KSD
3-18-14
Period: 3

Reebops

LT: Identify & analyze genetic traits carried through three generations of Reebops.

Hypothesis: If we cross two heterozygous Reebops, then the offspring will most likely have these traits: 2 antennae, Orange Nose, 2 eyes, 3 body segments, 2 green humps, curly tail, and purple legs.

- antenna
- nose
- eyes
- body segments
- green bumps
- tail
- legs

Antenna

	A	a
A	AA	Aa
a	Aa	aa

2 antenna

Nose Color

	Q	q
Q	QQ	Qq
q	Qq	qq

Orange Nose

# of eyes

	E	e
E	EE	Ee
e	Ee	ee

2 eyes

Body Segments

	D	d
D	DD	Dd
d	Dd	dd

3 body segments

# of green humps

	M	m
M	MM	Mm
m	Mm	mm

2 humps

Curly Tail

	T	t
T	TT	Tt
t	Tt	tt

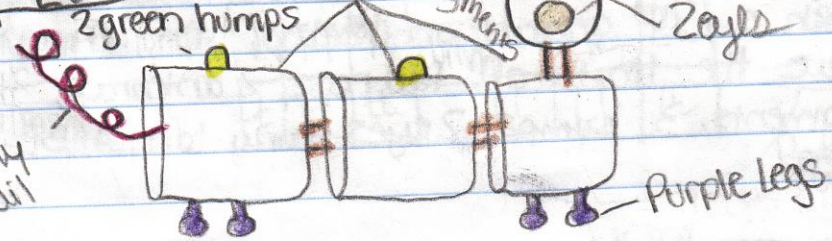
Curly tail

Color of legs

	L	L
L	LL	LL
L	LL	LL

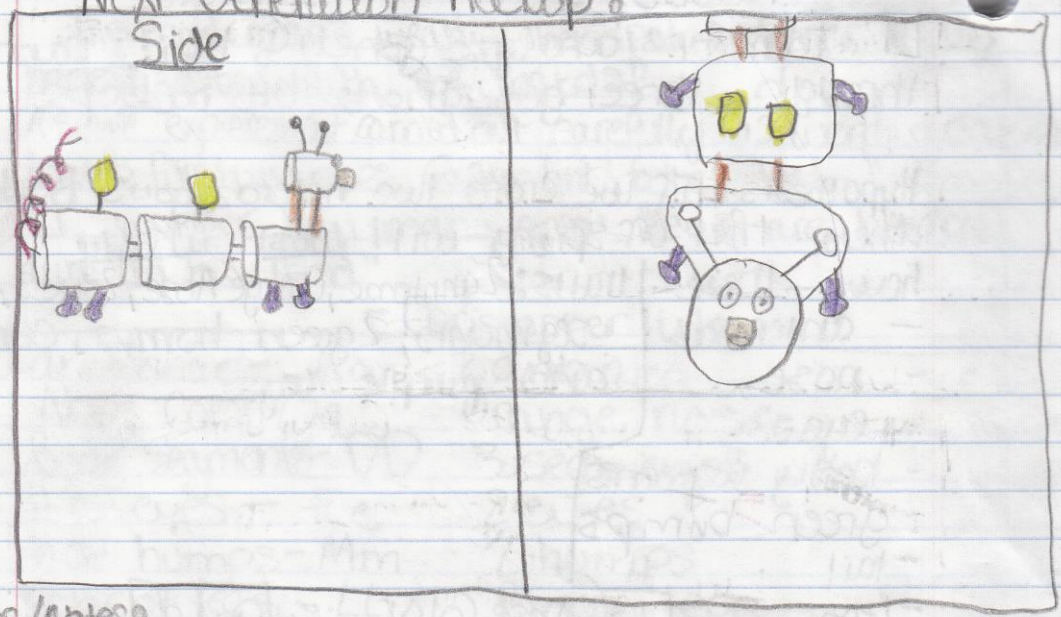
Purple Legs

Parents:
- 2 antennae
- orange nose
- 2 eyes



Next Generation Reebop:

Side

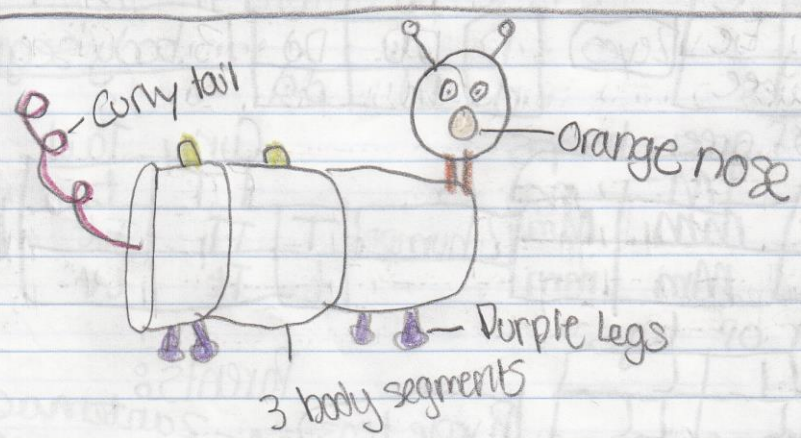


Observations/Notes:

- Exact same as parents
-

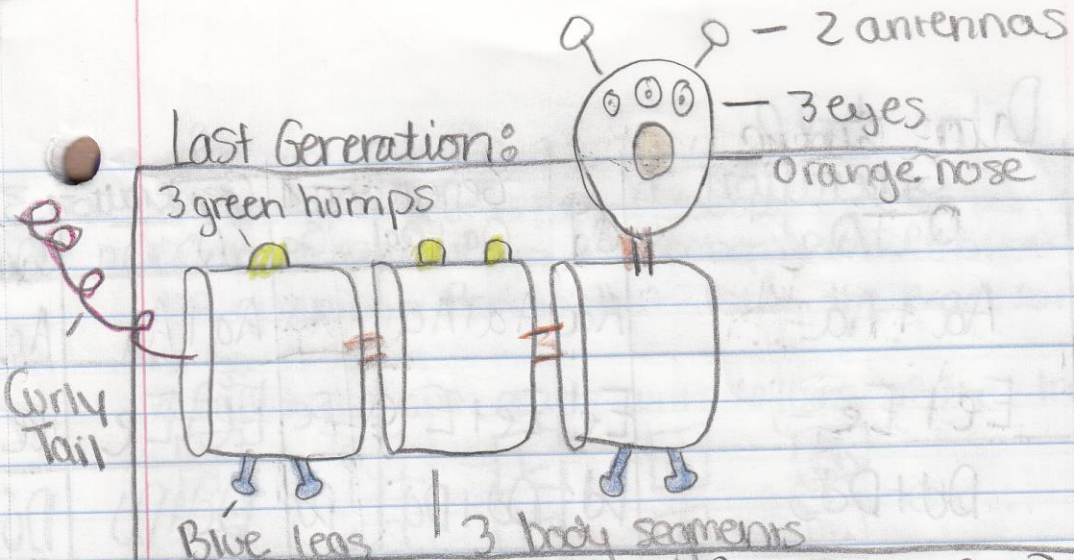
Gene Cards:

L
L
M
m
D
d
E
e
Q
q
A
a
T
t

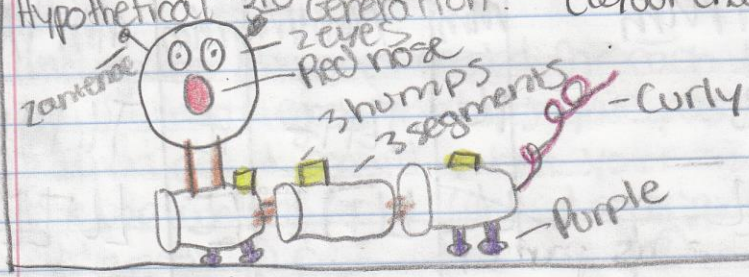


Hypothesis #2: If we breed a 2nd generation Reebop with a 3rd generation Reebop, then it will have the traits of: Red nose, 2 antennas, 3 body segments, 3 humps, 2 eyes, curly tail, 2 purple legs

Last Generation:



Hypothetical 3rd Generation! (w/out chance factor)



Observations/Notes

3 eyes, Orange nose, 2 antannae, 3 body segrements, 3 green humps, Curly tail, blue legs.

- This was the outcome when mixing our baby with a reebop with 3 humps, red nose, two eyes, 3 body segments, curly tail, and 2 antennae

① Q Q / Q QQ QQ / q Qq Qq

② A a / A AA Aa / a Aa aa — Red nose

③ E e / E EE Ee / e Ee ee — 2 antenna

④ D d / D DD Dd / d Dd dd — 2 eyes

3 body segments

⑤ m m / M Mm Mm / m Mm Mm — 3 humps

⑥ T t / T TT Tt / t Tt tt

⑦ L L / L LL LL / L LL LL — Curly

Purple

What the Reebob Should look like w/out the factor of chance.

