



Mendel's Minions

Scouts BSA Nova Award Workbook



This workbook can help you but you still need to read the Boy Scout Nova Awards Guidebook. This Workbook can help you organize your thoughts as you prepare to meet with your counselor. You still must satisfy your counselor that you can demonstrate each skill and have learned the information. You should use the work space provided for each requirement to keep track of which requirements have been completed, and to make notes for discussing the item with your counselor, not for providing full and complete answers. If a requirement says that you must take an action using words such as "discuss", "show", "tell", "explain", "demonstrate", "identify", etc, that is what you must do.

Counselors may not require the use of this or any similar workbooks.

No one may add or subtract from the official requirements found in the Scouts BSA Nova Awards Guidebook (Pub. 34033 – SKU 614936). The requirements were issued in 2019 • This workbook was updated in March 2019.

Scout's Name: _____ Unit: _____

Counselor's Name: _____ Counselor's Phone No.: _____



<http://www.USScouts.Org> • <http://www.MeritBadge.Org>

Please submit errors, omissions, comments or suggestions about this **workbook** to: Workbooks@USScouts.Org
Send comments or suggestions for changes to the **requirements** for the **Nova Award** to: Program.Content@Scouting.Org

This module is designed to help you explore how genetic information affects your life every day. It is part of the Science category

1. Choose A or B or C and complete ALL the requirements.

- A. Watch not less than three hours total of shows or documentaries that discuss genetics and/or genomics.

What was watched?	Date	Start Time	Duration

Then do the following:

1. Make a list of at least five questions or ideas from the show(s) you watched.

1.	
2.	
3.	
4.	
5.	

Workbook © Copyright 2019 - U.S. Scouting Service Project, Inc. - All Rights Reserved
Requirements © Copyright, Boy Scouts of America (Used with permission.)

This workbook may be reproduced and used locally by Scouts and Scouters for purposes consistent with the programs of the Boy Scouts of America (BSA), the World Organization of the Scout Movement (WOSM) or other Scouting and Guiding Organizations. However it may NOT be used or reproduced for electronic redistribution or for commercial or other non-Scouting purposes without the express permission of the U. S. Scouting Service Project, Inc. (USSSP).

- 2. Discuss two of the questions or ideas with your counselor.

1.	
2.	

Some examples include—but are not limited to—shows found on PBS (NOVA: "Cracking the Code"), Discovery Channel, Science Channel, National Geographic Channel, and TED Talks (online videos). You may choose to watch a live performance or movie developed by a local museum or state or federal agency. You may watch online productions with your counselor's approval and under your parent's supervision.

- B. Read (not less than three hours total) about genetics or genomics.

What was read?	Date	Start Time	Duration

Then do the following:

- 1. Make a list of at least five questions or ideas from each article.

1.	
2.	
3.	
4.	
5.	

- 2. Discuss two of the questions or ideas with your counselor.

1.	
2.	

Examples of magazines include—but are not limited to—Odyssey, Popular Science, Science Illustrated, Natural History, Scientific American, Nature Conservancy, Sage, and Smithsonian. Books might include The Immortal Life of Henrietta Lacks or The Gene: An Intimate History.

- C. Do a combination of reading and watching (not less than three hours total).

What was watched or read?	Date	Start Time	Duration

Then do the following:

- 1. Make a list of at least two questions or ideas from each article or show.

1.	
2.	

- 2. Discuss two of the questions or ideas with your counselor.

1.	
2.	

- 2. Complete one merit badge from the following list. (Choose one that you have not already used toward another Nova Award.) After completion, discuss with your counselor the genetic component of the merit badge you selected.

- | | | |
|----------------|--------------|-----------------------------|
| Animal Science | Insect Study | Public Health |
| Bird Study | Mammal Study | Reptile and Amphibian Study |
| Forestry | Medicine | Veterinary Medicine |
| Gardening | Nature | |

- 3. Complete two of the following activities:
 - A. Teach the basics of genetic inheritance to your patrol (or similar group), using gummy bear genetics or a similar method.
 - B. Helpful Link—Making Mendel's Model Manageable: www.nsta.org/publications/news/story.aspx?id=51651
 - C. Extract DNA from saliva, strawberries, or a banana.
 - D. Grow at least three generations of pea plants and explain the inheritance patterns. Helpful Link: <http://science.lovetoknow.com/life-sciences/gregor-mendels-pea-plant-experiment>
 - E. Create a three-dimensional model of DNA and explain how it leads to the production of proteins.
- 4. Present a report of at least 800 words or 10 minutes (with visual aids) on one of the following topics. Make sure to include the ethical issues involved in your topic. If possible, present our report to your unit or another group in addition to presenting to your counselor.
 - A. Mendelian inheritance, DNA, RNA, genetics, genomics, sequencing, and Punnett squares
 - B. Genetic diseases, personalized medicine, and genetic counseling

Mendel's Minions

Scout's Name: _____

- C. Genetically modified food, transgenic animals, and hybrid foods
 - D. Use of large genetics databases for forensic analysis/solving crimes, genealogical research, or medical studies (The Cancer Genome Atlas (TCGA), Catalogue of Somatic Mutations in Cancer (COSMIC), Exome Aggregation Consortium (ExAC), 100,000 Genomes Project, mitochondrial DNA, etc.)
 - E. Pharmacogenetics and oncogenomics
 - F. Human Genome Project
 - G. CRISPR (Clustered Regularly-Interspaced Short Palindromic Repeats)
 - H. Biotechnology, biologics, and biosimilar drugs
 - I. Another related topic approved by your counselor in advance
5. Visit a place where genetic and genomic information is being used, e.g., a biotechnology company or research lab, genetic counselor, a physician's office, crime lab, zoo, natural history museum, farm, hatchery, nursery/greenhouse, etc. Discuss the work done there with one (or more) of the employees. Find out how they are using genetic information, how it has changed their work, and what they look forward to in the future.

6. Discuss with your counselor how genetics and genomics affect your everyday life and how you think it will affect your life in the future.

When working on Nova and Supernova awards, Scouts and Scouters should be aware of some vital information in the current edition of the *Guide to Advancement* (BSA publication 33088). Important excerpts from that publication can be downloaded from <http://usscouts.org/advance/docs/GTA-Excerpts-nova.pdf>. You can download a complete copy of the *Guide to Advancement* from <http://www.scouting.org/filestore/pdf/33088.pdf>.