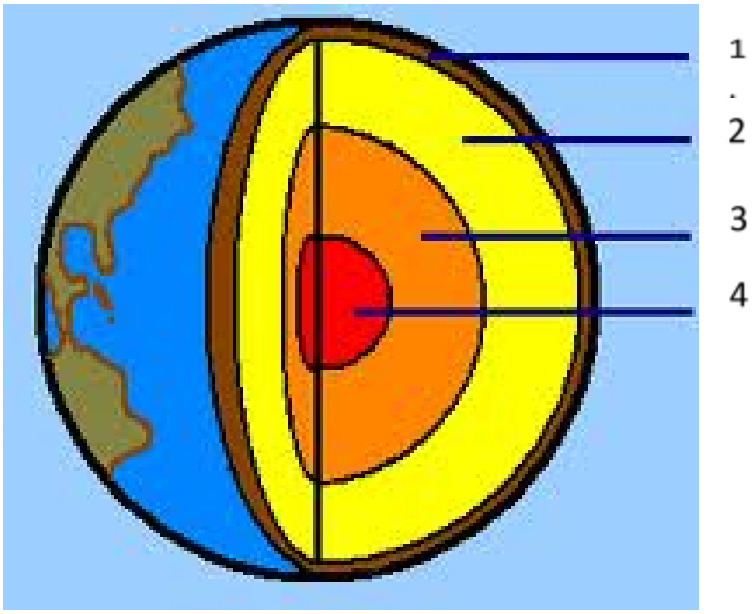
Station 1—Earth's Layers

Label the layers of the Earth shown on the picture below.



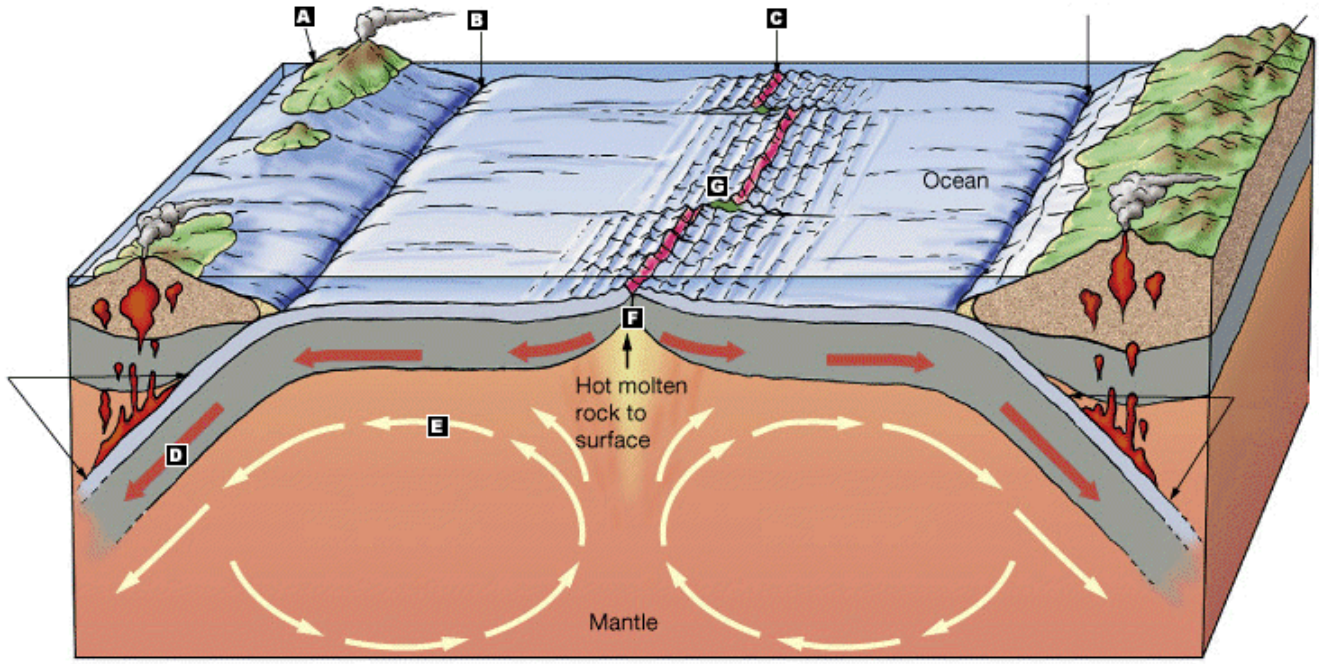
5. 3 and 4 are the same layer, but are shown as being separated in this picture. Why? What is different as you go from the orange part to the red part?

