5 Field Trip Materials

Contraction of the

### Science

Barnet Southgate College HeadStart

# Welcome to the Science team:

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### The courses

- BTEC Level 1 Applied Science Southgate Campus
- BTEC Level 2 Applied Science Southgate and Wood Street Campus
- BTEC Level 3 year 1 and 2 Applied Science, Southgate and Wood Street Campus
- GCSE Package Biology, Physics, Chemistry, Maths, English and/or Psychology
   Southgate Campus
- Pre-access to Science– Wood Street
   Campus
- Access to HE Science Wood Street Campus

## **Genetics**



- For each characteristic, a child **inherits** one allele <u>from the mother</u> and one allele <u>from the father</u>.
- This means that we have **two alleles** for every characteristic (e.g. eye colour).
- The alleles in a pair can be the **same** as each other <u>or</u> **different**.
- Alleles can be dominant or recessive.

## **Example**

**B** = brown eye allele

**b** = blue eye allele

2 dominant alleles
 BB

There are only dominant brown eye alleles so the child will have brown eyes.

2 recessive alleles
 bb

There are only recessive blue eye alleles so the child will have blue eyes.

1 dominant and 1 recessive allele
 Bb
 The dominant br
 allele 'wins' so the

The dominant brown eye allele 'wins' so the child will have brown eyes.

### In this case:

• The 'magical' (m) allele is RECESSIVE

• The 'muggle' (M) allele is DOMINANT





Another way of drawing genetic cross diagrams... Punnett squares









Task 1 Create your own Punnett square for a characteristic of your choice e.g. hair colour, tongue rolling. You can choose the letters to use just remember to include a key.



#### Task 2 Write a paragraph describing your Punnett square in detail, use the following words in your description as appropriate:



homozygous, heterozygous, dominant, recessive, alleles, genes and gametes

Key words:

## Task 3: Part A

In the 1850s an Austrian monk, called Gregor Mendel, carried out a series of investigations on heredity.

(i) What plants did he use for his investigations?

(ii) In his work he assumed that one gene controlled one characteristic. He started his investigations with pure breeding parents.Use a genetic diagram to show how he explained the following result.





## Task 3: Part B

For many year's scientists studied the organisms in an area of grassland.

One of the animals was a species of black fly. In this population only one allele B existed for colour. All the flies were homozygous BB.

A mutation occurred which produced a new recessive allele b which could produce a green colour.



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(a) Draw two genetic diagrams to show how the single b allele in just one fly was able to produce homozygous bb green flies in two generations.

First generation

Second generation



(b) Although this new allele was recessive and the mutation only occurred once, a large proportion of the fly population was soon green.

Suggest in terms of natural selection why the recessive b allele was able to spread through the population

Suggest in terms of natural selection why the recessive b allele was able to spread through the population



### Resources to help you

https://www.bbc.co.uk/bitesize/guides/zcdfmsg/revision/2

https://www.youtube.com/watch?reload=9&v=PyP\_5EgQBmE

https://www.youtube.com/watch?v=Vk8xu9LAw1E

https://alevelbiology.co.uk/notes/genetics/

Any good GCSE or A level textbook

# Chemistry

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## What is an element?

found in the Periodic Table

made of one type of atom

• pure substance e.g. gold



## What is a compound?



- made up of 2

   or more elements
   chemically
   combined
- pure substance
- cannot be separated by physical means e.g. Sodium chloride, water

## What is a mixture?

 made of 2 or more elements or compounds not chemically combined

 can be separated into components by physical means e.g. oil and water, ice cream





# What is inside a bottle of coke?







Explain what they have in common and what is different about them.



a) Identify all the elements present in each of the ingredients from Task 1

b) Find the
elements in the
Periodic table
and state the
groups and period
they belong to

## Task 3

a) Write the chemical formula for glucose, carbon dioxide and salt (sodium chloride)

b) Show the bonding for each one and explain why they are different

### Challenge

c) Relate the bonding to the structured) What technique can you use to separate them?





## Hope you enjoyed working through our Science tasks!

To apply go to:

https://www.barnetsouthgate.ac.uk/courses/display/full\_time/science\_and\_gcse