**Topic 6 - Defence against Disease**

Keywords

* **P\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**– a disease causing microbe e.g virus - flu
* **First line of defense** – S\_\_\_\_\_\_\_\_ and b\_\_\_\_\_\_\_\_\_ clotting stops microbes entering your body.
* **W\_\_\_\_\_\_\_\_blood cells** (protect you in three ways) – ingests bacteria, make antibodies and make antitoxins.
  + **P\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**– a white blood cell that ingests bacteria.
  + **L\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**– a white blood cell that produces antibodies and anti-toxins
  + **A\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_(Y)** – White blood cells make this chemical in response to pathogen. It is used to destroy pathogens.
  + **A\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**– These work by neutralizing the toxins made by pathogens which make you ill.
* **A\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**– the protein on the outside of a pathogen that causes your immune system to respond.
* **V\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_** – You are given a small amount of the weakened disease to get your body to produce white blood cells and antibodies specific to the disease.

Pathogens a) b) c)

Starter questions

1. What is the name of the hormone that is released when blood glucose levels are too high and what organ releases it? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
2. What is the name of the insoluble form of glucose that is stored in the liver? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
3. What is the difference between a heterozygous genotype and a homozygous genotype?

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

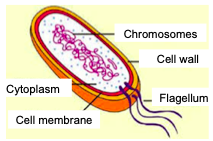
\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

* Micro-organisms consist of b\_\_\_\_\_\_\_\_\_\_, f\_\_\_\_\_\_\_\_\_, v\_\_\_\_\_\_\_\_\_\_and protists.
* Some micro-organisms are h\_\_\_\_\_\_\_\_\_\_\_\_and perform vital functions such as E.coli naturally found in the human intestinal tract.
* *Pathogens are micro-organisms that cause \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_* such as the pathogenic E.coli that causes diarrhoea. It is a different form of E.coli than the one naturally found in the intestines.

*Bacterial cells*

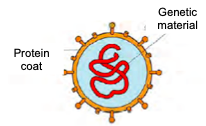


Consist of:

* Cell \_\_\_\_\_\_\_\_\_\_\_
* Cell m\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_and c\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_
* They have NO distinct nucleus just **free genetic material**

Genetic material

*Virus*



Consist of:

* G\_\_\_\_\_\_\_\_\_\_ material surrounded by a p\_\_\_\_\_\_\_\_\_\_\_ coat

Communicable diseases

These type of diseases are caused by pathogenic bacteria, viruses and fungi e.g. chicken pox.

They are spread through:-

* C\_\_\_\_\_\_\_\_\_\_\_\_\_\_, D\_\_\_\_\_\_\_\_\_\_\_\_\_\_/aerosol, w\_\_\_\_\_\_\_\_\_\_\_\_, contaminated food, b\_\_\_\_\_\_\_\_\_\_ fluids and i\_\_\_\_\_\_\_\_\_\_\_\_\_

