**IB Biology Name \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Individual Investigation Lab Period \_\_\_\_\_ Date \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_**

**Directions:** You will be designing an independent experiment of your choice. While you could enlist another student to help you collect data (a lab assistant), all other parts of this lab must be completed as an individual. With the data you collect you will write a full lab report. Remember, your lab report should be at least 6 pages long, but not more than 12 pages (this does not include a bibliography page or example consent form, if used). That report will be used for internal assessment if you are a tester. Below you will find some ideas for areas of experimentation. You are not limited to these choices, but your focused question and procedure must be approved by your teacher before you begin. You will also find a list of sensors and probes available for use on the back of this handout.

**Some Possible Ideas:**

* Investigate the behavioral responses of brine shrimp to an environmental factor.
* Design an investigation on the effect of an abiotic factor on the rate of photosynthesis in plants.
* Investigate the effect of an environmental variable on the transpiration rate of a plant.
* Investigate the effect of a physical or chemical factor on variations in the heart rate of water fleas or annelid worms.
* Investigate a factor affecting either heart rate, blood pressure, breathing rate, CO2 production, skin temperature or rate of sweat production.
* Investigate a factor affecting fermentation rates of yeast.
* Design an investigation on variations in the fitness of individuals.
* Design an investigation on the **hypothetical** survival of caterpillars (using models made from wool, pasta or modeling clay).

**Timeline:**

Approved Focused Question due:

Pre-lab (background data chart) due:

Data Collection dates:

Final Full Lab report due:

**Approval Process:**

Teacher Student

Initials Initials

\_\_\_\_\_ \_\_\_\_\_ My MV: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

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**List of sensors and probes**

Lab Quest – interface for sensors and probes

Respiration Monitor belt

O2 gas sensor

Spirometer – measures air capacity of lungs

Hand dynamometer – pinch or hand strength (force)

Gas pressure sensor

Temperature probe

Light sensor

Conductivity probe – measures solution conductivity or ion concentration

Microphone

CO2 gas sensor

Motion detector

Colorimeter-measures the amount of light transmitted through a sample at a user-selectable wavelength

Force probe

Force plate

Dissolved O2 probe

Turbidity sensor- measure of the degree to which the water loses its transparency due to the presence of suspended particulates

Spectrophotometers – measures the amount of light of each wavelength (color) absorbed by a solution

pH probe

salinity sensor

To learn more about these tools, visit **www.vernier.com**