 6 · International economic issues

 **specialise**

/ˈspeʃəlaɪz/

 **absolute advantage**

/ˈæbsəluːt ədˈvæntɪdʒ/

 **comparative advantage**

/kəmˈpærətɪv ədˈvæntɪdʒ/

 **terms of trade**

/tɜːmz ɒv treɪd/

 **protectionism**

/prəˈtekʃənɪzəm/

 **tariff**

/ˈtærɪf/

 **quota**

/ˈkwɒtə/

 **embargo**

/emˈbɑːgəʊ/

 **administrative barriers**

/ədˈmɪnɪstrətɪv ˈbærɪəz/

 **infant industry**

/ˈɪnfənt ˈɪndʌstri/

 **dumping**

/ˈdʌmpɪŋ/

 **retaliation**

/rɪˈtæliˈeɪʃn/

 **stakeholder**

/ˈsteɪkhəʊldə/

 **current account**

/ˈkʌrənt əˈkaʊnt/

 **trade in goods**

/treɪd ɪn ɡʊdz/

 **trade in services**

/treɪd ɪn 'sɜːvɪsɪz/

Morning Reading

Grade 11 · AS · Week 17

Read each word aloud, then copy the English word three times.

Reading

Read the passage aloud twice.

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 :

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

⊕ **intercept**

/ˌɪntə'sept/

÷ **division**

/dɪ'vɪʒn/

⌘ **reaction time**

/rɪ'ækʃn taɪm/

↔ **half the range**

/ha:f ðə reɪndʒ/

% **percentage difference**

/pə'sentɪdʒ 'dɪfrəns/

same number of significant figures

/seɪm 'nʌmbə ɒv sɪɡ'nɪfɪkənt 'fɪɡəz/

⊙ **error bar**

/'erə bɑː/

↗ **line of best fit**

/laɪn ɒv best fɪt/

↘ **worst acceptable line**

/wɜːst ək'septəbl laɪn/

⌘ **scale drawing**

/skeɪl 'drɔːɪŋ/

↓ **acceleration of free fall**

/ək'selə'reɪʃn ɒv friː fɔːl/

💧 **viscosity**

/vɪ'skɒsɪti/

⟨⟩ **plumb line**

/plʌm laɪn/

Chemistry

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

⬡ **amine**

/'æmaɪn/

⚗ **silver nitrate**

/'sɪlvə 'naɪtreɪt/

⚓ **transition state**

/træn'sɪʃn steɪt/

	aldehyde /'ældɪhaɪd/			
	ketone /'ketəʊn/			
	carboxylic acid /'kɑ:bək'sɪlɪk 'æsɪd/			
	ester /'estə/			
	distillation /'dɪstrɪ'leɪʃn/			
	reflux /'ri:flʌks/			
	tri-iodomethane /'traɪ 'aɪədəʊmθeɪn/			
	acidity /'æ'sɪdɪti/			
	carbonyl compound /'kɑ:bənəl 'kɒmpaʊnd/			
	carbonyl /'kɑ:bənəl/			
	hydrogen cyanide /'haɪdrədʒɪn 'saɪənaɪd/			
	hydroxynitrile /'haɪ'drɒksmaɪtrɪl/			
	Fehling's reagent /'feɪlɪŋz rɪ'eɪdʒənt/			
	Tollens' reagent /'təʊlənz rɪ'eɪdʒənt/			
	esterification /'estə,rɪfɪ'keɪʃn/			

Biology

Topics 9–10 · Gas exchange, Infectious diseases

🦠 **microbe**

/ˈmaɪkrəʊb/

🦶 **smooth muscle**

/smuːð ˈmʌsl/

🦶 **elastic fibre**

/ɪˈlæstɪk ˈfaɪbə/

🦶 **squamous epithelium**

/ˈskwɒməs ˌepɪˈθiːliəm/

🦠 **infectious disease**

/ɪnˈfekʃəs dɪˈziːz/

🦠 **pathogen**

/ˈpæθədʒɪn/

🦶 **transmit**

/trænˈsmɪt/

🦶 **cholera**

/ˈkɒlərə/

🦠 **contaminated**

/kənˈtæmɪneɪtɪd/

🦶 **faeces**

/ˈfiːsiːz/

🦠 **malaria**

/məˈleəriə/

🦶 **protocyst**

/ˈprəʊtəʊkɪst/

🦠 **mosquito**

/məˈskiːtəʊ/

🦠 **vector**

/ˈvektə/

🦶 **tuberculosis**

/ˌtjuːbəkjʊˈləʊsɪs/

 droplet /'drɒplɪt/			
 AIDS /eɪdz/			
 immune system /ɪ'mjuːn 'sɪstəm/			
 vaccine /væk'siːn/			
 insecticide /ɪn'sektɪsaɪd/			
 antibiotic /æntɪbaɪ'ɒtɪk/			
 penicillin /ˌpenɪ'sɪlɪn/			

