AQA GCSE Combined Science - Trilogy | 8464

SPECIFICATION POINT 4.5.3.4

# Contraception

## Mark schemes and examiner comments

| | |
|---|---|
| Tier | **Higher** |
| Question groups | **3** |
| Available paper years | **2018–2025** |

## Using this booklet

1. Booklet answer numbers match the question booklet.
2. Use the original question number within marking tables.
3. Examiner comments are included where available.

**Name:** _____ **Date:** _____

Where a precise marking extract is unavailable, the full source document is included in an appendix. Any missing mark scheme is explicitly identified.

### 4.5.3.4 Contraception

**Answer 01 · Mark scheme**

June 2018 | 8464/B/2H | Original Q6

| Question | Answers | Extra information | Mark | AO / Spec. Ref. |
|---|---|---|---|---|
| **06.1** | | an answer of 0.46 **or** 0.47 scores **2** marks | | AO2 4.5.3.3 |
| | $\frac{33}{72}$<br><br>**or**<br>0.45833… | allow $\frac{34}{72}$<br><br>**or**<br>0.47222… | 1 | |
| | 0.46 (arbitrary units per hour) | allow 0.47 (arbitrary units per hour)<br><br>allow an answer given to 2 significant figures from an incorrect calculation in step 1 for **1** mark | 1 | |

4.5.3.4 Contraception

Answer 01 · Mark scheme

June 2018 | 8464/B/2H | Original Q6

| Question | Answers | Extra information | Mark | AO / Spec. Ref. |
|---|---|---|---|---|
| 06.2 | any **five** from:<br>• (during the first days of the cycle) FSH from the pituitary stimulates an egg / follicle to mature<br>• FSH stimulates oestrogen from the ovaries<br>• oestrogen causes thickening of the uterus lining (in the first half of the cycle)<br>• oestrogen inhibits FSH but stimulates LH from the pituitary<br>• the high levels of LH stimulate release of the egg / ovulation (on day 14)<br>• progesterone is secreted by the (empty) follicle / corpus luteum (after day 14 / ovulation)<br>• progesterone maintains the lining of the uterus (during the second half of the cycle)<br>**or**<br>progesterone inhibits both FSH and LH<br>• progesterone falls (if no pregnancy happens) and uterus lining comes away as the menstrual blood flow | points must be in correct order to gain full credit<br><br>if no other marks awarded allow **1** mark for oestrogen and progesterone are produced by the ovaries and FSH and LH are produced by the pituitary | 5 | AO1<br>4.5.3.3 |

4.5.3.4 Contraception

Answer 01 · Mark scheme

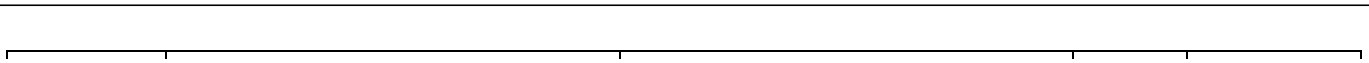
June 2018 | 8464/B/2H | Original Q6

| Question | Answers | Extra information | Mark | AO / Spec. Ref. |
|---|---|---|---|---|
| 06.3 | any **one** from:<br>• (lower dose so) fewer side effects<br>• (patch lasts longer so) don't have to remember to take pill every day<br>• hormone (from patch) goes directly into bloodstream so (contraception) unaffected by vomiting | | 1 | AO3<br>4.5.3.4 |
| **Total** | | | **8** | |

### 4.5.3.4 Contraception

**Answer 01 · Mark scheme**

June 2018 | 8464/B/2H | Original Q6



4.5.3.4 Contraception

Answer 02 · Mark scheme

November 2021 | 8464/B/2H | Original Q1

| Question | Answers | Extra information | Mark | AO / Spec. Ref. |
|---|---|---|---|---|
| **01.1** | endocrine (system) | ignore hormonal (system) | 1 | AO1<br>4.5.3.1 |
| **01.2** | D | | 1 | AO1<br>4.5.3.1<br>4.5.3.2 |
| **01.3** | A | | 1 | AO1<br>4.5.3.1 |
| **01.4** | (in / through / via) blood | allow (in / through / via) bloodstream<br>allow (in / through / via) plasma<br>allow (in / through / via) blood vessels **or** named blood vessel | 1 | AO1<br>4.5.3.1 |
| **01.5** | ovary / ovaries<br><br>testis / testes | in either order<br><br>allow testicle(s)<br><br>allow placenta<br><br>if no other mark awarded allow gonad(s) for **1** mark | 1<br><br>1 | AO1<br>4.5.3.1<br>4.5.3.3 |
| **01.6** | luteinising hormone (LH) | | 1 | AO2<br>4.5.3.3 |

