Genetics Review Assignment:

Student-Designed Study Guide

Block A

- Mrs. Kuebler writes: Gregor Mendel's work with pea plants helped him discover the idea of dominant and recessive alleles. In order for a dominant trait to show up, an organism only has to inherit one dominant allele (either from its mother OR from its father). In order to inherit a recessive trait, the organism MUST inherit a recessive allele from each parent. For more info about Mendel's experiments, click on: http://www.dnalc.org/view/16182-Animation-4-Some-genes-are-dominant-.html
    - That was a very informative post about Gregor Mendel. Did you know that in addition to being a scientist, he was also a monk? - SpongeBob
    - I liked learning about the discovery from Gregor Mendel, and I wonder if anone else would of discovered it if he hadn't. ^ I didn't know he was a monk spongebob. -Kendall W.

- Milo B writes: With homozygous and heterozygous, it decides all of your traits. If you are heterozygous, that means you have 1 dominant allele and 1 recessive allele since hetero means different. But since you have 1 dominant allele it means that you have the dominant trait. But if you are homozygous you could have the 2 dominant alleles or 2 of the recessive alleles. The only way that you can have the recessive allele is if you are homozygous.
    - Good, Milo. However, these rules don't necessarily decide all of your traits. There are a lot of traits that don't follow Mendel's "dominant/recessive rules." For example, polygenic traits such as hair color, eye color, and height are all more complicated. - Mrs. K.

- Ted B writes: The structure of DNA is a twisted ladder and also called a double helix. Its rungs are made up of 4 nitrogen bases: Adenine, thymine, cytosine and guanine. The sides are made up of phosphate, deoxyribose sugar and one of the nitrogen bases. These 3 components together are called a nucleotide.
    - I liked how you brought it all together with a final sentence -harry t.
    - I like how you include the names of the bases, you should add the names of the scientists who found out about the DNA structure -Rudy H
    - Good suggestion, Rudy. The scientists who discovered the structure of DNA were Rosalind Franklin, James Watson, and Francis Crick. - Mrs. K.
    - I like how descriptive you were with the names. It is a confusing subject and without it this would be quite confusing. -Ben H
    - This was very interesting, I liked how you put what a nucleotide is. I had forgot what they were, and this helped me. -Robert S

- Hannah C writes:DNA is shaped like a twisted ladder, or a "double helix", and has sides made up of phosphate, and deoxyribose sugar and the rungs of the ladder are made up of a nitrogen bases. The phosphate, nitrogen base, and deoxiribose sugar put together are called a nucleotide.
    - This is a great example of what DNA (deoxyribonucleic acid) looks like, since this is all I would need to know. -Lukas G
    - RNA has a similar make-up, but instead of deoxyribose, it has ribose sugar. In addition, one of

its nitrogen bases is different (uracil instead of thymine). Lastly, RNA is not a double helix because it is single-stranded. - Mrs. K.

- Cameron F writes: Punnett squares show the possible outcomes of the sperm cell and the egg cell's traits. If a pea plant is heterozygous for having a tall stalk and another one is homozygous for having a short stalk; when they fertilize, the possible genotypes are 50% tt , 25% Tt , and 25% TT. A good game link that I found last year on the brainpop site is:
    - I think that this is true about punnent squares and that you know this stuff really well. -Milo B-D
    - I think the link you were looking for is... http://www.brainpop.com/science/cellularlifeandgenetics/heredity/ - Mrs. K.

- Lukas G writes: Punnett squares are very helpful when trying to find out about possible offspring traits. For example, when you have brown hair and your partner has blonde hair, you can figure out what color the offspring's hair will be. If you are heterozygous for a potentially deadly disease, and so is your partner, then you can find out that there's approximately a 25% chance that your kid will have this. So, if that's the case, find another person to have kids with. Anyway, that was an interesting part of my science unit on genetics.
    - Wow, this was very interesting and helpful. It really helped me understand punnett squares more. ~Kiiana
    - Lukas, hair color follows a different set of rules since its a polygenic trait. However, I like your point about the couple being heterozygous for a deadly disease. You can trace this back through families using a Pedigree (we will be doing these this week). - Mrs. K.

- Rudy H writes: Meiosis is the process when sperm cells in the male are created and egg cells in the female are created. The cells start in the primary spermatocyte/ oocyte and from there they split into two and split into 4. All sex cells have 23 chromosomes and when the offspring is created the cells combine and give the offspring 46 chromosomes.
    - I like how you added the specific numbers for the number of chromosomes and the name of the parent cells for both the female and the male. -Ted
    - This paragraph was really quite superb. I thank you so much for the information addded to my knowledge. I thank you dearly, {LILY H}
    - Great detail in including the names of the primary spermatocyte and primary oocyte. - Mrs. K.

- Ben H writes: Gregor Mendel was a scientist/monk who lived from 1822 and 1884. He is famous for his studies of genes on pea plants. He lived in Austria and is credited as the founder of genetics. He combined tall pea plants, (the dominant trait,) and short pea plants,(the recessive trait.) He discovered that there were multiple results to his answers. When he mixed a homozygous tall and homozygous short, he found that they all ended up heterozygous tall! COOL RIGHT?!
    - Hi Ben. I really liked your post about Gregor Mendel and about his study about the pea plants. I didnt know he lived in Austria.-Ted
    - It's really cool how Gregor Mendel is given credit as to being the founder of gentetics. Roxie Z
    - Mendel used purebred (homozygous) plants in his first experiment which is why all the offspring turned out heterozygous. These resulting offspring were then considered "hybrid." - Mrs. K.

- Lily H writes: Codminance is when two dominant alleles both show up in their offspring. Both alleles are expressed the same, or equally. For example in blood types, A+B are codominant, both A blood type, and B blood type can both share the dominiance. When one person who has an A blood type, and another person who has a a B blood type have children, these alleles combine into their offspring's bloodtypes.
    - This was really good and it helped me understand more about codminance. ~abbie<3
    - Your paragraph was actually really helpful. Thanks. ~Kiiana
    - Hi lily this is coming from the person who sits next to you. I like how you added the blood types people could have but you forgot O type. -Rudy H
    - Good point. So types A and B are codominant, but blood type O still follows the "recessive rule" because two copies are needed in order for it to show up in the offspring. - Mrs. K.

- Amanda J writes: We get two copies of genes one from each of our parents. Depending on which genes they have determines what traits we get. We use Punnett squares to show the possible trait outcomes. Dominant traits always show up but recessive alleles only show when dominant alleles are not present.
    - I like how you described dominate and recessive traits. But maybe you could have included a little more about Punnett squares. MEGAN T
    - You mentioned that we get two copies of genes (one from each parent). This is because each parent give us 23 chromosomes. Once an egg is fertilized by a sperm, those numbers combine and the 23 chromosomes from one sex cell pair up with the 23 chromosomes from the other sex cell. These pairs are now called homologous pairs. - Mrs. K.

- Kiiana M writes: My favorite part about genetics unit was punnett squares. I found it interesting how you could have a different outcome than what you put in. Its sort've like an input output table except more complex. It is very interesting how you can use this quick way of finding out the result of the gene inputs. There are many words that are used when using punnett squares. Like homozygous which means a gene that has two of the same alleles and heterozygous which means two different alleles. The punnett squares are used to find out the result of two gene types.
    - Kiiana. Thank you so much for the wonderful paragraph. I really enjoyed the different perspectives of your likes.. or preferences. {LILY H}
    - Interesting comparison, Kiiana! - Mrs. K.