Mathematics

Topic 5 · Probability & Statistics 1

 conditional probability /kən'dɪʃənl ˌprɒbə'bɪləti/			
 discrete random variable /dɪ'skriːt 'rændəm 'veəriəbl/			
 probability distribution table /ˌprɒbə'bɪləti ˌdɪstrɪ'bjuːʃn 'teɪbl/			
 expectation /ekspɪk'teɪʃn/			
 binomial distribution /baɪ'nəʊmɪəl ˌdɪstrɪ'bjuːʃn/			
 geometric distribution /ˌdʒiːə'metɪk ˌdɪstrɪ'bjuːʃn/			

 **normal distribution**

/ˈnɔːml ˌdɪstrɪˈbjʊːʃn/

 **continuous random variable**

/kənˈtɪnjuːəs ˈrændəm ˈveəriəbl/

 **approximation**

/əˌprɒksɪˈmeɪʃn/

Further Mathematics

Topic 4 · Further Probability & Statistics

 **goodness of fit**

/ˈɡʊdnəs ɒv fɪt/

 **independence**

/ˌɪndɪˈpendəns/

 **contingency table**

/kənˈtɪndʒənsi ˈteɪbl/

 **non-parametric test**

/nɒn ˌpærəˈmetrɪk test/

Computer Science

Topics 1–11 · Information representation, Communication, Hardware, Processor Fundamentals, System Software, Programming

 **return value**

/rɪˈtʃːn ˈvæljuː/

 **format**

/ˈfɔːmæt/

 **register width**

/ˈredʒɪstə wɪθ/

 **arithmetic shift**

/ˌæɪrɪθˈmetɪk ʃɪft/

 **frame**

/freɪm/

 frame rate /freɪm reɪt/			
 Public Switched Telephone Network /'pʌblɪk swɪtʃt 'telɪfəʊn 'netwɜ:k/			
 public cloud /'pʌblɪk klaʊd/			
 private cloud /'praɪvət klaʊd/			
 repeater /rɪ'pi:tə/			
 bit rate /bɪt reɪt/			
 dedicated line /'dedɪkeɪtɪd laɪn/			
 cell phone network /sel fəʊn 'netwɜ:k/			
 fuser /'fju:sə/			
 digital-to-analogue converter /'dɪdʒɪtl tu 'ænəlɒg kən'vɜ:tə/			
 actuator arms /'æktʃu:reɪtə ɑ:mz/			
 floating-gate transistor /'fləʊtɪŋ geɪt træ'n'zɪstə/			
 pits /pɪts/			
 preset value /'pri:set 'vælju:/			
 operand /'ɒpərænd/			

 number of cores <i>/ˈnʌmbə ɒv kɔːz/</i>			
 amount of RAM <i>/əˈmaʊnt ɒv ræm/</i>			
 register transfer notation <i>/ˈredʒɪstə ˈtrænsfɜː nəʊˈteɪʃn/</i>			
 interrupt register <i>/ˈɪntəʁʌpt ˈredʒɪstə/</i>			
 opcode <i>/ˈɒpkəʊd/</i>			
 memory protection <i>/ˈmeməri prəˈtekʃn/</i>			
 scheduling <i>/ˈʃedjuːlɪŋ/</i>			
 directory <i>/daɪˈrektəri/</i>			

Economics

Topics 2–6 · The price system and the microeconomy, Government microeconomic intervention, International economic issues

 primary income <i>/ˈpraɪməri ˈɪŋkʌm/</i>			
 secondary income <i>/ˈsekəndəri ˈɪŋkʌm/</i>			
 current account deficit <i>/ˈkʌrənt əˈkaʊnt ˈdefɪsɪt/</i>			
 current account surplus <i>/ˈkʌrənt əˈkaʊnt ˈsɜːpləs/</i>			

≡ floating exchange rate

/ˈfləʊtɪŋ eksˈtʃeɪndʒ reɪt/

🔒 fixed exchange rate

/fɪkst eksˈtʃeɪndʒ reɪt/

👨‍💼 managed exchange rate

/ˈmænɪdʒd eksˈtʃeɪndʒ reɪt/

↗️ appreciation

/əˌpriːʃiˈeɪʃn/

↘️ depreciation

/dɪˌpriːʃiˈeɪʃn/

💸 expenditure-reducing

/ekˈspendɪtʃə rɪˈdjuːsɪŋ/

↔️ expenditure-switching

/ekˈspendɪtʃə ˈswɪtʃɪŋ/

🏆 competitiveness

/kəmˈpetɪtɪvənəs/

% Gini coefficient

/ˈdʒɪːni ˌkəʊɪˈfɪʃənt/

🔗 derived demand

/dɪˈraɪvd dɪˈmænd/

point elasticity

/pɔɪnt ɪləˈstɪsɪti/

Morning Reading

Grade 11 · AS · Week 18

Read each word aloud, then copy the English word three times.

