HWC Natural Science Tool Spring 2015

* Required

Class Volunteer Form

Thank you SO MUCH for volunteering to participate in the HWC Natural Science Assessment. Your participation will help to inform curriculum development, pedagogical practices, and policy decisions at Harold Washington College. Your responses will remain anonymous and will only be used in the aggregate.

Please answer the following questions honestly and based on your own knowledge, without any help from other people or resources. The assessment should take about 30 minutes. We hope that you will complete the entire survey, but you have the right to stop answering questions at any time.

The following questions are based in part on a tool created by the American Physical Society and the American Cancer Society.

If you have questions or concerns about this assessment process, please contact Carrie Nepstad, Chair of the HWC Assessment Committee at <u>cnepstad@ccc.edu</u> or call 312-553-6095.

1. Check all that apply.

I have read the above statement and consent to continue. (Check here.)

Student Identification

Please enter your 9 digit student ID. Providing this information allows us to reduce the time of this survey and improve its reliability. Again, this information is anonymous and not linked to individual student performance.

- 2. Please enter your Student ID number.*
- 3. Which of the following is a correct sequence of structures that can be found in living things, proceeding from least to most complex? *

- molecule, atom, organ, organism, tissue.
-) atom, molecule, cell, tissue, organ, organism.
-) cell, organ, organism, organ, tissue.
-) cell, tissue, organ, organ, tissue, organism.
- atom, molecule, tissue, cell, organ, organism.

4. The basic unit of structure and function for all life is the *

Mark only one oval.

\supset	atom.	

molecule.

	cell.	

🔵 organ.

organism.

5. Which of the following BEST describes the common flow of genetic information in a cell? *

Mark only one oval.

- \bigcirc RNA \rightarrow proteins \rightarrow DNA
- \bigcirc proteins \rightarrow DNA \rightarrow RNA
- \bigcirc DNA \rightarrow RNA \rightarrow proteins
- \bigcirc RNA \rightarrow DNA \rightarrow proteins
- \bigcirc DNA \rightarrow proteins \rightarrow RNA

6. Which of the following molecules store and transmit hereditary information? *

Mark only one oval.

\bigcirc	carbohydrates
\frown	lipids

- proteins
- nucleic acids
 -) vitamins

7. What is the relationship among DNA, genes and chromosomes? *

Mark only one oval.

- A chromosome is a DNA molecule with many genes.
- Genes are the proteins encoded by DNA of chromosomes.
- Chromosomes are proteins that carry genes made of DNA.
- Genes are the proteins around which DNA of chromosomes are packaged.
- A gene is a DNA molecule made of many chromosomes.

8. What is the relationship between mutations and cancer? *

- Some mutations cause cells to lose control over cell division, resulting in cancer.
- Cells do not require mutations to become cancerous.
- Any mutation will cause a cell to start dividing without control, resulting in cancer.
- Mutations prevent cells from becoming cancerous.
- Mutations only occur in certain cells.

9. A new family moved into your neighborhood. They have five children, all of whom are boys, and the mother is pregnant. Approximately, what is the probability that the new baby will be a boy? *

Mark only one oval.

\bigcirc	0%
\bigcirc	25%
\bigcirc	50%
\bigcirc	75%
\bigcirc	100%

10. Dogs have 78 chromosomes in most cells of their body. How many chromosomes would you expect to find in a dog sperm or egg cell? *

Mark only one oval.



11. When a plant-eating animal (herbivore) consumes a plant,_____

Mark only one oval.

- plant matter provides energy for animal cells to produce sugar.
- animal matter provides energy for plant cells to produce sugar.
- plant matter provides energy for animal cells to perform cellular work.
- plant matter provides energy for animal cells to produce water.
- > plant matter provides energy for animal cells to perform photosynthesis.

12. When sunlight reaches a plant, the_____

- Plant uses sunlight energy in cellular respiration to produce sugar
-) Plant produces energy that is absorbed by sunlight.
- Plant uses sunlight energy in photosynthesis to produce CO2
- > Plant uses sunlight energy in cellular respiration to produce CO2
-) Plant uses sunlight energy in photosynthesis to produce sugar

13. According to modern ideas and observations, what can be said about the location of the center of the Universe?

Mark only one oval.

- The Earth is at the center.
 - The Sun is at the center.
 - The Milky Way galaxy is at the center.
 - An unknown, distant galaxy is at the center.
 - The Universe does not have a center.

14. As seen from Chicago, when will an upright flagpole cast no shadow because the Sun is directly above the flagpole?

Mark only one oval.

- Every day at noon.
- Only on the first day of summer.
- Only on the first day in winter.
- Only on the first days of spring and fall.
- Never from your current location.

15. What is the best definition for the scientific term "theory"?

Mark only one oval.

- A scientist's initial tentative proposal when beginning an investigation.
- A statement that has been supported by an experiment.
- A statement that has been contradicted by an experiment.
- A controlled exploration of nature according to a planned strategy.
- Viewing or noting a fact for a scientific purpose

16. Below the outermost rocky shell of the Earth, it becomes

Mark only one oval.

