Lesson 16: B5.20 – IVF

Connection

Q1. Name the main sex hormones in males and females

Q2. List 4x hormones that control the menstrual cycle

Q3. Describe the role of these 4 hormones

Activation

LI: Describe the roles of hormones IVF

https://www.youtube.com/watch?v=4CxNeiAICmc

1. Make a note of the title and the LI
2. Read pages 210-211
3. Make a list of the key words and define those you don't know
4. Bullet point the 4x factors that help make IVF successful (blue)
5. Bullet point stages of IVF (purple)

Consolidation

Complete and self assess the relevant past paper question for this topic - From the B5 DIP file

Extension

Make a note of one thing you think you understand well and one thing that you would like to ask your teacher

Demonstration

Attempt questions 1-3 & 5-7
In 10 mins answer as many questions as you can.
Self mark the questions you have done making any necessary corrections in blue pen

Challenge yourself to answer as many as you can:
Green questions to GCSE Level 3
Blue questions to GCSE Level 6
Purple questions to GCSE Level 9

Answers: B5.20 – IVF

Connection

1 oestrogen and testosterone
2 oestrogen, progesterone, FSH, LH
3 oestrogen and progesterone promote and maintain the lining of the uterus
FSH causes the egg to mature in the ovaries
LH causes the egg to be released from the ovaries

Demonstration

1 FSH – causes eggs to mature in the ovaries. LH – triggers ovulation.

2 (to monitor) the number and size of developing follicles.

3 when eggs are removed from the mother and fertilised, in the laboratory, with sperm collected from the father.

4 Two from: young mother; mother has been pregnant previously; has a BMI in the range of 19- 30; has a low alcohol and caffeine intake, and does not smoke.

5 a single sperm could be collected and injected into an egg. The procedure is carried out microscopically.

6 the IVF process, from stimulation of the ovaries to implantation of an embryo.

7 Similarities: Both involve treatment with hormones FSH and LH to stimulate the production of eggs from the ovaries. Both used for couples wanting to conceive. Both can be emotionally quite stressful.
Differences: In IVF the eggs are collected and then mixed with the father's sperm in a lab. Successful embryos are then placed in mother's uterus In fertility treatment there is a risk of multiple births because the fertility drugs can stimulate more than
one egg to be released.

Lesson 16: B5.21 – IVF evaluation

Connection

Q1. What two hormones are used prior to IVF?

Q2. List 4 factors that can increase success with IVF

Q3. List 5x steps of IVF?

Activation

LI: Evaluate the social, emotional and ethical issues of IVF

https://www.youtube.com/watch?v=fOfFr9Q0WWA

1. Make a note of the title and the LI
2. Read pages 212-213
3. Make a list of the key words and define those you don't know
4. Make a table to show the ethic pros and cons of IVF treatment (bullet points in purple section)

Consolidation

Complete and self assess the relevant past paper question for this topic - From the B5 DIP file

Extension

Make a note of one thing you think you understand well and one thing that you would like to ask your teacher

Demonstration

Attempt questions 1-4 & 6
In 10 mins answer as many questions as you can.
Self mark the questions you have done making any necessary corrections in blue pen

Challenge yourself to answer as many as you can:
Green questions to GCSE Level 3
Blue questions to GCSE Level 6
Purple questions to GCSE Level 9

Answers: B5.21 – IVF evaluation

Connection

1 FSH & LH to try and stimulate ovulation

2

-Younger
-Previously pregnant
-Low BMI
-Low/No alcohol, caffeine or smoking

3

-FSH LH injected
-Eggs collected
-Mixed with sperm
-Embryos develop
-Best embryos implanted

Demonstration

1 NICE provides guidelines; the final decision is made by the woman's local NHS.

2 to prepare the couple for the process – success or failure.

3 learner answer. it can be estimated by increasing the success rate – from 32.2% in 2010 – by 1% each year, according to the year when the student makes the estimation.

4 Low success rate; possibility of multiple births; accompanying risk to mother and babies; there are reports of higher incidences of premature births, stillbirths, low birth-weights and infant deaths (but rates are higher still in babies born to couples with infertility problems who eventually manage to conceive).

5 student answer, related to IVF not being a natural process; production of many embryos, and the fate of those that are unused.

