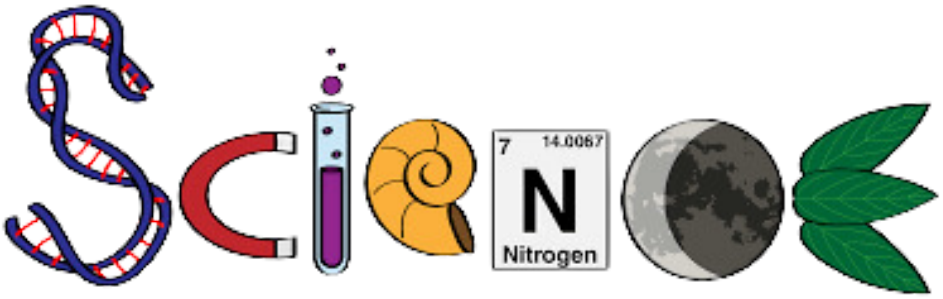
Meopham School

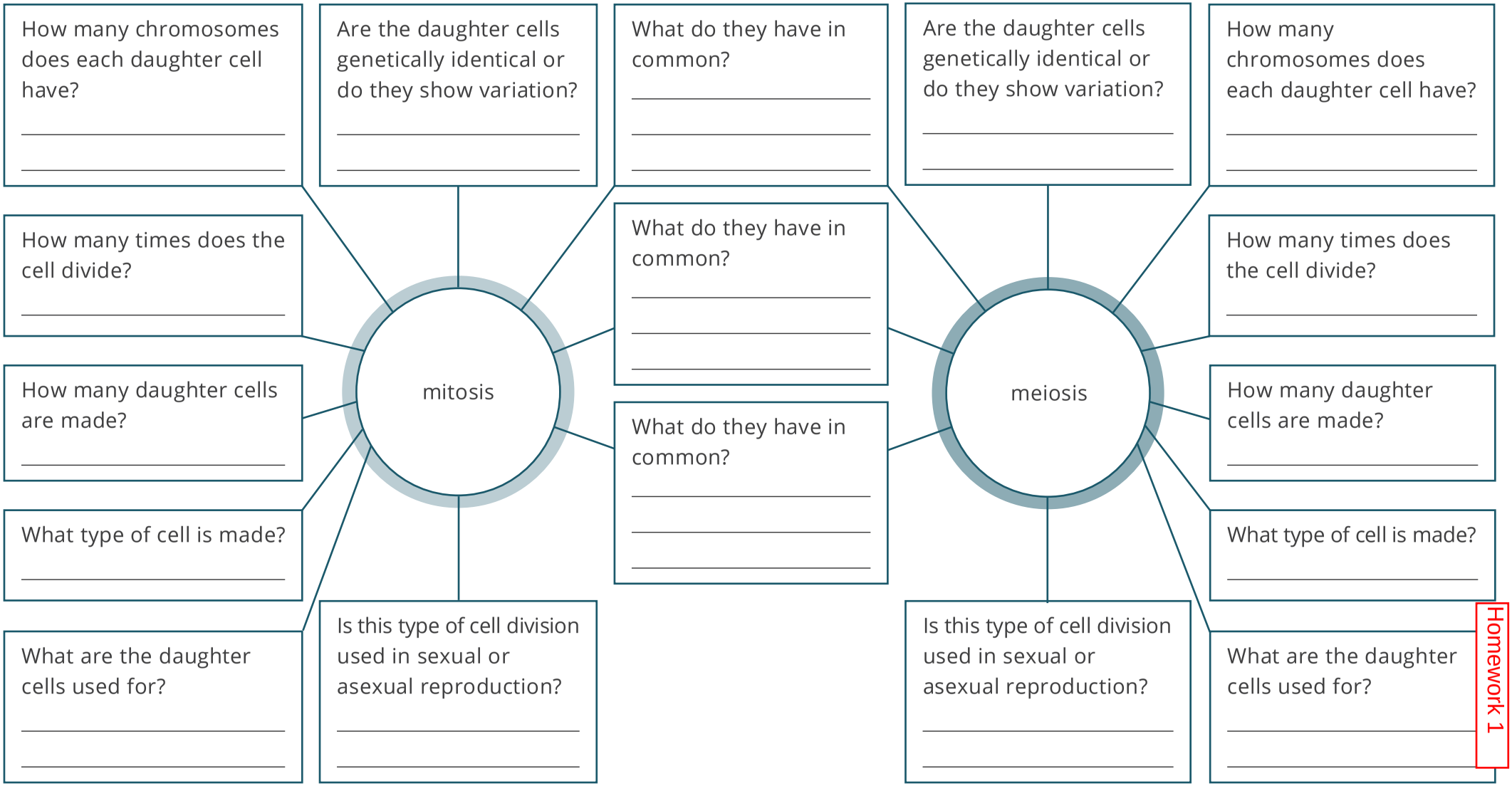


HOMEWORK BOOKLET

B6

Comparing Mitosis and Meiosis

Complete the questions in the diagram below to show the similarities and differences between mitosis and meiosis.



