Statistics

<table>
<thead>
<tr>
<th>Year</th>
<th>Number of candidates</th>
<th>VHA</th>
<th>HA</th>
<th>SA</th>
<th>LA</th>
<th>VLA</th>
</tr>
</thead>
<tbody>
<tr>
<td>2009</td>
<td>55</td>
<td>1</td>
<td>16</td>
<td>27</td>
<td>10</td>
<td>1</td>
</tr>
<tr>
<td>2008</td>
<td>51</td>
<td>3</td>
<td>24</td>
<td>19</td>
<td>4</td>
<td>1</td>
</tr>
<tr>
<td>2007</td>
<td>44</td>
<td>3</td>
<td>13</td>
<td>19</td>
<td>8</td>
<td>1</td>
</tr>
<tr>
<td>2006</td>
<td>49</td>
<td>4</td>
<td>11</td>
<td>27</td>
<td>5</td>
<td>2</td>
</tr>
<tr>
<td>2005</td>
<td>47</td>
<td>0</td>
<td>5</td>
<td>31</td>
<td>10</td>
<td>1</td>
</tr>
</tbody>
</table>

Multiple-choice questions

<table>
<thead>
<tr>
<th>Question</th>
<th>1</th>
<th>2</th>
<th>3</th>
<th>4</th>
<th>5</th>
<th>6</th>
<th>7</th>
<th>8</th>
<th>9</th>
<th>10</th>
</tr>
</thead>
<tbody>
<tr>
<td>Correct response</td>
<td>B</td>
<td>D</td>
<td>C</td>
<td>B</td>
<td>D</td>
<td>A</td>
<td>B</td>
<td>C</td>
<td>A</td>
<td>B</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Question</th>
<th>11</th>
<th>12</th>
<th>13</th>
<th>14</th>
<th>15</th>
<th>16</th>
<th>17</th>
<th>18</th>
<th>19</th>
<th>20</th>
</tr>
</thead>
<tbody>
<tr>
<td>Correct response</td>
<td>A</td>
<td>A</td>
<td>C</td>
<td>B</td>
<td>C</td>
<td>B</td>
<td>C</td>
<td>B</td>
<td>B</td>
<td>C</td>
</tr>
</tbody>
</table>

Characteristics of good responses

Many candidates’ responses demonstrated evidence that the candidates had actively read the questions and tailored their responses to precisely provide the answer required. The space provided for each response gave a good indication of the level of depth required within the response. Candidates who used the space provided as a guide demonstrated both appropriate subject knowledge and good time management skills.

Understanding biology

Responses assessed against this criterion showed a relatively good basic understanding of biological knowledge. More than two thirds of candidates performed well in this area. Most of the errors made by candidates appeared to be due to candidates failing to read questions accurately. Candidates should be aware of the specific requirements of a question when phrases such as “most probable” are used. While a response may be correct in essence, that is, the response may be possible, it does not provide sufficient evidence to demonstrate that they are able to determine the most probable scenario.
Investigating biology

It was very clear that some candidates had planned, carried out and reflected on investigations carried out during their study. The ability to read and interpret data was demonstrated very well in most responses.

Evaluating biological issues

A number of candidates’ responses demonstrated an ability to evaluate biological issues rather than focus on the social impacts of the issues being discussed. Candidates performed better in this criterion than those in previous years. Candidates who highlighted or underlined the key aspects of each question were better able to structure their responses ensuring all aspects of the question were covered. Summary statements were also beneficial in providing evidence for markers.

Common weaknesses

Some responses were illegible and were unable to be used as evidence of achievement. Candidates should take sufficient time when reading and responding to each paper to ensure they understand the questions and provide concise, coherent and legible responses. Poor literacy skills were evident in some papers, for example morden (modern), pacent (patient) and opporation (operation).

Some candidates provided long responses that often failed to adequately answer the questions.