**Our body’s defence** d)e)

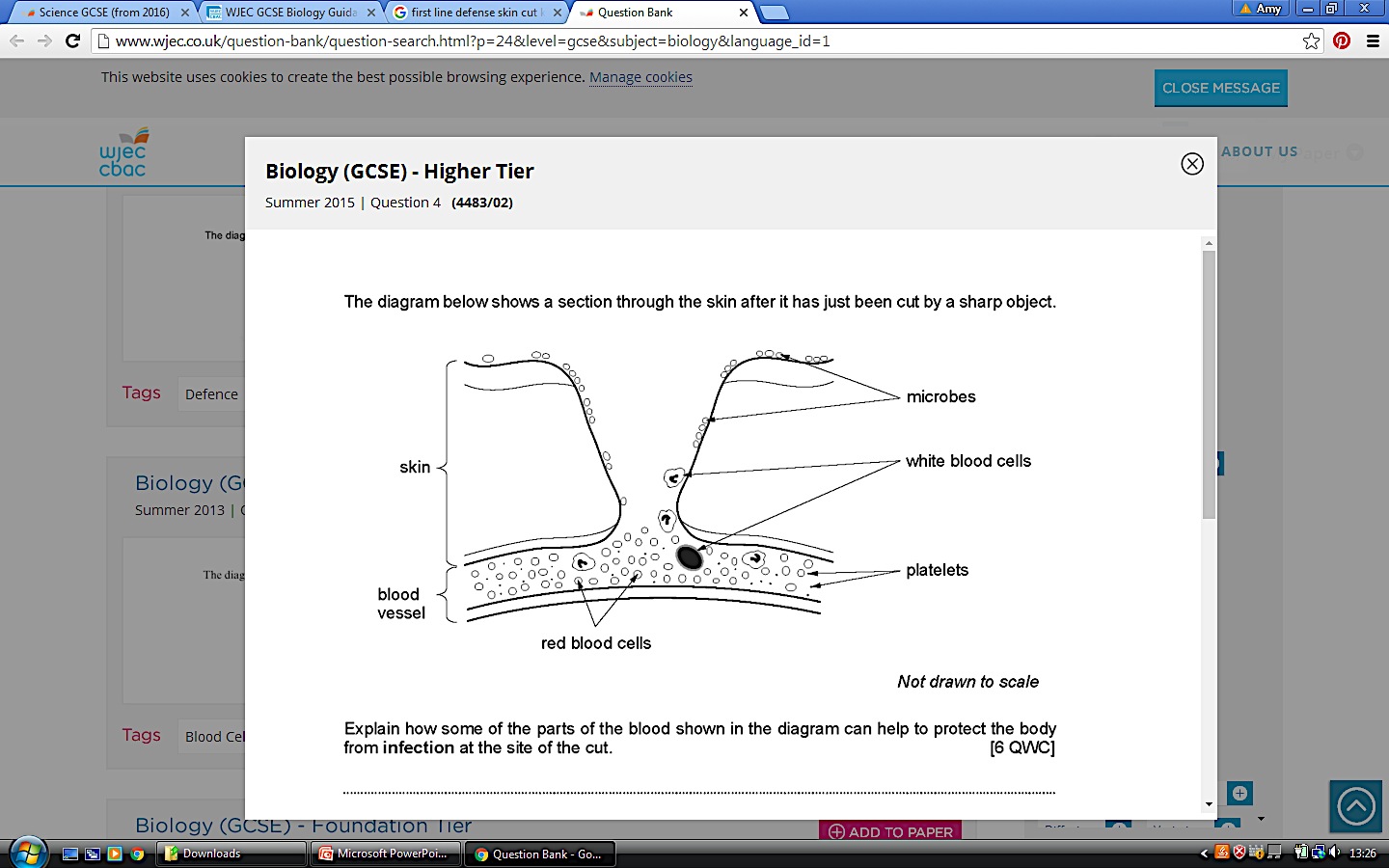
Starter questions

1. Give two lifestyle choices which can result in type 2 diabetes.
2. Name the two organs involved in regulating blood glucose levels.
3. What is the name of the kingdom which has fish as one of its classes?

**Intact Skin – defense barrier**

*Skin f\_\_\_\_\_\_\_\_\_*– the natural community of micro-organisms that live on the skin make it difficult for pathogens to become established.

If the skin barrier is broken our *b\_\_\_\_\_\_\_\_\_\_\_* is the next line of defence.

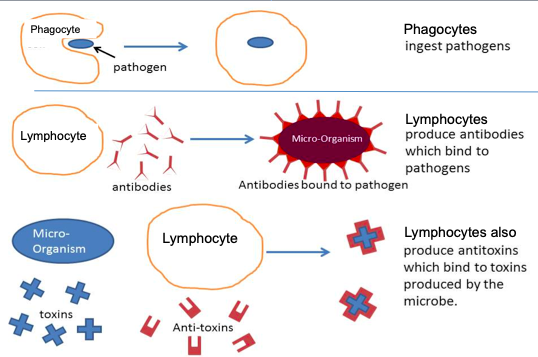


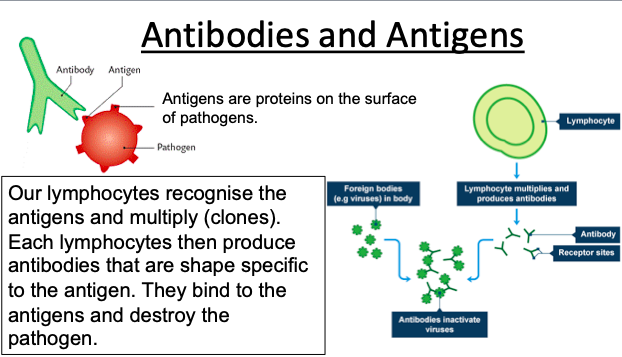
**Blood defense**

P\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_– they would cause the blood to c\_\_\_\_\_\_\_\_ over the ‘cut’ forming a scab (seal).

