**What is diabetes, really?**

**Directions:** Obtain the below supplies from under the White Board. Place them on your desk.

Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date\_\_\_\_\_

2 clear cups

1-20cc syringe

1-plastic spoon per group of two

1. Peach place mat

1-cup sugar per two people

Each table should have one graduated cylinder and one measuring cup full of blood. Okay, it is colored water but let’s pretend. 😊

Now,

1. Unfold your peach placemat and place it plastic side down on your desk. This will be where you will transfer water over to use as a place mat. The mat will observe any spills.
2. Decide who your partner is next to you. Write both of your names on this paper by “name”.
3. One of you measure out 90 mls of H2O. Use the graduated cylinders provided for each table and use the H2O placed at your table in the glass measuring cup.
4. The other person will now pour the measured H2O into the cup of C6H12O6 (sugar) and stir with the plastic spoon.
5. ANSWER HERE: 1- What happened to the viscosity of the H2O? 2- How did this happen?
6. Now, place 90ml of H2O into your second cup. Do not add sugar. This represents “non-diabetic” blood.

ANSWER HERE: What is the non-diabetic blood missing? Add a few drops of sugar to the non-diabetic blood. Did it become highly viscous? Why not?

1. Now, use your 20cc syringe to pull up 10cc of non-diabetic blood. Was it hard to pull up due to the blood’s viscosity?
2. Next, use 20cc syringe to pull up 10cc of diabetic blood. Was it hard to pull up due to the blood’s viscosity?

WHY?

1. What affect would the viscosity of the diabetic blood have on :
   1. Small capillaries?
   2. Vena cava?
   3. How is this related to diabetics having decreased blood flow in their feet?
   4. Why would it be the feet and not the hands? (Hint: Think of the blood pumping and distance of returning.)
   5. With such “thick” or viscous blood, how will this affect the oxygen flow
   6. What can be an end result if diabetics continue to have uncontrolled BS with their feet?

**What does diabetes really do to the blood?**

* 1. Their eyes?

Materials List for The Human Body and Issues in Health Topics Unit.

The materials needed for this unit are presented in chronological order as the unit progresses. Many activities can be presented as demonstrations if you are short on equipment.

