



**General Certificate of Education (A-level)
June 2013**

General Studies A

GENA4

(Specification 2760)

Unit 4: Science and Society

Final

Mark Scheme

Mark schemes are prepared by the Principal Examiner and considered, together with the relevant questions, by a panel of subject teachers. This mark scheme includes any amendments made at the standardisation events which all examiners participate in and is the scheme which was used by them in this examination. The standardisation process ensures that the mark scheme covers the candidates' responses to questions and that every examiner understands and applies it in the same correct way. As preparation for standardisation each examiner analyses a number of candidates' scripts: alternative answers not already covered by the mark scheme are discussed and legislated for. If, after the standardisation process, examiners encounter unusual answers which have not been raised they are required to refer these to the Principal Examiner.

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Unit 4 (A2 Science and Society)

INTRODUCTION

The nationally agreed assessment objectives in the QCA Subject Criteria for General Studies are:

- AO1** Demonstrate relevant knowledge and understanding applied to a range of issues, using skills from different disciplines.
- AO2** Marshal evidence and draw conclusions: select, interpret, evaluate and integrate information, data, concepts and opinions.
- AO3** Demonstrate understanding of different types of knowledge, appreciating their strengths and limitations.
- AO4** Communicate clearly and accurately in a concise, logical and relevant way.
- The mark scheme will allocate a number or distribution of marks for some, or all, of the above objectives for each question according to the nature of the question and what it is intended to test.
 - In most cases mark schemes for individual questions are based on *levels* which indicate different qualities that might be anticipated in the candidates' responses. The levels take into account a candidate's knowledge, understanding, arguments, evaluation and communication skills as appropriate.
 - Examiners are required to assign each of the candidates' responses to the most appropriate level according to **its overall quality**, then allocate a single mark within the level. When deciding upon a mark in a level examiners should bear in mind the relative weightings of AOs (see below). For example, in Section B more weight should be given to AOs 1 and 2 than to AOs 3 and 4.
 - *Indicative content* is provided as a guide for examiners. It is not intended to be exhaustive and other valid points must be credited. Candidates do not have to cover all points mentioned to reach the highest level.
 - A response which bears no relevance to the question should be awarded no marks.

Distribution of marks across the questions and assessment objectives for this unit

Question Numbers		Q1	Q2	Q3	Q4	AO marks for Sec. A	AO marks for Sec. B	AO marks for A + B
Assessment Objectives	AO1	2	2	3	3	10	8	18
	AO2	6	4	4	4	18	7	25
	AO3	1	4	2	2	9	5	14
	AO4	2	2	2	2	8	5	13
Total marks per Question		11	12	11	11	45	25	70

GENERAL MARK SCHEME FOR SECTION A

Level of response	Mark range	Criteria and descriptors for Assessment Objectives 1 – 4
LEVEL 3	10 – 11 (12)	<p>Good response to question</p> <p>Good to comprehensive knowledge and understanding demonstrating overall grasp of the range and nature of issues (AO1).</p> <p>Capacity to interpret evidence and sustained ability to present relevant arguments, analysis and exemplification, focusing on the main points of the question (AO2).</p> <p>Some understanding of different types of knowledge, with some appreciation of their limitation in seeking to reach a reasoned and logical conclusion (AO3).</p> <p>Ability to communicate clearly and accurately in a fluent and organised manner (AO4).</p>
LEVEL 2	5 – 9	<p>Reasonable attempt to answer question</p> <p>Modest to quite good knowledge and understanding demonstrating some grasp of the nature of some key issues (AO1).</p> <p>Moderate range of arguments, analysis and exemplification covering some of the main points of the question (AO2).</p> <p>Limited understanding of different types of knowledge but some ability to work towards a conclusion (AO3).</p> <p>Mostly clear and accurate communication and organisation (AO4).</p>
LEVEL 1	1 – 4	<p>Limited response to question</p> <p>Restricted / narrow knowledge and understanding of key issues (AO1).</p> <p>Simple, perhaps mostly unexplained points – or very narrow range – with limited interpretation or analysis and exemplification (AO2).</p> <p>Lacking in understanding of different types of knowledge with little or no evidence of ability to work towards a conclusion (AO3).</p> <p>Variable levels of communication and organisation (AO4).</p>
LEVEL 0	0	<p>No valid response or relevance to the question.</p>

SECTION A

01 Using the data and other information in Source A (Figures 1–7) only, examine progress in the use of renewable energy sources in the United Kingdom in recent years.