W\_\_\_\_\_\_\_\_\_\_\_blood cells – *there are two types of white blood cells – phagocytes and lymphoctyes - that would play a part.*

* *Phagocytes – i\_\_\_\_\_\_\_\_\_\_\_\_\_\_ the invading bacteria.*
* *Lymphocytes – produce a\_\_\_\_\_\_\_\_\_\_\_\_\_ and a\_\_\_\_\_\_\_\_\_\_\_\_\_\_.*

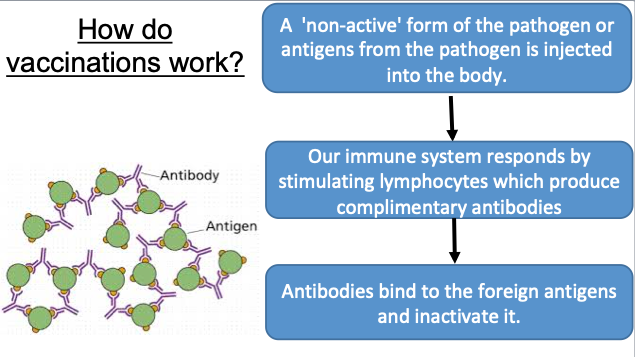
**

*Antibodies and antigens*

Vaccinations f) **g) h)**

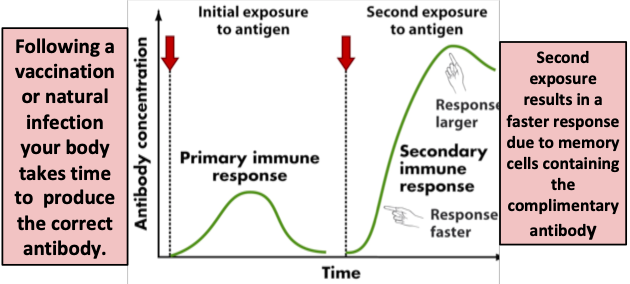
Parental choice

* Vaccinations p\_\_\_\_\_\_\_\_\_\_\_ humans for infectious diseases. They p\_\_\_\_\_\_\_\_\_\_\_the individual from becoming ill as well as preventing s\_\_\_\_\_\_\_\_\_\_.
* The problems arise if a parent decides that their child will not have a vaccination for a specific disease due to unfounding a\_\_\_\_\_\_\_\_\_\_\_ over s\_\_\_\_\_\_ effects.
* The M\_\_\_\_\_\_\_\_\_\_plays a huge role on whether parents decide their children will be vaccinated or not.



Immune response

* Following an antigen encounter m\_\_\_\_\_\_\_\_\_ cells remain in the body which will reproduce the specific antibody if the s\_\_\_\_\_\_\_\_ antigen attacks again.



* These memory cells provide immunity against the pathogen whether it was a natural infection or a vaccination.
* The second response produces antibodies q\_\_\_\_\_\_\_\_\_ and in l\_\_\_\_\_\_\_\_\_\_numbers compared to the first response.

Antibiotics and Resistance i)j)