6. Are these layers drawn to scale? Name 2 changes you would make if you were drawing it to scale.

Station 1 Answers—Earth's Layers

1. Crust
2. Mantle
3. Outer core
4. Inner core
5. As you go from the orange part to the red part, it becomes hotter, denser, and changes from a liquid to a solid. The pressure increases as you move toward the center, which is why it is a denser solid instead of a liquid.
6. The crust would be thinner, the mantle would be thicker.

Station 2—Plate Tectonics



1. What letter represents the “engine” that provides the force necessary to move the tectonic plates? What is the name of the “engine?”
2. What kind of plate boundary is represented by Letter B? Letter F? Letter G?
3. Which letter shows a Mid-Ocean Ridge?
4. Which letter shows an Oceanic Trench?
5. Which letter shows a Subduction Zone?
6. Which type of crust is forming at letter F?
7. Which type of crust is forming at Letter A?

Station 2 Answers—Plate Tectonics

1. Letter E – Convection Currents
2. B= Convergent, F = Divergent, G = Transform
3. C= Mid Ocean Ridge (similar to F and G)
4. B= Oceanic Trench
5. D= Subduction Zone
6. F is generating Oceanic Crust
7. A is generating Continental Crust

Station 3—Rocks & Rock Cycle

1. Rocks are made of minerals. Which of the following is not a way that minerals are formed:

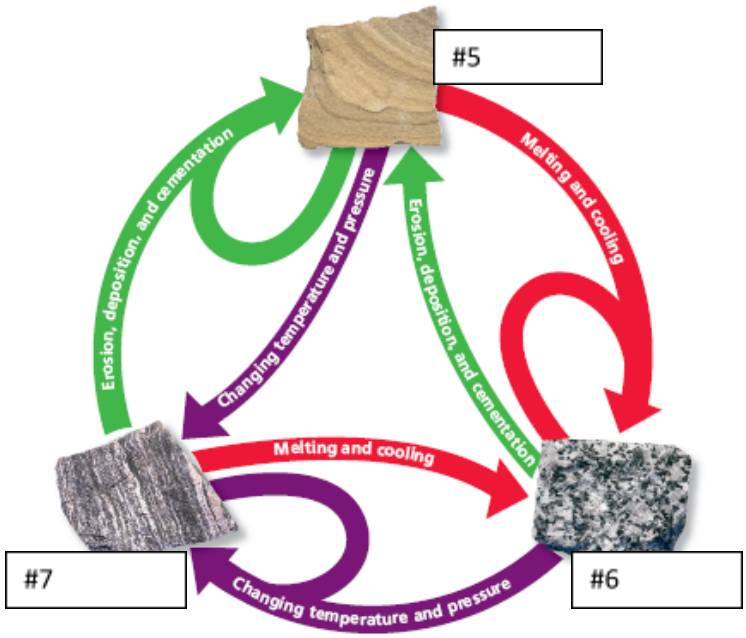
A. heat and pressure
B. cooling of magma or lava
C. evaporation of a liquid
D. erosion and deposition

2. If a rock has large mineral crystals, does that mean it formed quickly or slowly?

3. How could a metamorphic rock turn into an igneous rock?

4. How could a sedimentary rock turn into a metamorphic rock?

Name the three types of rock:



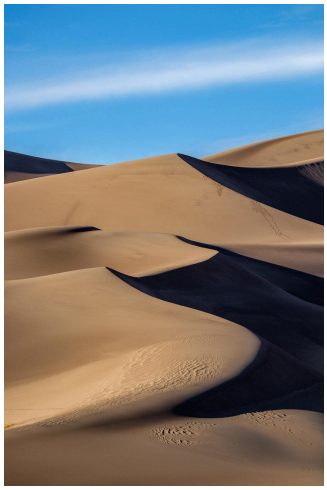
Station 3 Answers—Rocks & Minerals

1. D. Minerals do not form this way.
2. Slow formation causes large mineral crystals.
3. For a metamorphic rock to turn into an igneous rock, first it must melt into lava or magma. Then the lava or magma must cool, crystalize, and harden into an igneous rock.
4. If a sedimentary rock goes through enough heat and pressure, it will become a metamorphic rock.
5. Sedimentary
6. Igneous
7. Metamorphic

Station 4—Weathering/Erosion/Deposition

Identify if the following landforms are from erosion, deposition or both:

1. 

2. 

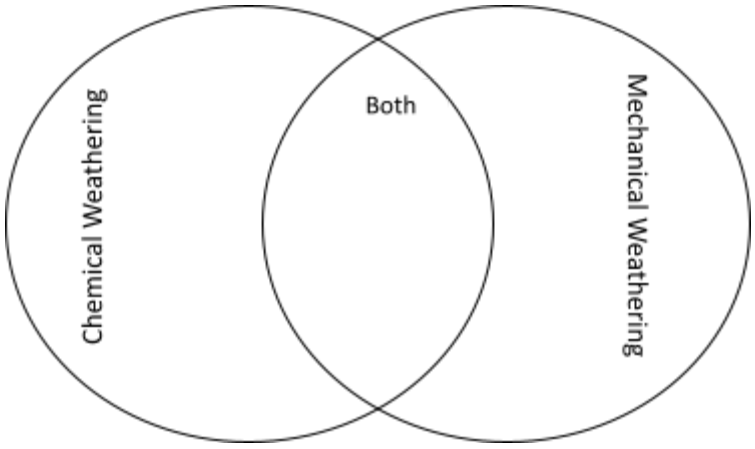
3. 

4. 

5. 

6. Place the following letters in the diagram below:

A. oxidation
B. acid rain
C. breaks apart rocks
D. changes the chemical formula
E. can make rocks smoother
F. can make rocks smaller
G. water dissolving away rocks
H. water slamming into rocks
I. wind
J. temperature changes breaking rocks
K. abrasion wearing away at rocks
L. pushing of plant roots
M. doesn't change the chemical formula
N. plant acids eating away at rocks

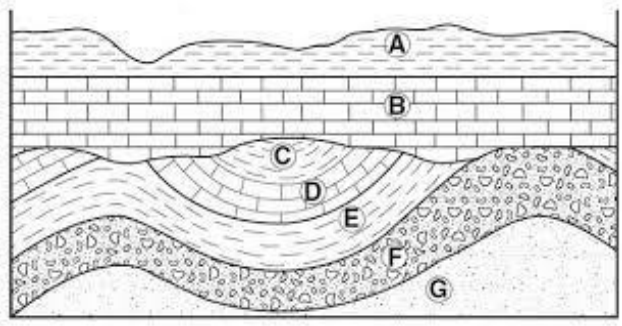


Station 4
Answers—Weathering/Erosion/Deposition

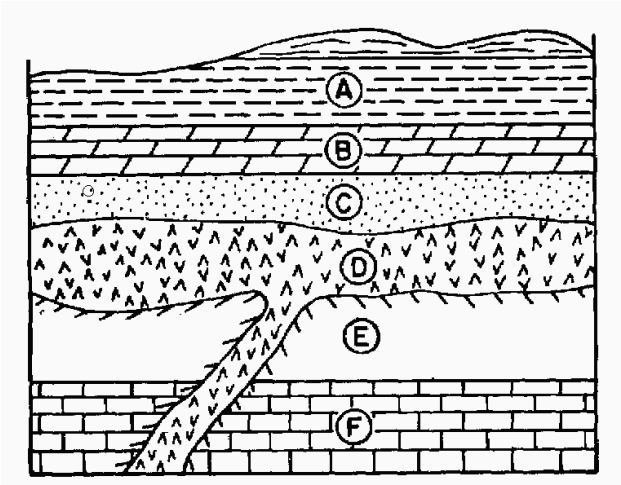
1. Erosion
2. Deposition
3. Both
4. Erosion
5. Erosion

6. Chemical Weathering = A, B, D, G, N
   Mechanical Weathering = H, I J, K, L, M
   Both = C, E, F

Station 5—Superposition



1. Why are layers C-G different than the top layers?
2. When did the event mentioned in question #1 happen?
3. What happened before layer B was deposited?