(11 marks)

- There are seven separate figures in Source A, each providing data/information which might be used to answer the question. Level 1 answers may be very brief/narrow and/or have a tendency to re-write the data/information descriptively instead of using the data/information more analytically.
- Level 2 answers are likely to cover at least half of the figures in Source A, perhaps with a combination of some descriptive writing and some analytical comment in the recent progress in the use of renewable energy sources in the UK.
- Level 3 answers will use data/information from most of the figures in Source A with clear, critical and relevant interpretation/analysis leading to a logically argued conclusion relating to the recent progress in the use of renewable energy sources in the UK.

Indicative content

- There is considerable diversity, and therefore potential, in terms of the range of renewable energy sources available (Figure 1) and potential for community involvement (Figure 2).
- Renewables are significant because they can be “indefinitely replenished”. (Figure 1)
- Renewables have key advantage over fossil fuels because renewables do not produce harmful emissions that might add to global warming and so have been encouraged. (Figure 1).
- Increase in percentage of electricity generated/transport powered via renewable energy sources in 2010. (Figure 2) Similar figures for use of renewables in third quarter of 2010 BUT data in Figures 2 and 3 only shows % changes.
- Progress in the use of renewable sources can be affected by weather variables such as decreased rainfall and lower wind speeds in 2010. (Figure 2)
- Growth in use of/ planning consents for wind energy (with more use of offshore sites since 2004) between 2000 and 2011. (Figure 4) BUT we are not told in Figure 4 how much electricity is generated from windpower compared with electricity generated by conventional sources such as coal.
- Still very heavy UK use and dependency on non-renewables. (Figure 5)
- Increasingly the UK is relying more on fuel imports which can be costly and unreliable. Development of renewables helping to reduce import dependency if it is rapid enough. (Figure 6)
- UK lags behind many other EU countries in use of renewable energy resources but, although the figures for such use are increasing, there remains a very significant EU dependency on conventional fuels. (Figure 7)

Candidates should be able to achieve marks in the highest level by using a selection of relevant points, not necessarily the complete range.

In Question 1, only information contained in Source A should be credited.

Any other valid points from Source A not included in the indicative content should be credited.

02 In the light of evidence in Source B and Source C, consider how far the views of local individuals should be considered if their opposition to turbines and pylons threatens the essential development of wind power in the UK.

(12 marks)

- Candidates who write in a very brief, or mainly descriptive, and/or general fashion about planning and wind power in the context of renewable energy targets are likely to be placed in Level 1.
- Those who use evidence from Sources B & C to demonstrate more analytical ability relating to material about planning and wind power in the context of renewable energy targets will reach Level 2.
- Those who approach the material about planning and wind power in the context of renewable energy targets using Sources B & C to demonstrate a good range of clear arguments, leading to a conclusion, will reach Level 3.

Source B: Indicative content

This source makes a number of points to stress the importance of wind power, all of which point to its further development and growing *national* significance in meeting UK energy targets. (The source – RenewableUK – is essentially the ‘voice’ of the energy industry so it doesn’t claim to be impartial.)

- Data throughout Source B covering scale and development of wind power in the UK.
- “Wind will be a key component in meeting the UK’s 2020 target for energy from renewable sources.” (1st Box – Paragraph 1)
- “The wind industry can be a key player in creating the investment, exports and jobs we need for a return to economic prosperity.” (1st Box – Paragraph 1)
- “The UK is the windiest country in Europe” and will be an important source of “free fuel”. (Main Source – Paragraph 1)
- “Wind energy has established itself as a mature, clean energy-generating technology. In 2007 wind energy overtook hydropower to become the largest renewable generation source.” (Main Source, Paragraph 2)
- “Wind has been the world’s fastest growing renewable energy source for the last seven years and this trend is expected to continue...” (Main Source – Paragraph 3)
- Wind will have to provide “the lion’s share” of the green sources necessary to meet the UK’s 2020 energy targets. (Main Source – Paragraph 4)
- “Onshore and offshore wind together can deliver 30% of the UK’s electricity supply by 2020 and be part of a radical decarbonisation of the economy by 2030.” (Main Source – Paragraph 5)

Source C: Indicative content

This source highlights growing opposition to wind power and students need to determine, in the light of some of the points made in Source B, how far they consider such opposition (as outlined in Source C) on the part of individuals (or individuals acting in groups) to the development of wind power to be justified. (National interest – is opposition simply Nimbyism? – role of local democracy and individual choice – local people pursuing legitimate objections – is it just a few outspoken locals?)