6 selecting the characteristics of a baby to be born/eugenics.

Lesson 16: B5.22 – Key concept: Working together

Connection

Q1. Why is counselling important for couple undergoing IVF?

Q2. Give a medical issue associated with IVF

Q3. Give and ethical argument for and against IVF

Activation

LI: Describe the effect of adrenalin and how the nervous and the endocrine system can interact

https://www.youtube.com/watch?v=OcPqX0oCyKA

1. Make a note of the title and the LI
2. Read pages 214-215
3. Make a list of the key words and define those you don't know
4. Draw figure 5.61 adrenalin released version only
5. Draw and label fig 5.62 and name which part of the brain connects the nervous system and the endocrine system in this example

Demonstration

Attempt questions 1-7
In 10 mins answer as many questions as you can.
Self mark the questions you have done making any necessary corrections in blue pen

Challenge yourself to answer as many as you can:
Green questions to GCSE Level 3
Blue questions to GCSE Level 6
Purple questions to GCSE Level 9

Consolidation

Complete and self assess the relevant past paper question for this topic - From the B5 DIP file

Extension

Make a note of one thing you think you understand well and one thing that you would like to ask your teacher

Answers: B5.22 – Key concept: Working together

Connection

1 Prepare them for either success or failure – life changing events

2

-Low success rate
-More premature or still births
-Low birth weights and infant deaths
-Multiple births

3

For

Everyone has a right to the opportunity to conceive

Against

A "human life is destroyed" when the unselected embryos are discarded

Demonstration

1 adrenaline.

2 it is diverted from other areas (the gut and the skin).

3 the stimulus is detected by the nervous system (the sense organ, the eye, and perhaps other senses); nerve impulses transmitted to and through the brain; nervous message is sent to the adrenal medulla – an endocrine gland; the hormone adrenaline is secreted.

4 glucagon.

5 *insulin* promotes the conversion of glucose into glycogen. *glucagon* and *adrenaline* promote the conversion of glycogen to glucose. *Thyroxine and cortisol also affect glucose metabolism, but you do not need to know how.*

6 *thyroxine* affects our mental and physical development, in the embryo, infant and child. *oestrogen* and *testosterone* control our sexual development, including the development of secondary sexual characteristics. *growth hormone* controls our growth through its effects on bone and muscle and other cells.

7 Concept map to link words with correct explanations for links.

Lesson 16: B5.23 – Contraception

Connection

Q1. Why is adrenalin also known as the "flight or fight" hormone

Q2. What is special about the adrenal medulla?

Q3. What other hormone is released with adrenalin in response to fear/stress?

Activation

LI: Explain how fertility can be controlled by hormonal and non hormonal methods

https://www.youtube.com/watch?v=5rsdXadNj-E

1. Make a note of the title and the LI
2. Read pages 216-217
3. Make a list of the key words and define those you don't know

Demonstration

Attempt questions 1-7
In 10 mins answer as many questions as you can.
Self mark the questions you have done making any necessary corrections in blue pen

Challenge yourself to answer as many as you can:
Green questions to GCSE Level 3
Blue questions to GCSE Level 6
Purple questions to GCSE Level 9

Consolidation

Complete and self assess the relevant past paper question for this topic - From the B5 DIP file

Extension

Make a note of one thing you think you understand well and one thing that you would like to ask your teacher

Answers: B5.23 – Contraception

Connection

1 Prepares us for survival by sending extra blood to our heart and muscles

2

Part of the kidney that responds to the nervous system and links it with the endocrine system

3 cortisol

Demonstration

1 hormonal methods; non-hormonal methods, which tend to use barriers to sperm reaching the egg.

2 time in the cycle, at around 14 days; a slight increase in body temperature; a thinning of mucus secreted from the cervix.

3 condom; diaphragm.

4 with other contraceptives, such as the diaphragm. it is not reliable used on its own, and should not be used with a condom (it is not necessary to enable the condom to work effectively, and they are now known to *not* reduce infections such as gonorrhoea, HIV or chlamydia; in fact, they may increase the risk of infection).

5 use reproductive hormones; oestrogen and progestogens inhibit the release of pituitary hormones that control egg maturation and release.