Understanding biology

Candidates made a number of errors by not reading and interpreting questions correctly. For example, in response to Paper Two Part A Question 6 regarding phagocytosis, one candidate presented a precisely drawn lifecycle of a sexually reproducing organism. This response, which was incorrect and unrelated to the question, was undoubtedly time-consuming. Question 14, regarding levels of taxonomy, prompted a response detailing the levels of energy required in food sources.

Investigating biology

Some questions required candidates to provide evidence of independent planning of experimental investigations. Poorly performing responses consisted of descriptions of standard recipe-style experiments that did not allow for individual planning, investigation or analysis. It was clear that some candidates did not conduct any experimental activities at all during their study of biology.

It should be noted that dissections, while investigative to some extent, are not considered part of the application of the scientific methods expected in this course of study. Many candidates showed a limited understanding of independent and dependent variables, which affected their ability to design constructive investigations.
Evaluating biological issues

Responses from candidates who performed poorly in this criterion did not demonstrate a solid understanding of the requirements of each question. They tended to spend a lot of time and words restating the question, often repeating already-established facts and posing new problems instead of addressing the biological concepts and impacts of the stated scenario. There was a considerable amount of evidence that some candidates did not understand some basic biological concepts, such as natural selection, let alone show an understanding of the particular concept under discussion.

Prospective candidates should read and understand the assessment standard descriptors for each criterion in the syllabus.

Sample solutions

Sample solutions/responses for 2009 are printed on the following pages to help teachers and candidates prepare for future Biology examinations.
Part B

Short response

Suggested time allocation: 40 minutes.
This part has five questions of equal value. Attempt all questions.
Part B assesses Investigating Biology (IB).
Respond to the questions in the spaces provided.

Question 1
A researcher was testing the hypothesis that the range of sound frequencies that a person can hear decreases as they age. Males and females of differing ages were selected. A sound generator produced noises that varied in frequency. State the dependent variable in this experiment.

Question 2
Vitamin C is believed to prevent colds. To test this, 10000 volunteers were divided into four equal groups. Each person received a dose every evening for one year. The results were as follows:

<table>
<thead>
<tr>
<th>Group</th>
<th>Contents of dose</th>
<th>Percentage who developed colds</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Sugar</td>
<td>20</td>
</tr>
<tr>
<td>2</td>
<td>Sugar + 1 gram of Vitamin C</td>
<td>19</td>
</tr>
<tr>
<td>3</td>
<td>Sugar + 3 grams of Vitamin C</td>
<td>21</td>
</tr>
<tr>
<td>4</td>
<td>Sugar + 9 grams of Vitamin C</td>
<td>10</td>
</tr>
</tbody>
</table>

State which group (1, 2, 3 or 4) is the control group. Justify your response.

- Group 1
- no vitamin C so can be used to compare other groups' results against

Question 3
In an experiment, the following trials were set up.

Both jars are kept in the dark. State the most probable hypothesis being tested.

If $O_2$ is removed, photosynthesis cannot occur in the dark
Question 4

A student performed an experiment in which yeast cells were placed in differing concentrations of glucose. The growth of yeast was measured.

In the space below, sketch and label the axes that would be used to most appropriately display the results.

\[ \text{Growth of Yeast (Cloudiness)} \]
\[ \text{(% of light transmission)} \]
\[ \text{conc. of glucose (m)} \]

Question 5

A guide to whether an individual is overweight is calculated using the body mass index (BMI). This is calculated in the following way:

\[ \text{BMI} = \frac{\text{mass (kg)}}{\text{height (m)} \times \text{height (m)}} \]

The table below shows weight categories.

<table>
<thead>
<tr>
<th>Category</th>
<th>BMI (Female)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Underweight</td>
<td>19.9 or less</td>
</tr>
<tr>
<td>Acceptable weight</td>
<td>20–25</td>
</tr>
<tr>
<td>Overweight</td>
<td>25.1–30</td>
</tr>
<tr>
<td>Obese</td>
<td>30.1–40</td>
</tr>
<tr>
<td>Extreme obesity</td>
<td>40.1 or more</td>
</tr>
</tbody>
</table>

A 1.57 m woman weighing 63 kg would be in which category?

\[ \underline{\text{Overweight}} \]

End of Part B
Part C. Paper

Q1

**Hypothesis:** Stem cell research has the potential to help treat a wide range of diseases by replacing damaged cells. Patients may die as a result of treatment. Their consent and understanding is essential.