- Nearly 50% of applications to develop wind farms in the UK countryside are currently rejected (Paragraph 1) with rate of rejections increasing rapidly (Paragraph 2).
- Seems to be “a hardening of attitudes” among opponents of wind power. (Paragraph 1)
- Increasing influence of nimbyism. (Paragraph 1)
- Government support for more ‘localised’/de-centralised decisions might lead to even more rejections of planning applications. (Paragraph 3)
- Jacqueline Harris suggests that developers might not be given a fair hearing and that special consideration is given to the visual impact of wind turbines even if relatively few houses are in sight of them. (Paragraph 4)
- Nick Medic of RenewableUK claims that objectors to wind turbines might be “a vociferous minority”. (Paragraph 5)(The views of Ms Harris and Mr Medic may certainly be open to challenge.)
- “High refusal rates have raised concerns about the UK’s ability to meet its 2020 renewable energy and greenhouse gas targets.” (Paragraph 6)
- Cost to local communities of nimbyism and anti-wind campaigners? (Paragraph 7)
- Difficult balance between government’s intention to create a planning system that “supports sustainable growth and green energy development” and giving “communities a say in the planning of their local area”. (Paragraph 9)

Candidates should be able to achieve marks in the highest level by using a selection of relevant points from Sources B and C, not necessarily the complete range. Any other valid points from Sources B and C not included in the indicative content should be credited.

03 Using evidence from Source D, and your own knowledge, consider whether you would support or oppose the move to set UK energy targets as far ahead as 2027.

(11 marks)

- Candidates who write in a very brief, or mainly descriptive and/or general fashion about energy targets in 2027 are likely to be placed in Level 1.
- Those who demonstrate some analytical ability using some evidence from Source D, and their own knowledge, to make a case either for or against the setting of UK energy targets for 2027, will reach Level 2. (Candidates who only use *either* evidence from Source D *or* their own knowledge, will be restricted to a Level 2 mark.)
- Those who use both Source D and their own knowledge, in a clearly analytical way to make a case for or against the setting of UK energy targets for 2027, leading to a conclusion, will reach Level 3.

Source D: Indicative content – SUPPORT long-term energy targets

- Potentially courageous – no other country has done this before. (Paragraphs 1 & 3).
- Need to tackle “the worst ravages of global warming”. (Paragraph 1)
- Britain can plan in the long-term to free itself from dependence on fossil fuels. (Paragraph 6)
- The fact that many of the new technologies are still being developed “offers a key advantage” in terms of opportunities to innovate. (Paragraph 8)
- Opportunity for Britain to be a world leader in renewable technologies. (Paragraph 9)
- Natural advantage of windy weather in Britain. (Paragraph 11)
- Gives Britain “a chance to cut its emissions bill, establish energy security (and establish energy security for the nation”. (Paragraph 12)
- Offers many opportunities for community involvement and ‘localism’. (OK)
- Chance to re-shape Britain’s industrial and manufacturing base. (OK)

Source D: Indicative content – OPPOSE long-term energy targets

- Potentially reckless – no other country has done this before. (Paragraph 1)
“Uncharted territory.” (Paragraph 3)
- Likely to be too ambitious and involves huge costs/investment in new techniques. (Paragraphs 4-5).
- “Unproven technology”. (Paragraph 6) “Relying on power sources that still have to be developed looks naive.” (Paragraph 7)
- Not everyone agrees that fossil fuels are dangerous. (Paragraph 7)
- Britain’s previous record in atomic and wind power is not encouraging. (Paragraphs 10 & 11).
- Climate sceptics likely to mount a strong opposing lobby. (OK)
- Long term goals are rarely appropriate for politicians elected on a short-term basis. (OK)
- Likely to lead to significant economic dislocation and loss of jobs in some traditional energy sectors. (OK)
- Not appropriate at a time of world economic uncertainty and public spending cuts. (OK)

Candidates should be able to achieve marks in the highest level by using a selection of relevant points from Sources D, and their own knowledge, not necessarily the complete range. Any other relevant points from Source D or own knowledge not included in the indicative content should be credited.

