

General Certificate of Education
June 2007
Advanced Level Examination



ENGLISH LANGUAGE (SPECIFICATION A)
Unit 4 Language Investigation

EA4W

Thursday 14 June 2007 1.30 pm to 4.00 pm

For this paper you must have:

- a 12-page answer book.

Time allowed: 2 hours 30 minutes

Instructions

- Use blue or black ink or ball-point pen.
- Write the information required on the front of your answer book. The *Examining Body* for this paper is AQA. The *Paper Reference* is EA4W.
- Do all rough work in the answer book. Cross through any work you do not want to be marked.

Information

- The maximum mark for this paper is 60.
- The marks for the question are shown in brackets.
- You will be marked on your ability to use good English, to organise information clearly and to use specialist vocabulary where appropriate.

Advice

- It is recommended that you spend at least 30 minutes studying the texts and planning your investigation. When you write your answer, the majority of your time should be devoted to analysis of data.

There are no questions printed on this page

Language Investigation

Your task is to carry out a language investigation using **some or all** of the texts that have been provided for you.

Description of Texts

These texts are about sexual reproduction and the process of fertilisation.

Text	Genre and date of publication	Title
1	Leaflet published by the Family Planning Association 2005	<i>Body Works – a rough guide to eggs, sperm and conception</i>
2	Children’s illustrated book 1995	<i>Mummy Laid an Egg</i>
3	An informative book for boys 1998	<i>What’s Going On Down There? Answers to Questions Boys Find Hard to Ask</i>
4	AS/A Level Textbook 1990	<i>Biological Science 2: Systems, Maintenance and Change</i>

Suggested structure for writing up your investigation

1: Aim(s)

State the aim(s) of your investigation and identify which texts you are using.

2: Method

Explain the linguistic frameworks you are using to analyse your data.

3: Analysis

Present a detailed analysis of your data.

4: Conclusion

Draw your conclusions in response to your aim(s) and based on your analysis.

5: Evaluation

Evaluate the validity of your conclusions and suggest any further research that might be undertaken.

(60 marks)

Text 1 has been omitted due to third-party copyright restraints.

Text 2 has been omitted due to third-party copyright restraints.

Text 3 has been omitted due to third-party copyright restraints.

Text 4

20.3.4 Fertilisation

Sperm are deposited high up the vagina close to the cervix. Investigations have shown that sperm pass from the vagina through the uterus and to the top of the fallopian tube within five minutes as a result of contractions of the uterus and fallopian tubes. These contractions are thought to be initiated by the release of oxytocin during sexual intercourse and the local action of prostaglandins, present in semen, on the uterus and fallopian tubes. Sperm are viable in the female genital tract for 24–72 h but are only highly fertile for 12–24 h. Sperm can only fertilise the oocyte after spending several hours in the female genital tract, usually seven hours, during which time they undergo a process known as **capacitation**. This involves a change in the properties of the membrane covering the acrosome and enables fertilisation to proceed. Fertilisation usually occurs high up the fallopian tube.

When a sperm reaches the oocyte (fig 20.41), the outer membrane of the sperm covering the acrosomal region and the membranes of the acrosome rupture enabling **hyaluronidase** and **protease** enzymes stored in the acrosome to ‘digest’ away the cell layers, including the zona pellucida, surrounding the oocyte. These changes in the sperm head are known as the **acrosome reaction**. Subsequent changes in the sperm head evert the inner membrane of the acrosome allowing penetration of the zona pellucida and the cell surface membrane of the oocyte and, in humans, entry of the entire sperm. Once one sperm has entered the oocyte, cortical granules beneath the cell surface membrane, beginning at the point of sperm entry, rupture, releasing a substance which causes the zona pellucida to thicken and separate from the cell surface membrane. This is called the **cortical reaction** and spreads over the entire surface of the oocyte causing the zona pellucida to form an impenetrable barrier called the **fertilisation membrane** which prevents the entry of further sperm, that is preventing **polyspermy**.