- Scott P writes: Punnett squares shows all the possible combinations of alleles that can show up in the offspring. The Punnett square shows the possible results of the egg and sperm once fertilization takes place. I think this is the most interesting part of the unit because it is a way to show the dominant and recessive traits.
    - I think punnett squares are interesting too - amanda j
    - Punnett squares work very nicely for genes that are simple (dominant/recessive, incomplete dominance, or codominance). However, these can get very complicated once you start taking polygenic traits into consideration. (You'll do more with those in high school!) - Mrs. K.

- Abbie R writes: My favorite part of the genetics unit was learning about Punnett squares because it is really easy to learn about. Punnet squares is a chart that shows all the possible combinations of alleles for a trait when passed from parents to offsring. They help to find out combinations to many

things.

- I agree, Punnett squares were very easy to learn. I was out sick for a day and I got caught up just by looking at an example. ~Kiiana
- Yes, they're pretty easy to figure out. Once you understand them well for dominant and recessive traits, it's easier to figure out how to solve problems involving incomplete dominance and codominance. - Mrs. K.

- Robert S writes: The most interesting part of this unit for me was learning about Dominant and Recessive traits. The dominant trait will show up if there are two dominant alleles (homozygous) or one dominant and one recessive (heterozygous). The recessive trait will only show up if the dominant trait is not present. An example is in pea plants, where tall is the dominant allele and short is the recessive allele. It would need to be tt to be short, but it could be either TT or Tt to be tall. It would have to inherit these traits from it's parents; they don't just show up from nowhere.
  - Robert, this was beyond amazing. Its very helpful. and easy to understand when you explain dominant and recessive traits.~Kiiana
  - Pea plants give us lots of easy ways to figure out dominant and recessive alleles. Unfortunately, there are too many genes in the human body that follow these simple rules. However, there are things like tongue-rolling, widow's peak, hitchhiker's thumb, and earlobes that do follow these rules! - Mrs. K.

- Harry T writes: I learned how DNA replicates and how it binds together. A always bonds to T and C always bonds to G. First in DNA replication the helicase splits the DNA into two single strands. Then floating nucleotides bond with the nucleotides on each of the single strands. This is called semi conservative replication because half of the DNA strand is saved. Then since the cell has two sets of DNA it can divide to make two new cells.
  - This is very helpful I forgot what semi-conservative means. This isn't sarcastic-Hannah
  - This paragraph is very informative and really helped me remember about helicase-Scott
  - Nice job Harry. You're the first one to write about DNA replication on this study guide. It's a really important process to remember because without DNA replication, our cells would stop dividing and we would cease to exist! - Mrs. K.

- Megan T writes: Meiosis is the process in which egg and sperm cells divide. It only occurs in male and females reproductive organs. This type of cell division starts with the primary spermatocyte in males and the primary oocyte in females. Then they divide into 4 new sperm or egg cells. Then when a sperm and an egg cell join together to create an offspring, it is called fertilization.
  - That was a very good description of meiosos. I didn't really get it in class. You did a very good job of making it clear. I was wondering: How do the cells divide? Roxie Zalkind
  - Same it was difficult in class but this is a really clear explanation-hannah
  - I like how you simplified meiosis. It was difficult to understand in class, and this made it much clearer. -Robert S
  - Meiosis is similar to mitosis in that it involves cell division. However, it is more specific than mitosis because it only occurs to the sex cells. - Mrs. K.

- Kendall W writes: During the whole unit of genetics, my favorite part was the mutations. I think it was cool to see how you get different diseases. I never knew that cancer had to do with your cells, I

always thought that it was just something that happened. It was interesting to look at the exact causes and effects that could happen by just a mutation in your cells. The three types of mutations are insertion, deletion, and substitution. Insertion is when a nitrogen base gets added into the DNA segment. Deletion is when a nitrogen base gets deleted from the DNA segment, and substitution is when one nitrogen base replaces another.

  - That was a really great explanation of the three mutations. I was wondering: How do you get these mutations? Roxie Zalkind
  - Mutations can be inherited (passed down from parents to offspring through the sex cells), can occur during DNA replication mistakes (the wrong nitrogen bases pair up), or can be caused by environmental factors (such as UV radiation, nuclear radiation, toxic chemical exposure, etc.) - Mrs. K.
  - Thanks for specifying the different type of mutations. It really helped me. And also the process was good to hear again. {Lily H}

- Roxie Z writes: When someone says you are homozygous dominant it means that you have two dominant alleles. For example: your parents could have brown hair, and you could also have brown hair you would have the dominant alleles BB. This homozygous dominant. You could also be homozygous recessive. If your parents both have blond hair and you also have blond hair that means that you have the recessive alleles of bb. If you are a heterozygous that means you have both a dominant and recessive allele. Your parents could have BB and bb, but you would would most likely have the alleles: Bb. So you would end up brown hair.
  - Good...two homozygous parents with opposite phenotypes will always produce offspring with the heterozygous genotype. (Ex. TT and tt will always produce Tt 100% of the time.) - Mrs. K.
  - Learning about this was a little confusing in science class, but you explained it very well! -Kendall W.

Block B

- LILY A writes: A gene is a segment of DNA. There are about 30,000 genes. We get two different codes of the genes from our parents. Chromosomes are in two pairs because we get one from each of our parents. We have 46 chromosomes and 23 pairs.
  - Thats really cool lalt! keep up the good work -Caroline B
  - lily, good work from... jake o
  - This is really good. from, emma g
  - These sets of 23 chromosomes that we get from each of our parents are called “homologous pairs” - Mrs. K.

- Grace A writes: Heterozygous is when you inherit two different alleles (one from your mom and one from your dad.) If you have a child with another heterozygous parent you have a 50% your child will be

heterozygous. You have a 25% chance that your child will be homozygous dominant or 25% homozygous recessive. Homozygous is when you have two of the same alleles for a trait.

- GRACIE: Good job!! This is very well written and full of great facts! - LOVE, your best friend SAMANTHA
- Good job! This is a great way to explain it. ~Molly
- Good, and if two parents who are homozygous (one for recessive and one for dominant) have a baby, they have a 100% chance that their offspring will have a heterozygous genotype. - Mrs. K.

- Jeff B writes: The difference between codominance,and incomplete dominance is for codominance both of the alleles are expressed in the offspring. This means that neither of the alleles are more or less dominant. Codominance is represented with a capital or lowercase letter, or if there is a capital letter, it will be represented as a capital letter and superscript character. Incomplete dominance means that neither allele is more dominant than the other. It means that one allele is not completely more dominant over another. Incomplete dominance is a blended version of both traits. It is represented by 2 capital letters, like RW or RN.
  - Good work, from emma garber.
  - YAY JEFF GOOD WORK I LIKE IT - JAKE OWEN =-)
  - Thanks guys, I appreciate the comments! -Jeff :D
  - Incomplete dominance example: curly vs straight hair makes wavy hair. Codominance example: A blood type and B blood type make AB blood type. - Mrs. K.

- Polina B writes: When there is a problem in the DNA in a unborn baby that means that baby will have some abnormalilty or some kind of disease. This is caused by mutations in that DNA like substitution, deletion, and insertion. Substitution is not as dangerous, because it may substitute to a amino acid that is the same as the DNA copy(mutations only occur in RNA copies). But substitution might be sort of dangerous but it depends what the RNA copy is. Insertion is extremeley dangerous because if a nitrogen base is added where it's not supposed to be, the entire code "squishes" in and can cause severe damage, and can even be deadly. Deletion is as dangerous as insertion because then it pushes everything over and there will be two letters left over, where in insertion there will be 1 letter left over. Deletion is dangerous because, each letter in the D/RNA copy has their own importance so if you delete one letter it is, like insertion, deadly. So pretty much, when the DNA copies itself, the nitrogen bases that attach are: Adenine with Thymine, and Guanine with Cytosine. In the RNA copy, the nitrogen base Thymine is replaced with Uracil.
  - The only thing that you could have added was that G= guanine A= adenine T= thymine and C= cytocine. And that C is paired with G and A is paired with T- Lily A
  - agreed- Zara
  - Thanks guys-Polina
  - These mutations you discussed may occur through environmental factors (such as UV radiation or toxic chemical exposure), mistakes in DNA replication, or because of inheritance (if one parent passes the trait down to his or her offspring through their sex cells). -Mrs. K.

