

OurCS: Augmented Reality Visualizations of IoT

DAY 2: Writing a Manual

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OurCS Event at Indiana University

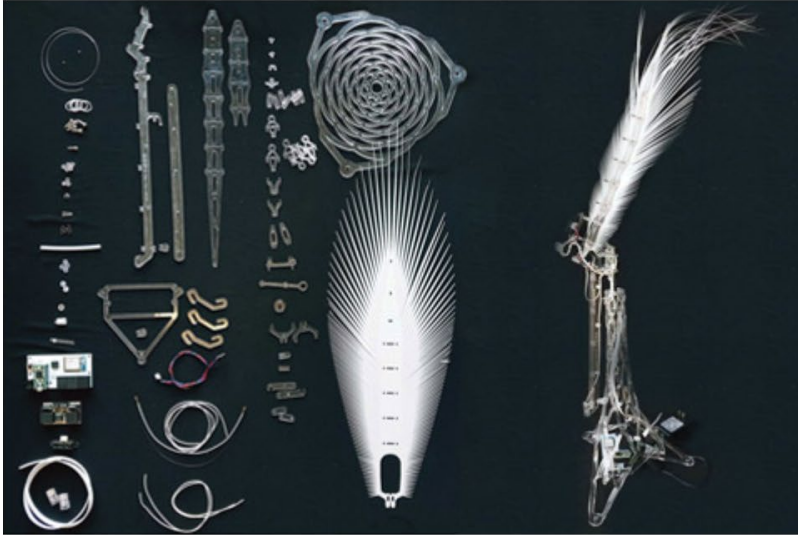
Oct 26-28, 2018



OurCS Goes Moth

Day	Time	Activity	Location	Who	Needed
Fri Oct 26	11a-12.30p	Self-introductions Intro to Sentient Architecture (Katy), Amatria tour (Andreas), Dendrite Moth Field Array, show videos Q&A	VIS/Fab Lab	Katy, Mike, Andreas	<ul style="list-style-type: none"> - 15 handouts of Dendrite instructions - 15 handouts of Moth instructions - Printouts of Amatria schematics and plans
	2.15-3.30p	Moth building part 1, build base for electronics	VIS/Fab Lab	Mike	15 kits, spargate, crazy long screwdriver
	4-5.45p	Moth building p2, extruding, assemble frond + actuators	VIS/Fab Lab	Mike	
Sat Oct 27	9-10.30a	Intro to laser-cutting, also cut Chevrons	VIS/Fab	Mike	Cut for 30(?) more Moths? How many laser-cutters do we have? Precut elements? Minimize waiting times
	11-12.30p	Manual writing, figure out what to capture in what way	VIS/Fab Lab	Katy	Camera setup for this.
	3.15-3.30p	Group picture!		Andreas	
	4-6p	Manual writing, p. 2 Kit construction, impacted by	VIS/Fab Lab	Mike	

Amatria Dendrite



Amatria Dendrites, on display in the Luddy Hall Visualization Lab (room 4012), are pieces of living architecture. Each comprises one light sensor (the eye) and actuators such as lights and a strand of shape memory alloy that makes the sculpture move. Software controls the sensor and actuators. Dendrite fields were built in the 2017 ISE Summer camp. See below for events and activities where you can build or view dendrites.

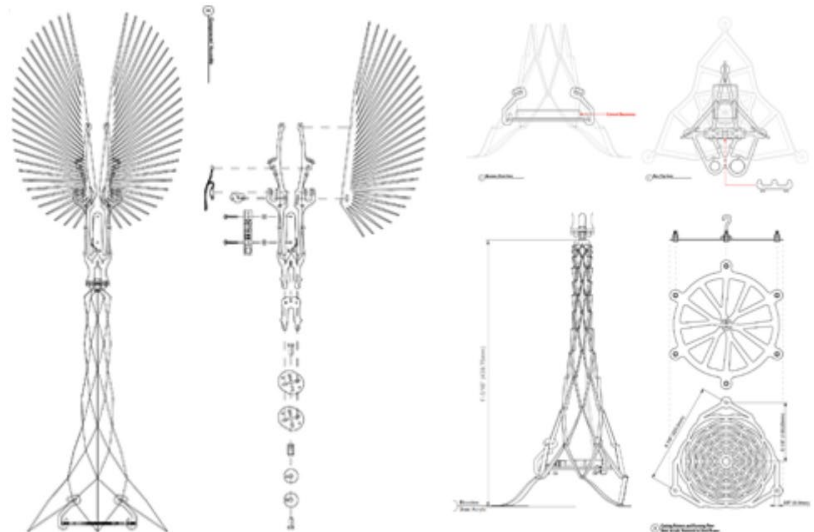
Resources: [Amatria Dendrite Manual](#) | [Code on GitHub](#)

Amatria Moth

Amatria Moths, on display in the Luddy Hall Visualization Lab (room 4012), are the newest generation of *Amatria*-related architectural elements. For a limited time you can purchase a moth kit and build one yourself. Kits are \$25 and can be ordered at go.iu.edu/moth. See below for additional events and activities where you can build or view moths.

