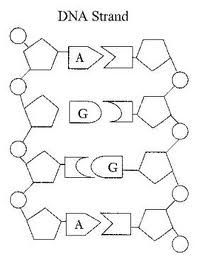
**Name:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ /53**

**Year 10 Extension Science**

**DNA & Microscope Mini Test**

1a Label the following diagram: 4

[](http://www.google.com.au/url?sa=i&rct=j&q=&esrc=s&frm=1&source=images&cd=&cad=rja&docid=LrUXW_twbDKvrM&tbnid=sF0L20GrUnmpVM:&ved=0CAUQjRw&url=http://www.psd202.org/pshs/depts/science/Mezger/DNA%20STUDY%20GUIDE-biology.htm&ei=KgYbUcGWE6LwmAX0uYCIDw&bvm=bv.42261806,d.dGI&psig=AFQjCNGJR7wsixjE--42qoHAb7q2ZhsV3w&ust=1360811870892519)

1b Fill in the missing letters on each of the bases 2

1c How did you know which letter to write? 1

2a What do the following letters stand for? 2

**A**

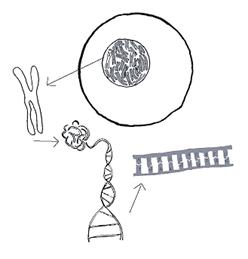
**G**

**C**

**T**

2b What does DNA stand for? 1

3 The diagram below shows *a gene, a chromosome, the nucleus of a cell and a strand of DNA*. Label each of the diagrams correctly 4

[](http://www.google.com.au/url?sa=i&rct=j&q=&esrc=s&frm=1&source=images&cd=&cad=rja&docid=t-qDr_ZowQECLM&tbnid=wQ1Gi_v61gurdM:&ved=0CAUQjRw&url=http://www.geneticalliance.org.uk/genesandyoudna.htm&ei=OgcbUePJCM2ikAWzrYGYCw&bvm=bv.42261806,d.dGI&psig=AFQjCNHD6EHFpc_Hpn2ALNEspVIxPkwm4g&ust=1360812171836144)

4a What is a gene? 1

4b How many chromosomes do somatic human cells contain? 1

4c Which cells contain a different number? 2

4d Why? 2

5a Explain 2 differences between mitosis and meiosis 2

6 Name and explain one way in which meiosis provides variation in daughter cells 2

7 Explain why sexual reproduction is preferable to asexual reproduction 2

**Vocabulary**

7

Alternates with phosphate groups to form the ‘sides of the ladder’ of DNA

Alternates with sugar groups to form the ‘sides of the ladder’ of DNA

The term used to describe the way in which each nucleotide can only join to one other nucleotide eg A only ever pairs with T and C only ever pairs with G

Forms the ‘rungs of the ladder’ of DNA and make up the genetic code

The chromosomes that determine if you are male or female

Chromosomes that do not determine sexual characteristics

Only one chromosome from each homologous pair present

The process by which offspring are produced via gametes

Chromosomes the same length with the same genes in the same positions

One strand of a chromosome

Process which produces four haploid gametes

Process which produces two identical daughter cells

Containing two copies of each chromosome

The point where two chromosomes join

**Microscope Section**

Use the microscope correctly to draw one diagram showing two stages of mitosis. 5

Point out the two cells you have chosen showing the two different stages.

Label which stage each are going through. 2

What features did you use to decide which phase was shown. 2

Low power on your microscope has a field of view of 4.2mm.

What is the field of view on high power? Show all working. 4

Use this information to estimate the size of the two cells you pointed out above. 4

Show all working.

If we were able to add another objective lens to the microscope which had a magnification of x 50, what field of view would it show? 4

SOLUTIONS

**Vocabulary**

7

Sugar Alternates with phosphate groups to form the ‘sides of the ladder’ of DNA

Phosphate Alternates with sugar groups to form the ‘sides of the ladder’ of DNA

Comp Base Pairing The term used to describe the way in which each nucleotide can only join to one other nucleotide eg A only ever pairs with T and C only ever pairs with G

Nitrogen rich bases Forms the ‘rungs of the ladder’ of DNA and make up the genetic code

Sex Chromosomes or X&Y The chromosomes that determine if you are male or female

Autosomes Chromosomes that do not determine sexual characteristics

Haploid Only one chromosome from each homologous pair present

Sexual Reproduction Offspring produced via gametes

Homologous Chromosomes the same length with the same genes in the same positions

Chromatid One strand of a chromosome

Meiosis Process which produces four haploid gametes

Mitosis Process which produces two identical daughter cells

Diploid Containing two copies of each chromosome

Centromere The point where two chromosomes join

**Microscope Section**

Use the microscope correctly to draw one diagram showing two stages of mitosis. 5

1 mark lost for each of the following missing or incorrect

* In a circle
* In pencil
* Title
* Magnification
* Sketch – no shading
* Realistic Scale

Point out the two cells you have chosen showing the two different stages.

* Cells pointed out must show mitosis

Label which stage each are going through. 2

What features did you use to decide which phase was shown. 2

Low power on your microscope has a field of view of 4.2mm.

What is the field of view on high power? Show all working. 4

1 Low power total Mag x40

1 High power total Mag x400

1 showing working

1 correct answer with correct units 420um

Use this information to estimate the size of the two cells you pointed out above. 4

Show all working.

1. Field of view on high power = 420um
2. Estimate of number of cells that would fit across field of view
3. Working

1 Answer

If we were able to add another objective lens to the microscope which had a magnification of x 50, what field of view would it show? 4

1 Low power total Mag x40

1 Extra High power total Mag x500

1 showing working

1 correct answer with correct units 336um