**Supporting evidence:**

- **First and foremost, any patient has the right to choose their own treatment.** At times, medical processes are uncertain, and terminal conditions may not be long enough for successful treatments. A decision based on a patient’s wishes is crucial.

- **Stem cells are undifferentiated.** They have the potential to develop into muscle, bone, or nervous tissue, depending on the need. In some cases, stem cells can help in the recovery of injured tissues, such as in spinal cord injuries or bone fractures.

- **Embryonic stem cells are a prime source of stem cells.** Embryo development occurs before much cell specialization occurs. The use of stem cells from the source, confronts the question of the death of an embryo.
loss, in many cases, of a possible human being. Who can our life be traded for another? A patient has an adult voice, but who can speak for an embryo? Does a mother, or a father, or a doctor have such ethical powers and responsibilities? Currently, our politicians make laws to determine such guidelines. An alternative course of stem cells would resolve such an ethical dilemma. Stem cells from bone marrow may present the undifferentiated tissue of a newborn. Stem cell research needs to continue to provide such possible solutions. Because of their ability to mature into new cells, a stem cell 'grows' or 'divides' to produce others. When this results in a patient's cancer, their quality of life is diminished. But is their progress any worse, if they are terminally ill? Cancer cells reproduce without a capsule to contain them, making it likely that a malignancy can spread to any part of the body and produce secondary cancers. Some cancers can be treated by surgery, radiation or chemotherapy, so getting cancer may be able to be spared and give a patient a good quality of life, later.
<table>
<thead>
<tr>
<th>Hyperkinesis</th>
<th>Transplantation of hearts, one ground-breaking revision, is now common. Lungs even, not to mention kidneys, and other organs!</th>
</tr>
</thead>
<tbody>
<tr>
<td>Outline agreement to follow.</td>
<td>It is possible to replace defective tissue with healthy organs, thereby giving life, or a better quality of life, to patients. Questions such as cost, and source of donors, make these decisions not quite as simple as they seem. Perhaps the future will lead to cell banking, and self-renewable tissues when a 'sick' organ can be replaced by a 'healthy' one, tissue can be saved, a blind person can see, a hospital-bound kidney patient can enjoy anormal life. There is no doubt of the benefits of the surgical procedure of transplantation.</td>
</tr>
<tr>
<td>Point 1</td>
<td>Scarcity of organs requires careful planning. Usually dead people, are the sources of such organs, which must be removed quickly, before deterioration that occurs after death. Unfortunately, this is not always the case. There is a market in organs, and poor people in third world countries are known to sell theirs. A murderer who may exist in refugee camps as a source of their organs for sale. Prisoners in some countries are claimed to be used as organ sources. Our medical authorities encourage 'organ donation', which can be availed if our donors licenses are renewed, so that when we die, our organs may...</td>
</tr>
</tbody>
</table>
be used to save life to others.

A problem with organ transplants is the waiting time needed before a transplant can be produced. We literally wait for other to die. Others who match our tissue type will be rejected and a patient dies.

Even so, drugs are needed to maintain accept of an organ's tissue or antibody. Future research may avoid this problem if a healthy clone of our own cells may produce

an organ that can be used without much delay, without the need for death, without the frustration of rejection, without the need of long hospital stay. What better way is there, as with skin grafts, then to use our own tissue to replace defective organs.

The black market in organs would dry up.

So too would the ethical question, which arises from limited organ availability. No longer to decisions of who deserves to live! More, no longer the costs from long hospital stay, providing dollars which can be spent elsewhere, helping others who now 'miss out'.

