**Lesson 1:** External features and behaviours of Protista.

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| **SUBJECT:** Life Sciences  **Lesson Topic:** Protista (external) | Grade Level: 6  Length of lesson: 45 min |
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**Stage 1 – Link to Big Idea**

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| **Essential Question(s)**:  - How do microscopic organisms move and behave?  - How is their behaviour and appearance similar to plants and animals? How is it different?  **Gaining access to topic**: *What is it about this lesson topic that makes it important to know? What is emotionally engaging about this topic? What within the topic can evoke wonder/interest?*  - Discovering a completely new form of life that they have never seen before is amazing. Initial engagement can be fostered by providing examples of micro-organisms that do amazing things.  - Using art crossed with science to engage students in the topic. | | |
| **Stage 2 – Desired Results** | | |
| **Prescribed Learning Outcomes (PLOs):**  Analyse how different organisms adapt to their environments  Distinguish between life forms as single or multi-celled organisms and belonging to one of five kingdoms:  Plantae, Animalia, Monera, Protista, Fungi | | |
| **Enduring Comprehension(s)** *Students will come to understand:*  - Different micro-organisms require specific conditions to survive.  - There are many similarities between plants/animals and plant-like/animal-like Protista |  | |
| **Student Objectives (Specific Outcomes):** *Students will be able to:*  - Identify and describe the various mechanisms Protista use for movement  - Name some of the more well-known types of Protista | | |
| **Stage 3 – Assessment Evidence** | | |
| *How will I know the students have met the specific objectives?*   * **Formative - For/As Learning**:   + Students learn about important elements to include as they design a unique species of Protist. The teacher can look at misunderstandings reflected in the art project in order to determine what to focus on next. * **Summative - Of Learning**: *N/A* | |  | |

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| **Stage 4 – Learning Plan** | | |
| ***Preparation:*** | Follow instructions at end of this lesson plan for how to set up the Protista Design Activity. |  |
| ***Section*** | **Structure of Lesson** | **@ Time** |
| **I. HOOK**  *(to lesson topic)*  **II. MAIN**  **III. Closure**  *(to lesson topic)* | **Ask the class:**  Did you know there is a creature that can grow fins when it enters water and then un-grow them again? <http://www.ucmp.berkeley.edu/protista/basalprotists.html> (Amoeboflagellata)  Did you know there is a creature that harvests energy like a plant but can also move around and hunt other organisms? <http://www.fcps.edu/islandcreekes/ecology/euglena.htm> (Euglena)  Get students to discuss the possibility of these creatures and explore their ideas.  Explain that they are Microscopic organisms that behave similar to plants and animals but at a much smaller scale. Show various images of Protista on the projector.  **Ask:** questions to prime them into thinking about adaptations and behaviour:  If you were as small as a protist, how would you move? What would a microscopic “fin” look like? How far would you move in your life? What would you eat?  If you were as small as a protist, how would you handle changes in temperature?  **Optional:** Supplement hands-on activity with some group reading from a textbook or with explicit instruction of important info.    **Activity:**  Students will learn about the different external characteristics of Protista by visiting a variety of stations around the room.  The task is to design a unique Protist species based on different considerations including Movement, Environment, Temperature, and Energy/Food  Students will need to draw their Protist design using the components they chose from the various stations as a guide. The components have descriptions and illustrations to help them learn more about it.  CLEAN UP  **Ask:** Does anyone want to share their work so far?  Explain that there will be time to finish the design in art class or during next science class. | 8 min  1 min  10 min  20 min  + more time in later lessons.  4 min  2 min |

**Considerations/Adaptations/Extensions:**

*How will I meet the needs of various learners/offer differentiated learning activities and strategies?*

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| **Adaptations:** | **Extensions:** |
| Student doesn’t stay on task:  Pair with a hard working student and get them to collaborate on their designs.  Student Needs More Structure:  Explicitly say how many from each category they pick to design their protest or choose the elements for them and allow them to interpret to create their design.  Student has trouble with art:  They can represent their design as a short paragraph description or can even just express their understanding to the teacher directly. | Rather than designing just a protest they could design a microscopic ecosystem including non-living things such as minerals.  Additional research could be done to find out what different microscopic things look like.  If access to microscopes is readily available, a station could be just allowing students to observe things under the microscope. |

**Materials/Resources:**

*What materials and resources/resource people will I need to gather?*

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| **Materials:** | **Resource people:** | **Resources:** |
| * Art materials for creating the Protist design * Projector and computer. * Adaptation/Characteristic description sheets. * (Optional) Various supplementary materials to provide inspiration |  | Protists\_Lesson1\_SupportFiles.pdf |

**Protista Design Activity:**

Students will learn about the different external characteristics of Protista by visiting a variety of stations around the room. Their task is to design a unique Protist species based on different considerations:

* Movement
* Environment
* Temperature
* Energy/Food

**Set-Up:**

For each station, include objects or images that inspire students to think about those characteristics. For example, have some rocks or minerals and a light source in the station about energy sources. Have images of hot and cold areas for the temperature station. You can set this up simply with posters and illustrations or print images from the internet.

“Adaptation/Characteristic Description Sheets”: Each station also includes specific characteristic or adaptations and an explicit description of how they relate to protists. The first 2 pages of the lesson 1 support files show **movement** and **environment**.

When creating the artwork to represent their Protist design, students can use any medium they choose either digital or analogue art.

A final product is provided as an example on the last page of the lesson 1 support files. For the example the student used <http://weavesilk.com/> to produce the image then took a screenshot and added the description after inverting the colors.