- - Hotter, melted, and gravity increases
 - Hotter, gaseous, and magnetism increases
- Colder, solid, and pressure increases
- Hotter, denser, and pressure increases
- Colder, denser, and pressure increases

17. Select the situation in which rain is most likely to form.

- When warm air with high humidity cools down.
- When warm air with low humidity cools down.
- When cool air with high humidity warms up.
- When cool air with low humidity warms up.
- The mechanism(s) that cause rain are still unknown.

HWC Natural Science Tool Spring 2015

18. Why is the sky blue?

Mark only one oval.

- It is reflecting the blue color from the oceans.
- Water in raindrops is blue.
- Air molecules scatter blue light.
- Yellow light from the sun and the blackness of space mix to make blue.
- The sun emits primarily blue light.

19. Which of the following best describes what happens when a pot of water boils?

Mark only one oval.

- The water break up into small droplets of liquid water which float away.
- The water break up into molecules of water vapor which float away.
- The water breaks up into molecules of oxygen and hydrogen gas.
- The water breaks up into individual oxygen and hydrogen atoms.
 - The water molecules transform into heat energy.

7	
Ν	
14.007	

20. Above is the information from the periodic table for nitrogen. Based on this information, which statement is ALWAYS true?

Mark only one oval.

- An atom of nitrogen has 7 protons.
- An atom of nitrogen has 7 neutrons.
- An atom of nitrogen has 14 protons.
- An atom of nitrogen has 14 neutrons.
- An atom of nitrogen has 14 electrons.
- 21. You put fresh batteries into a flashlight. Then you turn it on and leave it on until the bulb gradually dims and finally goes out. Which statement best describes the involvement of energy in this process?

Mark only one oval.

- The energy has been used up by the bulb and no longer exists anywhere.
- All the energy that the batteries originally had when new still exists somewhere or other.
- The energy of the batteries was converted to heat by the bulb, so it no longer exists.

(ight) The amount of energy in the flashlight, batteries, and bulb remain the same, because energy
is coi	nserved.

The energy has moved from one end of the batteries to the other.

22. Two metal balls are the same size but one weighs twice as much as the other. The balls are dropped from the roof of a single story building at the same instant of time. The time it takes the balls to reach the ground below will be

Mark only one oval.

- about half as long for the heavier ball as for the lighter one.
- about half as long for the lighter ball as for the heavier one.
- about the same for both balls.
- considerably less for the heavier ball, but not necessarily half as long.
- considerably less for the lighter ball, but not necessarily half as long.

23. A significant problem in learning science is being able to memorize all the information I need to know.*

Mark only one oval.

Strongly agree
Agree
Neutral

- Disagree
- Strongly disagree

24. I think about the science I experience in my life. *

Mark only one oval.



25. Knowledge in science consists of many disconnected topics. *

Mark only one oval.



-) Agree
- Neutral
- Disagree
-) Strongly disagree

26. I am not satisfied until I understand why something works the way it does. *



- ____ Agree
 -) Neutral
 - Disagree
 - Strongly disagree

27. I do not expect equations to help my understanding of the ideas; they are just for doing calculations.*

Mark only one oval.

Strongly agree
Agree
Neutral
Disagree
Strongly disagree

28. If I get stuck on a science problem on my first try, I usually try to figure out a different way that works.*

Mark only one oval.

Strongly agree
Agree
Neutral

Disagree

Strongly disagree

29. Nearly everyone is capable of understanding science if they work at it. *

Mark only one oval.

Strongly agree
Agree
Neutral
Disagree
Strongly disagree

30. If I want to apply a method used for solving one scientific problem to another problem, the problems must involve very similar situations. *

Mark only one oval.



)	NIAUMAN
)	Neutral
	nouliu

Disagree

Strongly disagree

31. I enjoy solving scientific problems. *



-) Neutral
- Disagree
 - Strongly disagree

32. In science, mathematical formulas express meaningful relationships among measurable quantities. *

Mark only one oval.

Strongly agree

- 🔵 Agree
- Neutral
- Disagree
- Strongly disagree

33. Learning science changes my ideas about how the world works. *

Mark only one oval.

\bigcirc	Strongly agree
\bigcirc	Agree
\bigcirc	Neutral

- Disagree
- Strongly disagree
- 34. Reasoning skills used to understand scientific concepts can be helpful to me in my everyday life. *

Mark only one oval.



- Neutral
- Disagree
- Strongly disagree
- 35. Spending a lot of time understanding where formulas come from is unnecessary.*

Mark only one oval.



- Agree
- Neutral
- Disagree
 -) Strongly disagree
- 36. To understand science, I sometimes think about my personal experiences and relate them to the topic being analyzed. *



-) Neutral
- Disagree
 - Strongly disagree

37. When studying science, I relate the important information to what I already know rather than just memorizing it the way it is presented. *

Mark only one oval.

Strongly agree Agree Neutral Disagree Strongly disagree

38. Feel free to share any comments you have about this survey that you want us to know.