04 Compare and contrast the arguments for and against the renewable energy referred to in Source E and Source F.

(11 marks)

- Candidates who write in a very brief, or mainly descriptive (and/or general) fashion about attitudes to renewable energy shown in Sources E and F are likely to be placed in Level 1.
- Those who demonstrate some limited awareness of how Sources E and F compare and contrast on the subject of renewable energy will reach Level 2. (Those who use only one of the two sources will be limited to Level 2.)
- Those who make a clear and consistent comparison and contrast between attitudes to renewable energy shown in Sources E and F, leading to a conclusion, will reach Level 3.

Source E: indicative content arguments for

Source E is clearly supportive of the need to reduce dependency on fossil fuels and to develop the use of renewables to reduce dependency in a way that exploits natural resources and helps to meet government targets. Source based on ‘green supporting’ groups.

- Need to tackle dependence on fossil fuels. (Paragraph 3)
- Indigenous fossil fuel supplies are becoming depleted. (Paragraph 3)
- Greater reliance on fuel imports leading to concerns about supply security and increasing price volatility. (Paragraph 3)
- Need to meet rising government energy targets for energy generation from renewables. (Paragraph 5)
- Need to increase use of renewable energy in view of limited performance previously. (Paragraph 7)
- Chris Huhne’s view that UK has advantage of both “one of the best renewable energy resources in the world – and the know-how to exploit it”. (Paragraph 8)

Source F: indicative content arguments against

Source F is more critical and focuses on the extent to which politicians are hiding behind energy companies while consumers are facing increased fuel bills to pay for the move to use more renewables.

- Bold opening question “IS GREEN ENERGY WORKING?”
- Families being “forced to pay an average of £200 a year in taxes on their energy bills to fund Britain’s investment in wind and solar power”. (Paragraph 1)
- Dr Benny Peiser’s use of the phrase Britain’s “stubborn but wrong-headed commitment to renewable energy”. (Paragraph 2) [Dr Peiser is director of the Global Warming Policy Foundation – a registered educational charity which is concerned about the cost of implementing green policies.]
- Peiser’s further reference to “stealth taxes” (Paragraph 3) and criticism of government using fuel bills to pay for green developments rather than more direct increases in taxation which would be unpopular with voters (Paragraph 4).
- Wider concern that there is a lack of transparency in fuel bills and public trust of energy companies. (Paragraphs 6 and 7).

Candidates should be able to achieve marks in the highest level by using a selection of relevant points from Sources E and F, not necessarily the complete range. Any other valid points not included in the indicative content should be credited.

GENERAL MARK SCHEME FOR SECTION B

Each essay should be awarded a single mark out of 25. In awarding the mark examiners should bear in mind the overall assessment objectives for General Studies (see INTRODUCTION) which the essay questions are intended to test in the following proportions:

AO1 – 8 marks: AO2 – 7 marks: AO3 – 5 marks: AO4 – 5 marks.

Level of response	Mark range	Criteria and descriptors: knowledge, understanding, argument, evaluation, communication
LEVEL 4	20 – 25 (6)	Good to very good treatment of the question: Wide ranging and secure knowledge of the topic (AO1); good range of convincing and valid arguments and supporting illustrations, effective overall grasp and logically argued conclusion (AO2); good understanding and appreciation of material, nature of knowledge involved and related issues (AO3); coherent structure and accuracy of expression (AO4).
LEVEL 3	13 – 19 (7)	Fair to good response to the demands of the question: Reasonable knowledge of topic (AO1); a range of arguments with some validity, appropriate illustrations with reasonable conclusions (AO2); some understanding and appreciation of material, nature of knowledge involved and related issues (AO3); mostly coherent structure and accuracy of expression (AO4).
LEVEL 2	6 – 12 (7)	Limited to modest response to the demands of the question: Limited / modest knowledge of topic (AO1); restricted range of arguments and illustrations but some awareness and attempt at conclusion (AO2); little understanding and appreciation of material, nature of knowledge involved and related issues (AO3); weak structure and variable quality / accuracy of expression (AO4).
LEVEL 1	1 – 5 (5)	Inadequate attempt to deal with the question: Very limited knowledge of topic (AO1); little or no justification or illustration, no overall grasp or coherence (AO2); inadequate understanding and appreciation of material, nature of knowledge involved and related issues (AO3); little or no structure / frequent expression (AO4).
LEVEL 0	0	No valid response or relevance to the question.

