Meden School Curriculum Planning							
Subject	Biology	**Year Group**	8	**Sequence No.**	1	**Topic**	Inheritance and variation

Retrieval	Core Knowledge	Student Thinking
What do teachers need **retrieve** from students before they start teaching **new content**?	What **specific ambitious knowledge** do teachers need teach students in this sequence of learning?	What real life examples can be applied to this sequence of learning to **development of our students thinking, encouraging them to see the inequalities around them** and 'do something about them!'
KS2 Learning Year 2 Students should be taught to notice that animals, including humans, have **offspring** which grow into adults KS3 Learning Year 7 Students should be taught about reproduction including the male and female **reproduction** cells. Students should have the knowledge of **fertilisation** and the development of a baby.	**L1**: Why do people look so different to each other? **Variation** is the differences among/between a species. Different individuals have **characteristics** which make them **unique.** These characteristics can be **inherited, environmental** or sometimes a mixture of both. **Inherited** characteristics are ones we are **born** with. **Environmental** characteristics are ones we are not born with but are shaped by our environment and choices. L2: What controls the way I look? All our cells contain **DNA**, which is found in the **nucleus** of the cell. Every cell (bar gametes) contain 46 **chromosomes**, except for our **gametes** which contain **23 chromosomes**. These **chromosomes** are where **inherited** characteristics come from. The **gametes** are the **sex cells (egg cell and sperm cell),** meaning we get half (23) our chromosomes from our biological mother and half (23) from our biological father. At **fertilisation** the egg cell nucleus and sperm cell nucleus **fuse** together combining their chromosomes. These chromosomes have small sections on them called **genes** which are the instructions for **inherited characteristics**. L3: Can I choose what an animal will look like? **Selective breeding** is a process in which organisms can be carefully bred to increase the chances of the offspring having the **desired** characteristics. The four stages of selective breeding are: 1) Decide which **characteristics** are important / which characteristics you want to **select** for. 2) Choose **parents** that show these characteristics. 3) Select the best **offspring** from parents to breed the next generation. 4) **Repeat** this process, continuously.	**L4: Do I agree or disagree with selective breeding?** Facilitate the moral debate between farmers and animal rights activists. **L5: Could I feed the ever-growing population through plant cloning?** Could a new system using cloning strategies find a way to grow more crops to feed the growing population? **L9: Should we be allowed to test for genetic disorders before birth?** Facilitate the moral debate of life is a life.

	L4: Do I agree or disagree with selective breeding? Selective breeding has many considerations including, economical, ethical, and social. Positives for selective breeding are: It can produce new varieties of crops, **higher yield,** shorter growing times, ability to **grow crops in varied climates** and more **profit for farmers**. Negative points to selective breeding are: Exposing the organism to **vulnerability** to **diseases** and **pathogens.** Narrowing of the **gene pool** due to **inbreeding** this leads to a loss of variety among a population. L5: How would I clone a plant? A **clone** is an organism that is **genetically identical** to its parent. **Plant cloning** can be carried out using a method that involves **asexual** reproduction (no fusion of the gametes required). The method to cloning plants is to take **cuttings** from a parent plant. The cutting is then dipped in **rooting powder** which contains plant **hormones** to encourage the growth of the roots. L6: How would I clone an animal? A **clone** is an organism that is **genetically identical** to its parent. The process to make a clone uses **asexual reproduction.** Identical twins are **natural** clones as they come from the same **zygote** which has split; therefore they contain the exact same **DNA. Dolly** the sheep was the first mammal to be cloned in Scotland. Dolly was cloned using a process called **somatic cell nuclear transfer**. This process takes the **DNA** from female A and fuses it with the **nucleus** from female B. The **embryo** is then implanted into the **uterus** of a foster mother. Once the **lamb** is born it will be **genetically identical** to female A as the **DNA** was taken from her. The positives to animal cloning are all the new **offspring** will have the **desired** characteristics. The disadvantages to cloning are if a clone is **susceptible** to **diseases,** they all will be, and it can lead to less **variation** within a population. L7: What is the chance of having a boy? Biological sex will be determined by the sperm that **fertilises** the egg. When the **gametes** are within the male are produced one sperm will contain an **X chromosome** and one sperm will contain a **Y chromosome**. Both female **gametes** (egg cells) will contain an **X chromosome**. A **genetic cross diagram** can be used to calculate that there is always a 50% chance of having either a male or female **offspring**. L8: Why do I have blue eyes when both my parents have brown eyes? **Chromosomes** can either be **dominant** or **recessive.** Parents can be either **homozygous dominant, homozygous recessive** or **heterozygous. Heterozygous alleles** mean that the **dominant phenotype** will be expressed however the parent will carry the **allele** for the **recessive characteristic.** Therefore, if two parents who are carriers reproduce there would be a 25% chance of the **recessive alleles** pairing up to produce a **homozygous recessive offspring.**	

	L9: Why are some people born with disorders? **Chromosomes** can either be **dominant** or **recessive.** Parents can be either **homozygous dominant, homozygous recessive** or **heterozygous. Genetic disorders** can be inherited from parents who do not have the disorder if they are both **carriers** of the **gene.** An example is **cystic fibrosis** where a **recessive gene** will cause the offspring to have the condition that affects the **lungs**. Parents can be screened to see if they carry the **gene** for **cystic fibrosis. Genetic cross** diagrams can be used to calculate the probability of an offspring being born with a **genetic disorder**. L10: a simple model of chromosomes, genes and DNA in heredity, including the part played by Watson, Crick, Wilkins and Franklin in the development of the DNA model L11: EoTT L12: GPA	