1. Computer that runs PowerPoint.
2. LCD Projector (For Classroom Teachers)
3. PowerPoint remote for advancing slides (Recommended! - Unit has 1050+ slides)
4. realPlayer for videos <http://www.real.com/realplayer/search>
5. Marbled Science Journal (Class Set)
6. PART I – Levels of Biological Organization
7. Activity: (FFF) Form Follows Function – Students roam the room looking for an object that they can present where form follows function. Having a box with some objects handy may be helpful. My room is always so filled with stuff that finding things is not difficult.
8. Activity (Optional) Cheek and Onion Cell Lab. Students look at onion cells and cheek cells under the microscopes. Students peel layers of onion and with fingernail to gather a layer of cells. Students do a numbers of sketches on low, medium, and high power. Students then swab mouth with toothpick to collect cheek cell. Class set of microscopes needed. Glass slides and cover slips. Onion and toothpick and eyedroppers + water are needed. Paper towels to wipe slides and trash can should be handy.
9. Homeostasis Activity: Students need safe space in room to move / increase heart rate with stand in place exercises. Timers are needed. I like to use a large timer on the screen that can be found at <http://www.online-stopwatch.com/>.  **A few thermometers can check for a difference in skin temperatures. Students follow instructions and take pulse several times and average. (Calculators Optional)**
10. PART II - SKELETAL SYSTEM
11. Safe space for students to do a standing jump. I usually form a line and do it in the middle of the room.
12. Building an arm activity. Students should partner-up. Each group gets two Popsicle sticks, elastic bands, scissors, black marker, and several standard elastic bands. Students follow step by step instructions to build an arm and label all of the parts including joints.
13. Activity Link. A link can send you to an activity that has the teacher print-up sheets. Students need scissors and brass fasteners. Students cut-out the bones and then piece together a human skeleton. <http://www.enchantedlearning.com/crafts/halloween/bones/>
14. Activity. Naming the bones in the human body. Teacher prints up provided anatomy resource book which is a blank skeleton. Students visit a website to get the answers. If you don’t have computer usage for students you can do it as a class. The website is <http://www.getbodysmart.com/ap2/systems/tutorial.html>
15. PART III – THE MUSCULAR SYSTEM
16. A similar activity as the one above has the teacher print-up the blank muscle sheet, and the students name some common muscles in the human body after doing research from <http://www.getbodysmart.com/ap2/systems/tutorial.html>.
17. Dissection Lab. Student divide into partners for a dissection of a chicken leg. Teacher should get class sets of whole chicken legs (thigh) not just wings. Groups should have dissections trays or plates to work on with dissection tools. Refrigeration should be available for before and after the activity. All work surfaces should be cleaned before and after activity. Students should also have gloves and eye protection. The PowerPoint explains the process one step at a time.
18. An activity that is relevant for the digestive system is presented. Teacher finds two equal sized pieces of chicken. One of those pieces is cut many times into smaller pieces. Both are added into containers filled with vinegar and sealed. The contents will be observed in a week+.
19. PARTS IV & V MOLECULES OF LIFE AND HEALTHY LIVING TOPICS
20. Saltines (Class Set) and Iodine + eye droppers, Goggles (Class Set). Students learn about starch and make SaltineMan / Woman.
21. Celery sticks class set to discuss fiber. Students enjoy some fiber as the lesson is being taught.
22. Wooden / Plastic Molecule Set (ONCH) gum drops and toothpicks could work for students to make biologically molecules one step at a time. Directions are includeD in PowerPoint.
23. Plastic or real food for separation into categories for molecules of life. (Optional)
24. Twinkies (Class Set) having Twinkie sitting in front of you gives the lesson more drama.
25. Table sugar and scale / balance. Students weigh how much sugar is actually in some popular soda cans. Seeing that much sugar puts it into perspective.
26. Ailing man sues fast food chains reading. Visit the activities folder and print-up article for each member of your class.
27. Jell-O Pineapple and processed food. Teacher creates Jell-O squares for class. Teacher then creates two different fruit juices in a blender. One uses fresh pineapples and the other uses canned pineapples. Students use eye dropper to drip the two juices onto two different Jell-O cubes. The fresh pineapple juice breaks down the collagen in the Jell-O while the canned does not. This shows how processed foods can damage many important enzymes.
28. PART VI – THE DIGESTIVE SYSTEM
29. Chewing activity. A piece of bread is passed to each student. Be aware or any food allergies in your class / gluten.
30. Tasting Activity! Sour Patch Kids, Cocoa Powder (unsweetened), Saltwater and plates for the food items. Enough needed for each student to touch to tongue a few times.
31. Revisiting the chicken pieces mechanically broken up prior to the acid / chemical digestion.
32. Activity! Eating an apple. Class set of apples.
33. Chewing Activity. Each student gets a plastic bag, graham cracker, banana piece. Teacher needs a clean squirt bottle filled with water.
34. Peristalsis Activity. Teacher needs 10 golf balls and some dish soap, and a tray to wet hands. Paper towels are needed to clean hands at end. Make sure floor doesn’t get to wet and remind students about slip hazard.
35. 10 meters or garden hose and a large jacket / sweatshirt.
36. Testing baking soda with litmus paper. See how an antacid neutralizes acid. Place a spoonful of Baking Soda (base) into the vinegar (acid). Note reaction. Measure pH of baking soda and vinegar product.
37. Digestion Simulation. Several bags of Cheerios. Several durable trash bags. Each partner groups needs large white paper to label their part of the GI Tract. Several student groups have spray bottles filled with water. One group has jelly that they add to the bag. Several sponges to clean up any water that spills. A couple of strainers to strain the moisture out of the Cheerio mix. Trash barrel at end to dispose of material.
38. PART VII – THE CIRCULATORY SYSTEM
39. Respiration Activity. (Optional) Students can use white boards to practice the equation for cellular respiration. Dry Erase Markers and something to clear the board are needed.
40. Activity! Students need a safe place to stand next to their seats. Teacher should have sound system to play a song.
41. Students learn about blood by making blood soup. Students Add 200 ml of corn syrup to a clear plastic Zip-Lock Bag and seal it. Record 55% plasma in Sharpie Marker on the outside of the bag. Add several (100 + Red Hot candies or Red Tic-Tac’s or other small Red candy in the relative shape of a disc, that won’t dissolve quickly) into the Zip-Lock bag and seal it. Record 45% RBC’s on the bag in black sharpie. Students then add a few mini- marshmallows to the clear plastic Zip-Lock Bag and seal it. Record <1% WBC’s on the bag in black Sharpie Marker. Students then add a few Rice Krispies to the soup. Record <1% Platelets on the bag in black Sharpie Marker.