4. What was the very last thing that happened to these rock layers?
5. Which layer is the oldest?

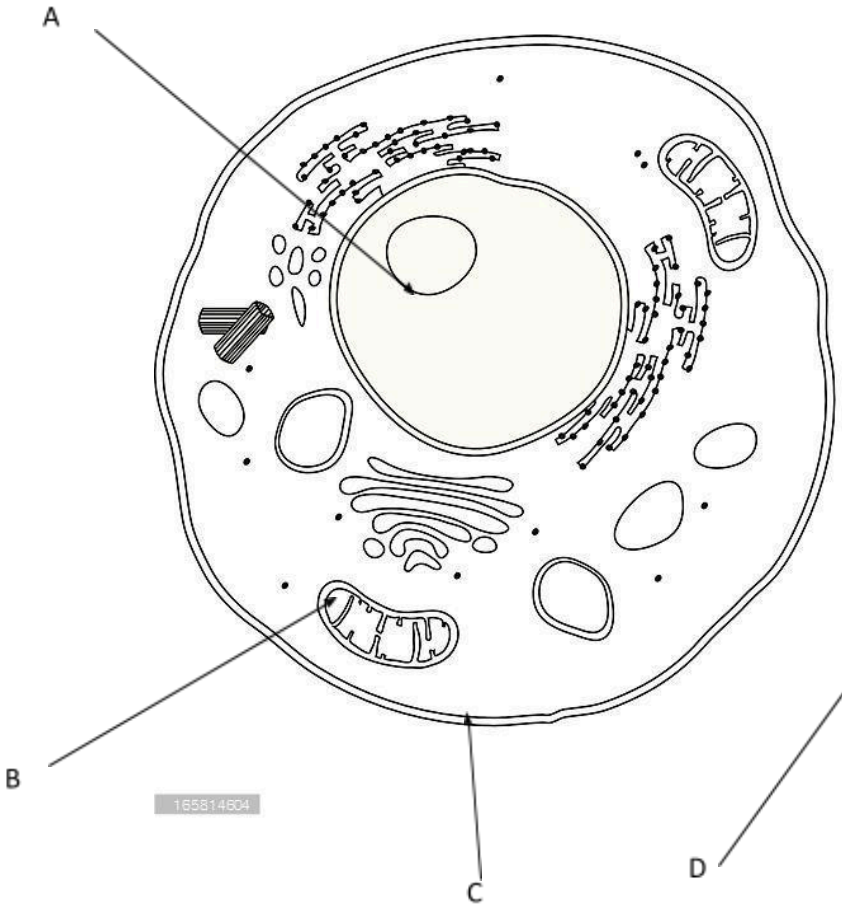
Station 5 Answers—Superposition

1. they went through the stress of compression, causing them to fold.
2. it happened after C formed but before B formed.
3. erosion, that is why the line between B and the stuff under it is bumpy.
4. probably erosion at the top, even though it is not possible to know if the layer D happened at the very end.
5. F is the oldest.