- Dylan B writes: DNA is a double helix. This structure was discovered by Francis Crick and

Jim Watson. DNA is made of nucleotides. They are formed of a nitrogen base, a phosphate and a deoxyribose molecule. Deoxribose and Phosphates form the sides of the “ladder”, the nitrogen bases form the “rungs” of DNA. The four bases are Guanine, Cytosine, Adenine, and Thymine. Adenine always bonds with Thymine and Cytosine always bonds with Guanine. This is called the base pair rule. For on DNA go to How Stuff Works: DNA YES.

- That was very detailed and good-Caroline
- another piece of information, insignificant as it is (but still good to know) is that the deoxyribose that forms the side of the ‘ladder’ (along with the phosphate) is a sugar- the deoxyribose sugar. -JB
- you should also talk about the women who took the x-rays that they used-alice
- Good point, Alice. We must mention Rosalind Franklin! - Mrs. K.
- I like how you mentioned the scientists names- Lily A

- CAROLINE B writes: Punnett squares show the outcome of all possible allele combinations from parent to offspring
  - Doesn’t it show the outcome from a parent to an offspring? -Lily A
  - They are a way to show us the results of fertilization. “If this egg and that sperm combine, then the offspring will have these traits.” - Mrs. K.

- Elias B writes: Recessive traits only show up if they are the only trait in the gene.
  - YAY good job =-) - jake o
  - Can you elaborate on this concept and maybe explain the exceptions? -alice
  - You should go into more detail, however this sentence does make sense and is very clear. -Tess
  - If both parents are homozygous recessive for a trait, then 100% of their offspring will have the recessive phenotype for that trait. However, it is possible for two heterozygous parents to have an offspring with a recessive phenotype if the egg and sperm that created that offspring both had the recessive allele inside its genetic code. - Mrs. K.

- Lillian D writes: Heterozygous and homozygous are words that describe the genotype, or allele combinations represented with letters. They tell whether the two letters in the pair are both capital or both lower case, as in homozygous, or one lower case and one upper case, as in heterozygous. One can tell the difference by remembering the morphemes we learned in ELA; homo meaning same and hetero meaning different.
  - Great incorporation of ELA class in science class! - Mrs. K.
  - Can you clarify what that means for offspring. from josh
  - If offspring have the heterozygous genotype (Tt), they will have the dominant phenotype (tall). If offspring have the homozygous dominant genotype (TT), they will also have the dominant phenotype (tall). However, if offspring inherit the homozygous recessive genotype (tt), they will have the recessive phenotype (short).
  - HI, ok so you used too many sciency words for me to comprehend buuuttttttt..... very straight forward and really goood - Anna s

- Josh F writes: Codominance physically looks as if the specimen has been cut in half by a specific trait. For example in chickens if one parent has black feathers and the other has white feathers, then the resulting offspring will have half white feathers half black feathers. For more information on codominance feel free to check the following link
  http://ghr.nlm.nih.gov/glossary=codominance
  - of course, however, just to clarify, by saying "the specimen has been cut in half", a codominant chicken that is brown and white wouldn't have the left side completely white and the right side completely brown- the feathers would provide a mix of both brown and white feathers 'randomly' scattered among the organism. just to clarify. -JB McQ
  - Good point...it's a random scattering of the alleles. - Mrs. K.
  - good job from emma garber
  - To my dear friend JB. Thank you so much for helping me to explain this concept even more. Sincerely ~Josh F

- Emma G writes: DNA looks like a twisted ladder. This is called a double helix. DNA is made up of 3 parts. The first part is deoxyribose sugar, the second is phosphate and the third part is a nitrogen base. The nitrogen bases can be one of 4 chemicals: adenine (A) thymine (T) guanine (G) cytosine (C). These are like the steps on the ladder. Adenine can only attach to thymine and guanine can only attach to cytosine.
  - Is the twisted ladder called the double helix?-elias b
  - Emma this is really good -Grace
  - GOOD JOB EMMA! Love, Samantha
  - Agreed ~Josh
  - The three parts that make up the main structure of DNA are called nucleotides. This is an important term to remember. (Nucleotide = sugar, phosphate, and base.) - Mrs. K.

- Jacob G writes:Homologous pairs are pairs of chromosomes you inherit from your parents. You get twenty-three chromosomes from you father and twenty-three from your mother. The first chromosome inherited from your father, and the first one from your mother bind to make a homologous pair. You have forty-six chromosomes, twenty-three from both parents, that bind into twenty-three homologous pairs.
  - Each chromosome within the homologous pairs are identical but may have different alleles. (For instance, all the genes on chromosome #4 from your mom are the same as the genes on chromosome #4 from your dad. These two genes, however, may have different alleles depending on which form you inherited.) The only exception to this rule is homologous pair #23 in a MALE. These are the sex chromosomes. Men have an X chromosome as well as a Y chromosome, which contain completely different genes. It is the SRY gene on the Y chromosome that helps to determine the male traits of that individual. - Mrs. K.

- Samantha K writes: The dominant trait always shows up if the trait is given. The recessive trait is only shown if there are no dominant traits given. An example of a dominant trait is widow's peak and

an example of a recessive trait is attached earlobes. What happens is each parent gives two alleles, dominant or recessive or both. To decide what traits the child could get we can use punnett squares.

- good job samantha!! from emma g
- Good job yours is really good <3 Grace
- Each of these traits are passed down from parents to offspring through the sex cells. A mother donates an egg while a father donates a sperm. The random combination of the alleles that occur during fertilization determine the outcome of the offspring. - Mrs. K.

- J.B. M writes: When more than one gene affects a trait, it is called polygenic inheritance. The alleles from the different genes then *both* are factors in those traits. For example, the trait of the height in humans is determined by polygenic inheritance.
  - Can you please elaborate more on this concept? ~Josh F.
  - JB MY MAIN MAN GOOD JOB - jakY POO
  - JB you have a good start, but you might want to make it longer.--Dylan B.
  - Some other common examples of polygenic inheritance in humans are eye color, skin color, and hair color. - Mrs. K.

- Caitlin O writes: Three scientist discovered the shape of DNA, they were Rosalind Franklin, Francis Crick, and James Watson. They figured out that the shape of DNA was a double hellix or twisted ladder. Rosalind Franklin took x-rays of the DNA inside the nucleus. Crick and Watson saw the x-rays and put all the information together to learn the shape of DNA is a double hellix.
  - Although her contributions were critical in furthering knowledge about DNA structure, Rosalind Franklin did not earn the Nobel Prize for her work. Watson and Crick, however, did receive this prestigious award because they were still alive at the time it was announced. - Mrs. K.