Section B questions are set in two parts.

Candidates need to answer both parts of the question well to gain access to a Level 4 mark.

An unbalanced response with one part answered very well and the other answered significantly less well could only gain access to a maximum Level 3 mark.

SECTION B

05	Date	Unemployed 16-24 yr olds	Youth Unemployment % 16-24 year olds
	May-July 2004	580 000	12.2%
	May-July 2011	933 000	20.8%
	July-Sept 2011	1 020 000	21.9%

A poll taken early in 2012 lists the following as the main causes of youth unemployment.

State of the global economy (19%)
Present coalition government (17%)
Businesses not providing training for young people (12%)
Last Labour government (12%)
Banking industry (10%)
Migrant workers (10%)
Britain's education system (7%)
Young people themselves (5%).

To what extent do the poll results shown above reflect your own views on the main causes of youth unemployment?

Discuss what measures could be taken to reduce the high level of youth unemployment in the United Kingdom.

Indicative content: To what extent do the poll results reflect your own views....

- State of the global economy (19%): world economic problems which have proved difficult to tackle successfully/youth unemployment rates are high in many countries.
- Present coalition government (17%): coalition government has been in power since May 2010/cutting public spending has been central to economic policy/many jobs in the public sector have been lost/impact of re-shaping of the Educational Maintenance Allowance.
- Businesses not providing training for young people (12%): businesses often complain that young people lack basic skills and criticise the education system yet do not always offer much themselves in the way of training.
- Last Labour government (12%): successive Labour governments in power between 1997-2010/particular criticism of last Labour government for ‘overspending’ and poor control of public finances so that the UK was “living beyond its means”.
- Banking industry (10%): banks in the UK and abroad have come in for particular criticism for poor decision making and reckless loans. Some UK banks had to be rescued by the British government and many jobs were lost.
- Migrant workers (10%): sometimes argued that migrant workers have taken “British jobs”, especially those of young people. Empirical evidence is very mixed.
- Britain’s education system (7%): argued that too many young people in the UK leave school with only limited literacy and numeracy skills.
- Young people themselves (5%): some critics say that too many young people don’t want to work/are too choosy/prefer to live on benefits.
- The 8 reasons given may well be the 8 most important to explain youth unemployment though any other valid reasons should be credited. Whether they are in the correct order of importance is impossible to say as much of the evidence available is limited or conflicting and the views of many people are influenced by their own subjective beliefs and values. There are no ‘correct’ answers and candidates should be placed into a mark level that best represents the quality of their arguments in the context of the essay mark scheme.

Indicative content: Discuss what measures could be taken.....

- With youth unemployment in the UK at its highest since 1992, employment of young people aged between 16 and 24 should be a higher political priority. (Deputy PM, Nick Clegg, promised that this would happen in 2012.)
- Financial incentives, such as subsidies or tax breaks, should be offered to employers to provide jobs/work experience for young people. (The government's flagship Youth Contract programme offers payments to firms to encourage them to take on an apprentice and offer work experience places to young people.)
- Ensure, perhaps through legislation, that there is a job/work experience available for all young people entering the labour market.
- More investment in infrastructures that will help to encourage more employment especially in more depressed areas.
- Tackle the socio-economic culture where there is more money to be made from drugs and crime than there is from work.
- Encourage more young people to enter higher education, rather than the labour market, by restoring EMA support or cutting tuition fees.
- Reverse cuts/invest more in careers service.
- Provide incentives for more voluntary organisations, such as the Prince's Trust, to help young people to prepare for work. (The New Deal of the Mind is one such organisation specialising in taking young unemployed people and finding them placements in creative industries. Another is the Carlisle Youth Zone, a charity which provides young people with a place to go - a state of the art building with 150 volunteers – as well as advice on jobs.) There are many local examples.
- There are clearly no easy solutions to the problem of youth unemployment especially in the context of world recession and high national unemployment rates.

Candidates should be able to reach marks in the highest level with a selection of relevant points, not necessarily the complete range. Any other valid points not included in the indicative content should be credited.

06 'It is important that as many sports as possible make full use of available technology to settle disputes about decisions made while events take place.'

Examine the extent to which different sports currently use technology in an effort to settle disputes about decisions made by referees and umpires.

Discuss the factors that might make some sports authorities cautious about the use and spread of technology to settle disputes about decisions.