4.5.3.4 Contraception

Answer 02 · Mark scheme

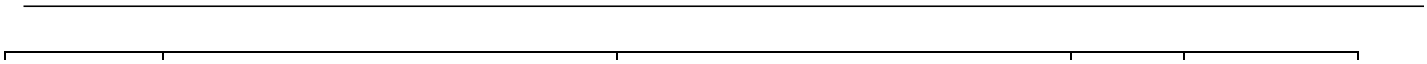


| Question | Answers | Mark | AO / Spec. Ref. |
|---|---|---|---|
| 01.7 | **Level 3:** A judgement, strongly linked and logically supported by a sufficient range of correct reasons, is given. | 5–6 | AO3<br>4.5.3.4<br>4.3.1.9 |
| | **Level 2:** Some logically linked reasons are given. There may also be a simple judgement. | 3–4 | |
| | **Level 1:** Relevant points are made. They are not logically linked. | 1–2 | |
| | **No relevant content** | 0 | |
| | **Indicative content**<br><br>Advantages<br>• non-permanent like condom / diaphragm / IUDs / spermicides / abstinence **or** unlike surgical sterilisation<br>• longer lasting than condom / diaphragm / IUDs / spermicides<br>• no need to remember unlike oral contraceptive<br>• one injection rather than surgery for sterilisation<br>• surgery (for sterilisation) has risks, for example, infection<br>• no other method of long-lasting contraception (rather than sterilisation) relies on men<br><br>Disadvantages<br>• no protection from sexually transmitted diseases unlike barrier methods **or** named barrier method<br>• not as long lasting as (surgical) sterilisation<br>• at clinical / drug trial stage, so unknown side effects<br>• at clinical / drug trial stage, so unknown efficacy<br>• do not know how long it will last (as info only states 'up to 13 years')<br>• can stop taking a pill **or** using a condom if you change your mind / want to get pregnant, whereas have to wait 13 years with the injection<br>• (minor) risk of infection posed with an injection compared to no risk with the oral contraceptive<br><br>For **Level 3** references to advantages **and** disadvantages of the new drug compared to named existing methods are required. | | |
| **Total** | | **13** | |

### 4.5.3.4 Contraception

**Answer 02 · Mark scheme**

November 2021 | 8464/B/2H | Original Q1



4.5.3.4 Contraception

Answer 03 · Mark scheme



## Question 2

| Question | Answers | Extra information | Mark | AO / Spec. Ref. |
|---|---|---|---|---|
| **02.1** | oestrogen | allow phonetic spelling<br><br>allow other correct named hormone eg progesterone<br><br>do **not** accept FSH / LH | 1 | AO1<br>4.5.3.3 |

| Question | Answers | Extra information | Mark | AO / Spec. Ref. |
|---|---|---|---|---|
| **02.2** | any **one** from:<br><br>• (stimulates / causes) sperm production<br><br>• (stimulates / causes male) secondary sexual characteristics | <br><br><br><br>allow (stimulates / causes) puberty<br>allow (stimulates / causes) named male secondary sexual characteristic(s) eg muscle growth | 1 | AO1<br>4.5.3.3 |

4.5.3.4 Contraception



| Question | Answers | Extra information | Mark | AO / Spec. Ref. |
|---|---|---|---|---|
| 02.3 | any **one** from:<br>• protection / prevention against sexual transmitted diseases(s)<br>• fewer / no side effects<br>• immediate<br>• (may) contain a chemical to kill sperm<br>• (more) easily accessible<br>• described disadvantage of hormonal method(s) eg (contraceptive) pill could be forgotten | allow converse if clearly referring to hormonal methods<br>allow protects / prevents against STD(s) / STI(s)<br>allow protects / prevents against named STD / STI<br>allow do not affect menstrual cycle<br>allow fewer / no named (possible) side effects of hormonal contraceptives eg fewer / no headaches / nausea / acne<br>ignore do not affect hormones<br>ignore safer<br>allow quicker to use<br>ignore temporary<br>allow (may) contain spermicide | 1 | AO3<br>4.5.3.4 |