- Austin O writes: Punnett squares show the alleles for the genes that two parents have and what alleles and genes their children would have. For example, a mother might have the gene Rr and the father might have the gene rr so a punnett square would show the possible gene combinations the child could have, which in this case would be Rr or rr. Depending on how many times the gene appears in the punnett squares, the punnett squares would help find the probability of the child having a certain gene. For the example above, Rr appears twice out of the four squares and rr appears twice out of the four squares. Because of this, there would be a 50% chance (1 out of 2 children) that the child would have the gene Rr and there would also be a 50% chance (1 out of 2 children) that the child would have the gene rr.
  - This is good Austin as far as i know this is correct good job-Grace
  - Good Austin. The offspring inherit these genes when the egg is fertilized by the sperm. This is why one allele comes from mom (from her egg) and the other allele comes from dad (from his sperm). - Mrs. K.

- Jake O writes: Heterozygous and homozygous genes are the way genotypes is written. Homozygous is when there are two of the same allele combinations while heterozygous is when there's a dominant and recessive allele in the same genotype. Homozygous genotypes are the only

way recessive genes can show and they're the only way purebred dominants are made. An example of heterozygous is Dd while homozygous looks like DD or dd. Homozygous and Heterozygous genes can affect your offspring to

- Another word for homozygous is purebred and another word for heterozygous is hybrid. When conducting his first experiment, Gregor Mendel used two purebred plants (homozygous tall and homozygous short) and saw that these created 100% hybrid offspring (heterozygous tall). - Mrs. K.
- Good job explaining jakey. It was very clear. -Lily A
- This was a satisfyingly studious assessment of the significant topic you have chosen to focus your attention upon. thank you for your effort in this incredibly scientific review. i express my gratitude freely- JB McQ
    - Wow, that's a pretty amazing review, JB. Haha! - Mrs. K.

- Molly P writes: Heterozygous genotypes are when the two alleles are different. For example Tt (the capital letter is dominant and the lower case is recessive). Homozygous genotypes are when the two alleles are the same. For example TT or tt. Heterozygous genotypes have one dominant and one recessive allele and heterozygous genotypes have either both recessive alleles or both dominant alleles.
    - And since there is one dominant allele in a heterozygous pair the specimen will come out with the dominant trait because whenever the dominant trait is present it will appear in the specimen. ~Tess
    - Punnett squares make it easy to figure out if the offspring will inherit the heterozygous or homozygous genotypes. - Mrs. K.

- Alice R writes: Alleles are the cause in the difference in human traits within a gene. Alleles are dominant or recessive. If the dominant allele is present it automatically shows up while the recessive allele is only shown in an organism if they do not possess a dominant allele. However, there are some special cases where there are more than two alleles that control a gene, or an allele is not completely dominant (incomplete dominance), or when both alleles are shown equally (codominance).
    - Good description, I like how you describe codominance and incomplete dominance-Jacob
    - I like your first sentence because it helps to explain why we all look different. Diversity is nothing more than differences in gene alleles! Something you mentioned at the end of you post is when more than two alleles control a gene...this is called multiple gene inheritance. - Mrs. K.

- Zara S writes: The DNA structure is made of a twisted ladder and a double helix. There are four bases that lie on the twisted ladder. The bases are: Adenine, Guanine, Cytosine, and Thymine. One base pairs with another, Adenine with Thymine, and Guanine with Cytosine. This pattern is called the Base Pair Rule. There are three parts to the nucleotide: the sugar, the phosphate and the bases(Adenine, Thymine, Guanine, and Cytosine.)
    - you should specify the sugar and the type of base-josh
    - Nucleotide = deoxyribose sugar + phosphate + nitrogen base (A, T, C, or G) - Mrs. K.
    - This is really good! Maybe you can include how long it is and how long it *can* be. -Polina
    - If all 46 chromosomes in one body cell were to be unraveled and lined up, it would measure out

to 6 feet long! - Mrs. K.

- Anna S writes:Ok imagine that there is a black and white panda and a purple and orange panda. Most of the human civilization would think that a panda would always be black and white so they never heard of the recessive gene, purple and orange. A dominant allele is the most common like black and white pandas. [This is not always true, Anna. There are many recessive traits that are MUCH more common than dominant traits. (See Lillian's response below) - Mrs. K.] It is what most people see and what is most common. A recessive trait is what baisicly shows up when the dominant trait is not present. So what i am saying is that if a panda is orange and purple the most common trait/dominant(black and white) the black and white trait is not present:)
  - I like the visual, makes it easy to understand-Jacob
  - ANNA PANDA good work =-) - jake o
  - Yay good job but doesn't the recessive not have to be the most uncommon? like the whole five fingers thing :) -your favorite person Lillian
    - Right Lillian. Dominant does NOT equal more common! - Mrs. K.
  - I like how you related this to PANDAS!!!!! from emma g

- Tess S writes: Incomplete dominance is exactly what it sounds like; traits that are not completely dominant. Incomplete Dominant traits end up mixing together because one is not more dominant so it doesn't show up more than another. The traits mix together, putting an equal amount of their trait into their offspring. For example if red flowers and white flowers are both incomplete and having offspring, they both will put the same amount of their trait into their offspring, resulting in pink flowers. This happens because the red flower trait is not fully dominant, so its offspring does not come out completely red flowered, and the white flower trait is not completely dominant, so its offspring does not come out completely white flowered as well. The offspring comes out a mix of both red flowers and white flowers, therefore pink flowers.
  - Great description -Zara
  - A good example of this in humans is hair shape. Curly and straight result in wavy haired offspring. - Mrs. K.

- Josh V writes: Punnett squares show all the possible outcomes of a offspring. The rows and columns stand for the mother's and father's alleles. Usually the punnett square is a 2 by 2 square but in the case of multiple alleles there can be more. In a punnett square the phenotypes are represented by a letter. If the allele is dominant then it is represented with a capital and the letter is the first letter of the genotype. The recessive allele is represented as a lowercase version of the dominant allele. For a picture of this, click: Here
  - Nice description -Matthew
  - I like the website image that you attached to your post. Good visual representation of Punnett squares. - Mrs. K.

- Matthew Y writes: DNA is made up of a double helix, in which each strand there is a deoxyribose sugar, a base, and a phosphate. The base is either an A, T, C, or an G. (In RNA transcription, The T

is replaced by a closely related U). There are many forms/ causes of mutations in the DNA. One is substitution, where a base is replaced with another. This one causes the least problems and is less harmful than others. Another is insertion, where a random base is inserted into the sequence. Also, deletion is where a random base is deleted. Keep in mind that these mutations will/ might affect the transcription (of DNA) . You can see an example -> Here <- .

  - good description and link -eric
  - Not only do mutations affect transcription, they affect the translation of the RNA code into amino acid chains. This causes an entirely new protein to be made, which could result in a potentially harmful disease. On the other hand, it could just result in a new variation of a trait. We are all mutants, after all! - Mrs. K.

- Eric Z writes: Someone can find the trait that follows the rule of incomplete dominance by using a Punnett square and using capital letters (instead of capital and lowercase letters). This can tell someone like a flower breeder who wants a pink snapdragon what to breed. He can breed a white snapdragon flower with a red snapdragon flower to get a pink snapdragon flower. This process uses a Punnett square to find the offspring outcome, instead of having to cross them then wait for their desired outcome. See an example here
  - Superscripts (T^s) are used during codominance, while incomplete dominance is just represented with two capital letters. - Mrs. K.