6 an intrauterine device – it prevents a fertilised egg from implanting in the uterus.
plastic IUDs also release a progestogen. some IUDs have copper wound around them; copper is toxic to sperm.

7 IUDs prevent implantation of an egg in the uterus so conception can occur. For those that consider life to begin at conception, IUDs could be considered unethical. However, others consider life begins at implantation and the IUD prevents this so it could be argued not to be unethical.

Lesson 16: B5.24 – Which contraceptive?

Connection

Q1. Name 2 types of contraception

Q2. Name 2 barrier methods of contraception

Q3. What are the 2 types of pill available and how do they work?

Activation

LI: Evaluate the different methods of contraception

https://www.youtube.com/watch?v=kMY-v0F6bX0
https://www.youtube.com/watch?v=Zx8zbTMTncs

1. Make a note of the title and the LI
2. Read pages 218-219
3. Make a list of the key words and define those you don't know
4. Make a poster to cover the advantages and disadvantages of surgical sterilisation, hormonal contraceptives, barrier methods, IUD.
5. List the wider issues regarding a persons choice for contraception

Consolidation

Complete and self assess the relevant past paper question for this topic - From the B5 DIP file

Extension

Make a note of one thing you think you understand well and one thing that you would like to ask your teacher

Demonstration

Attempt questions 1-7
In 10 mins answer as many questions as you can.
Self mark the questions you have done making any necessary corrections in blue pen

Challenge yourself to answer as many as you can:
Green questions to GCSE Level 3
Blue questions to GCSE Level 6
Purple questions to GCSE Level 9

Answers: B5.24 – Which contraceptive?

Connection

1 hormonal and Barrier methods
2
Condom and diaphragm
3 Combined pill (oestrogen & progesterone) and POP progesterone only pill. Inhibit pituitary hormones that cause maturation and release of an egg

Demonstration

1 there are computerised devices that monitor hormonal changes and therefore reduce the possibility of error.

2 IUDs and oral contraceptives (>99% effective).

3 oral contraceptives are hormonal contraceptives taken in through the mouth and are absorbed through the gut. if a person vomits or has diarrhoea, the contraceptive may not have been absorbed into the bloodstream before the vomiting or diarrhoea occurs. the hormonal contraceptives in injections, implants or patches are injected or are absorbed into the bloodstream and are therefore not affected by factors that affect absorption through the gut.

4 Advantage – works immediately when it's inserted; can stay in place for several years
Disadvantage – insertion may be uncomfortable; periods may be longer and more painful.

5 contraceptive pill.

6 student answers. these should include religious factors; economic and lifestyle factors such as when a couple could afford to start a family, how frequently would contraception need to be used, how soon would the women like to become pregnant after contraception ceases.

7 Advantages of sterilisation: Works immediately, very reliable, does not affect hormone levels, does not affect sexual health, long term affordable
Disadvantages: Not easy or impossible to reverse, risks associated with surgery, no protection again STIs.

Lesson 16: B5.25 – Auxins (Triple)

Connection

Q1. The most reliable form of contraceptive is?

Q2. Why might barrier methods such as the condom be a better choice or used as well as the pill?

Q3. Describe an ethical issue surrounding contraception

Activation

LI: Explain how auxin affects plant shoots and roots

https://www.youtube.com/watch?v=rKHIfsHX1aA

1. Make a note of the title and the LI
2. Read pages 220-221
3. Make a list of the key words and define those you don't know
4. Draw and label fig 5.68
5. Draw and label fig 5.69

Demonstration

Attempt questions 1-6
In 10 mins answer as many questions as you can.
Self mark the questions you have done making any necessary corrections in blue pen

Challenge yourself to answer as many as you can:
Green questions to GCSE Level 3
Blue questions to GCSE Level 6
Purple questions to GCSE Level 9

Consolidation

Complete and self assess the relevant past paper question for this topic - From the B5 DIP file

Extension

Make a note of one thing you think you understand well and one thing that you would like to ask your teacher

Answers: B5.25 – Auxins (Triple)

Connection

1 The pill
2 To protect against STI
3 Some people object to birth control methods on religious grounds. Every egg is a potential life.

Demonstration

1 tropism.

2 grow towards the light.