Organ transplants will continue to save lives. New directions of medical research may reduce ethical and financial concerns that debate for the valuable procedure saving millions of lives.
| Conclusion | Some issues are ethical as well as medical. If abortion research continues with the assistance of terminated patients, many lives in the future may be saved. Such benefits surely outweigh the risks. Who should decide whether this research continues or not? Future beneficiaries? Present patients and doctors? Recent legislation? Undeveloped embryos? |
Paper Two

Part A

Short response

Suggested time allocation: **45 minutes**.
This part has **25** questions of equal value. Attempt all questions.
Part A assesses *Understanding Biology* (UB) and *Investigating Biology* (IB).
Respond to the questions in the spaces provided.

Questions 1 to 15 assess *Understanding Biology* (UB).

**Question 1**

State the **name of the complex molecule from which energy for a cell's use is released.**

ATP (Adenosine triphosphate)

**Question 2**

State one function of the endoplasmic reticulum in cellular function.

Provides surface for ribosomes to synthesize protein

**Question 3**

Explain why the DNA molecule replicates itself during cell division.

Because it divides there must be enough to maintain the correct amount of DNA in the final cell

**Question 4**

Describe one function of the small intestine.

Absorption of nutrients into the bloodstream

**Question 5**

Briefly describe how a foetus receives nutrition during its development in the womb.

Via the umbilical cord connected to the placenta where nutrient and waste exchange with the mother happens
Question 6

In the space below, draw a series of diagrams to show the process of phagocytosis.

\[ \text{antigen} \rightarrow \text{phagocyte} \rightarrow \text{antigen digested} \]

Question 7

Where an injury occurs, pus (thick yellow fluid) may accumulate. Describe what pus consists of.

- White blood cells that have engulfed foreign material and died

Question 8

Briefly describe, using an example, one way in which a new species could be formed.

- Geographic isolation - separated by a physical barrier, developing different characteristics as each adapt, eventually unable to interbreed

Question 9

A grasshopper zygote has 30 chromosomes. How many chromosomes are in a grasshopper muscle cell? Explain your reasoning.

- 15 because a zygote is a sex cell containing half the full number of chromosomes

Question 10

In Drosophila (fruit flies), sex is inherited in a similar way to humans. The wild-type body colour is sex-linked and dominant to the yellow body colour. State the ratio of the phenotypes resulting from a wild-type male crossed with a yellow female. Show your working.

\[
\begin{align*}
\text{wild male } (XY) & \times \text{ yellow female } (X^yX^y) \\
Y &= \text{dominant wild} & \text{yellow female } (X^yX^y) \\
y &= \text{recessive yellow} & \text{yellow female } (X^yX^y)
\end{align*}
\]

- So: So wild female: yellow male
Question 11

A DNA segment has this nucleotide sequence:

\[ \text{A A G C T C T T} \]

List the mRNA sequence that is complementary to this sequence.

\[ \text{U U C G A A} \]

Question 12

Explain mutualism, using an example.

e.g. lichen - algae provide food, fungus provides nutrients

Question 13

The table below shows the characteristics of five plant species.

<table>
<thead>
<tr>
<th>Characteristic</th>
<th>Species</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>1</td>
</tr>
<tr>
<td>Habitat</td>
<td>aquatic</td>
</tr>
<tr>
<td>Produces flowers</td>
<td>✓</td>
</tr>
<tr>
<td>Produces cones</td>
<td>x</td>
</tr>
<tr>
<td>Produces seeds</td>
<td>✓</td>
</tr>
<tr>
<td>Produces own food</td>
<td>✓</td>
</tr>
<tr>
<td>Has vascular tissue</td>
<td>✓</td>
</tr>
</tbody>
</table>

Decide which two of the species described above could be included in the plant group known as angiosperm.

\[ \text{species 1 and 3} \]

Question 14

State the level of taxonomy at which the greatest degree of similarity between two organisms is found.

\[ \text{species} \]

Question 15

Many chemical reactions in living organisms depend upon an exact binding between two molecules. The action of enzymes is an example. Explain the role of an enzyme.

\[ \text{to speed up specific reactions without changing the reactants, in biological systems} \]

**Question 16**

A scientist is comparing the density of water fleas in two different environments. For each environment, she collects five samples of 100 ml and counts the number of water fleas present in each sample.