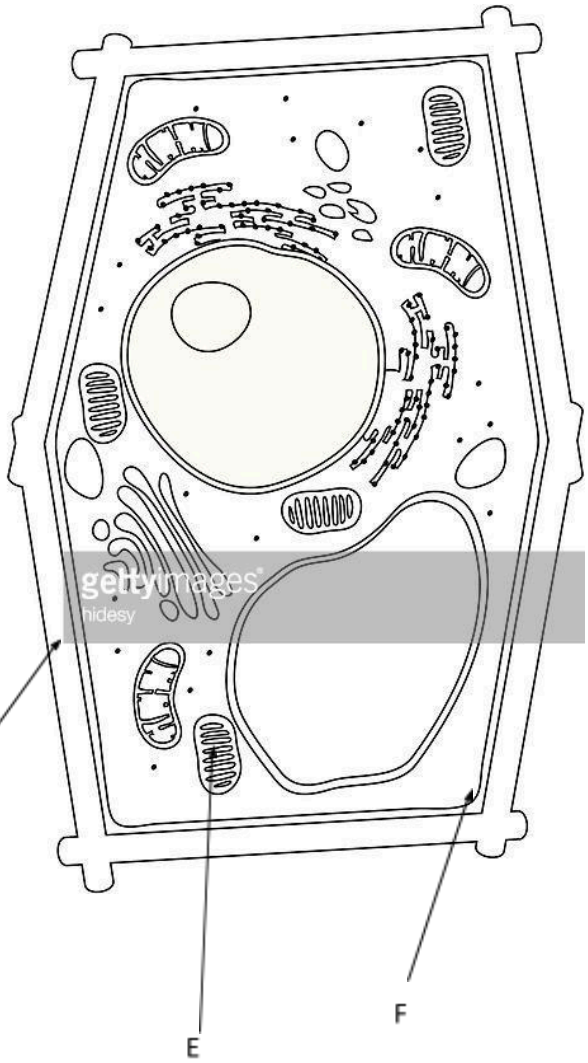
Station 6—Cells

1. Identify the organelles labeled in each cell.

Cell #1



Cell #2



2. Which cell is a plant cell? Name 3 pieces of evidence.

Station 6 Answers—Cells

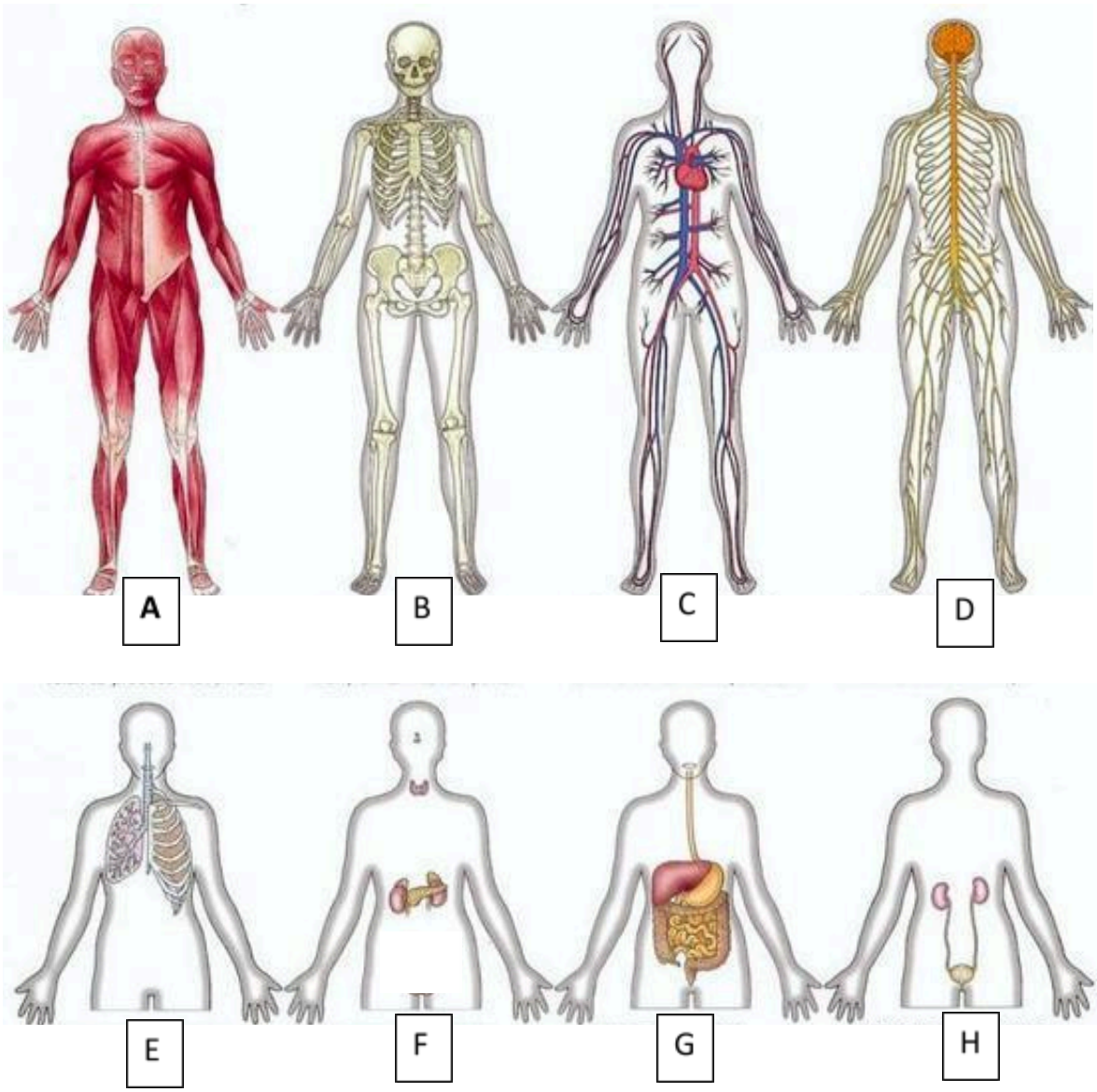
1. Cell parts

Cell #1:
A- nucleus
B- mitochondria
C- cell membrane

Cell #2:
D- cell wall
E- chloroplast
F- cell membrane

2. Cell #2 is a plant cell: chloroplasts, cell wall and large vacuole

Station 7—Organ Systems



For each picture, tell what organ system is represented, two organs that belong to that system and the main purpose of that system in your body

Station 7 Answers—Organ Systems

A. Muscular System-any two muscles, movement within your body and your body parts

B. Skeletal System- any two bones, protection, support and generation of blood cells