3 negatively gravitropic/grow upwards.

4 as the shoot begins to grow (from the lowest point), it will change direction and grow upwards; a the root begins to grow (from the uppermost point), it will change direction and grow downwards.

5 auxin produced in the shoot tip diffuses towards the shaded side; causes cells on the shaded side to grow/elongate; so more growth on the shaded side causes the shoot to grow towards the light. owing to gravity, auxin accumulates on the lower side; the auxin promotes growth, so there is increased growth on the lower side; the shoot grows upwards.

6 Negative gravitropism ensures plant shoots grow upwards and therefore towards sunlight. *Note that this is the reverse of the response in roots (positively gravitropic), where the auxin is inhibitory, so there is increased growth on the upper side; the root grows downwards.*

Lesson 16: B5.26 – Application of Auxins (Triple)

Connection

Q1. Name the 2 tropisms in plants

Q2. 3x bullet points to explain effect of auxins on shoots

Q3. 3x bullet points to explain the effect of auxins on roots

Activation

LI: Describe some applications of auxins

https://www.youtube.com/watch?v=6boD9x0MMcs

1. Make a note of the title and the LI
2. Read pages 222-223
3. Make a list of the key words and define those you don't know
4. Draw and label fig 5.70

Demonstration

Attempt questions 1-6
In 10 mins answer as many questions as you can.
Self mark the questions you have done making any necessary corrections in blue pen

Challenge yourself to answer as many as you can:
Green questions to GCSE Level 3
Blue questions to GCSE Level 6
Purple questions to GCSE Level 9

Consolidation

Complete and self assess the relevant past paper question for this topic - From the B5 DIP file

Extension

Make a note of one thing you think you understand well and one thing that you would like to ask your teacher

Answers: B5.26 – Application of Auxins (Triple)

Connection

1 Phototropism and gravitropism/geotropism

2

-Light causes auxin to concentrate on the shady side of the shoot

-Presence of auxin causes the cells on the shaded side to grow more quickly

-Shoot bends towards the light

3

Opposite effect in roots

-Auxin more concentrated at the lower side of the root

-Slows the growth of the cells

-Shoot bends down

Demonstration

1 in meristems; (at the tip of the shoot; towards the tip of a root [in the root, the very tip is covered by the root cap, which protects the tip as it is growing through the soil]).

2 to produce clones of plants (quickly).

3 auxin and other types of plant hormones, nutrients, agar, water.

4 to promote cell division and cell enlargement.

5 roots: approximately 5 x 10-9 mol/dm-3. shoots: approximately 2 x 10-4 mol/dm-3.

6 At the concentration used in auxin-based weedkillers, plants with broad leaves are more sensitive than narrow-leaved plants such as grass and cereal crop therefore farmers can use auxin based weedkiller on wheat and barley. They can also be used on lawns to kill broad-leafed weeds such as dandelion without damaging the grass.

Lesson 16: B5.27 – Required practical: Effect of light and gravity on seedlings (Triple)

Connection

Q1. Name the part of the plant where stem cells are found

Q2. How are plant hormones useful when taking cuttings?

Q3. How can auxins be used as a weedkiller?

Activation

LI: Carry out the required practical

https://www.youtube.com/watch?v=fEo21LbnJJM

1. Make a note of the title and the LI
2. Read pages 224-225
3. Make a list of the key words and define those you don't know
4. Carry out Practical

Demonstration

Attempt questions 1-10
In 10 mins answer as many questions as you can.
Self mark the questions you have done making any necessary corrections in blue pen

Challenge yourself to answer as many as you can:
Green questions to GCSE Level 3
Blue questions to GCSE Level 6
Purple questions to GCSE Level 9

Consolidation

Complete and self assess the relevant past paper question for this topic - From the B5 DIP file

Extension

Make a note of one thing you think you understand well and one thing that you would like to ask your teacher

Answers: B5.27 – Required practical: Effect of light and gravity on seedlings (Triple)

Connection

1 Meristem
2 Help the cuttings grow roots
3
Auxins disrupt cell metabolism and kill plants. Plants with broad leaves are more susceptible

Demonstration

1 Amount of water, Carbon dioxide levels, Temperature, Amount of light, Supply of nutrients, Make sure all roots are horizontal, Make sure plants are the same age and size

2 Result after 20 minutes (accept 10 mins) maybe anomalous, because it is different from all the others (and unexpected)

3 Geotropism or gravitropism

4 After 30 mins

5 Diagram should include stem and leaves, and the bending towards the light and an indication of the direction of the light source

6 Auxins are produced in the shoot tip and travel down the shoot, if you cut off the tip, then the auxin cannot be produced, so it is better to cover the tip with foil.