42. PART VIII – THE RESPIRATORY SYSTEM
43. Students learn some breathing techniques and watch a yoga video. Having an open place for students to stand and sit is necessary. Having mats is nice but not necessary.
44. Teacher Demonstration. Candle secured to table with clay or other. Clear Glass container.
45. Students learn about the vocal cords and some Karaoke videos are provided.
46. Activity. Lung Capacity. Students all need several of the same kind of standard party balloon. Students also need a standard metric ruler or meter stick. Calculators are optional.
47. An optional activity is provided - Making a spirometer. <http://peer.tamu.edu/curriculum_modules/OrganSystems/module_4/activity1.htm>
48. Activity. Lie detector (Optional) Teacher needs to place a dish with some candies for everyone in the middle of the classroom.
49. <http://www.getbodysmart.com/ap2/systems/tutorial.html>
50. Respiratory System resource book -Teacher prints-up the blank respiratory system sheet, and the students name some common organs found using computers with internet access. <http://www.getbodysmart.com/ap2/systems/tutorial.html>.
51. Part IX – The Excretory System
52. Activity (Optional) Strainer and the nephron. This is not an activity posted in the slideshow. As slides talk about the nephron teacher can use a strainer and biological contents to reinforce concept with visual.
53. Part X – The Nervous System
54. Activity. Stimulus and Response. Teacher needs an ice cube for each student.
55. Build a nephron activity. Students can build neuron from pipe cleaners, clay, beads, ropes, and other materials you can find. Examples provided in slideshow.
56. Neuron simulation activity. Teacher needs a place where students can stand in a line. The line can bend and curve around desks. Students tap hands of each other.
57. Similar activity. But this time teacher needs objects for students to drop into the hand of the person next to them. (tennis balls or other similar sized object)
58. Interneuron activity requires that each student has a straight edge.
59. Teacher Demonstration. Mr. Egg Head. Two clear containers slightly larger than an egg with cover are needed. Teacher draws face on each egg with permanent marker. Teacher places egg in one container and fills completely with water and puts top on container. Teacher places other egg in container without water and covers. Teacher shakes both containers equally. – The non water container’s egg breaks and Mr. Egg dies tragically.
60. Building a Brain - Building a Brain. The brain should be about 3 lbs. (1.35 kg.) and feel like a real brain. 1 gallon ZipLock Bag. Add 1.5 cups (360 ml) instant potato flakes. Add 2.5 cup (600 ml) hot water Add 2 cups (480 ml) clean sand.
61. Building a Brain more Advanced. 2 cups water, 2 cups flour, 4 teaspoons cream of tartar, 1 cup salt, One quarter cup vegetable oil, Cook over low heat until lumpy and then let cool. Use hands to mold into a brain. Recipe provided in slideshow.
62. Students can take a left right brain test on the computer. Each student would need computer and internet access. Link is provided.
63. Teacher Demonstration – Making a spinal column. Teacher needs string, empty spools of thread or other column container.
64. Binoculars (One) and line of tape on the floor. Make sure area is safe incase a student gets dizzy.
65. Dark classroom and light classroom. Just going from a dim class with the projector on to outside on a sunny day will work.
66. (Optional) Having some convex and concave lenses, as well as double concave and convex could be used to reinforce some instruction (Optional)
67. Night vision activity. A place in the school that is extremely dark. Simply pulling the shades won’t work. A conference room, or supply closet or other space that gets very dark is needed. Make sure room has a light source or bring your own for the end. Also remind students of new escape route incase of fire drill etc.
68. I like to spray an air freshner into the air to show diffusion of volatile molecules and sense of smell for upcoming activity.
69. Smelly Belly Activity. Teacher needs to obtain several paper bags and jelly beans. The PowerPoint is set-up for the following flavors although you could always just switch your own flavors in and change the slideshow. Jelly Belly Flavors – Sour Apple, Buttered Popcorn, Licorice, Bubble Gum, Juicy Pear, Very Cherry. Bags are used to hold the flavors. Some bags need to crush the jelly beans (smell). Students need to count off 1,2,1,2,1. 1’s are the tasters while 2’s are the trial leaders. The groups switch.
70. Finding your partner with sound. Teacher needs to make class set of film canisters with a match. Teacher takes two canisters and places a similar object in them that will make a unique sound such as a paperclip. Teacher makes enough pairs for the whole class. Many different sounds so all partners are unique. Students shake canisters and walk around trying to find their match. These are good to have around for partner projects in the future where you want the students to end up with someone random in the class.
71. Activity. Pennies and Hearing. Teacher needs to collect a large sample of pennies that are pre 1982 and post 1982. Students partner up and drop pennies from a set distance. Students need a ruler to mark the distance. Students try to recognize the sound differences in these pennies.
72. Activity. Touch and Feet. Students need to remove socks and shoes during the activity. Students close eyes and place foot into various shoe boxes or trays. The following materials are built-into the slideshow. Boxes are… Angled pebbles from a walkway, rolled up tissue paper, Ice-cubes with cold water, Warm water with plastic bags, crayons, grass from outside or leaves, Styrofoam packaging peanuts, and a teacher choice box.
73. Safe space for dancing at seat for movement activity and game of Simon Says.
74. PART XI – THE ENDOCRINE SYSTEM
75. Students divide into two groups based on gender to read an article about puberty and answer some questions. Teacher prints articles found in the activities folder.
76. PART XII – THE REPRODUCTIVE SYSTEM
77. Activity (Optional) Sugar Babies. Students get partnered up (boy / girl). Each partnership gets a large bag of granulated sugar from the grocery store. Students dress up sugar baby and carry around / care for over the next week and answer several questions before passing in bag that must be in pristine condition.
78. PART XIII – THE IMMUNE SYSTEM
79. HIV Simulation – Class set of cups (Not clear) Mix one or two with baking soda. Conduct activity described in PowerPoint slideshow and test each students cup with Litmus paper. If the Litmus paper turns green that person contracted HIV in the simulation. Students retrace their steps / swapping of fluids to figure out who originally had the virus.