C. Circulatory (AKA Cardiovascular) System- heart, arteries, and veins, circulates the blood (along with all the nutrients in it)

D. Nervous System- brain and spinal cord, controls body parts and functions

E. Respiratory System- lungs and trachea, obtains oxygen and expels carbon dioxide

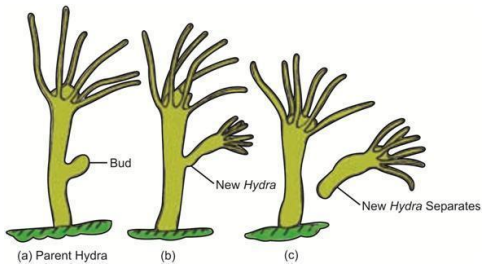
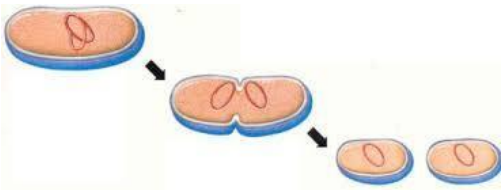
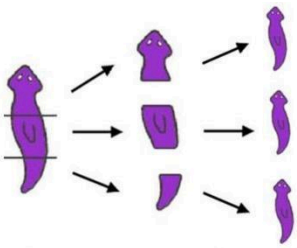
F. Endocrine System- If you knew this one, great. If you didn't, that's ok because we didn't learn it and you don't need to know it.

G. Digestive System-, liver, and intestines/obtain nutrients from food

H. Excretory System- kidneys and the bladder, filters toxins from the blood

Station 8—Reproduction

Write “A” for each answer that is Asexual Reproduction, write “S” for each answer that is Sexual Reproduction.