| Question | Answers | Mark | AO / Spec. Ref. |
|---|---|---|---|
| 02.4 | **Level 2:** Scientifically relevant facts, events or processes are identified and given in detail to form an accurate account. | 4–6 | AO1<br>4.5.3.3<br>4.5.3.4 |
| | **Level 1:** Facts, events or processes are identified and simply stated but their relevance is not clear. | 1–3 | |
| | **No relevant content** | 0 | |
| | **Indicative content**<br><br>**Method**<br>• oral contraceptive **or** pill<br>**Detail of how the contraception is used**<br>○ taken daily **or** taken every 21/28 days **or** taken in a monthly cycle<br>○ containing progesterone<br>○ containing oestrogen<br>○ (hormones) absorbed into the blood<br><br>**Method**<br>• injection<br>• patch<br>• implant<br>• intrauterine system / device **or** IUD **or** IUS **or** coil<br>**Detail of how the contraception is used**<br>○ last several weeks / months<br>○ containing progesterone<br>○ slow release of progesterone / hormone<br>○ into blood<br><br>**Detail (that can apply to all hormonal contraceptive methods)**<br>○ to inhibit / reduce / prevent FSH (release)<br>○ (lack of FSH) so no eggs mature / develop<br><br>○ to inhibit / reduce / prevent LH (release)<br>○ (lack of LH) so no eggs released (from ovary) **or** so prevents ovulation<br><br>○ (progesterone) thickens (cervical) mucus<br>○ (mucus) prevents / reduces sperm movement (to uterus)<br>○ (oestrogen / progesterone) changes the thickness of the uterus lining<br>○ (uterus lining thickening / thinning) makes implantation less likely<br><br>For **Level 2**, answers must give details for the method(s) described. | | |

| | |
|---|---|
| **Total Question 2** | **9** |

4.5.3.4 Contraception

Answer 01 · Examiner comments

June 2018 | 8464/B/2H | Original Q6

# Question 6 (standard / high & high demand)

**06.1** There were 16% correct responses to this question, achieved by reading correctly from the graph, followed by correct calculation and rounding.

However, a significant proportion of students misread the graph and so started with the wrong data. One mark was often achieved for giving their answer correct to two significant figures.

A large number of students did not to the rise in concentration of LH by time, although 'units per hour' was shown on the answer line. Many attempted to divide by days or minutes. Students also carried out the inverse calculation or tried to calculate percentage change.

**06.2** 10% of students gave excellent, clearly set out responses gaining four or five marks. These students demonstrated that they had understood and learnt the quite difficult interactions of hormones during the menstrual cycle. On the other hand, many students wrote confused accounts or simply describing the levels from the graph, so this question discriminated well.

A number of students referred to the pancreas as the site of production for some hormones while others did not gain because they referred to the 'master gland' rather than the pituitary. Some answers did not relate to the menstrual cycle. These students may have only read the second part of the question, name where each hormone is produced, for which they listed as many as they could, including testes and testosterone, pancreas and insulin, adrenalin and adrenal glands, thyroid and thyroxine.

The compensation mark was awarded in a number of cases, although there were many who gave the location of the hormones as the pancreas, or got all but one correct. 51% of students did not achieve any marks.

**06.3** This question was not well answered with 'not having to remember to take the pill every day' being the most frequent correct response. There were many insufficient responses about it being more effective, longer lasting or being safer.

There was some confusion regarding how both patch and pill are used. Some students thought the patch was placed inside the vagina, in the mouth or on ovary. Others thought that it would reduce the risk of STDs, or that it is easy to remove if you want to get pregnant.

### 4.5.3.4 Contraception

**Answer 02 · Examiner comments** November 2021 | 8464/B/2H | Original Q1

**Question 1 (standard demand)**

This question was about hormones and contraception. Early parts of the question involving recall of correct terms such as ‘endocrine’ were not well answered. Common incorrect answers were digestive system, respiratory system or attempts to name the organs. The vast majority of students knew that hormones travel in the blood. Some students knew the hormones were likely to be in the plasma, which was creditworthy. Inaccuracies in responses such as ‘in red blood cells’ did not gain the mark. Confusion was seen regarding the term ‘glands’ in **01.5** in this context, with a wide range of other parts of the reproductive system being named.

There was a generally a good attempt at evaluating a new contraceptive method with existing methods in **01.7**. In this extended response question students needed to consider both advantages and disadvantages compared with named existing methods of contraception to access 5 or 6 marks. Clear guidance relating to command words used in AQA GCSE Science examinations is available. Students were not given information regarding the efficacy of the new contraceptive, but some students attempted to compare the efficacy with existing contraceptive methods.