Resources: [Amatria Moth Manual](#)

<https://cns.iu.edu/amatria.html>



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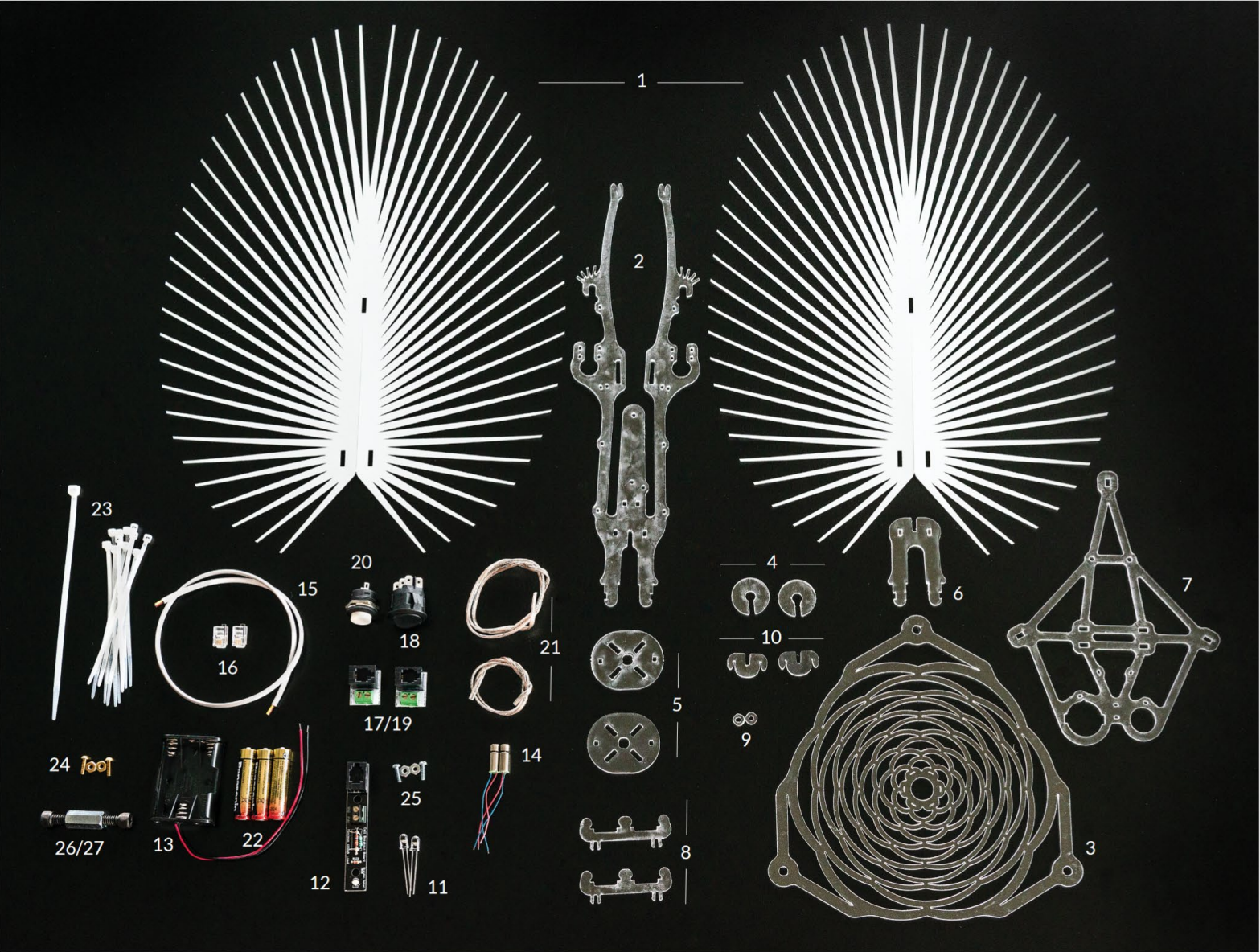
Notes

Legend

- 1. Frond (2)
- 2. Moth sled (1)
- 3. Spar (1)
- 4. Moth sled fastening (2)
- 5. Moth sled fastening plate (2)
- 6. Moth sled holder (1)
- 7. Electronics sled (1)
- 8. Electronics sled fastener (2)
- 9. Acrylic washer (2)
- 10. Frond fastener (2)
- 11. LED lightbulb (2)
- 12. Jack plate (1)
- 13. Battery pack (1)
- 14. DC motor (2)
- 15. Flat 4P short cable (47cm) (1)
- 16. Modular plug end (2)
- 17. Moth breakout board (2)
- 18. DPDT switch (2)
- 19. 4P4C jack (2)
- 20. Momentary button (1)
- 21. 24AWG speaker wire (2)
- 22. AAA battery (3)
- 23. Zipties (12 sm, 1 lg)
- 24. Screw & washers for battery pack (2 ea)
- 25. Screw & washer for moth sled (2 ea)
- 26. Large plastic screw (2)
- 27. Metal sleeve for large plastic screw (1)