Block C

- Maddie A writes: Mutations- they can be caused by heredity, environmental factors, or a dna replication mistakes. There are three mutations, called substitution, deletion, and insertion. Insertion and deletion can cause serious damage, however substitution makes a variation in our species. It makes us all unique :)
  - Very good :D but you might want to go more in depth about each one! -scott tambascio
  - Substitution replaces one of the bases, insertion adds one (therefore shifting the entire reading frame for translation) and deletion adds a base (this also shifts the whole reading from so the wrong amino acids are put into the chain). - Mrs. K.
  - Nice maddie. Your's is good with details. Nice :) at the end--Daniel s
  - Good description. You could describe how substitution makes a variation in our species, and how insertion/deletion can cause serious damage. But yours was good -Scott.K

- Molly C writes: DNA mutations come in three different forms Substitution, Insertion and deletion. Substitution is when a DNA base is replaced by a different one. Insertion is when 1 or more bases are added into a DNA sequence. Deletion is when 1 or more bases is deleted (lost) from the sequence. When mutations happen things can be very bad or they can be fine and normal.

- Right, because if we didn't have mutations, everyone would be exactly the same. Mutations increase genetic diversity and are what cause species to evolve! - Mrs. K.

- Jack C writes: A gene is a segment of DNA that codes for a protein which determines traits in a human. In a baby there are two copies of each gene in which are inherited from our parents. In one parent there are 23 chromosomes and when a child is formed there are 46 chromosomes and 23 in each parent. If there is a chromosome missing (like 22 in one and 23 in an other) and there will be a genetic disorder.
  - Each of these 23 sets of chromosomes inherited from parents are called homologous pairs. - Mrs. K.
  - I agree but instead of saying genetic disorder you can say mutation-Caleb C
    - Inheriting an abnormal number of chromosomes (45 instead of 46) is actually called a genetic disorder, not a mutation. This is because there is an entire chromosome missing (or an entire extra chromosome) which causes abnormalities in THOUSANDS of genes! This is much more serious than a single base mutation. - Mrs. K.
  - Yes, but you should change the wording of your paragraph- it is kind of hard to follow- Natalie

- Caleb C writes: In codominance both alleles are expressed in the offspring. For example in humans blood types A and B are codominant. Also, in a Punnett square, depending on what the parents' blood types are, the offspring could get either parents' blood type.
  - Nice Caleb yours is very good with details-Daniel s
  - This is good, but you should add that there is more than two blood types- Natalie
  - Only blood types A and B follow the rules of codominance. If a child inherits an allele for A and an allele for B, then his or her blood type will be AB. However, there is a fourth blood type known as O. This is the recessive form for this gene. - Mrs. K.
  - I really liked your response, good job - Tom F
  - Good examples -Ilana

- Tom F writes:DNA is made with four letters, A, T, G, and C. These letters pair with each other and it is called the base-pair. A bonds with T and G bonds with C. In RNA, T is replaced with U. For example: DNA=T+A RNA= U+A.
  - Nice Tom -Jack c
  - Good Job explaining -Naomi
  - Good summary, but it might be better if you included an explanation of how transcription works. -Zoe
  - Transcription is the creation of an RNA strand from the DNA code. This occurs in the nucleus when the DNA double helix unwinds, unzips, and nitrogen bases pair up to ONE strand according to the base-pair rule. This process builds the single-stranded RNA molecule. As Tom mentioned, C and G pair together, but in the case of RNA, the T is replaced with U. Therefore, U and A pair up during transcription. - Mrs. K.
  - I agree and I like your example, good job-Caleb C

- Each letter stands for a specific chemical: A = adenine, T = thymine, C = cytosine, G = guanine, U = uracil. - Mrs. K.

- Natalie F writes: Codominance: So there are two types of zebras; the Bushel's zebra and the Mountain zebra (this is true, not made up). The Bushel's zebra is a dominant pattern, the Mountain zebra pattern is codominant. If a female Bushel's zebra and a male Mountain zebra were to have babies, their babies would have a codominant coat. The genes would mix enough so that there would be splotches of both types of coat in the babies. The Bushel's zebra has a more vertical stripe (V), while the Mountain zebra has a more diagonal coat(M). The babies would all have the genotype VM, creating a new species of zebra. These babies would be Codominant, because they have both of the dominant genes in their gene makeup, just like the example that we had in class with the black and white chickens. NOTE: This has never been done before, but these types of zebra exist. DONE
  - Very interesting connection to Zebra's! I like how you say 'This has never been done before' :-)- guess who
  - I did not know this! Very interesting!
  - Good job natalie i liked how you gave the examples of zebras! Emily :P
  - This is extremely thorough great job - Tom F.
  - Sounds like you could "invent" a new looking zebra! Zebras definitely have all sorts of awesome patterns but I've never heard of the first zebra you mentioned. - Mrs. K.

- Peter F writes: Dominant and recessive traits determine the traits affected by alleles. The dominant trait is a capital letter and the recessive is a lowercase letter. When there is a dominant letter it always shows up but there has to be two lowercase letters for a recessive trait to show up. For example, if brown eyes is the dominant trait for humans, then if the allele is Bb then you would have brown eyes
  - You might want to be a little more in depth!-scott t
  - I agree, you can add examples to your paragraph to -daniel s
  - As you've learned, eye color is a polygenic trait, so it doesn't work out as nicely as some of the other gene examples we've studied. Another good example would be the trait for widow's peak. In order to have a widow's peak, an individual would only have to inherit one copy of the gene from his or her parent. If the mother's egg had the dominant allele, the offspring would end up showing the dominant phenotype. - Mrs. K.

- Andrew F writes: In incomplete dominance, one allele is not completely dominant over another. In incomplete dominance, the heterozygous form of the gene is a blended combination of the two genes. This is different from when there dominant and recessive alleles present, and only the dominant allele shows up. In incomplete dominance neither allele is completely dominant but they blend together. For example, if someone breeded a plant with a red coloration, and a plant with a white coloration, then their offspring would be pink In codominance, both of the alleles are dominant. For example, if there was a chicken with black feathers, and a chicken with white feathers, then their offspring would have a combination of black and white feathers.
  - To help you tell the difference between a Punnett square showing dominant/recessive, a Punnett square showing incomplete dominance, and a Punnett square showing codominance, scientists use different types of letter combinations. Dominant/recessive inheritance is shown with capital and lowercase letters (Tt, TT, or tt). Incomplete dominance is represented with

two different capital letters (RW). Codominance is represented with a capital letter and a superscript (F^B F^W) - Mrs. K.

- Emma H writes: Punnett squares shows all the combinations of alleles for the traits that gets passed down from the parents. Some of the combinations are Tt,TT, and tt. Heterozygous is when there are two different alleles and homozygous is two of the same alleles.
    - Before a Punnett square can be drawn, fertilization between an egg and sperm has to take place. Before that can even take place, meiosis has to occur. Meiosis creates the sex cells and a Punnett square shows the possible results when those eggs are fertilized by sperm. - Mrs. K.

- Annelise H writes: When a dominant allele shows up, it is always represented in the trait, even if a recessive trait is present. The only way a recessive trait can be seen in your genes, is if there is no dominant allele present. The Dominant Allele is usually the more “normal” form of a gene, and codes for a regular protein. Even though a gene is dominant is doesn’t mean that it is the more common or regular one. For example, the dominant trait is six fingers, but having six fingers is very rare.
    - Very well written- JACK C!!!!!!!:D
    - Good point about dominant not being the same thing as “more common.” Also, dominant doesn’t always HAVE to be the normal form of the gene. It just usually is in a lot of cases -Mrs. K.

- Emily H writes: DNA is like a twisted ladder or double helix. DNA is made up of nucleotides. Nucleotides consist of phosphate, deoxyribose sugar, and a nitrogen base. The outside of the ladder is made up of a pattern of deoxyribose sugar and phosphate. The rungs of the ladder are combinations of Adenine, Thymine, Cytosine, and Guanine which are the nitrogen bases in the nucleotide structure. These nitrogen bases will only bond in a certain way. The base pair rule is the rule that determines which bases bond together. For example Adenine will only bond with Thymine, and Cytosine will only bond with Guanine. The floating nucleotides attach to each other and form a DNA strand.
    - Really good, The way you described it was really greatttt:):):):)-Naomi:)
    - Great detail. It is important to remember all these facts when explaining DNA replication as well. The helicase unwinds and unzips the double strand so that two semi-conservative strands can be made using the Base-Pair rule. - Mrs. K.

