WHAT A LIFE! NOVA AWARD FOR VENTURERS

Additional checkoff sheets and helps are available from ScouterMom.com.

This module is designed to encourage you to explore different facets of the biological life and living systems around you,including macrobiotic and microbiotic life, ecology, genetics,and advances in medicine.										
1.Choose A or B or C and complete ALL the requirements.										
1A.Watch not less than three hours total of shows or documentaries related to areas of biology: botany, zoology, genetics, medicine, ecology, veterinary medicine or microbiology. Then do the following:										
1A-1. Make a list of at least five questions or ideas from the show(s) you watched.										
1A-2. Discuss two of the questions or ideas with your counselor.										
1B. Read (not less than three hours total) about anything related to a biological topic and do the following:										
1B-1. Make a list of at least five questions or ideas from each article.										
1B-2. Discuss two of the questions or ideas with your counselor.										
1C. Combined Reading and watching activities (not less than three hours total),and do the following:										
1C-1. Make a list of at least five questions or ideas from each article or show.										
1C-2. Discuss two of the questions or ideas with your counselor.										
2. Choose ONE subject from the following list. Complete ALL the requirements from among the Venturing STEM exploration topics.If you have already completed a Venturing STEM exploration in one of these fields, please choose a different field for this award.Discuss with your counselor THREE salient points you learned from each activity.										
Animal Science										
Environmental science										
Fishing										
Fish and Wildlife Management										
Forestry										
Gardening										
Insect Study										
Mammal Study										
Medicine										
Nature										
Oceanography										
Plant Science										
Soil and water conservation										
Veterinary science										
Wildlife conservation										

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3.Be a biologist! Consider different areas of biological explorations presented below and pick TWO from A or B or C or D or E. Run the experiments or perform the activity and discuss your observations and conclusions with your counselor.Always be sure you have your parent's or guardian's permission before using the Internet.										
3A.Botanical Investigation: Effect of Light on Plant Growth										
3A-1. Experiment: Plant pea seeds in potting soil,and grow and water one set under normal sunlight,another set under fluorescent light,and a last set of potted peas in large boxes with only one quarter-size hole for sunlight. Predict what difference(s) you expect to see among the three conditions, and allow plants to germinate and grow for at least two weeks.Record specific observations about the height, leaf size, number of leaves, color,and stem diameter. Document your results with photos.Graph your quantitative results.										
3A-2. Discuss With your counselor:										
3A-2a. What was your hypothesis?										
3A-2b. Did your experimental results agree with your hypothesis?										
3A-2c. What factors contributed to the differences, if any, between your hypothesis and the actual experimental results?										
3A-3. Explain to your counselor possible reasons that support your experimental results. Then answer TWO of the following questions.										
3A-3a.How does sunlight affect the process of photosynthesis?										
3A-3b.How do different colors of light affect plant growth?										
3A-3c. What is the best color of light to grow a plant in?										
3a-3d. How can this knowledge be used to improve the quality and yield of food crops?										
3B. Microscopic Discovery: Life in a Drop of Pond Water										
3B-1. Experiment: Collect a pint of water from a local pond, creek, river or estuary, or any source of standing water. Observe a drop of the water under the microscope at 100x magnification, using a slide with a well depression. Draw what you see, and research the identity of the microorganisms you discovered in the sample.Divide your sample into three equal portions,and store them in jars with access to air (e.g.,punch some holes into the lid):										
3B-1a. To the first jar, add a pinch of rice flour or ground yeast. Predict what will change in one week										
3B-1b. To the second jar, add a teaspoon of household bleach. Predict what will change in one week.										
3B-1c. Keep the third jar as a control sample. Predict what will change in one week.										
3B-1d. At the end of the one-week incubation, take samples from each jar,and observe under the microscope what changes occurred.										
3B-2. Discuss with your counselor the following:										

