Unit 4 Genetics

Big Idea #10: Hereditary information is inherited and expressed. (The Laws of inheritance in sexual reproduction are determined by genetics. The gene is the common functional unit of heredity.)

a. The DNA that comprises an organism's genome is organized into chromosomes. (S11.B.2.2.1)
b. Genes and their related proteins comprise chromosomes. (S11.B.2.2.1)
c. One or more pairs of genes code for the expression of inherited traits. (S11.B.2.1.2; S11.B.2.1.4; S11.B.2.2.1)
d. Two or more versions of a gene (alleles) contribute to the expression of inherited traits. (S11.B.2.1.4; S11.B.2.2.1)
e. Meiosis involves a two-step nuclear division reducing the number of chromosomes in half – producing gametes. (S11.B. 1.1.3; S11.B.2.1.4; S11.B.2.2.1 & 2 & 3)
f. During the process of meiosis genetic recombinations may occur contributing to genetic variability within a population. (S11.B. 1.1.3; S11.B.2.1.4; S11.B.2.2.1 & 2 & 3)
g. Patterns of inheritance reflecting how genes interact and express themselves (including dominant, recessive, codominance, incomplete dominance, sex-linked, sex-influenced, multiple alleles) can be predicted, observed, and described. S11.B.2.1.4; S11.B.2.2.1 & 2 & 3)
h. The Punnet square is a tool that can be used to predict the probability of an offspring's genotype and phenotype. (S11.B.2.2.1 & 2 & 3)

Tuesday & Wednesday November 23 & 24 – Chapter 10 Test

11.1 The Work of Gregor Mendel

1. ~~11.1 Lesson Overview PowerPoint (37 slides)~~
2. The Work(sheet) of Gregor Mendel – hand in
3. 11.1 Skills Workbook: (11.1 due next Tuesday after break)

Describe Mendel's studies & conclusions about inheritance
Describe what happens during segregation

Begin Mendelian Genetics

1. "Mendelian Genetics in the Simplest Terms I Can think Of" PPT lesson with notes
2. Simple Monhybrid & Dihybrid Cross Worksheet (Frog Biology Workbook) together
3. ~~Blast Animations: Single Trait Crosses~~ ~~http://media.pearsoncmg.com/bc/bc_0media_bio/blast/index.htm?single_trait_cross~~
   ~~Genetic Variation: Independent Assortment~~
   ~~http://media.pearsoncmg.com/bc/bc_0media_bio/blast/index.htm?independent_assortment~~
   ~~Two Trait Crosses~~ ~~http://media.pearsoncmg.com/bc/bc_0media_bio/blast/index.htm?two_trait_cross~~
4. ~~Marshan Genetics – if time~~

Review concepts & terms of genetics &construct Punnett squares in examples
Randomly select the genotype of an organism & construct its phenotype

11.2 Applying Mendel's Principles *– will probably still need to finish #2, #3 & #4 from yesterday in periods 1&4*

1. ~~Review with 11.2 Lesson Overview PowerPoint (52 slides)~~
2. SpongeBob Genetics Problems: SB Gen 1, SB Gen 2 & SB Dihybrid – check answers as you go – finish Tuesday
3. 11.1 due after break

Explain how geneticists use the principles of probability to make Punnett squares
Explain the principle of independent assortment
Explain how Mendel's principles apply to all organisms

**Animation: http://www.sumanasinc.com/webcontent/animations/content/mendel/mendel.html

Tuesday November 30

1. Collect, check & go over 11.1 homework at the end of class
2. Finish SpongeBob problems
3. Hand out notes: Genetics & Math
4. Lab: The Ups & Downs of Probability
5. Homework: 11.2 Study Workbook & SpongeBob Genetics Quiz tomorrow (?)

11.1 The Work of Gregor Mendel

Explore how probabilities can be used to predict outcomes

Compare predicted outcomes to experimental outcomes
Substitute properly marked coins for gamete cells & toss the coins to represent offspring
Determine the expected offspring & compare it to observed offspring obtained through coin tossing

Wednesday December 1: 11.3 Other Patterns of Inheritance

→ go over additional genetics & math notes & examples
→ finish up/down labs

11.2 Applying Mendel's Principles

1. Collect, check & go over & 11.2 homework at the end of class
2. ~~SpongeBob Genetics Quiz: (genetics problems I & II only, no dihybrid)~~
3. ~~11.3 Lesson Overview PowerPoint (15 slides) or~~ my complex inheritance PPT
4. SpongeBob Genetics: Incomplete Dominance(or worksheet w/ codominance problems also) – check answers & hand in
5. 11.3 due tomorrow, & 11.4 due Friday

Describe the other inheritance patterns
Explain the relationship between genes & the environment

Thursday December 2: 11.4 Meiosis

11.3 Other Patterns of Inheritance

1. Collect, check & go over 11.3 homework at the end of class
2. My Meiosis notes
3. Cells Alive Meiosis Animation http://www.cellsalive.com/meiosis.htm
4. ~~11.4 Lesson Overview PowerPoint (50 slides)~~
5. Frog Workbook worksheet: Stages of Meiosis & Comparing Mitosis & Meiosis
6. Lab: Comparing Mitosis & Meiosis
7. Homework: 11.4 Study Workbook & Vocab Review

Contrast the number of chromosomes in body cells & gametes
Summarize the events of meiosis
Contrast meiosis & mitosis
Describe how alleles from different genes can be inherited together

BioFlix: Mitosis http://media.pearsoncmg.com/bc/bc_0media_bio/bioflix/bioflix.htm?cc6mitosis
BioFlix: Meiosis http://media.pearsoncmg.com/bc/bc_0media_bio/bioflix/bioflix.htm?cc6meiosis

11.4 Meiosis

Friday December 3

1. Collect 11.4/voc rev – check while class completes Comparing Mitosis & Meiosis
2. BioJunction Mendelian Genetics PowerPoint (slides 1-64) & Notes
3. Review for Test – poker? Jeopardy

Monday December 6:

1. Chapter 11 Test
2. **Human Chromosomes**
   a) Genetics & Heredity Concept Map
   b) My Human Heredity Notes page 1 & PowerPoint (slides 1-5)
   c) Lab 21: A Chromosome Study – *cut out chromosomes* – *or do simpler giant version*
   d) Chapter 14 Study Workbook

Learn what a karyotype is
Prepare a karyotype of a normal human's chromosomes
Prepare a karyotype of an abnormal human's chromosomes