Indicative content: Examine the extent that different sports use technology.....

- Developments in video technology (and the use of replays) in recent years have been used to resolve uncertainty and disputes by a number of professional sports (most notably cricket, rugby union, rugby league and tennis). Soccer has had a more cautious approach. The arrival of High Definition has clarified images.
- In the USA, professional sports such as baseball, American football and basketball have long used instant replay and other high-tech aids to help referees.
- In international cricket, a “third umpire”, who has access to TV replays in certain situations, is commonly used. The third umpire can use the technology of the ‘hot spot’ and slow motion replays from cameras placed at different angles. (Since 2001, Hawkeye – a computer system developed in the UK showing the path of a cricket ball – has been used by cricket commentators on TV, as has the snick-o-meter, a very sensitive microphone located in one of the stumps.)
- Hawkeye is widely used in major tennis tournaments and tennis players are able to refer to it themselves. It offers a line-calling system which traces the ball’s trajectory and sends it to a virtual-reality machine. It uses 6 or more computer linked TV cameras situated round the court. The computer reads in the video in real time, tracking the path of the tennis ball on each camera. The 6 separate views are combined to produce an accurate 3D representation of the path of the ball.
- In rugby (both league and union), a video referee/Television Match Official can determine if a try has been properly scored or if kicks at goal go between the posts and over the bar.
- Soccer has been more cautious about the use of technology although Premier League referees and their assistants use headsets to keep in contact. Soccer’s world governing body, FIFA (under president Sepp Blatter), has so far resisted suggestions (based on Hawkeye and Cairos – a German development which uses a micro-chip/ electronic sensor inserted in the ball) to use ‘goal line technology’ despite some highly controversial decisions, not least to disallow an England ‘goal’ against Germany in the 2010 World Cup even though TV replays showed that the ball was well over the goal line. However, systems continue to be tested and there are suggestions that goal-line technology might be approved by IFAB (football’s law-making body) for use by 2013–14.

Indicative content: Discuss the factors that suggest that sports should be cautious about the use and spread of technology.....

- The costs for a relatively rare scenario are unjustified.
- Many spectators like a sense of immediacy in sport and delay when decisions are 'referred' affect the tempo of a game and can be frustrating.
- There is always the question of when, and in what circumstances, the services of a video referee/umpire should be utilised.
- Technology cannot always be definitive.
- Technology undermines the position of match referees and umpires. Human errors should be accepted as part of the game.
- Who's responsible for making the decisions? Traditionally whatever decision was made by the match referee has been considered the last word.
- Some soccer fans argue that technology might affect the 'spirit' and character of the game and make it too robotic.
- Incorrect/contentious decisions make for fascinating debate among fans and the media.

Candidates should be able to achieve marks in the highest level with a selection of relevant points, not necessarily the complete range. Any other valid points not included in the indicative content should be credited.

07 ‘Science and religion cannot co-exist easily or even at all.’

Examine the practices and beliefs on which science and religion are based.

Discuss the arguments for and against the assertion that ‘science and religion cannot co-exist easily or even at all.’

Indicative content: Examine the practices and beliefs on which science and religion are based.

- Scientific practice/method is based on a clearly understood sequence of steps: ask a question; research the topic; formulate a hypothesis; test the hypothesis; analyse the data; draw conclusions; publish results..
- The key elements underlying scientific practice/method are objectivity; consistency; flexibility; observability.
- Science is based on rational and logical thinking and depends on the establishment of verifiable and reputable measurements and observations.
- Religion is usually a matter of belief and faith (e.g. Christians belief in God, the Virgin birth, Jesus as the son of God, the Bible as the Holy Book, the Resurrection; Muslims believe in one God (Allah), Muhammad as God’s messenger and the last prophet to visit earth, the Quran as the Holy Book, five pillars etc). There is no way to prove faith scientifically.
- Religious beliefs cannot be tested by using scientific methods.
- Scientific knowledge contradicts a literal interpretation of Genesis, the first book of the Bible although many believers argue that Genesis need not be taken literally.
- Religion is more likely to have certain rituals, and not necessarily practices in the scientific sense.
- Some scientific work may have religious and moral implications.

Indicative content: “Discuss the arguments for and against the assertion that.....”