Starter questions

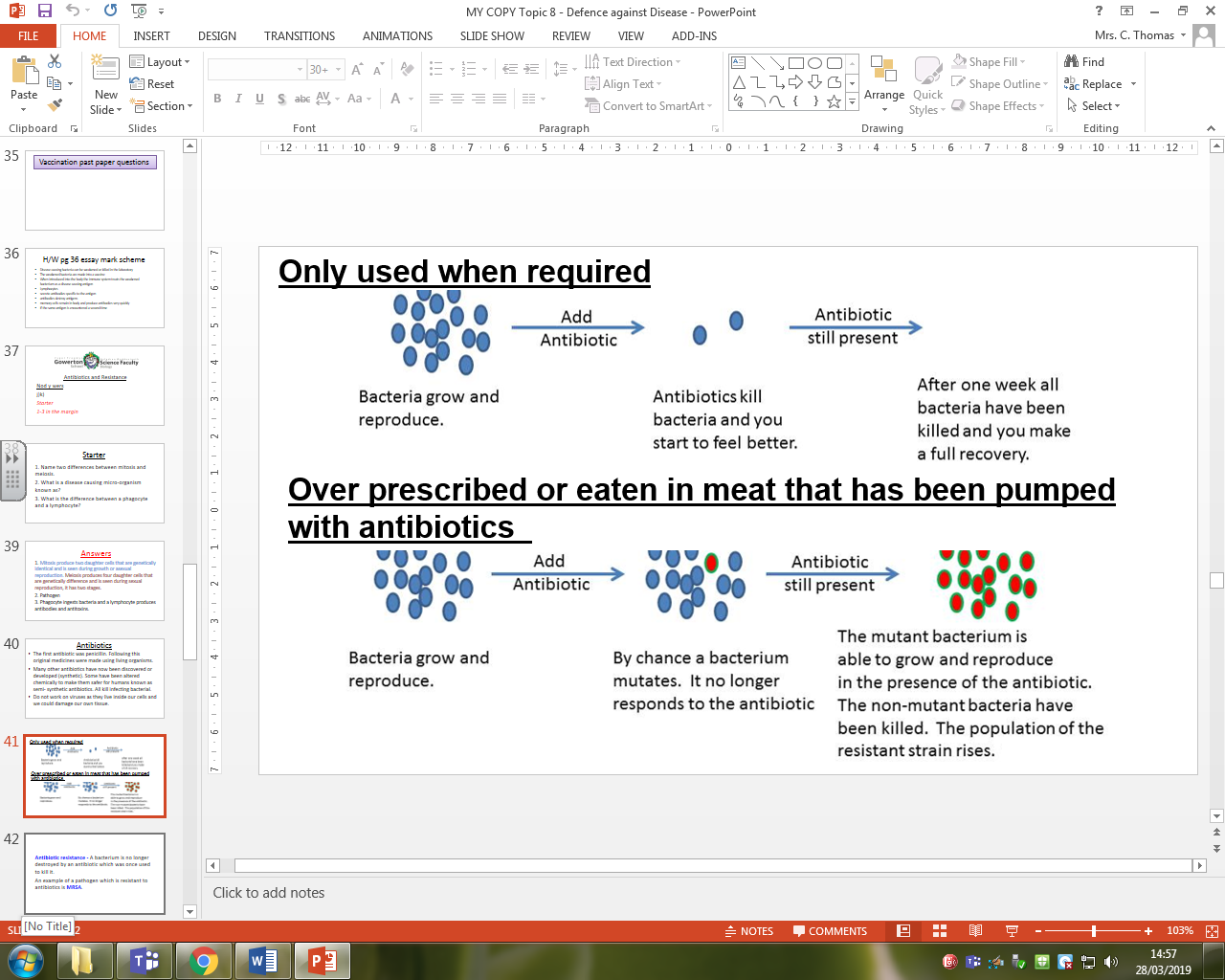
1. Name two differences between mitosis and meiosis.

2. What is a disease causing micro-organisms known as? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

3. What is the difference between a phagocyte and a lymphocyte?

Antibiotics

* The first antibiotic was p\_\_\_\_\_\_\_\_\_\_\_\_\_\_. Following this original medicines were made using living organisms.
* Many other antibiotics have now been discovered or developed (synthetic). Some have been altered chemically to make them safer for humans known as semi- synthetic antibiotics. All kill infecting b\_\_\_\_\_\_\_\_\_\_\_\_\_.
* Do not work on v\_\_\_\_\_\_\_\_\_\_as they live inside our cells and we could damage our own tissue.



**Antibiotic resistance - A bacterium is no longer destroyed by an antibiotic which was once used to kill it.**

An example of a pathogen which is resistant to antibiotics is **MRSA**.

MRSA control measures could include:

• h\_\_\_\_\_\_\_\_\_\_washing

• thorough cleaning of hospital wards

• use of a\_\_\_\_\_\_\_\_\_\_\_ gels

• MRSA s\_\_\_\_\_\_\_\_\_\_\_

**Treatments for Diseases** k)l)

Starter

1.Name the four bases. \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

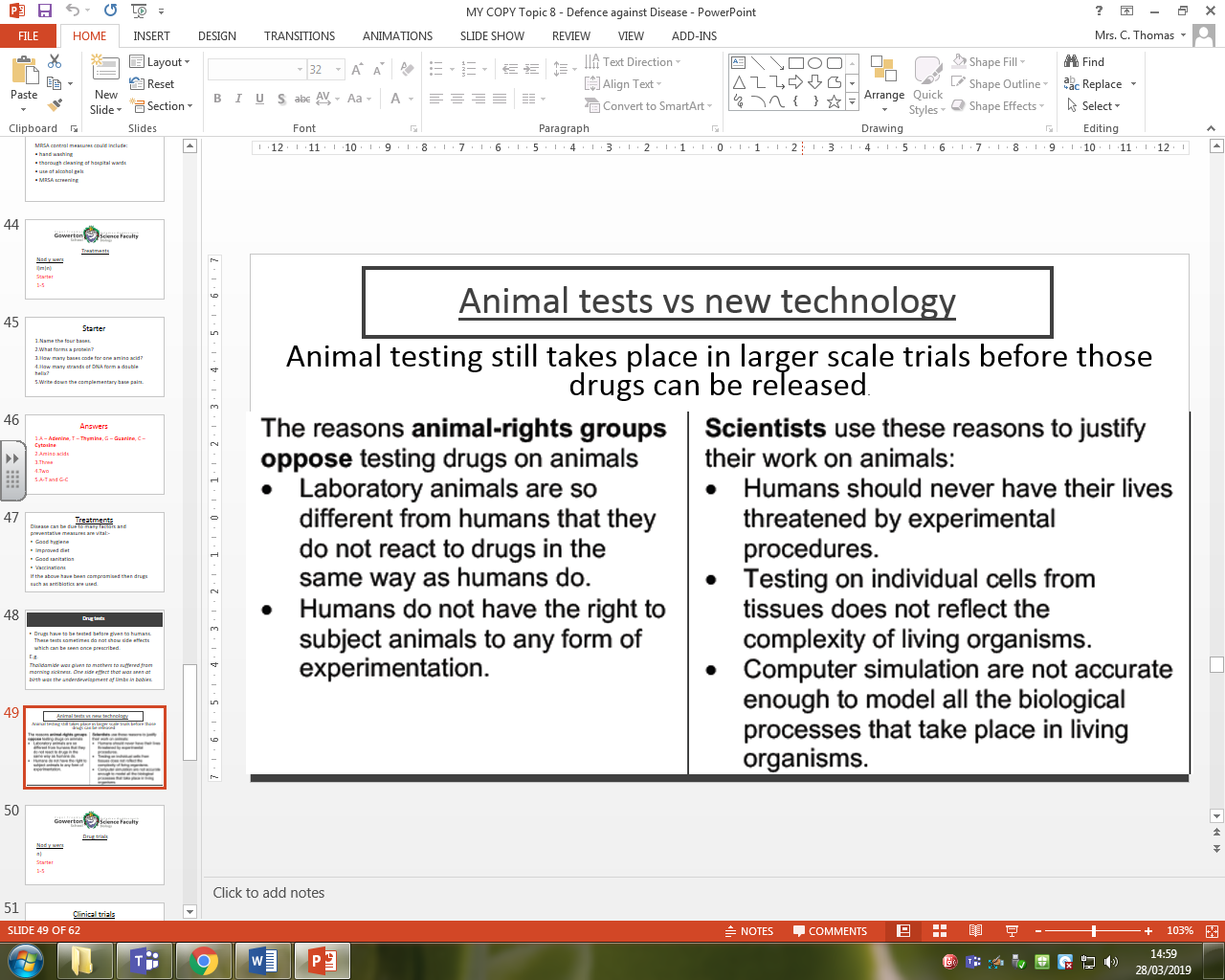
2.What forms a protein? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

3.How many bases code for one amino acid? \_\_\_\_\_\_\_\_\_\_\_

4.How many strands of DNA form a double helix? \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

5.Write down the complementary base pairs \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ and \_\_\_\_\_\_\_\_\_\_\_\_\_\_

Disease can be due to many factors and the **preventative measures** are vital:-



* Good h\_\_\_\_\_\_\_\_\_\_\_\_
* Improved d\_\_\_\_\_\_\_\_\_
* Good s\_\_\_\_\_\_\_\_\_\_\_\_
* V\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

If the above have been compromised then d\_\_\_\_\_\_\_\_\_

such as a\_\_\_\_\_\_\_\_\_\_\_\_\_are used.

Drug Trials

* Drugs have to be tested before given to humans. These tests sometimes do not show s\_\_\_\_\_\_\_\_\_ e\_\_\_\_\_\_\_\_ which can be seen once prescribed.

*E.g Thalidamide was given to mothers to suffered from morning sickness. One side effect that was seen at birth was the underdevelopment of limbs in babies.*