Homework 1

Homework 1

Genes and Inheritance **Match and Draw**

Draw a line to match the keyword with its meaning.

Nucleus	A section of a chromosome which codes for a particular characteristic.
chromosome	The coiled up form of a DNA molecule.
gene	A sex cell, in humans this is an egg or a sperm.
allele	Location in a eukaryotic cell where the genetic material is stored.
dominant	A characteristic which is only expressed if paired with an identical allele.
recessive	A characteristic which is expressed regardless of the paired allele.
gamete	Both alleles for a particular characteristic are identical.
homozygous	The physical expression of the characteristics in an organism.
heterozygous	Different versions of the same gene.
genotype	The alleles for a particular characteristic are different.
phenotype	The genes and alleles which determine the characteristics of an organism.

Inherited Disorders

Homework 1

1. State the main symptom of polydactyly.

   _____

   _____

2. Two people with polydactyly are heterozygous for the polydactyly allele. They have a child.

   Use a Punnett square diagram to find the probability that their child will have polydactyly.

   You should identify any children with polydactyly in your diagram.

   Use **A** for the dominant allele and **a** for the recessive allele.

3. A person has polydactyly; their partner does not. They plan to have a baby and are told there is a 50% probability that their child will inherit the disorder.

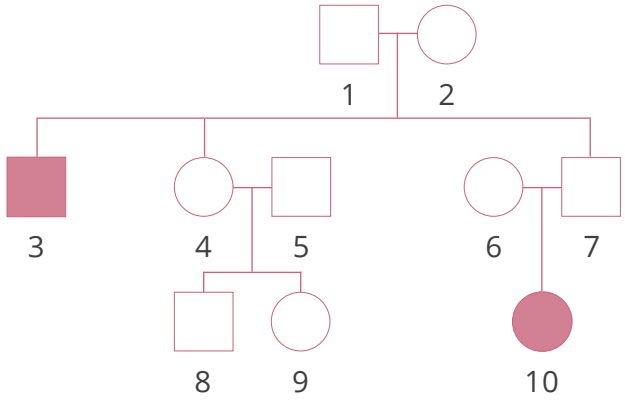
   Use a Punnett square diagram to show why the probability their child will inherit the disorder is 50%.

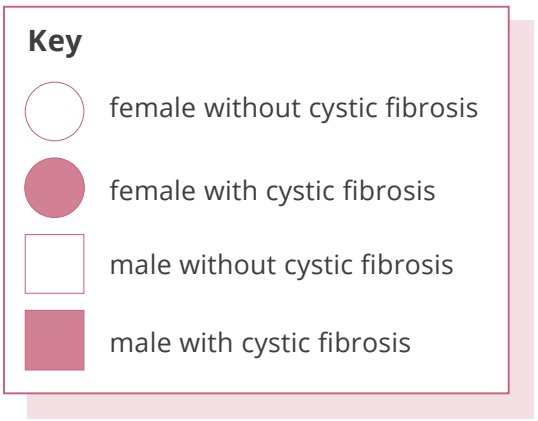
   You should identify any children with polydactyly in your diagram.

4. Name the part of the cell that does not function correctly in people with cystic fibrosis.

   _____

The diagram shows the inheritance of cystic fibrosis in a family.





5. Write down the genotype of person 1

_____

6. Couple 6 and 7 are having a second child.

   Use a Punnett square diagram to determine the probability that their child will inherit cystic fibrosis.

   You should identify any children with cystic fibrosis in your diagram.

   Use **B** for the dominant allele and **b** for the recessive allele.

The Genetic Engineering Debate

Homework 2

Genetic engineering is the deliberate altering of an organism's genes to change its characteristics. This relatively new science can be used to change the genetic makeup of plants, animals and, most controversially, humans. Some forms of genetic engineering are legal in the UK, but it is subject to tight regulations. However, there are many people who would like to see this law reversed. They feel that genetic engineering is immoral and should not be allowed.

What Are the Benefits of Genetic Engineering?

People who support genetic engineering point out that it has many benefits. One of the main benefits is its ability to potentially provide lifesaving medical treatments. Genetic engineering could be used to ensure genetic conditions, such as cystic fibrosis, are not passed on from parent to child. Further, genetic engineering can be used to create 'saviour siblings'. These are children whose genes are modified to ensure they are genetically compatible with a brother or sister who needs treatments such as a transplant.

Some argue there are further benefits to genetic engineering. Firstly, it can be used to create better more efficient crops. These could be used to cure famine and food poverty. Secondly, by allowing genetic engineering, we are helping scientists practise cutting-edge science. This may lead to future scientific developments which could be hugely beneficial to humans.

Why Do Some People Oppose Genetic Engineering?