Data table

	Generation 1		Generation 2		Generation 3	
NOSE	Qq + Qq	Qq	Qq + Qq	Qq	QQ + Qq	Qq
Antenna's	Aa + Aa	Aa	Aa + Aa	Aa	Aa + Aa	Aa
Eyes	Ee + Ee	Ee	Ee + Ee	Ee	Ee + Ee	Ee
Body Segments	Dd + Dd	Dd	Dd + Dd	Dd	Dd + Dd	Dd
Green Humps	Mm + Mm	Mm	Mm + Mm	Mm	Mm + Mm	Mm
Tail	Tt + Tt	Tt	Tt + Tt	Tt	Tt + Tt	Tt
Color of Legs	Ll + LL	LL	Ll + LL	LL	Ll + LL	LL

Materials: 1) Marshmallows (Gumm 2) Thumb Tacks 3) Regular Tacks
4) Toothpicks 5) Split-in-½ toothpicks 6) Green mini marshmallows
7) Orange mini marshmallows 8) Pipe cleaner 9) Ruler
10) Notebook 11) Pencil 12) Construction Paper
13) Sharpie 14) Code for construction paper

Procedure: 1.) Get a Student guide for the code of all of the parts of your Reebop (M's are humps).
2.) Make a Punnet Square for each of the traits of the parents to find out what traits your baby should have.
3.) Record your results and then take the gene cards (as drawn on previous page) and mix them up and draw at random two of each letter & then discard the other two cards of that letter. Record your data
4.) The cards that you draw (AA or Dd) are the traits of your new Reebop because this is the chance aspect of genes.

...Procedure Continued

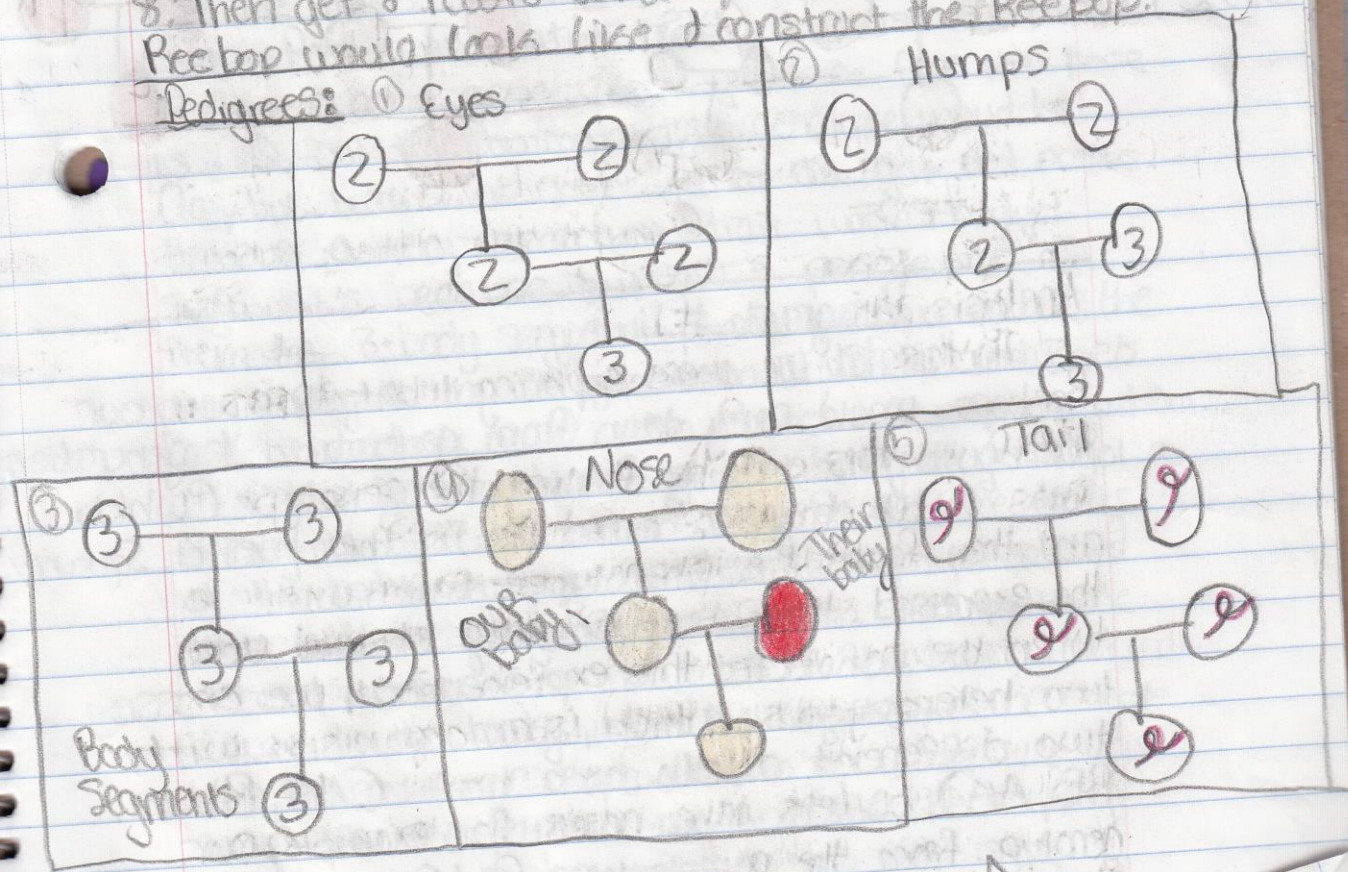
5. Construct your new Reebop.
6. Then "breed" your Reebop with another 2nd generation Reebop that isn't the exact same as your own.
7. Gather cut out cards with letters of the traits:

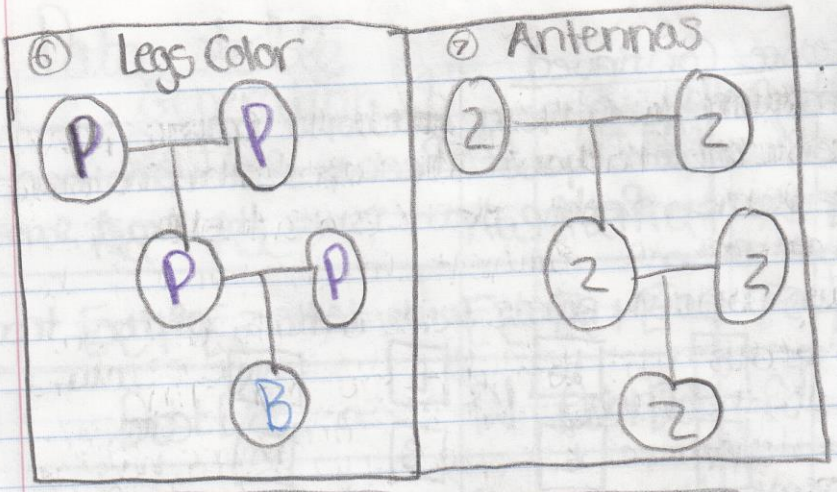
d	a	L	E	M	etc...
P	A	L	e	m	

and gather the ones needed for each Reebop & mix & draw from each Reebop's pile, as before.

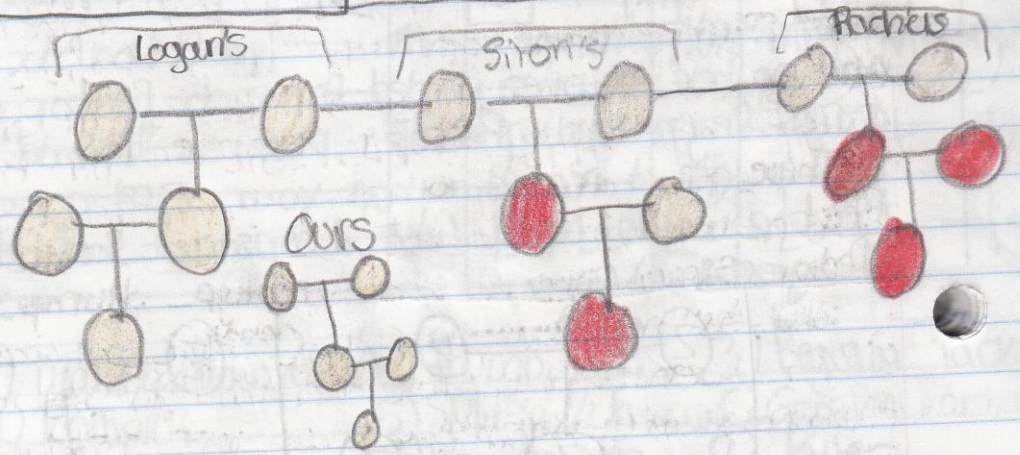
8. Then get & record what your 3rd generation Reebop would look like & construct the Reebop.