◦

Reading

Read the passage aloud twice.

◦

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 :

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 2–11 · Kinematics, Dynamics, Forces, density and pressure, Work, energy and power, Deformation of solids, Waves, Superposition, Electricity, D.C. circuits, Particle physics

 **graphical methods**

/ˈgræfɪkl ˈmeθədz/

 **non-uniform**

/nɒn ˈjuːnɪfɔːm/

 **closed vector triangle**

/kləʊzd ˈvektə ˈtraɪæŋɡl/

 **electrical**

/ɪˈlektrɪkl/

 **bungee jumper**

/ˈbʌndʒiː ˈdʒʌmpə/

 **rubber band**

/ˈrʌbə bænd/

 **elastic hysteresis**

/ɪˈlæstɪk ˌhɪstəˈriːsɪs/

 **Wave motion**

/weɪv ˈməʊʃn/

 **γ-rays γ**

/ˈgæmə reɪz/

 **principle of superposition**

/ˈprɪnsɪpl ɒv ˌsuːpəpəˈzɪʃn/

 **semiconductor diode**

/ˌsemɪkənˈdʌktə ˈdaɪəʊd/

 **closed loop**

/kləʊzd luːp/

 **balance length**

/ˈbæləns leŋθ/

 **driver cell**

/ˈdraɪvə sel/

• **fundamental particles**

/ˌfʌndə'mentl 'pɑ:tɪklz/

 **uniform gravitational field**

/ˈjuːnɪfɔːm ˌgrævɪ'teɪʃənl fiːld/

 **negligible**

/ˈneglɪdʒəbl/

 **parabola**

/pə'reɪbələ/

→ **driving force**

/ˈdraɪvɪŋ fɔːs/

Chemistry

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

 **monomer**

/ˈmɒnəʊmə/

 **repeat unit**

/rɪ'pi:t 'juːnɪt/

 **poly(ethene)**

/ˈpɒli/

 **poly(chloroethene)**

/ˈpɒli/

 **non-biodegradable**

/nɒn ˌbaɪəʊdɪ'greɪdəbl/

 **synthetic route**

/sɪn'θetik ruːt/

 **reagent**

/rɪ'eɪdʒənt/

 **by-product**

/baɪ 'prɒdʌkt/

 **infrared spectroscopy**

/ˌɪnfərəˈred spekˈtrɒskəpi/

 **absorption**

/əbˈsɔːpʃn/

 **wavenumber**

/ˈweɪvnʌmbə/

 **mass spectrometry**

/mæs spekˈtrɒmətri/

 **mass-to-charge ratio**

/mæs tə tʃɑːdʒ ˈreɪʃiəʊ/

 **isotopic abundance**

/ˌaɪsəˈtɒpɪk əˈbʌndəns/

 **molecular ion**

/məˈlekjələ ˈaɪɒn/

 **molecular ion peak**

/məˈlekjələ ˈaɪɒn piːk/

 **fragmentation**

/ˌfrægmənˈteɪʃn/

 **fragment**

/ˈfrægmənt/

Biology

Topics 10–11 · Infectious diseases, Immunity

 **resistance**

/rɪˈzɪstəns/

 **phagocyte**

/ˈfægəsaɪt/

 **macrophage**

/ˈmækrəfɪdʒ/

 **phagocytosis**

/ˌfægəsiˈtəʊsɪs/

	self antigen			
	/self 'æntɪdʒən/			
	non-self antigen			
	/nɒn self 'æntɪdʒən/			
	immune response			
	/ɪ'mju:n rɪ'spɒns/			
	T-helper cell	T		
	/ti: 'helpə sel/			
	plasma cell			
	/'plæzmə sel/			
	memory cell			
	/'meməri sel/			
	T-killer cell	T		
	/ti: 'kɪlə sel/			
	antigen-binding site			
	/'æntɪdʒən 'baɪndɪŋ saɪt/			
	variable region			
	/'veəriəbl 'ri:dʒən/			
	monoclonal antibody			
	/'mɒnəʊklɒnl 'æntɪbɒdi/			
	hybridoma			
	/'haɪbrɪ'dəʊmə/			
	diagnosis			
	/'daɪəg'nəʊsɪs/			
	active immunity			
	/'æktɪv ɪ'mju:nɪti/			
	passive immunity			
	/'pæsɪv ɪ'mju:nɪti/			

 natural immunity			
/ˈnætʃərəl ɪˈmjuːnɪti/			
 artificial immunity			
/ˌɑːtɪˈfɪʃl ɪˈmjuːnɪti/			
 vaccination			
/ˌvæksɪˈneɪʃn/			
 herd immunity			
/hɜːd ɪˈmjuːnɪti/			