Answer 03 · Examiner comments



# Question 2 (Standard demand)

**02.1** The most common answer was oestrogen, with many alternative spellings. The usual rule regarding phonetic spelling was applied. See page 5 of the mark scheme for an explanation of how this is applied. Progesterone was less frequently given and testosterone was given by a few students and was also correct.

Incorrect responses included FSH / LH / other varied combination of letters. The reference to something being 'produced in the ovaries' led some students to respond with 'eggs' instead of a hormone. Glucagon, adrenaline and insulin were very occasionally offered as an answer.

**02.2** Many students gave correct answers to this question, the responses being evenly split between the two points listed in the mark scheme.

Puberty was often named in relation to bullet point 2 and various secondary sexual characteristics were suggested, the most frequent being 'muscle growth'.

Incorrect answers often arose from not reading the question and giving the name of the hormone released from the testes as testosterone.

Credit was not gained for statements that:

- were too vague such as – 'hair growth', 'helps males develop' or 'sperm' without qualification
- named the hormone rather than its function
- referred to functions of sperm cells rather than of the hormone
- suggested adaptations of sperm cells instead.

**02.3** Students generally gave appropriate answers here, the most commonly seen correct response being 'protection from sexually transmitted infections'. A significant number also identified the lack of side effects or the accessibility of condoms. Credit was not given for responses which focused only on either how condoms acted as a method of contraception or their relative efficacy.

**02.4** This was a levelled, extended response question based on hormonal methods of contraception. The command word, 'describe', allowed students to feel confident in answering and many gained high marks.

The suggested indicative content covered both the naming of methods and the key details of those methods.

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### 4.5.3.4 Contraception

**Answer 03 · Examiner comments** June 2025 | 8464/B/2H | Original Q2

Students achieving a Level 1 mark had to correctly give at least one point from the indicative content. This could be a named hormonal method, or relevant detail as demonstrated by the indicative content. On the Higher tier, for most students, this a very accessible question.

To enter Level 2 it was necessary to give a greater variety of relevant facts and to correctly identify at least one method with some details about the method. Many students were comfortably able to achieve this level. Usually, Level 2 was accessed by students giving detail of two or more methods, but full marks could be achieved even if only one method was referred to if the level of detail was appropriate.

All points from the indicative content were evident in answers and the full variety of different types of pill and of other appropriate methods was seen. The least commonly referred to ideas were about hormones being released into the blood and about possible effects on cervical mucus or on changes to the uterine lining. It is, however, never necessary for all, or even most, suggested points to be covered for the award of the highest marks.

Many responses included demonstration of:

- good basic knowledge of the different types of hormonal contraception
- the ability to marshal ideas effectively and in a sensible sequence
- inclusion of appropriate detail to answer the question.

Frequently seen aspects of answers that did not gain credit included:

- inclusion of non-hormonal methods such as the condom / sterilisation / spermicides (such reference to non-hormonal methods had no impact on the mark awarded)
- consideration of IVF as a method of contraception
- details of the normal roles of hormones and of their interactions without relating to their significance in contraception
- statements that were too vague such as ‘it makes the body believe it is pregnant’ / ‘it has an effect on’ (e.g. eggs being released) or ‘it controls’ (e.g. FSH production) without any specific creditworthy detail
- evaluation of the efficacy rather than a description of methods as was asked for in the question.

There were a few misconceptions with students stating that the hormones killed the sperm or stopped the sperm entering the egg. Others responded that the contraceptive pill makes the body produce oestrogen / progesterone, rather than ‘containing’ those hormones. Some students also thought the hormones had a ‘rebalancing’ effect on the body or gave insufficient answers such as ‘the body is tricked into thinking it is pregnant’.

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### 4.5.3.4 Contraception

**Answer 03 · Examiner comments**

June 2025 | 8464/B/2H | Original Q2

**0 2 . 4** Describe how **hormones** are used in different methods of contraception.

**[6 marks]**

- Patch → releases progesterone and ~~oe~~strogen to stop the egg maturing/releasing. Goes on arm
- IUD → plastic, releases progesterone
- implant → releases progesterone, lasts up to 3 years, stops egg maturing, goes in your arm
- injection → releases progesterone, stops egg maturing
- the pill → progesterone and oestrogen → ingested, stops egg

Extra space maturing and releasing

This student has given five hormonal methods and six details and is therefore, Level 2, 6 marks. The repeated references to hormonal methods releasing progesterone are only credited once.

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