Pedigrees:





Extended family tree: (Nose)



Analysis Paragraph #1:

In this lab we were exploring what traits in our Reebops would carry down from generation to generation. We found this out by finding the genotype (which was what trait showed up in the Punnet Square) and then found the phenotype - which was the expressed trait that actually showed up. When we conducted this experiement, we crossed two heterozygous, which is an organism with two different allels as a trait (Aa, Bb vs. BB, AA). So let's take nose's for example, our genotype from the parents was Qq + Qq, which the phenotype was orange nose. Then our 2nd generation genotype for their nose was Qq because our

whole second generation ended up exactly identical to the parent Reebops. For nose color, a majority of the people in the class got a different phenotype as the parent, for example Grady and I's Reebop this was not the case, as well as Logan & Lucas's Reebop because we both got the same genotype (Qq) as the parent (& the same phenotype.) But the majority of the class had a red nose in their second generation rather than orange or yellow. The little (q) is still the recessive trait, but because there is always the chance that the recessive trait may show up. As demonstrated by Sitori, Rachel, and Katie's reebop because all three of their second generation genotype for the nose is QQ, but the dominant trait genotype woud be Qq, but because of chance they all got red noses. However a very dominant trait was 3 body segment's because out of 5 people, all of them the 3-body segment phenotype carried all the way through to the 3rd generation. In Sitori and Zoe's case when they bred with Rachel & Santanna who only had a two-body segment baby they still got a 3-segment 3rd generation baby. So all the traits of the body segments of these five groups carried down all the way. Overall I think that with the second generation that most of the traits carried down to the baby, with the exception of a couple traits on certain reebops. Like in our case ours was exactly like the parents meaning that the luck of the draw just so happened to be that way.

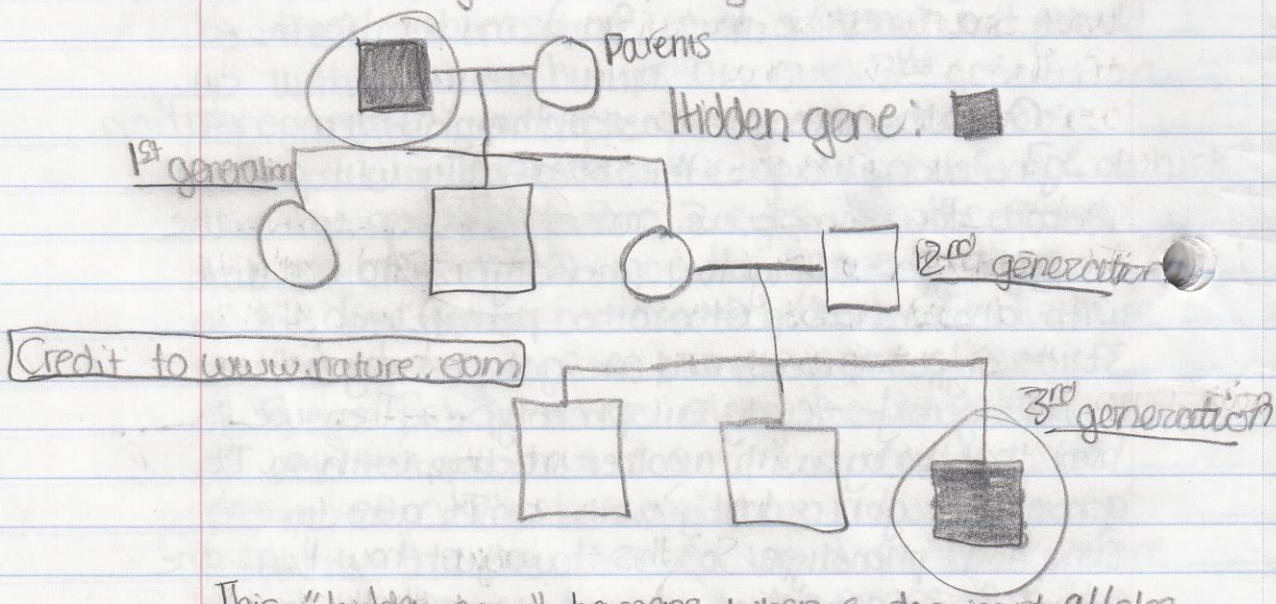
Furthermore, once we got our second generation