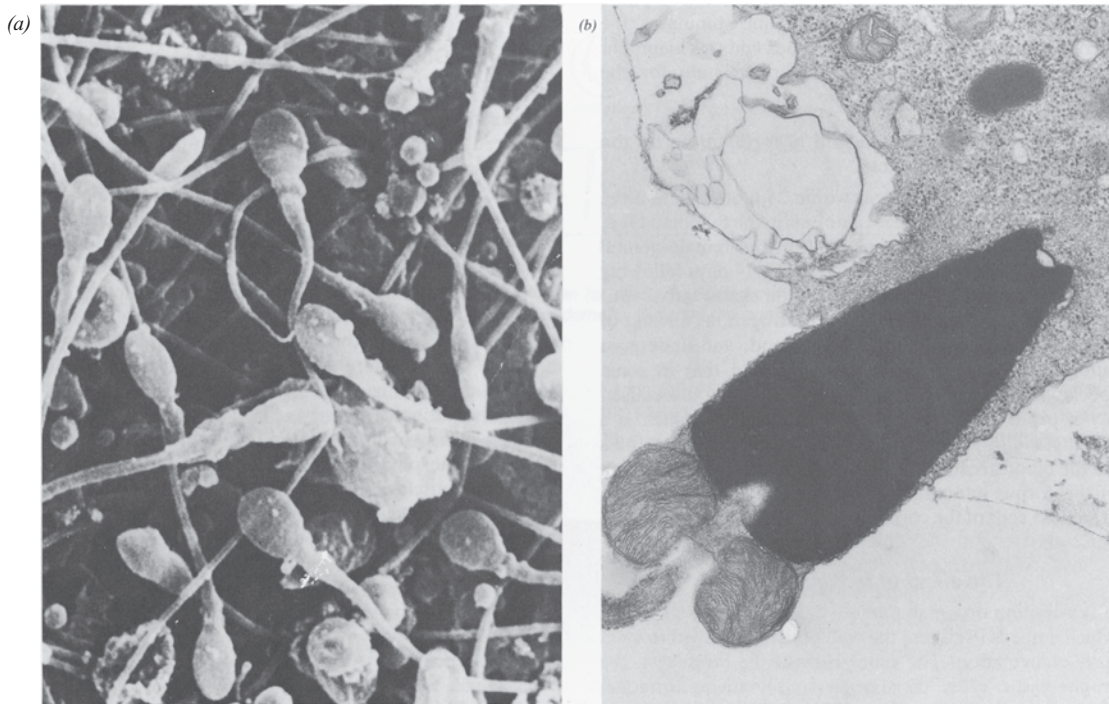


Fig 20.41 (a) Scanning electron micrograph of human sperm clustered around secondary oocyte
(b) The precise moment of fertilisation as a sperm penetrates the membrane of a sea-urchin's egg. The dark wedge is the head of the sperm which contains the genetic code. The grey shape behind it is where energy is released that provides power for the tail. The sperm has digested the egg's surface coating of sugary protein and entered. Now the egg's internal fluid welds itself to the outside of the sperm, and draws it in to complete the mating. In some unknown way, the entry of one sperm prevents any others getting in, probably because of rapid changes in the egg's surface coating.

Source: R. SOPER, N.P.O. GREEN, G.W. STOUT AND D.J. TAYLOR, *Biological Science 2: Systems, Maintenance and Change*, Cambridge University Press, 1990

END OF TEXTS

There are no texts printed on this page

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Text 1: © Contraceptive Education Service. *Body Works*, Family Planning Association, 2005

Text 2: from *Mummy Laid an Egg* by Babette Cole, published by Jonathan Cape. Used by permission of The Random House Group Ltd.

Text 3: Reprinted by permission of Walker & Co.

Text 4: ROLAND SOPER, NIGEL P.O. GREEN, G. WILFRED STOUT, DENNIS J. TAYLOR, *Biological Science Vol No 2, 2nd ed.*, Cambridge University Press, 1990

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