- Catherine K writes: punnett squares are charts that show all the possible combinations of alleles for a trait when passed down from parents to offspring. Homozygous is two of the same alleles,while heterozygous is two different alleles. Can someone explain to me what incomplete dominance and codominance is?
    - codominance is when both allelles are expressed in the offspring.~Maddie
    - I am sort of confused about incomplete dominance and codominance; I dont know the complete definition about them both. ~Gabby

- me too ^^^^ but besides that gooooooooooood job! - Molly
- Girls, here's an explanation for you:
  - Incomplete dominance is when neither allele is dominant, but neither is recessive either. Instead, the two alleles blend together when they show up. For example, in humans, curly hair and straight hair both show incomplete dominance. If an offspring inherits a curly hair gene from her mom and a straight hair gene from her dad, she will end up with a blended phenotype: wave hair! - Mrs. K
  - Codominance is when BOTH alleles are equally dominant. Because one is just as dominant as the other, they BOTH show up. This is the case in blood types A and B. If an offspring inherits a type A allele from one parent, and a type B allele from the other parent, then he will have blood type AB. Both alleles show up. Another example is in chickens (feather color). Black and white feathers are equally as dominant so the offspring all end up with patches of BOTH black and white feathers. - Mrs. K.

- Scott K writes: During his experiment with pea plants, Gregor Mendel developed the Punnett Square. The square showed that each parent can only pass on 1 of it's alleles to its offspring, and that the traits of the offspring depend upon which alleles it receives from its parents. Using this technique, Mendel was able to determine which pea plants would get which alleles.
  - His first experiment crossed two purebred tall plants and he found all the offspring were still tall! However, once Mendel crossed the resulting offspring, the recessive trait showed up again in the next generation. It was "hiding" in the heterozygous offspring. - Mrs. K.

- Naomi R writes: DNA mutations are very common, they are the reason why we don't look exactly the same. Everyone has different Alleles turned on and others turned off. Sometime mutations happen in which it turns off a certain allele. This isn't bad, but it just changes what trait the person will have. But sometimes, there is deletion or insertion which is bad. It is bad because Adenine is supposed to go to Thymine and Guanine has to go to Cytosine. When Adenine is matched with Guanine that is a mutation. Usually this mutation shifts the DNA reading frame and the wrong amino acid chain is made. When this happens sometimes nothing if affected, but other times it can affect the physical trait of someone.
  - Good Job Naomi! I really like the first sentence, because when people think of mutations they usually think of something bad, and not normal. -Annelise H.
  - Very well said naomi, even though we learned about this a few weeks ago you really refreshed my mind about this topic. I also like how you said thats why we all look different instead of not normal or normal because what's normal? Gabby :)
    - Exactly - everyone has a different perspective on what "normal" is. Nice wording! - Mrs. K.
  - Great Job!!!!!!!!!!!!!!!!!!!!!!! Naomi. I liked how you talked about why people look different and how it happens. Emily :P

- Daniel S writes: Punnett squares show you all the possible combinations of alleles for a trait when passed from parents to offspring. A Punnett square also shows you the percentages of the phenotype and genotype. Like for example, phenotype can be 100% tall and the genotype can be 100% tall TT.

- I think that you did a pretty good job on explaining the outcomes of the punnett square! :D -Scott T
- This is good, but what is the difference between a genotype and a phenotype? ~Maddie
  - Genotype is the allele combination represented with letters (TT, Tt, tt) while phenotype is the actual physical appearance (tall, short). - Mrs. K.
- Ya same here!-scott t
- I agree with you ~ Shreya Y

- Scott T writes: Heterozygous is two different Alleles. Homozygous is two of the same Alleles. An example of Heterozygous is Rr. An example of Homozygous is RR or rr. A Genotype is the Allele combination represented with letters; RR,rr,Rr. A Phenotype is the physical appearance of a trait; tall, short.
  - I like how you gave examples of heterozygous and homozygous. LIke the genotypes RR, rr, Rr. -Daniel S
  - Good Job. Nice Example. -Naomi
  - Another way of saying homozygous is "purebred" while another way of saying heterozygous is "hybrid." These terms are often used by dog and cat breeders. - Mrs. K.

- Gabby T writes: There are two different genotypes.There are heterzygous and homozygous genotypes. Heterozygous is two different alleles. If the dominant trait is tall the heterozygous genotype would look like this: Tt. Homozygous is the same alelle. If the trait is yellow the homozygous genotypes would look like this: TT or tt.
  - Letters for alleles are almost always the first letter of the dominant trait
    - Good point, so if the dominant trait in your example is yellow, the genotypes would be YY or Yy. - Mrs. K.
  - good job gabby it was very clear and good info - molly
  - Great Job, I agree with Molly that your info was clear and I liked how you gave an example:) -Naomi

- Zoe W writes: When crossing a heterozygous dominant genotype with another heterozygous dominant genotype you will *always* get 50% heterozygous dominant, 25% homozygous dominant, and 25% homozygous recessive offspring. When crossing a heterozygous dominant genotype with a homozygous dominant genotype you will *always* get 50% homozygous dominant and 50% heterozygous dominant offspring. When crossing a homozygous dominant genotype with a homozygous recessive genotype you will *always* get 100% heterozygous dominant offspring.
  - Nice Job Zoe! It gets a little confusing and hard to follow, but the information is very detailed and well explained.-Annelise H.
    - If you draw out the Punnett squares, these percentages all make sense. - Mrs. K.
  - Good job Zoe. I agree with Annelise, and you go a little off topic, but the information is good-Natalie
  - very scientific and very good Information! :-) Ilana
  - Gregor Mendel was able to see these percentage probabilities in all the experiments he

performed with pea plants. This is what has led to our current understanding of some basics in modern-day Mendelian genetics. Thank you Fr. Mendel! - Mrs. K.

- Shreya Y writes: Punnett squares is a chart that shows the different outcomes/possibilities of an offspring, furthermore Punnett squares is a chart that shows all the possible combinations of alleles for a trait when it gets passed from parents to an offspring. The simplest of all punnett squares that we've learned about so far is one that has a dominant allele (a capital letter) and a recessive allele (a lowercase letter), some of the allele combinations can be homozygous or heterozygous depending on which one it is. Some of the outcomes can be the same, dominant allele or recessive allele. When punnett squares get more complicated it can have a combination of a trait, not a dominant or recessive allele. For example, if a chicken has an allele for a black feather and a white feather then the chicken can get a trait for mixed feathers
    - i like the information that you described up above - by catherine k
    - I liked your description, and the info is very easy to follow- Natalie
    - The example you described with chickens is codominance. Another complicated example is what happened during incomplete dominance. In this case, the heterozygous phenotype is a blended version of both alleles (red + white = pink). - Mrs. K.