reebop, we then crossed it with a different, second generation reebop thus creating a third generation reebop. We did this to see what traits would carry down even further to yet another generation. We used our reebop which had the genotype of Mm for green humps and crossed it with theirs which had the genotype of mm, and having the phenotype of 3 green humps. So obviously when we cross the two the more dominant allele would be the lowercase m, which is why we ended up with 3 green humps on our 3rd generation. For another example of genotype in our reebop was we had the genotype of Ee which was the phenotype for 2 eyes. Then the reebop that we crossed with had the same genotype of Ee, but when we crossed them (Ee+Ee) we got the genotype of ee, which is the phenotype of 3 eyes. But no where along the line did any of our reebops have 3 eyes, this explains the nature of chance because there is/was always a chance that the little e's would pop up therefore giving the reebop that trait, this means that the trait of having three eyes was recessive in our case because it skipped around generations and it didn't follow every generation. In addition to that the genotype of LL - the phenotype of purple legs would be a dominant trait because it was passed down to the two baby's, but then when we crossed the two babys we came up with the genotype of LL - phenotype of blue legs. The phenotype of blue legs would be an example of a recessive trait because again, it skipped generations and

then just by chance blue legs phenotype showed up. So the phenotype(s) that carried all the way through to our 3rd generation reebop is 3 body segments, 2 antennas, orange nose, and curly tail. These would be the dominant traits because they each carried through each generation. Then the traits that didn't down to our third generation were: 3 body segments, curly tail, & orange nose so these would be: 2 eyes → 3 eyes, purple legs → blue legs, 2 humps → 3 humps, these being the recessive traits found in the reebop.

Overall, traits are passed through from generation to generation. We saw this specifically with our reebops. For example we crossed a rebop with the Tt genotype - curly tail phenotype and bred it with another reebop (the other parent) with the Tt genotype as well and we got a baby with the Tt genotye - curly tail phenotype. Then we bred that baby with another reebop with a Tt genotype & got a baby with a Tt geno type - curly tail phenotype. So this shows just how traits are passed from generation to generation. Mostly the dominant traits like 3 body segments were the traits that we really saw in every generation. Like in Sitori's group their baby had 3 body segments but they bred it with a 2-body segmented they still got a 3-segmented body reebop showing that the genotype of DD or Dd was the dominant trait and not the dd genotype. So basically the way that traits are passed down from one generation to the next is by the parents breeding & producing offspring and these offspring will

get the same genotype/phenotype as the parent. This depends on whether or not a certain trait is dominant or recessive, if dominant, then it will show up throughout multiple generations, where as recessive not so much. However a recessive trait usually bounces around through generation (the leg color on our reebops). The reason this trait bounces around is because a gene can be hidden through multiple generations.



This "hidden gene" happens when a dominant alleles hides a recessive one and then throughout some generations it pops back up (above). The place that we get homozygous and heterozygous is homozygous is when each parent contributes the same allele (DD or dd), a heterozygous is when each parent contributes 2 different alleles to the offspring (Dd). So that is the difference between recessive & dominant and heterozygous & homozygous.

In this lab we were trying to find evidence to

identify & analyze the genetic traits passed through three generations of Reebops. I accept my first hypothesis because those were the the traits that were listed were the exact traits that showed up on my baby Reebop. However, I reject my second hypothesis because after we drew our cards, some of the traits that I guessed were incorrect. This is because when you incorporate the chance factor it throws off what shows up on the Punnet square. What I learned in this lab was that certain traits actually carry down from generation to generation, but some of the other traits that don't show up in one generation may show up in the next one. Now I wonder what would happen and if we would have the same 3rd generation baby if we crossed two homozygous Reebops?

4/7/14 "You know Orv, man will not fly in our lifetime. No, they won't even fly in a thousand years!"
-Wilbur Wright

4/8/14 "One small step for (a) man, one giant leap for mankind!" - Neil Armstrong

4/9/14 "Gravity explains the motions of the planets, but it cannot explain who set the planets in motion. God governs all things, and knows all that is or can be done. God is the final cause, this we know."
-Izaac Newton

4/10/14 "Who can assure us that everything that can be known in the world already known?"
-Galileo