1		5	
2		6	
3		7	
4		8	

9. All of the offspring are identical

10. The offspring show genetic variation (differences in their genes)

11. Very fast and easy way to reproduce if you live in a stable, unchanging environment

12. Best type of reproduction if your population may need to deal with changes in the environment

Station 8 Answers—Reproduction

1. Asexual
2. Sexual
3. Asexual
4. Sexual
5. Sexual
6. Asexual
7. Asexual
8. Asexual
9. Asexual
10. Sexual
11. Asexual
12. Sexual

Station 9—Adaptations

For each picture, name one structural (physical) and one behavioral adaptation. Also name a reproductive adaptation for at least one of the pictures.

Station 9 Answers—Adaptations

Here are some possible answers. There are many others you may have written.

Monkey:
Structural- long arms, long fingers, fur, strong tail
Behavioral- moving from tree to tree to find food, avoid predators
Reproductive- any of the above make it attractive to a mate

Jellyfish:
Structural- long tentacles, stinging cells
Behavioral- using stinging cells to ward off predators, hunting prey
Reproductive- any of the above help it survive to reproduce

Tree:
Structural- thick bark, tall growth, strong roots
Behavioral- growing tall to get more sunlight
Reproductive- seeds

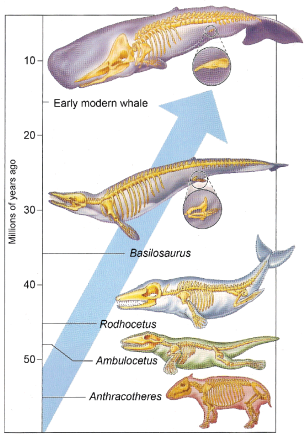
Station 10—Evolution

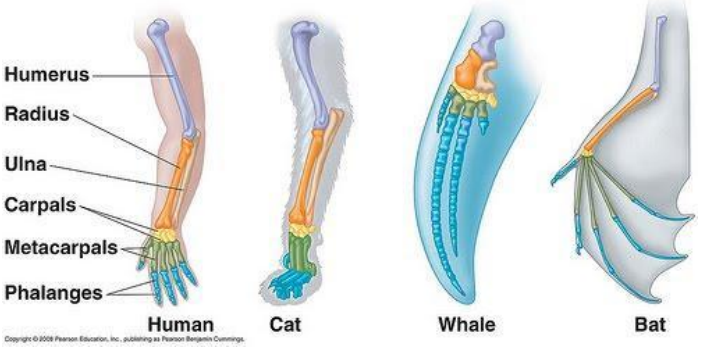
There are FOUR major sources of evidence for species changing over time. Look at the pictures, identify the type of evidence, and give an example of how it shows a relationship that developed over time.

MITOCHONDRIAL DNA CODES

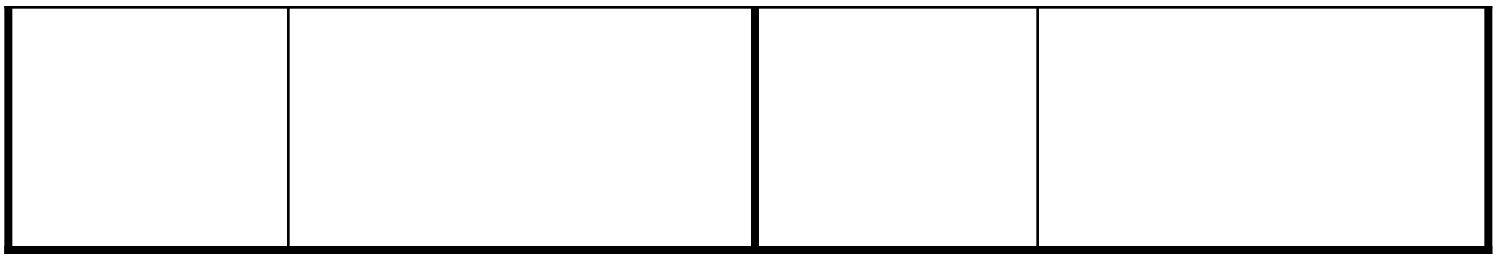
Organism	DNA Codes
American black bear	ATT GGA GCA GAC TTA
Giant panda	ATT GGC ACT AAT CTA
Red panda	ATT GGA ACT AAC CTT
Raccoon	ATC GGA TCT AAC CTT

Name of Evidence:	How it shows relationships:	Name of Evidence:	How it shows relationships:





Name of Evidence:	How it shows relationships:	Name of Evidence:	How it shows relationships:



Station 10 Answers—Evolution

Top Left:

EMBRYOLOGY

Observe patterns in the development of species to see how the process is the same or different. More similar development suggests closer relationships

Top Right:

DNA ANALYSIS

Compare sequences of DNA from species to find out how closely the genetic code matches. Fewer differences suggests a closer relationship.

