**Welcome to Navigate Powered by NIDES Biology 11!**

Please note that the First Assignment is a requirement to be registered in the course.

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| **Legal last name:** |  | **First name:** |  |
| **Other last name:** |  | **Home phone#:** |  |
| **Middle name:** |  | **Cell Phone #:** |  |
| **Student Email:** |  | **Parent or guardian email:** |  |
|  |  | **Other school attending:** |  |

**Instructions: This assignment is intended to take approximately 5 - 10 hours to complete. It is worth 10% of your final grade for the course, so complete it carefully:**

1. Read each question carefully before answering
2. Answer all questions to the best of your ability, and in your own words. Plagiarized assignments will not be accepted, and you will not be registered in the course.
3. Take your time and explore all of the resources. You will receive a higher mark on your First Assignment if you include your learning from the readings and resources provided.
4. When you have completed this assignment, return it as an attachment to an email to: [**registrar@sd71.bc.ca**](mailto:registrar@sd71.bc.ca)

|  |
| --- |
| **Office Use Only Date:**  **Part 1: /20 Part 3: /8 Total: /45**  **Part 2: /12 Part 4: /5**  **Teacher feedback:** |

|  |
| --- |
| **Note to students:**  In this course, the First Assignment must be **saved and submitted as** either a **Word Document file (.doc**) or as a **Rich Text file (.rtf)**. These are both editable formats which allow for teacher feedback.  **Do not print them out** and do them the ‘old-fashioned’ way. This will leave you no option but to to submit the assignment as an image, which is not editable.  First Assignments received in any other format (such as pdf, jpg, key, pages), will be **returned to the student unmarked** to be converted to and resubmitted as a **Word doc** or **rtf** which will delay enrollment in the course. |

**Introduction to Biology, the Scientific Method, Cells and the Microscope**

**Links to Resources:**

* **[Unit 1, Lesson 1: Introduction to Biology & The Scientific Method](http://vschool.nides.bc.ca/_first_assignments/2015%20Biology%2011%20FA/unit1_1_scientific%20method.pdf)**
* **[Textbook Readings for Lesson 1](http://vschool.nides.bc.ca/_first_assignments/2015%20Biology%2011%20FA/Textbook%20readings%20for%20Lesson%201.pdf)**
* **[Unit 1, Lesson 2: Cells & The Microscope](http://vschool.nides.bc.ca/_first_assignments/2015%20Biology%2011%20FA/unit1_2_cells%20and%20microscope.pdf)**
* **[Textbook Readings for Lesson 2](http://vschool.nides.bc.ca/_first_assignments/2015%20Biology%2011%20FA/Textbook%20readings%20for%20Lesson%202.pdf)**

**TOTAL: /50 marks = %**

**Multiple Choice Section /20 marks**

***For each of the following, select the best possible answer:***

******

1. Methods in science do not include:

a) experimentation

b) data collection

c) trial and error testing

d) developing a hypothesis

2. The scientific method begins with

a) a control

b) an observation

c) an experimental design

d) a hypothesis

 3. A hypothesis must contain which of the following variables?

a) only the dependent or responding variable

b) only the dependent or manipulated variable

c) both the manipulated and responding variables

d) both the manipulated and responding variables, as well as all the controlled variables

 4. Select the best formulated hypothesis from the observation that students perform better on tests when they are well rested.

a) Lack of sleep decreases test performance.

b) Students who do not get enough sleep will fail the test.

c) If the number of hours of sleep increase, then test scores (%) will also increase.

d) Increased amounts of sleep improve a student’s overall mood, which in turn improves their test performance.

5. A controlled experiment is one in which:

a) only one variable is changed at a time

b) the hypothesis is refuted

c) the hypothesis is supported

d) a conclusion is produced

6. Which of the following does not exhibit all of the characteristics of life?

a) a virus

b) a mushroom

c) a bacterium

d) an ant

7. In the “hierarchy of life” which of the following terms is above (includes) all of the others?

a) organism

b) community

c) population

d) ecosystem

 8. Homeostasis refers to:

a) all generations of a species that are similar

b) features that are plainly seen in an organism

c) maintaining a steady state inside an organism

d) similar populations in a environment

9. Which of the following is an example of qualitative data?

a) the plant’s height is ten centimeters  
 b) the fish swam in a zig-zag motion  
 c) six pairs of robin’s hatched an average of three chicks  
 d) stomach contents are mixed every twenty seconds.

10. James notices that his shower is covered in a strange green slime. James decides to spray half of the shower with coconut juice thinking this will kill the slime. He sprays the other half of the shower with water. After 3 days of "treatment" the green slime on the coconut juice side of the shower dies. The dependent variable in his experiment is:

a) coconut juice

b) there is no dependent variable

c) the death of the green slime

d) water

 11. Which of the following statements about cells is NOT true?

a) All organisms consist of many cells.

b) Cells vary in size and shape.

c) The cell is the basic unit of both plants and animals.

d) Cell structure and function are dependent on location.