Mathematics

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

 continuity correction			
/kɒntɪˈnjuːɪti kəˈrekʃn/			
 standardisation			
/ˌstændədaɪˈzeɪʃn/			
 point of inflexion			
/pɔɪnt ɒv ɪnˈflekʃn/			
 improper integral			
/ɪmˈprɒpə ˈɪntɪgrəl/			
 back-to-back			
/bæk tə bæk/			
 measure of central tendency			
/ˈmeʒə ɒv ˈsentrəl ˈtendənsi/			
 Coding			
/ˈkəʊdɪŋ/			
 assumed mean			
/əˈsjuːmd miːn/			

Further Mathematics

Topic 4 · Further Probability & Statistics

sign test

/saɪn test/

Wilcoxon signed-rank test

/'wɪlkɒksn saɪnd ræŋk test/

Wilcoxon rank-sum test

/'wɪlkɒksn ræŋk sʌm test/

probability generating function

/ˌprɒbəˈbɪlɪti ˈdʒenəreɪtɪŋ ˈfʌŋkʃn/

Computer Science

Topics 1–12 · Information representation, Communication, Processor Fundamentals, System Software, Security, privacy and data integrity, Ethics and Ownership, Databases, Algorithm Design and Problem-solving, Data Types and Structures, Programming, Software Development

hardware interrupt

/'hɑːdweə ˈɪntərəpt/

software interrupt

/'sɒftweə ˈɪntərəpt/

fragmented

/fræɡˈmentɪd/

incremental backups

/ˌɪŋkriˈmentl ˈbækʌps/

object code

/'ɒbdʒekt kəʊd/

context-sensitive prompts

/'kɒntekst ˈsensɪtɪv prɒmpts/

 dynamic syntax checks			
<i>/daɪ'næmɪk 'sɪntæks tʃeks/</i>			
 prettyprint			
<i>/'pretpɪnt/</i>			
 single stepping			
<i>/'sɪŋɡl 'steɪpɪŋ/</i>			
 report window			
<i>/rɪ'pɔ:t 'wɪndəʊ/</i>			
 parity block check			
<i>/'pærɪti blɒk tʃek/</i>			
 code of conduct			
<i>/kəʊd ɒv 'kɒndʌkt/</i>			
 partial dependency			
<i>/'pɑ:ʃl dɪ'pendənsi/</i>			
 sub-problem			
<i>/sʌb 'prɒbləm/</i>			
 modules			
<i>/'mɒdju:lz/</i>			
 identifier			
<i>/aɪ'dentɪfaɪə/</i>			
 initialise			
<i>/ɪ'nɪʃəlaɪz/</i>			
 separator			
<i>/'sepəreɪtə/</i>			
 IDE			
<i>/aɪ di: 'i:/</i>			
 hierarchical decomposition			
<i>/haɪə'rɑ:kɪkl ,di:kɒmpə'zɪʃn/</i>			
 packet switching			
<i>/'pækɪt 'swɪtʃɪŋ/</i>			

 modem /'məʊdəm/			
 ALU /ˌeɪ el 'juː/			
 time slice /taɪm sleɪs/			
 interrupt handler /'ɪntərʌpt 'hændlə/			
 properties /'prɒpətɪz/			

Economics

Topics 2–6 · The price system and the microeconomy, The macroeconomy, Government macroeconomic intervention, International economic issues

joint demand /dʒɔɪnt dɪ'mænd/			
alternative demand /ɔ:l'tɜːnətɪv dɪ'mænd/			
joint supply /dʒɔɪnt sə'plaɪ/			
value added /'væljuː 'ædɪd/			
net national income /net 'næʃənl 'ɪŋkʌm/			
capital depreciation /'kæpɪtl dɪ'priːʃi'eɪʃn/			
market prices /'mɑːkɪt 'praɪsɪz/			
basic prices /'beɪsɪk 'praɪsɪz/			

technological unemployment			
/ˌteknəˈlɒdʒɪkl ʌnemˈplɔɪmənt/			
capital spending			
/ˈkæpɪtl ˈspendɪŋ/			
current spending			
/ˈkʌrənt ˈspendɪŋ/			
average tax rate			
/ˈævərɪdʒ tæks reɪt/			
marginal tax rate			
/ˈmɑːdʒɪnl tæks reɪt/			
credit regulation			
/ˈkredit ˌregjəˈleɪʃn/			
trading possibility curve			
/ˈtreɪdɪŋ ˌpɒsəˈbɪlɪti kɜːv/			