Many people are very concerned about genetic engineering. Some people worry that, as it is a modern practice, it may have side effects which we currently do not know about. If this is the case, it could permanently damage the genetic makeup of humans or animals in future generations.

Some people are also concerned about so-called 'designer babies'. These are children whose characteristics are altered using genetic engineering to please their parents (for example, changing their eyes to a specific colour). This is currently illegal in the UK, but those who oppose genetic engineering believe this practice: interferes with nature; is not necessarily improving the child's life if the changes are purely cosmetic; and could lead to a unhealthy attitude in society where people's genes are routinely changed.

Religious opposition to genetic engineering is closely related to religious views on the environment. Most religious people believe that the world was created by a god or gods and that humans are supposed to look after it. By altering genetic material, religious people may believe we are 'playing God' and that we are therefore rejecting the perfection of natural creation. Further, they may see it as violating the sanctity of life. This is the idea that life is sacred and belongs only to their given deity.

It should be noted, however, that not all religious people oppose genetic engineering. Some may feel that curing people should take priority and we should use our given knowledge to improve people's lives.

The Genetic Engineering Debate

Homework 2

1. What is genetic engineering?

2. What are some of the benefits of genetic engineering?

3. What is a 'designer baby'? Why might some people oppose their creation?

4. Why might religious people oppose genetic engineering?

5. Why else may people oppose genetic engineering?

6. What is your view on genetic engineering?

Questions

Homework 2

1. Why might Darwin's ideas have been controversial when he first published them? Would people have had the same opinions and thoughts as they do now?

2. Explain the process of natural selection in your own words. Keywords: evolution, compete, variation, alleles, environment, offspring.

3. How is selective breeding different from natural selection? Think about the cause of each type of selection.

4. In the space below, illustrate the process of selective breeding. Choose an animal for your diagram and decide which traits you want to select for in the offspring.

5. Why might a farmer want to selectively breed their cows? Think about what we 'use' cows for.

6. What are the benefits of selective breeding for the human population? Think about the things you eat every day, how you might decorate your house and garden, and the animals you might interact with.

7. How do you think the adaptations of the greyhound and cocker spaniel help them to do their original 'jobs'? Think about what they do and how their bodies are shaped and built.

8. Why might humans want to selectively breed domesticated pets? Consider what you would want your ideal cat/dog/rabbit to be like.

9. What are the main disadvantages of selectively breeding animals? Think about the impact of selective breeding on variation in a population and the effects this could have.

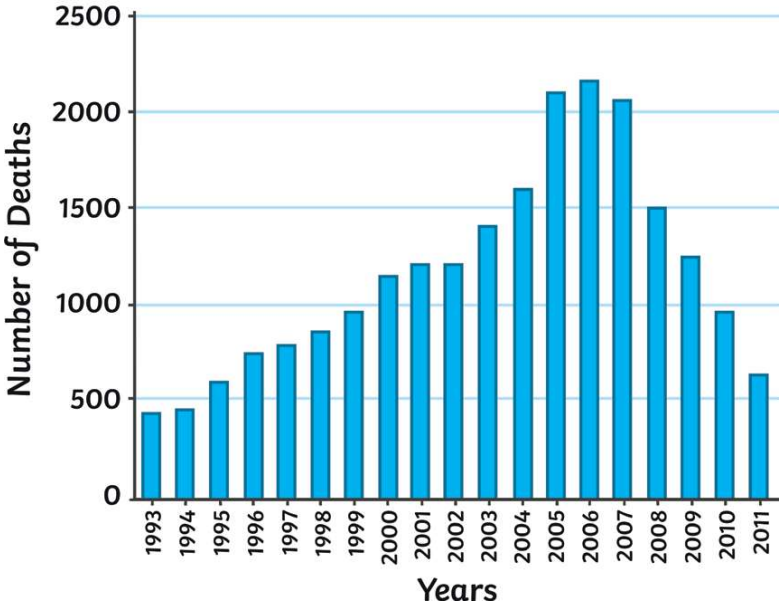
10. How might these disadvantages impact on humans? How are animals involved in your daily life?

11. Evaluate the use of selective breeding. Remember to include a conclusion that gives your opinion.

MRSA

Homework 3

Deaths from MRSA in England and Wales



Explain why the data has been presented in this type of graph.

When did the most deaths from MRSA in the UK occur? _____

Describe the trend in the data shown on the graph.

Explain the trend in the data shown on the graph.

Fossils

Homework 3

What is a fossil?

How are fossils formed?

1.

2.

3.

Explain why scientists can't be certain of how life on earth began.

What can we learn from fossils?

What might cause a species to become extinct?

1.

2.

3.

4.

5.

6.

Rabbits were introduced to Australia from Europe and their population size increased rapidly in the 19th century. The rabbits are suspected of being the most significant factor in species loss in Australia. Explain how the introduction of rabbits to Australia may have caused the extinction of other species.