- Ilana Z writes: A gene is a segment of DNA that codes for a protein that determines traits of humans. There are Allele's which determine one of many forms of a gene. There are also Dominant traits or alleles or there is recessive traits. Dominant traits are the ones which are seen most often in the offspring. recessive traits are the alleles which only appear if there are no dominant alleles present. There is also Heterozygous Dominant and Recessive. This is when there are two different alleles. Heterozygous Dominant would determine the main trait which would show up in the offspring. There is also Homozygous Dominant and Homozygous recessive. Homozygous means when there are two of the same alleles. For example: TT and tt would be the only possible alleles for homozygous traits. In Homozygous Dominant, the Capital letters would be the allele for that trait and the recessive would be two lowercase letters. Next there is a Genotype. Genotype is the allele combination represented with letters. That is to say that all combinations are written with letters. As I said before, Capital letters are Dominant and lowercase letters are Recessive. Next there is a Phenotype. Phenotype is a physical appearance of a trait which appears in an offspring. A Punnett Square determines the possible combinations of a trait. If you cross a Heterozygous dominant with a Homozygous Dominant, there would be 50% chance that the Genotype of homozygous Dominant trait will appear in the offspring and a 50% chance that the Genotype of heterozygous Dominant trait will appear in the offspring. Since Dominant is the 'winner' as Ms. Kuebler puts it, 100% for the Phenotype will be the dominant trait.
    - This is good, and you go really into detail-Natalie
        - Thanks Natalie!
    - This is really good! -scott t
    - Excellent detail, Illana. It is important to remember that there is no genotype referred to as heterozygous recessive. There is simply homozygous dominant, heterozygous dominant, and homozygous recessive. The word "heterozygous" implies that there are two alleles present (one dominant and one recessive) and that the dominant allele will always take over. This is not the case, however, during incomplete dominance where the heterozygous form is a mixing

of the two other forms (R = red, W = white, RW = pink) - Mrs. K.

Block D

- Nikki A writes: A punnett square is a chart that has all the allele combinations that make up your traits. For example, if your mother was short, she would have the combination tt. If your father was short, he would have the combination tt also. When you were born you would have to be short because if both your parents only have the trait tt, you would get the traits tt too.
    - The Punnett square shows the possible outcomes of fertilization. If an egg carrying a recessive allele is fertilized by a sperm carrying the dominant allele, a completely different offspring would result than if that same egg were fertilized by a sperm carrying a recessive allele. - Mrs. K

- Evan A writes: Dominant and Recessive: There are 2 types of alleles, dominant and recessive. A dominant allele always shows up if it is present while a recessive allele only shows up if there is no dominant allele there. These make up traits so you will have a different trait if you have a dominant allele than the trait you would get if you got the recessive allele. For example: if your grandfather has 6 fingers and you inherit this from your parents, then you will have 6 fingers. However, if you have a recessive allele for 5 fingers, then you will only pass that trait onto your offspring.
    - Evan your response not only has a bunch of true facts but also has great examples! -Mia
    - I think this is very simple and easy to understand. -Amanda
    - Good, also an important fact to mention is that the alleles are passed from parents to offspring in the sex cells. A mother will contribute half of her genes (through the egg) while a father will also contribute half of his genes (through the sperm). When the egg is fertilized by the sperm, the resulting 23 pairs of homologous chromosomes will become the first cell of the developing offspring. - Mrs. K.

- Stephanie B writes: The latin word part hetero means different. If someone is heterozygous they have two different alleles. The latin word part homo means same. If someone is homozygous they have two of the same alleles. Someone who is heterozygous has one recessive and one dominant allele. The one dominant trait takes over so the person shows the dominant phenotype but is a carrier for the recessive trait. Someone who is homozygous can either have two recessive, or two dominant alleles. Your parents each give you one allele and those two together make up your genotype that determines you phenotype. For example, if you have two heterozygous parents, you have a 25% chance of being homozygous dominant, 25% chance of being homozygous recessive, and 50% chance of being heterozygous dominant.
    - I like your latin definitions of hetero and homo but maybe you could describe how you inherit these heterozygous and homozygous alleles. ~Evan A :)
        - Good suggestion, Evan. Please see my response to your post up above for a description of inheriting these alleles. - Mrs. K.

- As you mentioned, the term “carrier” is often used when describing the heterozygous form of a gene. Good word choice! - Mrs. K.

- Daniel B writes: There are many differences between Mitosis and Meiosis. One example is in Mitosis, only two cells are made. While in Meiosis four cells are made. In Meiosis the parent cells are different than their daughter cells. In Mitosis, they are both the same. Meiosis takes place in the reproductive organs. Mitosis happens in most of the body with a few exceptions. Mitosis’s offspring are body cells while Meiosis produces sex cells. There are the same amount of chromosomes in Mitosis. In Meiosis there are half the chromosomes. Even though Mitosis and Meiosis seem the same, they have many differences.
  - good! by rosana b
  - Great job mentioning that even though these are both processes of cell division, they are completely different. One thing to add onto your point about chromosome number is that mitosis creates two daughter cells, each with 46 chromosomes. Meiosis, on the other hand, creates four daughter cells, each with 23 chromosomes. - Mrs. K.

- Rosana B writes: In Meiosis a original cell making sex cells has two copies of the same chromosomes (homologous pair).This Homologous pair of chromosomes goes through DNA replication so there are two copies of each chromosome. Then the homologous pairs separate into two cells. Next those two cells divide one more time and each cell ends up with half the number of chromosomes as the original cell.
  - Great explanation. Those original cells making the sex cells are called primary spermatocytes (in males) or primary oocytes (in females). - Mrs. K.

- Bobby C writes: heterozygous and homozygous both refer to your alleles. Hetero means different, and homo means same. That basically means that heterozygous means different alleles, and homozygous means same alleles. An example of heterozygous is Tt, and homozygous is tt or TT. These differences will determine your traits
  - I think this is very descriptive! *smiley face* Good job! -Amanda
  - What are the effects of having homozygous or heterozygous traits-Elan
    - Heterozygous genotypes result in the dominant phenotype always appearing. Homozygous genotypes can result in either the dominant or recessive phenotype appearing (depending on if the offspring is homozygous dominant or homozygous recessive). - Mrs. K.

- Kurt C writes: Punnett squares are charts that show all the possible offspring of 2 parents. Depending on homo or hetro and all different allele combos, offspring can look different.
  - Think your doing great - Dan H
  - Very good start kurt -Jordan
  - Meiosis and then fertilization must first take place in order for a Punnett square to be drawn. Once you know the alleles in the sperm and egg, it is easy to figure out the percentage probabilities of the offspring. - Mrs. K.

- Jacob C writes: incomplete dominance is when one allele is not more dominant than the other. and both dominant alleles blend with each other and make a blended version of both traits. An example would be a blue flower and a red flower make a purple flower. it also uses different lettered alleles for example the blue flower would be BB and the red flower would be RR so the purple would be BR since the alleles have blended.
    - Thank you for explaining what incomplete dominance is because I forgot what it was after my day off. It was simple but very clear-Dan Borah
    - Good, this is much different from the other types of inheritance we've studied in which there are both dominant and recessive alleles. Some other types of inheritance include polygenic inheritance, multiple alleles, and codominance. - Mrs. K.

- Riley D writes: A dominant allele always shows if it is present. You can have one or two dominant alleles for a gene, and the trait will still be present. If you have only one dominant allele that means that your other allele is recessive. The recessive allele will not show up in you, but you can still give your child a recessive allele. In order for a recessive allele to show there must be two recessive alleles, which means no dominant ones.
    - Riley I liked all of your examples in your paragraph :)
    - True, if the recessive allele does not show up in you, but it does in your children, you must be heterozygous for that gene. You are referred to as a "carrier" for the trait. - Mrs. K.