Bottom Left:

FOSSILS

Observe fossils through geologic time to see how traits change and which creatures are the ancestors of modern species.

Bottom Right:

COMPARE BODY STRUCTURES (Comparative anatomy)

Look at body structures between species to see which parts share common features. More similar structures means closer relationship.

Station 11—Forces/Gravity

1. Which direction is the friction acting in the picture?
2. Are the forces balanced or unbalanced?

3. Which cat has more gravity?

Brown Cat: 10 kg White Cat: 8.5 kg

You have two locations:

Boise, Idaho (elevation 2,704 ft)

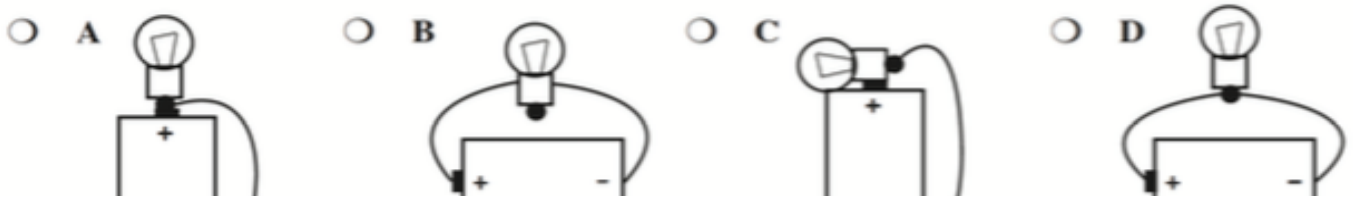
Kathmandu, Nepal (elevation 4,600 ft)

4. Where is your mass the greatest?
5. Where is your weight the greatest?

Station 11 Answers—Forces/Gravity

1. Friction always works against motion
2. If the sled is moving, it is because the forces are unbalanced. The forces exerted by the boy pulling the sled are stronger than the forces of friction (with the air and ground) working against the sled.
3. The brown cat has more gravity because it has a higher mass.
4. Your mass is the same at either location, changing location doesn't change the amount of matter you are made of.
5. You would weigh more in Boise, ID. It is at a lower elevation, that means it is closer to the center of the earth and thus has more gravity. Weight is a measure of how much gravity is pulling on you, so stronger gravity means more weight.

Station 12—Electricity/Magnetism



	Number of steel washers picked up		
Number of magnets	Trial 1	Trial 2	Trial 3
1	8	9	7
2	13	16	14
3	22	23	24

1. Which circuit will light the bulb?
2. What is the energy source in the circuits above?
3. Study the data table. What question is this student testing?
4. What claim could be made from the data in the table?
5. Two groups of students are doing controlled experiments with electromagnets. They each start with an electromagnet that has 30 winds on the core, one D-cell, and a switch. All of the equipment that the groups are using is the same.
   - Group 1 decides to improve the electromagnet design by changing the number of D-cells in the circuit. They will test 2 D-cells to see if performance is improved.
   - Group 2 decides to improve the electromagnet design by adding 20 more winds and doubling the thickness of the wire used.

Which group has a better experimental design? Why do you think so?

Station 12 Answers—Electricity/Magnetism

1. circuit C
2. the battery
3. they are testing if the number of magnets used increases the strength of the magnetic force, they are measuring it by how many steel washers the magnet(s) picked up.
4. using more magnets increases the strength of the magnetic force.
5. Group 1 have a better plan because they are only changing one variable. Group 2 is changing two variables, so if they get results they will not know which variable was responsible for the results.