7 Line graph (continuous process), independent variable (time) on x axis, curvature on y axis. Axes labelled, including units. Sensible scale used on both axes. Points plotted accurately. Points joined together
8 As the shoot grows (time passes) the greater the mean angle of curvature

9 Auxin is produced in the shoot tip and travels down the shoot. Auxin makes plant grow more (where the auxin is) The auxin is destroyed by sunlight, so there is less growth on this side of the shoot. The shaded side still have auxin and the shoot grows more on this side. The result is that the shoots bends towards the light

10 Repeat the investigation for gravitropism (geotropism) on page 224, but as well as keeping the seedlings in normal light (control), also germinate 3 additional sets of seedling and put one set with a blue filter in the canister, one set with a red filter and one set with a green filter, using the canister from the investigation on page 225, make sure the seedlings are placed with their roots horizontal and keep all other conditions the same.

Lesson 16: B5.28 – Other plant hormones (Triple)

Connection

Q1. What happened to the root of a seeding that was placed horizontally?

Q2. Where is the light sensitive part of the plant located? How can you test this?

Q3. Why has the ISS been instrumental in making some of these discoveries?

Activation

LI: Explain the importance of gibberellins and ethene

https://www.youtube.com/watch?v=nuVVF5dnifE

1. Make a note of the title and the LI
2. Read pages 226-227
3. Make a list of the key words and define those you don't know
4. Bullet points to explain importance of gibberellins (green)
5. Bullet points to explain the importance of ethene (blue)

Consolidation

Complete and self assess the relevant past paper question for this topic - From the B5 DIP file

Extension

Make a note of one thing you think you understand well and one thing that you would like to ask your teacher

Demonstration

Attempt questions 1-7
In 10 mins answer as many questions as you can.
Self mark the questions you have done making any necessary corrections in blue pen

Challenge yourself to answer as many as you can:
Green questions to GCSE Level 3
Blue questions to GCSE Level 6
Purple questions to GCSE Level 9

Answers: B5.28 – Other plant hormones (Triple)

Connection

1 The root started off horizontal but gradually grew to point downwards due to geotropism
2 The tip. Test this by either covering (reversible) or cutting off (irreversible) the tip.
3 In the ISS experiments can be carried out in the absence of gravity

Demonstration

1 speed up/promote germination; promote flowering, e.g. of apples; increase fruit size, e.g. in cherries,(seedless) grapes.

2 increasing the concentration of gibberellins increases the average mass of the grapes; the graph levels off above around 30 ppm.

3 the banana produces ethene, which causes the tomato to ripen.

4 ethene production increases up to around 4.5 days, and then levels off, with production at around 4 nanolitres/g/h. There may be a slight decrease at 8 days, when the tomato is fully ripe.

5 so that they can be at the optimum degree of ripeness in the supermarket/not overripe by the time they reach the supermarket.

6 student answer. The answer should include reference to adequate ventilation.

7 Bananas produce ethene gas which ripens fruit so any fruit placed next to the banana will ripen.

Connection: B5.Revision

Connection – questions (Triple only)

Q1. List 3x uses of gibberellins

Q2. What is the effect of ethene?

Q3. How is ethene useful to supermarkets?

Connection: B5.Revision

Connection – answers Triple only

A1 Promote germination, flowering and fruit growth

A2 Produced by plants when they ripen

A3 Ethene gas can be used by supermarkets to regulate fruits ripening. Pick and transport when unripe then spray with ethene to ripen them for the shelves

Revision

Connection

Q1. The most reliable form of contraceptive is?

Q2. Why might barrier methods such as the condom be a better choice or used as well as the pill?