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3B-2a. What was your original hypothesis?										
3B-2b. Did your experimental results agree with your hypothesis?										
3B-2c. What factors contributed to the differences, if any, between your hypothesis and the actual experimental results?										
3B-3. Discover:Explain to your counselor possible reasons that support your experimental results.Then answer TWO of the following questions. (With your parent's or guardian's permission, you may use the internet to find this information.)										
3B-3a. What did you learn about the changes in your micro-ecosystem,and how can you extrapolate what you learned to a larger ecosystem?										
3B-3b. Which methods are used to purify the water?										
3B-3c. Research how to make yeast bread, yogurt OR cheese (Choose ONE only).										
3B-3d. Prepare a sample of the food product to show to your counselor.										
3B-3e. Discuss with your counselor how microbes were utilized in production of this food.										
3C. Zoology and Veterinary Science: Puppy Chow										
3C-1. Experiment:Visit an animal feed store or research the internet for information on nutritional requirements for the different life stages—juvenile, adult,and senior adult—of ONE animal.										
3C-1a. Compare and contrast the nutrient content of feed for at least three major life stages of your selected animal subject.										
3C-1b.Volunteer at an animal center for at least eight hours. Gather practical information about diet components and feeding requirements of at least three animals representing the different life stages.										
3C-1c. Tabulate your data,and present it to your counselor.										
3C-2. Discuss with your counselor the following:										
3C-2a. Why each life stage requires a different balance of nutrients										
3C-2b. Why is overfeeding a nutrient, such as protein, not a good practice?										
3C-2c. Why do pets need at least an annual check-up?										
3C-3. Discover: Take a tour of a local veterinary clinic or animal shelter and interview a medical professional about what is involved in a routine pet check-up,including vaccinations, and why.										
3C-3a. Explain to your counselor what kind of education is required to be a veterinarian.										
3C-3b. What are other related career options in this field?										
3C-3c. Are there differences in routine check-ups of different pets										
3C-3d. What is the difference in the digestive system of ruminants?										
3D. Genetics: DNA Demystified										

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3D-1. Experiment: With permission of your parents or guardians, find a recipe on the internet to create your own DNA extraction kit using household materials,and use it to purify DNA from strawberries.										
3D-1a. Perform the DNA extraction, recording your materials and observations at each step.										
3D-1b. Present a report of your experiment to your counselor.										
3D-2. Discuss with your counselor the following										
3D-2:a.What is DNA, its composition and structure,and where is it found in a cell?										
3D-2b. What is the purpose of each of the components of your DNA extraction liquid?										
3D-2c. Why are strawberries a good choice for DNA extraction?What else could you use?										
3D-2d. Why do you think you are able to see the DNA without using a microscope										
3D-3. Explain to your counselor TWO of the following questions:										
3D-3a.What is the science of genetics?The fields of genetics and genomics offer dozens of career possibilities. Which are the three most interesting to you?										
3D-3b.What are some diseases or disabilities that result from genetic mutations or alterations in human DNA?What possible environmental factors cause genetic mutations in humans?										
3D-3c.Do you think that genomic medicine and personalized medicine will improve our health? Are there any ethical or moral issues that need to be considered as these technologies are developed?										
3E. Ecology										
3E-1. Study at least four diverse environmental areas near where you live. Plan and execute a field trip to each of these areas, with the permission of your parents and your counselor.										
3E-1a. Describe the reasons for selecting these areas, their boundaries,user groups, any outside forces that interact with them, and a list of what plants, animals,and other life you expect to find at each of them.										
3E-1b. Explain the basic natural systems, cycles, and changes that occur over time. Include the four basic elements(what are these?), land–use patterns, and at least six different species in your analysis and how they have changed over time. Discuss both biological and physical components.										
3E-1c. Under the guidance of a natural resources professional, carry out an investigation of an ecological subject approved by your counselor in one of the four identified environmental areas. Make sure to inventory and map the area, and to observe the living and nonliving parts of the ecosystem.										

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3E-2. Discuss with your counselor the following:										
3E-2a. How living things respond to changes in their environments.										
3E-2b. What are the environmental concerns for that area?Explain them using photographs, graphs,or available data.										
3E-2c. What project has been or could be done to improve the natural habitat threatened in that area?										
4. Discover: Research and discuss with your counselor THREE of the current environmental issues listed below and their effect on microbiotic and macrobiotic life.										
4a. Pollution										
4b. Global warming										
4c. Overpopulation										
4d. Natural resource depletion										
4e. Waste disposal										
4f. Climate change										
4g. Loss of biodiversity										
4h. Deforestation										
4i. Ocean acidification										
4j. Ozone layer depletion										
4k. Acid rain										
4l. Water pollution										
4m. Urban sprawl										
4n. Public health										
5. Discuss with your counselor how macrobiotic and microbiotic life affects your everyday life										
Completed										
Presented										