12. Eukaryotic cells can be distinguished from prokaryotic cells by the presence of:

a) organelles

b) DNA

c) a nucleus

d) chloroplasts

13. Plant cells can usually be distinguished from animal cells because only plant cells possess:

a) mitochondria

b) ribosomes

c) a cell wall

d) chromosomes

 14. A human skin cell may be classified as both

a) prokaryotic and animal  
 b) eukaryotic and animal  
 c) prokaryotic and plant  
 d) eukaryotic and plant

15. The human eye has its limitations—it is not able to distinguish objects smaller than:

a) 1 millimeter

b) 1 micrometer

c) 0.1 millimeters

d) 0.1 micrometers

 16. The ability of a microscope to distinguish between two objects is called:

a) magnification

b) depth of field

c) resolution

d) field of view

 17. The diaphragm of a microscope acts to:

a) focus the image

b) magnify the object

c) adjust the stage for proper focal distance

d) control the amount of light passing through the specimen

18. What magnification would let you see the most objects at one time?

a) 50 X

b) 100 X

c) 200 X

d) 400 X 

19. A microscope is focused using a 20x objective and then is re-focused using a 40x objective.  The diameter of the field of view will now be:

a) twice as large as before

b) 40x as large as before

c) half as large as before

d) 20x as large as before 

20. A student prepares a slide of Paramecium caudatum.  Without moving the slide he counts 1000 cells under low power and 13 cells under high power.  The reason for this is:

a) the light intensity under low power is greater than under high power.

b) the population under high power is smaller than under low power.

c) the diameter of the high power field of view is smaller.

d) organisms move more slowly under the low power.

**Data Analysis  */10 marks***

**A biology student observes that fern plants seem to grow best in the shade.**

In order to see how the **amount of sunlight** shining on ferns affects the **growth rate** of the ferns, the student set up an experiment. For this experiment the student obtained five of the same type of fern, and placed each one in a separate identical pot using the same type and amount of soil. The student then placed each fern plant under a sun lamp for varying amounts of time (see data table below).

When the student started the experiment she measured the heights of the plants (initial height) and entered the data in the table on the following page. She watered all the plants with an equal amount of water every day, and measured the height of the plants every day at the same time. The experiment continued for five days.

Here is the original data that the student collected:

**DATA TABLE: HEIGHT MEASUREMENTS OF FERN PLANTS FOR 5 DAYS**

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **# of hours under sunlamp** | **Initial height (cm)** | **Day 1 (cm)** | **Day 2 (cm)** | **Day 3 (cm)** | **Day 4 (cm)** | **Day 5 (cm)** | **Total growth**  **(cm)** |
| **1** | **10** | **11.3** | **12.8** | **14.2** | **15.8** | **16.2** | **6.2 cm** |
| **3** | **10** | **10.8** | **11.6** | **13.0** | **14.5** | **15.0** | **5.0 cm** |
| **6** | **10** | **10.5** | **11.0** | **11.6** | **12.2** | **13.2** | **3.2 cm** |
| **9** | **10** | **10.1** | **10.4** | **10.8** | **11.2** | **11.8** | **1.8 cm** |
| **12** | **10** | **10** | **10.1** | **10.3** | **10.3** | **10.5** | **0.5 cm** |

a) In this experiment, what is the manipulated variable? ***( /1 mark)***

b) In this experiment, what is the responding variable? ***( /1 mark)***

c) Based on the student’s original observation, write a properly formulated hypothesis for this experiment. Your hypothesis must be written in the “If…then…” format and include words that are measurable (increase and/or decrease). ***( /2 marks)***

d) Name the factors/variables that were controlled (kept constant) in this experiment.   
***(max. 4 marks) ( /4 marks)***

e) Why is it important to control (keep the same) all variables except for the manipulated variable? ***( /2 marks)***

**Calculations Related to the Microscope  */20 marks***

1**.** What is the total magnification when viewing a specimen through a 10x ocular lens and a medium power (10x) objective lens? *Show all steps for full marks*. ***( /2 marks)***

2. Perform the following conversions: ( /***2 marks)***

4.5 millimeters = ? micrometers

1800 micrometers = ? millimeters

3. A student observes a clear plastic, millimeter ruler under low power of her microscope.  She sees three divisions of the ruler.  What would be the field diameter of this microscope on low power? Give your answer in millimeters and micrometers? *Show all steps and include units for full marks.* ***( /2 marks)***

4. An organism is viewed under low power , and occupies approximately 1/4 of the field of view. The field diameter of this particular microscope under low power is 2000 µm. Calculate the actual size of the organism. *Hint: You may want to draw a picture of the field of view to assist you in answering this question*. *Show all steps and include units for full marks.* ***( /3 marks)***

5. A microscope's field diameter under high power is 400 micrometers.  An organism's actual size is 0.10 mm.  How many organisms can line up and completely cover the field diameter under high power? *Show all steps and include units for full marks.* ***( /3 marks)***

6. A 300 µm specimen is viewed under medium power. If the observer estimates that the specimen takes up 1/8 of the field of view, what is the diameter of the field of view under medium power? *Show all steps and include units for full marks.* ***( /3 marks)***

7. You calculate that under low power (40x) your compound microscope has a field of view of 4 mm.

a. If you switched to a higher power objective lens, would the field of view increase or decrease? Explain you answer ***( /2 marks)***

b. Given that the field diameter is 4mm under low power(40X), calculate the field diameter under high power (400x). Give your answer in both millimeters and micrometers.

*Show all steps and include units for full marks.* ***( /3 marks)***

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