<table>
<thead>
<tr>
<th>Sample number</th>
<th>Pond</th>
<th>Stream</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>8</td>
<td>6</td>
</tr>
<tr>
<td>2</td>
<td>9</td>
<td>3</td>
</tr>
<tr>
<td>3</td>
<td>12</td>
<td>4</td>
</tr>
<tr>
<td>4</td>
<td>14</td>
<td>8</td>
</tr>
<tr>
<td>5</td>
<td>5</td>
<td>3</td>
</tr>
</tbody>
</table>

Compare the density of water fleas in the two environments. State a possible reason for these results.

\[ \text{pond: } 9.6/100 \text{ml}, \text{stream: } 4.8/100 \text{ml} \]

\[ \text{Eg increased water movement in the stream may have a negative impact on the flea population} \]

**Question 17**

The graph below shows world human population changes.

In what 100-year period was the greatest increase in the world’s human population? Provide a possible biological reason for this increase.

\[ 1900 - 2000 \]
Question 18

The table below shows plant and animal counts for the years 1985 to 1990 in a small area. The counts include all of the plants in the area.

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Plant 1</td>
<td>10</td>
<td>79</td>
<td>95</td>
<td>35</td>
<td>15</td>
<td>0</td>
</tr>
<tr>
<td>Plant 2</td>
<td>0</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>5</td>
<td>20</td>
</tr>
<tr>
<td>Plant 3</td>
<td>80</td>
<td>62</td>
<td>23</td>
<td>4</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Plant 4</td>
<td>20</td>
<td>4</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Plant 5</td>
<td>0</td>
<td>5</td>
<td>20</td>
<td>95</td>
<td>110</td>
<td>50</td>
</tr>
<tr>
<td>Animal A</td>
<td>5</td>
<td>1</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td>Animal B</td>
<td>12</td>
<td>10</td>
<td>7</td>
<td>8</td>
<td>9</td>
<td>10</td>
</tr>
<tr>
<td>Animal C</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>5</td>
<td>25</td>
<td>16</td>
</tr>
</tbody>
</table>

State the most probable food for Animal C. Justify your response.

Plant 5 - plant 5 increases from 1988 to 1989 then drops which coincides with the animal C numbers. Also - plant 3 + 4 not present with animal C and animal C not present with plant 1, plant 2 too low.

Question 19

Two pumpkins are growing on the same plant. At the start of their development, one was enclosed in an aluminium foil bag and the other enclosed in a clear plastic bag. Both bags allowed the passage of oxygen, carbon dioxide and water. The mass of the pumpkins was measured with the results recorded below.

<table>
<thead>
<tr>
<th>Type of enclosure</th>
<th>Pumpkin mass</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Start of experiment</td>
</tr>
<tr>
<td>Aluminium foil</td>
<td>5 g</td>
</tr>
<tr>
<td>Clear plastic</td>
<td>5 g</td>
</tr>
</tbody>
</table>

Suggest possible improvements to the experiment.

*eg - include repeats
- control other variables
- improve specific measurements of pumpkin size*
Question 20

The table below shows the fitness levels of men.

