Station D

Words in RED are important-make sure you know them!

What you do:

1) The genetic information found in DNA is essential in creating all the characteristics of an organism. This genetic information is passed to the offspring through reproduction.
   a) Record the differences between asexual and sexual reproduction in your notebook using a T-chart.
   b) How does reproducing sexually help a species?
   c) What cell division process makes sexual reproduction possible?
   d) How does meiosis differ from mitosis?
   e) Make a drawing of chromosome structure and include the following labels on your drawing: sister chromatids, gene segment, centromere.
   f) What are homologues (homologous chromosomes)?
   g) What homologues determine your sex?

2) Demonstrate your knowledge of the steps in mitosis and meiosis by placing the D – 2 cards in a vertical sequence. Use the green cards and labels to show mitosis and the brown cards and labels to show meiosis.

3) Review the characteristics of the two cell division processes by sorting the D – 3 cards into two groups. Compare your sorted answers to the T-chart you made earlier. Note any characteristics that you need to study.

4) The sex organs which produce the haploid gametes are the site of many occurrences where genetic information is exchanged or manipulated.
   a) Review genetics vocabulary terms by matching the term and description cards together using the D – 4a cards. List at least 4 examples of inherited traits. List at least 2 traits that might be influenced by the environment in which the organisms lives. Identify which cards represent non-Mendelian inheritance.
   b) Compete the cross activities using Punnett squares with Mats D – 4 and the D – 4b cards.

5) Because an individual's DNA is as distinctive as a fingerprint, it has been used since the mid 1980’s to help solve crimes. Review the process of DNA fingerprinting by solving the Lollipop case at http://tinyurl.com/yb3cqf39.
   a) Summarize the steps that you observed in the animation in your notebook.
   b) Identify the candy culprit.
   c) List at least 4 other body materials that can be used for DNA fingerprinting besides saliva.

6) Genetic engineering is a growing field of research. Review your knowledge of genetic modifications by completing the activity using Mat D – 6 and the D – 6 cards. Use references to review or look up any terms you don’t know.
   a) List at least 3 benefits of using genetic modifications.
   b) Explain at least 1 safety concern and 1 ethical concern.
   c) Go to http://tinyurl.com/kv238tt and complete the Zoo Matchmaker activity called Maximize Disease Resistance. Use a copy of the Zoo Matchmaker Data Tables in bag D – 6c to track your choices. At the end, answer the question about your graphed data and what you might do differently next time. Record your % results and print a copy of the graph for each group member to glue into their notebooks.

7) Read together the information about the Human Genome Project on Mat D – 7. Each person takes a Human Genome Project foldable® from the D – 7 bag. Fold and cut where indicated and record answers to the four questions.

8) Tidy and reorganize all the station materials for the next group using them.
Station E

Words in RED are important-make sure you know them!

What you do:

1) Scientific theories serve as models of understanding the world. They explain a wide variety of data and observations, can be used to make predictions, and can be changed as new data or information is discovered. In science, the term “scientific theory” does not express doubt because it refers to statements or models that have been tested and confirmed many times.
   a) The theory of evolution by natural selection is considered a Unifying Theory of Biology because it answers many questions and explains observations and data. The theory that organisms descended from the same ancestor is the theory of common ancestry.
   b) Charles Darwin traveled world-wide in the 1830’s observing many species. His book The Origin of Species introduced his theory of evolution to the world.
   c) Go to http://tinyurl.com/o4wax8o to view What is Natural Selection? An alternate video site is http://tinyurl.com/j24mkdt.
   d) Review Darwin’s theory and contributions by completing the answers spaces of the Evolution Concept Map in the E – 1d bag and then glue it into your notebook.
   e) Review evidence of common ancestry by using the E – 1e card set. Match each term to a description card and a visual that relates to its meaning.

2) The fossil record plays a key role in explaining the scientific theory of evolution. It is a substantial but incomplete record of evolutionary history. Explain why paleontology is so important to the study of evolution.
   a) Review the fossilization process by sequencing the picture cards in the E - 2 card set.
   b) Then sort the remaining cards as statements that are CORRECT and statements that are INCORRECT. Write the correct version of any incorrect statements in your notebook.
   c) Discuss the similarities and differences between Gradualism and Punctuated equilibrium.

3) Play Natural Selection Jeopardy using the E - 3 card set. Arrange the cards into categories and place them where all in the group can see the answers. The youngest person in the group goes first.
   a) The player chooses an answer card and states a question to match the answer.
   b) Play continues until a question is missed. Play then moves to the next player.
   c) The other players determine if players’ answers are correct or not. If needed, check reference sources for accuracy. Make notes in your notebook about any terms you need to re-learn.
   d) Each card earned by a correct question is worth 10 points. Total your points to find the winner.

4) Complete a natural selection simulation at http://tinyurl.com/4c8noav Use the information and questions on Mat E - 4 and record answers in your notebook.

5) Evolution is the process by which modern organisms have descended with modifications from ancient ancestors. Evolution only occurs when there is a change in gene frequency within a population over time. These genetic differences can then be passed on to the next generation. Discuss how evolution fits the criteria for a “scientific theory” as shown in this graphic organizer.

6) Review the ways genetic changes can happen in populations by using Mat E - 6 and the E - 6 card set.

7) Tidy and reorganize all the station materials for the next group using them.