- Juan Antonio F writes: incomplete dominance is when one allele is not fully dominant. An example of this occurs in human hair, when a person with straight hair makes a baby with a person with curly hair the baby has a chance to have wavy hair. The same happens in snapdragon flower petals when there is a chance of either say red or white. there will be a 100% chance of the offspring being pink.
    - You have great examples, but you should expand on how it creates a new color in the flowers. Like how both parents are homozygous or heterozygous and how it effects the offspring. -Annemarie
        - In order for 100% of the offspring to have the blended phenotype, BOTH parents must be homozygous. - Mrs. K.
    - can you explain more on the topic and provide more examples-Elan

- Mia F writes: A Punnett Square is all possible combinations in a chart in which determine your traits which are passed from your parents. For example, if your parents both have brown hair dominance then you have a 100% chance of getting brown hair. While if your mom had blonde hair recessive homozygous and your dad has brown heterozygous hair dominance it woudn't be that high of a percentage. Instead it would be a 50% chance that you would have blonde hair and a 50% chance that you would have brown hair.
    - I like your description of punnet squares but hair color isn't the best example because it is a polygenic trait controlled by more than two alleles so it wouldn't be a simple punnett square. -Stephanie
        - Good point. Sometimes human traits are over-simplified with Punnett squares but unfortunately, very few human traits can be figured out with Mendel's methods. - Mrs. K
    - I liked your description :) - Riley

- Jordan G writes: Codominance is when both alleles are expressed in the offspring. An example of this is in humans is with blood types - both A and B are codominant. There are four different blood types: A, B, AB, and O. The possible Genotype for A blood is I^A i and I^A I^A. The possible Genotypes for B blood are I^B I^B and I^B i. The possible Genotype for AB is I^A I^B. The possible Genotypes for O are ii. O stands for universal Donor and AB stands for universal recipient.
    - I like how you used possible genotypes. Dan H
    - Nice job mentioning universal donors and recipients. People with type O blood can donate their blood to anyone because this type of blood does not have any antigens on the outside of the blood cell that may be detected and rejected by other blood types. If you are type AB, you can receive blood from anyone because your body recognizes the antigens on type A, type B, and type AB blood, in addition to type O (which has no antigens on the outside). - Mrs. K.

- Dan H writes: Incomplete dominance: One allele is not completely dominant over another. the heterozygous form is a blended version of both traits. One example is curly hair and straight hair combine to make wavy. Or tall hair and short hair combine to make medium.
    - Dan I really liked your paragraph! Maybe you should also add another example- Mia :)
    - This type of inheritance is represented with two capital letters (CC - curly, SS - straight, CS - wavy). - Mrs. K.

- J.P. M writes: In meiosis four sex cells are created from one original cell. In the male, the original cell is a primary spermatocyte and in the female body it is a primary oocyte. The original cell has two copies of the same exact chromosome - this is called a homologous pair. Then, the homologous pair goes through DNA replication. Once that has happened there is a pair of sister chromatids. After that, the homologous pair turns into two different cells. Finally, both cells divide and each sex cell ends up with half the number of chromosomes as the original cell.
    - i like how you said how the chromasomes split in half. Do you know there are 46 chromosomes in the origonal human body cell? - Jacob.C
    - Good description. So now the next step in making an offspring is fertilization (23 +23). Once this occurs, the chromosome number goes back to 46. - Mrs. K.

- Adri P writes: In order for your body to produce sex cells, the cells have to go through a process called Meiosis. This process is similar to the process, Mitosis, which we already learned about. In Meiosis one cell divides four times until there are four individual cells left with 23 chromosomes. Meiosis occurs in both men and women, in the reproductive organs. The egg “stem cell” is called the primary oocytes and the sperm “stem cell” is called the primary spermatocytes. Fertilization occurs when a sperm cell and egg cell “meet”.
    - i think you used a lot of great detail in that bobby c.
    - Then a Punnett square can show you the possible results of fertilization. Further examination of a Punnett square can then help you figure out if genotypes are homozygous or heterozygous; and can help you determine the probability of all the phenotypes. - Mrs. K.

- Elan S writes: DNA is the basic code for life but sometimes things can go wrong. DNA mutations

are rare but extremely harmful. There are 3 kinds of mutations: DNA replication mistakes, Inheritance, and lastly environmental factors. DNA replication mistakes happen in 3 ways: insertion, deletion, and substitution. Insertion is when a random nitrogen base is added which throws off the entire strand. Deletion is when a nitrogen base gets deleted that messes up the entire strand. Lastly substitution is when a nitrogen base gets replaced by a different base. Inheritance means that if your parents have a genetic disorder you can inherit it. Environmental factors are the factors around you before you are born, say if your parents live in a highly irradiated place you will most likely have a mutation. Many things in this world are lethal weapons: chemicals, and diseases. But one of the most harmful things in life can happen before you are born.

  - You do a great job of walking through the different kinds of DNA mutations. - J.P.
  - If an egg that has a mutated gene is fertilized by a sperm, you will inherit that mutated gene from one of your parents. Although this can lead to diseases, it can also just lead to variety in a species. - Mrs. K.

- Alex S writes: Incomplete dominance is when there are two alleles that combine to create a different color. For example, in eye color, there are many different alleles. If a parent with blue eyes and a parent with green eyes have a child, there is a chance that the eye colors will mix. Neither will be dominant over the other causing the child's eyes to appear a turquoise color. Also, if one parent has straight hair and the other has curly hair, the child will most likely be a mix of the two. This means that the child will have neither straight nor curly hair but they will have wavy hair.
  - Eye color is a tricky subject because it is a polygenic trait and has multiple allele inheritance. Whether or not it follows the rules of incomplete dominance is questionable. It is one of those topics that is not fully understood by scientists. - Mrs. K.

- Annemarie W writes: Codominance is when both alleles from the parents are expressed in the offspring. An example in us humans are blood types. There are four blood types: A, B, AB, and O. When the parents are both homozygous A and B and they have a child, the child's blood type will be AB. Neither A or B is more dominant than the other. Don't be confused - the blood types DON'T mix, like they would if it were Incomplete Dominance. Codominance is like water and oil, they may be next to each other and surround each other, but they don't ever mix.
  - nice examples-Elan
  - Great oil and water analogy. It is common for students to confuse incomplete dominance with codominance so it's great that you pointed out their differences. - Mrs. K.

- Caelan W writes: Genes are segments of DNA that code for a protein, which determines your traits. Humans have approximately 30,000 genes, and we have two copies of each gene (one on each chromosome we inherited from our parents). And since we inherit XX or XY chromosomes, our gender goes 50-50 between female and male. Each gene has different forms. Different forms of genes are called alleles. Chromosomes occur in pairs because offspring inherit one from each parent. We have forty-six chromosomes. Each chromosome is made up of DNA that contains hundreds to thousands of genes. Click here for more information on genes and alleles.
  - Great detail and multiple facts. It's great how you pulled it all together! - Mrs. K.
  - I like how you tell alot of facts about this topic, but I wonder if you could describe how offspring inherits one from each parent ~ Evan Anderson

        - This is done through fertilization. - Mrs. K.
    - This website is a quality website for this topic. Great choice.-Alex
        - I agree, this is a nice website link, Caelan. - Mrs. K.

- Amanda X writes: Punnett Squares are charts that show all possible combinations of alleles for a trait passed down from parents to offspring. Click here
    - I like how you used “offspring” instead of just child. Dan H
    - I like how you talk about how they show all of the possible combinations of alleles, but maybe you could describe how meiosis relates to this. ~Evan A
    - Amanda I liked how you posted this great website :)
        - Yay Khan Academy! 25 minutes of Punnett squares...that’s my kind of movie! Haha - Mrs. K.
    - I think that you could bring up genotypes and phenotypes and show an example about genotypes of blood types. Caelan W
    - That website is a quality website for this topic. Great choice. -Alex
    - i agree! -Jordan