<table>
<thead>
<tr>
<th>Fitness level</th>
<th>Under 30 yrs of age</th>
<th>30–39 yrs old</th>
<th>40–49 yrs old</th>
<th>50+ yrs old</th>
</tr>
</thead>
<tbody>
<tr>
<td>Very poor</td>
<td>&lt;1.6km</td>
<td>&lt;1.5km</td>
<td>&lt;1.4km</td>
<td>&lt;1.3km</td>
</tr>
<tr>
<td>Poor</td>
<td>1.6–2.0</td>
<td>1.5–1.8</td>
<td>1.4–1.7</td>
<td>1.3–1.6</td>
</tr>
<tr>
<td>Fair</td>
<td>2.0–2.4</td>
<td>1.8–2.2</td>
<td>1.7–2.0</td>
<td>1.6–2.0</td>
</tr>
<tr>
<td>Good</td>
<td>2.4–2.8</td>
<td>2.25–2.6</td>
<td>2.0–2.5</td>
<td>2.0–2.4</td>
</tr>
<tr>
<td>Excellent</td>
<td>2.8+</td>
<td>2.6+</td>
<td>2.5+</td>
<td>2.4+</td>
</tr>
</tbody>
</table>

How fit does a 50-year-old man have to be to run farther than a 29-year-old man? Explain your response.

**Fair as a minimum as even a very poor 29 year old can run the minimum for a poor 50 year old.**

---

Question 21

The graph below shows the blood flow through various organs during strenuous exercise and at rest.

![Blood flow graph](image)

Analyse the data and explain the effect of exercise on the body’s organs.

**Exercise results in increased blood flow to skeletal muscles, heart and skin, and some decrease to gut and brain (areas not needed during exercise).**
Question 22

John is married to Margaret and they have three children, David, Alison and Jane. David is married to Claire. Their daughter Natalie has two brothers, Daniel and Justin. Gemma and Donna are twins. The mother of Gemma and Donna is Alison and the father is Robert.

Design a pedigree with a key. Use correct biological protocols for this family.

---

Question 23

Briefly describe an experimental investigation you have undertaken during your study of biology. Suggest valid improvements that could be made on the investigation design.

Should fully describe aim, hypothesis, conclusion and include improvements and be evidence of investigations carried out during coursework by the candidate.
Question 24

State the difference between primary data and secondary data using examples that you have been exposed to during your study of biology.

- primary - directly collected by scientist
- secondary - collected by another party

Question 25

Design an experiment to investigate one aspect of plant physiology. Justify the variables involved. Include methodology, the type of results to be gathered and a prediction of how results would be analysed.

- should include controls, variables, method, type of results to be collected and how these results could be analysed
- shows evidence of ability to design using Sci Theay

End of Part A
Part B

Q1

TITLE: Under Attack

Paragraph 1

Outline hypothesis: the proposal for large scale shark hunting is a valid one causing a threat to populations not only locally, but possibly to all of competitors (e.g. large fish, humans). It poses a major threat to the shark food source. With population not only of the food supply, but also of the species, it's nearly endangered species.

Briefly outline argument to follow:

Point 1: FACT

Evidence / source / eg quote

Two hundred Australians are dead from shark attacks, according to the data presented in the research. While not natural consumers of humans, in their own habitat, as food source diminishes, sharks move their territories to where humans exist.

Point 2: FACT

Evidence / source / eg quote

Until their food source for sharks is replenished, and as long as humans share the same environment, humans

 Queensland Studies Authority March 2010 | 19
Q1: Part B etc.

Part 1. Fact

Sharks are important to the ecosystem, as they help maintain the balance of the food chain. The removal of sharks can affect the population of other species and lead to an imbalance in the ecosystem. Indeed, it may well remove pressure from other predators, allowing them to thrive.

Part 1. Fact

Were shark hunting to be allowed, without intervention of fishing, many by many, the food chain effect would pass down to lower order consumers. Animals whose predators are more numerous become reduced in numbers, and their prey in turn can increase as a result. And so all other animals in the food web are affected. It is preferable, therefore, to return sharks to their own habitat as soon as possible.
| Out 5 | FACT | The reality of decisions such as that of shark hunting is that they are often made by politicians in response to popular pressure and economic factors. Frightened locals leave resorts, job security is threatened. Fishermen told to desert offshore grounds lose jobs, which is not popular. |

| Conclusions | The occur should go home, the reef as an argument. The contention is how to achieve this goal. Sharks entering new environments disrupt the balance of their ecosystems, just as man does when he overfishing or shark hunts. Ecosystems are a complex, set of interrelated factors, which are paramount to human swimming areas, having less fear and more economic security than man-the hunter, placing the shark under attack, rather than humans. |
Hypothesis/autumn argument to follow:

Current legislation favours the breeding of female mud crabs by protecting them. Future mudcrab harvesting is being made more difficult due to fewer, and smaller saleable and edible, male crabs. While females, as egg layers need protection in order to breed and keep stocks numbers high, it should be considered that by allowing larger female crabs to be eaten that harvesting would ensure without threatening the large stock of mudcrabs, this would ensure the economic survival of human needs. Alternatively, smaller male crabs could be harvested instead to sustain industry short term needs. Our crabbing industry relies on the retrieval of male crabs which are the only commercially saleable types. Unless their numbers are perpetuated, the industry cannot be economic. This means that male crabs might need some help.

Point 1: FACT
Female crabs are becoming more numerous. They compete with their own species for food. They are threatened by the same consumers who eat crab. The size of the female may after enrichment as a 'nice mortar specimen' to higher order consumers,
but, their size also confers strength which allows them to defend well against attack. Indeed, their sex protects them from human predation.

Male crabs are harassed by female behaviour, their aggression especially against young crabs who means that male have a hard time reaching maturity, as little time of making it to our table are lessons.

Conclusion: Perhaps we would be better served to allow some females against again to be eaten, taking some pressure off the male crabs in the exploitation. Reducing size requirements and allowing females to be eaten are two ways of maintaining the crab industry, but if we remove some of the larger, more aggressive females, we provide not only marketable crabs for fisherman, but also ensure a better chance to replenish. Allowing smaller males to be captured, may provide in the short term more crabs for fisherman, but it only perpetuates the already diminishing male numbers. Since female crabs numbers are very healthy, removal of some will not harm the survival of crab populations.
Title: Superman

A generation ago, it was stories of Superman who came to our rescue in some stories. Will he be able to solve man's problems of superbugs, now, in our time? The super drugs, antibiotics which emerged after WWII have saved millions of lives, but in our health, under threat now, by their use, or rather overuse, bacteria have become resistant to drugs which once may have killed them, making them sometimes useless in treatment of human diseases.

Point 1/2

Doctors in Australia are usually very do not to prescribe antibiotics. These drugs work by preventing cell wall assembly in bacteria, thus preventing their replication and development of disease. When humans recover, their own immune systems would recognize and remove the invading antigen.

This is what doctors expect will happen, while antibiotics are not taken. That, after a period of illness, the normal immune system of people will detect the antigen and produce the antibodies and white blood cells to fight off the disease, often rendering immunity as a result. The risk is that the disease is too powerful or fatal, and that the immune system is
Antibiotics are only effective against bacteria and are useless against viruses. Often a viral attack is followed by a bacterial disease, when antibiotics may be useful. But if we go to the doctor in the early viral phase of an illness, an antibiotic will be useless as it may cause serious harm.

Worse, a course of antibiotics to be prescribed, the doctor has delivered a tiny dose of bacterial attack. The drug will work quickly, and the patient often feels much better after a few days; the temptation to discontinue the drug is great, as bacteria are still present in the body and may need to be killed. Otherwise, their system to the drug may allow it to develop a resistant to the drug. Those bacteria hardest to kill are those already least affected by the antibiotic.

Such mutated bacteria are very hard to kill, as they have become resistant to one antibiotic; another would need to be used next time, and so on until, if used harder, harder to find drugs that work. Bacteria have developed multiple resistances to these drugs. Hospitals, because of the many patients, can easily harbour these super bugs.
Humans have a great immune system which has survived and developed since primitive man. If we can get better, without drugs, we are better for it. If we can have drugs available, such as antibiotics that work, we need not to overuse them. They are powerful life savers, if they work! Any prescribed course should be finished to make reaction less likely. There is no super man to help us with our super bugs - just us - who need to act prudently.