Q3. Describe an ethical issue surrounding contraception

Activation

LI: Create a topic summary sheet

1. Fold an A3 sheet so it is divided into 8 sections
2. Look back over you lesson and group them into 8 main headings
3. Summarise the key points into each section, use keywords and diagrams and symbols rather than sentences

Consolidation

Look though the relevant past paper questions for this topic - From the B1 DIP file – see if you can complete any additional questions

Demonstration

Test yourself by working with the person sitting next to you by talking though each box on your summary sheet and seeing how many key facts you can remember

Extension

Make a note of one thing you think you understand well and one thing that you would like to ask your teacher

Answers: B5.Revision

Connection

1 The pill
2 To protect against STI
3 Some people object to birth control methods on religious grounds. Every egg is a potential life.

PART B5: Diabetes

Should children with type 2 diabetes be offered a gastric op?

As a side-effect of the rise in childhood obesity, an increasing number of children are being diagnosed with type 2 diabetes - particularly, in some UK cities, in the Asian community. Will the NHS consider an approach now being tried in the US, and offer these children bariatric surgery, asks the BBC's Sue Mitchell. Type 2 diabetes was once known as "adult-onset diabetes" but two weeks ago Zaira was diagnosed with it at the age of 14. She is still trying to process the news.
"It was shocking because I didn't know I had diabetes. I just felt like I had stomach ache," she says.

Zaira knew she was overweight, and for a while she had tried to lose weight - but her efforts seemed to have no effect, so she gave up. She was planning on trying again another time and hadn't realised diabetes could strike so soon.
"I do feel ashamed. In school we've been told about diabetes and how it's something people get later in life if they're overweight," she says.
"I've got relatives who have it but they're much older. I didn't think I'd get it."
Zaira lives in Bradford and is being treated at St Luke's Hospital, where children with type 2 diabetes were unheard of 11 years ago when consultant paediatrician Dr Mathew Mathai started work in the paediatric diabetes clinic. Back then he only saw type 1 diabetes, which has nothing to do with diet or lifestyle. But now there are at least 18 children with type 2 diabetes at any one time - and the disease is turning out to develop much more quickly in the young than it does in adults.

"The complications are quite significant, and they start quite early," Mathai says.
"They include damage to the small blood vessels of the eye, the kidneys and to other organs, and this occurs much earlier on. And therefore, we really need to try and see how we can reduce that risk, but the treatment options at the moment aren't there."
A range of medication has been licensed for adults but there is only one oral medication for children - metformin, which lowers the amount of sugar in the blood.

What is type 2 diabetes?

- Type 2 diabetes is a common condition that causes the level of sugar in the blood to become too high
- It's caused by problems with a chemical in the body called insulin, which allows the sugar in our blood to enter our cells and fuel our bodies - if you have type 2 diabetes either the insulin you make can't work effectively or you can't produce enough
- It can cause symptoms like excessive thirst, needing to pee a lot and tiredness
- In the long term it can lead to heart disease and stroke, nerve damage, foot sores that can necessitate amputation, vision loss, miscarriage and kidney problems

Sources: **NHS**, **Diabetes UK**

One of Mathai's patients, Maryam, was diagnosed when she was just 10 years old. She's now 14 and has struggled to control her diabetes for the last four years. Initially she was given metformin in tablet form, which she had difficulty swallowing. A cousin then tried putting the tablets in chapatis for her, but it didn't work, so she tried the syrup form - but hated the taste. She now injects insulin and before summer she was missing more than half of her weekly treatments.
That all changed in July when Maryam went to stay with relatives in Pakistan. She swapped the junk food in her freezer and endless visits to takeaways near her Bradford home, for her gran's home-cooked meals and a never-ending supply of fresh fruit. At home she rarely exercised and was driven to and from school, but in Pakistan she had to walk everywhere. After two months she had lost 5kg and could feel her clothes becoming looser.

"In the UK we don't do anything, there's nothing to do. We just wash dishes and sit in front of the TV and go to a drawer and get something to eat," she says.
"We're always eating. We're not making ourselves more active as we should be. In Pakistan I saw how thin the girls were and I was really thinking about it and I thought I need to lose my weight. "I was looking at them and thinking about my health as well."
At her latest appointment with doctors at the paediatric diabetic clinic, Maryam weighed 115kg. She is still considered clinically obese, with a body mass index of 45.7 but staff think she may have turned a corner.