- Before and since the work of Darwin and the emergence of evolutionary thinking in mid-Victorian times, the relationship between science and religion has often been uneasy.
- Science can be used as a way of knowing about the physical universe (helping to discover the mechanism of existence) and religion can be a way of making sense of why we exist (illuminating the meaning of existence).
- Some surveys suggest that a number of scientists may be just as likely to believe in God as other people.
- There are theologians and some scientists who raise the question of whether or not evolution might have been used by a divine being to create the world.
- Things become more difficult when religion seeks to produce explanations about the physical world or when science seeks to exclude religion because of what is seen as the lack of proof, rational explanation or scientific empiricism.
- Many scientists might argue that it is very difficult to include, for example, God, in a scientific argument. (James Watson, co-discoverer of the molecular structure of DNA, declared that “one of the greatest gifts science has brought to the world is continuing elimination of the supernatural”. Richard Dawkins, academic and atheist views human beings as “survival machines” for genes.)
- We have yet to resolve fully (especially in the US) the question of whether beliefs such as Creationism and Intelligent Design should feature in the science curriculum in the same way that Evolution does.
- Can we always be as sure about some scientific ideas (e.g. evolution) as scientists might claim?
- There are many different religions where there are differences, whereas there are scientific principles which might be more commonly shared and agreed.
- Some scientists also have religious beliefs so clearly don't recognise them as necessarily being mutually exclusive. Perhaps science and religion sometimes serve different functions in life.
- The defence for some is that religion and science can be compatible because they are not talking about the same things. (As argued by the biologist Stephen Jay Gould in *Rock of Ages* and the physicist John Polkinghorne and the mathematician Nicholas Beale in their book *Questions of Truth* claiming that science is concerned with 'how' and theology/religion with 'why'.) Julian Baggini *Guardian 14 October 2011* headlines 'Religion's truce with science can't hold', arguing that, in reality, the 'hows' and 'whys' can get mixed up, thus threatening any peace between science and religion and that “how easily science and religion can rub [along] together depends very much on what kind of religion we're talking about”.
- Neither science nor theology can provide a complete understanding of some of the universe's more taxing and controversial issues. Perhaps they can be said to offer different perspectives based on different principles. In everyday life they may co-exist, though much may depend on how willing individuals are to look at both sides of an issue.
- Conversely, some will claim that every bit of science is backed by evidence and that a range of scientific discoveries in areas such as archaeology, genetics, physics, biology and anthropology offers more and more proof which can be used to challenge the arguments of theologians.

- Fundamentalists and some scientific thinkers have a seemingly inseparable gulf between them.

Candidates should be able to achieve marks in the highest level with a selection of relevant points, not necessarily the complete range. Any other valid points, and references to faiths not included in the indicative content should be credited.

08 ‘The £16bn High Speed 2 rail project linking London and Birmingham, and eventually extending to northern England, will bring many advantages and is crucial to the further development of both the rail network and the British economy.’

Examine the advantages of the High Speed 2 development, which is Britain’s biggest public project in peacetime.

Discuss the case made by critics of the project.

Indicative content: Examine the advantages of the High Speed 2 development.....

- Reduction in journey times (by an estimated 49 minutes) between England’s capital and second city.
- Significant increase in passenger capacity.
- Large number of jobs created in the construction.
- Plan to extend the line in the longer term to Manchester and Leeds.
- Will take passengers away from less environmentally friendly forms of travel such as cars and aircraft.
- Additional tunnels will be built in areas like the Chilterns to minimise environmental threats.
- Link to be created in London to High Speed line to Channel Tunnel.
- Examples of successful HS systems in other countries, eg France, Japan.

Indicative content: Discuss the merits of the case made by the critics of the project.

- Huge amount of capital involved; will there be the return on capital investment that’s claimed?
- Costs (£32bn with extensions to Manchester and Leeds) of such large projects almost invariably overrun, sometimes significantly.
- Will take a long time to construct, starting in 2017, with anticipated opening date 2026.
- Claim that there will be massive disruption while one of London’s biggest and busiest stations (Euston) is re-built.
- Line is planned to run through some of England’s most beautiful countryside.
- Environmental issues such as noise, with strong, determined and influential opposition.
- Construction will not start until at least 2 years after the next general election and political priorities might have changed.
- Significant opportunity costs.
- Alternatives to increase railway capacity not properly considered.

Candidates should be able to achieve marks in the highest level with a selection of relevant points, not necessarily the complete range. Any other valid points not included in the indicative content should be credited.