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Please submit errors, omissions, comments or suggestions about this **workbook** to: [**Workbooks@USScouts.Org**](mailto:Workbooks@usscouts.org?subject=Merit%20Badge%20Workbooks)

Send comments or suggestions for changes to the **requirements** for the **Nova Award** to: [**Program.Content@Scouting.Org**](mailto:program.content@scouting.org@scouting.org)

**This module is designed to help you explore how symmetry affects your life each day.**

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

⬜ A. Watch an episode or episodes (about one hour total) of a show that involves symmetry, mirrors, or artistic patterns

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| What was watched? | Date | Start Time | Duration |
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Then do the following:

⬜ 1. Make a list of at least two questions or ideas from what you watched.

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

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⬜ B. Read (about one hour total) about anything that involves symmetry, mirrors, or artistic patterns.

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Then do the following:

⬜ 1. Make a list of at least two questions or ideas from what you read.

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

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⬜ C Do a combination of reading and watching (about one hour total) about about anything that involves symmetry, mirrors, or artistic patterns.

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| What was watched or read? | Date | Start Time | | Duration | |
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Then do the following:

⬜ 1. Make a list of at least two questions or ideas from what you read and watched.

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

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2. Complete ONE adventure from the following list or complete option A or B. (If you choose an adventure, choose one you have not previously earned.)

Wolf Cub Scouts Bear Cub Scouts Webelos Scouts

⬜ Air of the Wolf ⬜ Forensics ⬜ Art Explosion

⬜ Code of the Wolf ⬜ Marble Madness ⬜ Build It

⬜ Motor Away ⬜ Maestro!

⬜ Option A: Complete all of the following:

⬜ a. Explain the difference between the symmetry of the flower of a geranium and the symmetry of the flower of herbaceous periwinkle.

⬜ b. Explain the difference in leaf arrangement (the pattern of where leaves appear on the stem) between a maple tree and a sweetgum tree.

⬜ c. Find another pair of plants that you can distinguish based on some difference in symmetry.

⬜ Option B: Complete both of the following.

⬜ a. Using toothpicks and colored marsh mallows, or other appropriate materials, make a model of the crystal structure of olivine,.

⬜ b. Using toothpicks and colored marsh mallows, or other appropriate materials, make a model of the crystal structure of halite.

⬜ c. Use your models to guess which of the two minerals is harder

Discuss with your counselor what kind of science, technology, engineering, and math was used in the adventure.

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⬜ 3. Choose TWO options from A or B or C or D or E and complete ALL the requirements for the options you choose..

⬜ A. Make a paper lantern.

⬜ 1. Fold a large piece of paper in quarters lengthwise.

⬜ 2. Cut decorative or symbolic shapes into the two folded edges.

⬜ 3. Unfold, tape the two edges of the paper together, and smooth into a cylinder. Hang by a string..

⬜ B. Learn about the kolam artwork of southern India..

⬜ 1. Look at some pictures of kolams. Find as many similarities as possible within each kolam. Is there a repeated pattern? If you turn it a little, do you get the same picture? If you look at it in a mirror, do you get the same picture?

⬜ 2. Use sand, chalk dust, flour, or some other material to make a kolam of your own.

⬜ C. Learn about the litema wall decorations from Lesotho and South Africa.

⬜ 1. Look at some pictures of litema. What does one basic tile look like? In how many ways can you see that tile arranged (turned a different direction, flipped backward, etc)

⬜ 2. Use clay. paper, or some other material to make a litema of your own.

⬜ D. Learn about the design of Navajo rugs.

⬜ 1. Look at some pictures of Navajo rugs. Find as many similarities as possible within each rug. Is there a repeated pattern? Is there a mirror image? How many?

⬜ 2. Using different colors of paper, or other materials, make your own Navajo-like rug.

⬜ E. Learn about Seminole or Miccosukee patchwork designs.

⬜ 1. Look at some pictures of Seminole or Miccosukee patchwork. Find as many similarities as possible within each piece. What does a basic block of each pattern look like? How many different basic blocks are used in the design?

⬜ 2. Using different colors of paper, or other materials, make your own Seminole-like patchwork.

⬜ 4. Visit a place where symmetry is important (such as an art exhibit, building site, or printer) or visit with a person who works with symmetry (such as an artist, interior designer, or landscape architect).

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⬜ Discuss with your counselor the symmetry or ideas of balance involved...

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⬜ 5. Discuss with your counselor how symmetry impacts your everyday life.

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**The Tyger**

**By William Blake**

**Tyger Tyger, burning bright,**

**In the forests of the night;**

**What immortal hand or eye,**

**Could frame thy fearful symmetry?**

**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**](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**](http://www.scouting.org/filestore/pdf/33088.pdf)**.**