"I think this is the first time I've seen Maryam be successful in losing weight, but also she seems confident that she can continue to lose weight and I think that's a real achievement," says paediatric dietitian Alison Woodhead.
"So, we will keep seeing her and supporting her and her family. I think maybe the environment in Pakistan helped her to lose weight and she's realised she can do it."

Sadly, many other patients find it very hard to change.
Just before Ahmed (not his real name) sat his GCSE exams he was warned that he was in danger of developing type 2 diabetes, and three months later the diagnosis has been confirmed. He says he regularly eats burgers and pizzas and does little exercise. His body mass index is 37.5 - less than Maryam's but still obese. At the age of 16, he already has high blood pressure.
Ahmed has seen his dad and other relatives develop type 2 diabetes in later life, and although his dad has recently had a heart attack, he'd already had the disease for some years. It may be that Ahmed thinks the disease will progress slowly in his case too.

"It is a lot of shock and grief when they are diagnosed. I think sometimes we might think, 'Well, that shock would be enough to motivate someone to do something about it.' But it doesn't work like that," says Vicki Lee, a psychologist who works alongside paediatricians and dietitians in the Bradford Children's Diabetes Service.
"The brain is very much still under construction until 25 and the last bit to develop is being able to think about long-term consequences, and so that's why with adolescents we often see behaviour that's more about the kind of short-term gain and what's important for me right now.

Reference: BBC News article; 23rd October 2019.

QUESTIONS:

1a) What was Type 2 diabetes formerly known as?

b) Why did Zaira think that she wouldn't get diabetes?

c) Type 1 and Type 2 diabetes are the same?

2a) Describe the main difference between Type 1 and Type 2 diabetes.

b) What is Type 2 diabetes?

c) Explain how medication, such as metformin, helps diabetics.

3a) Explain how insulin is involved in diabetes and list the symptoms and long-term effects.

b) Discuss why some people find it difficult to control their diabetes, in particular people under 25.

c) Do you think that Type 2 diabetes is a genetic or inherited disorder? Explain your reasoning.

DART B5: Diabetes - ANSWERS:

1a. Adult-onset diabetes.
b. Zaira didn't think she was old enough at 14.
c. Type 1 is not brought on by diet or lifestyle whereas Type 2 is.

2a. The main difference is that Type 2 can be controlled by changes in diet and exercise/lifestyle.
b. A common condition that causes the level of sugar in the blood to become too high.
c. Medication can help to lower blood sugar levels.

3a. Insulin allows sugar in our blood to enter our cells. With Type 2 diabetes not enough insulin is produced, or the insulin that is produced is not effective enough.
Symptoms include: excessive thirst, urinating (peeing) too much, tiredness.
Long-term effects: heart disease ,stroke, nerve damage, foot sores, vision loss, miscarriage.

b. People find it hard to change their lifestyle, particularly under-25s who don't tend to consider long-term consequences due to their brains still developing.

c. Getting Type 2 diabetes can be due to genetics (which can increase a person's susceptibility) although it

Attainment Band :	B5 Coordination and control (AQA) Knowledge and Understanding
Yellow Plus/ Yellow	Describe the components of body control systems and compare nervous and hormonal control. Explain how nerve impulses are transmitted across synapses. Explain how negative feedback is involved in homeostasis. Explain the roles and interactions of hormones in the menstrual cycle. Evaluate fertility treatments. Evaluate the use of different methods of contraception.
Blue	Recall that the nervous and endocrine systems are responsible for homeostasis. Describe how neurones are adapted to their role and the transmission of an impulse in reflex arc. Describe how changes in blood glucose concentration are controlled by the endocrine system. Describe the role of hormones in the menstrual cycle. Describe the techniques involved in fertility treatments. Describe how different methods of contraception work.
Green	Recognise the need for homeostasis. Describe the structure of the nervous system and location of the endocrine glands. Identify temperature, water and glucose concentrations as conditions requiring control. Identify the reproductive hormones and their role in the development of secondary sexual characteristics. Identify fertility drugs and *in-vitro* fertilisation as possible solutions to infertility. Identify different methods of contraception.
White	Some elements of the above have been achieved