Project
Amatria Moth

Title
Amatria Moth Parts



Reproducibility is the Hallmark of Science

Ten Simple Rules for Reproducible Computational Research

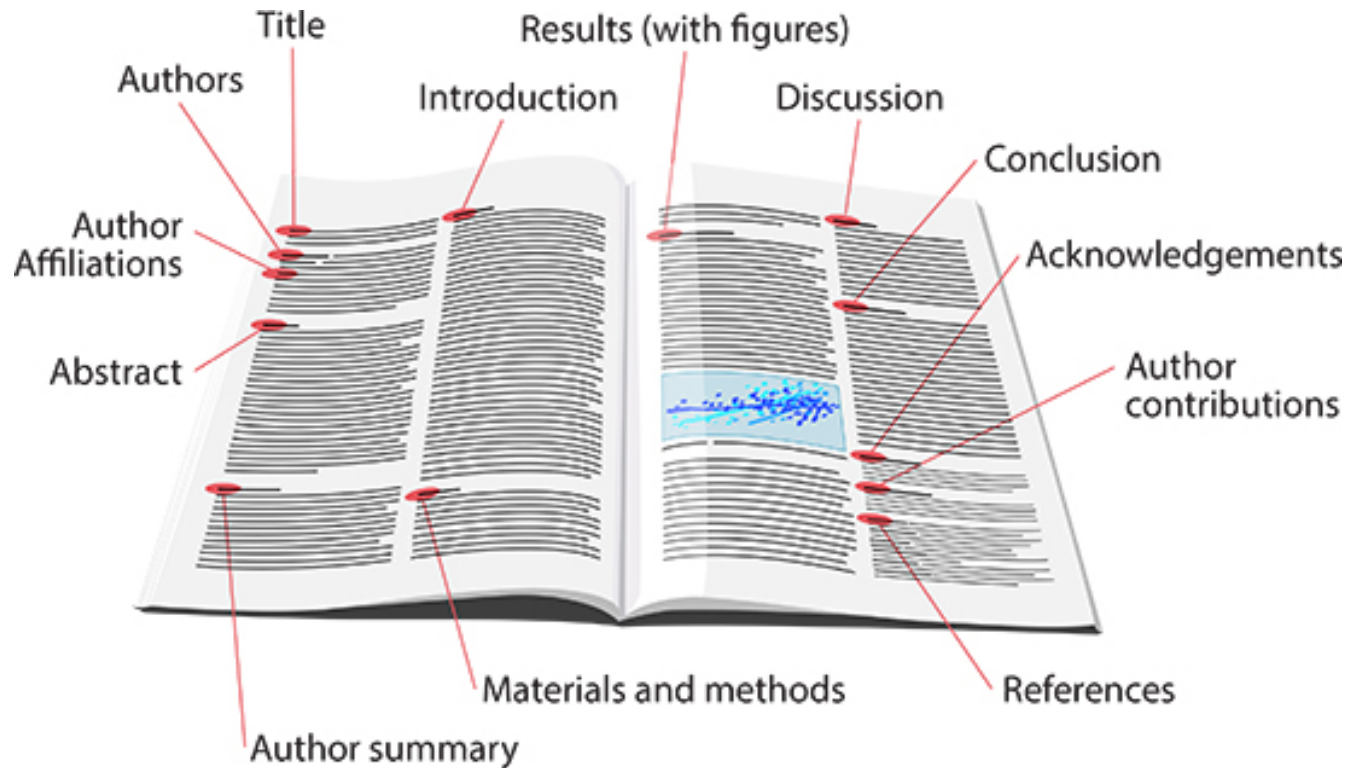
- Rule 1: For Every Result, Keep Track of How It Was Produced
- Rule 2: Avoid Manual Data Manipulation Steps
- Rule 3: Archive the Exact Versions of All External Programs Used
- Rule 4: Version Control All Custom Scripts
- Rule 5: Record All Intermediate Results, When Possible in Standardized Formats
- Rule 6: For Analyses That Include Randomness, Note Underlying Random Seeds
- Rule 7: Always Store Raw Data behind Plots
- Rule 8: Generate Hierarchical Analysis Output, Allowing Layers of Increasing Detail to Be Inspected
- Rule 9: Connect Textual Statements to Underlying Results
- Rule 10: Provide Public Access to Scripts, Runs, and Results

Sandve GK, Nekrutenko A, Taylor J, Hovig E (2013)

<https://journals.plos.org/ploscompbiol/article?id=10.1371/journal.pcbi.1003285>

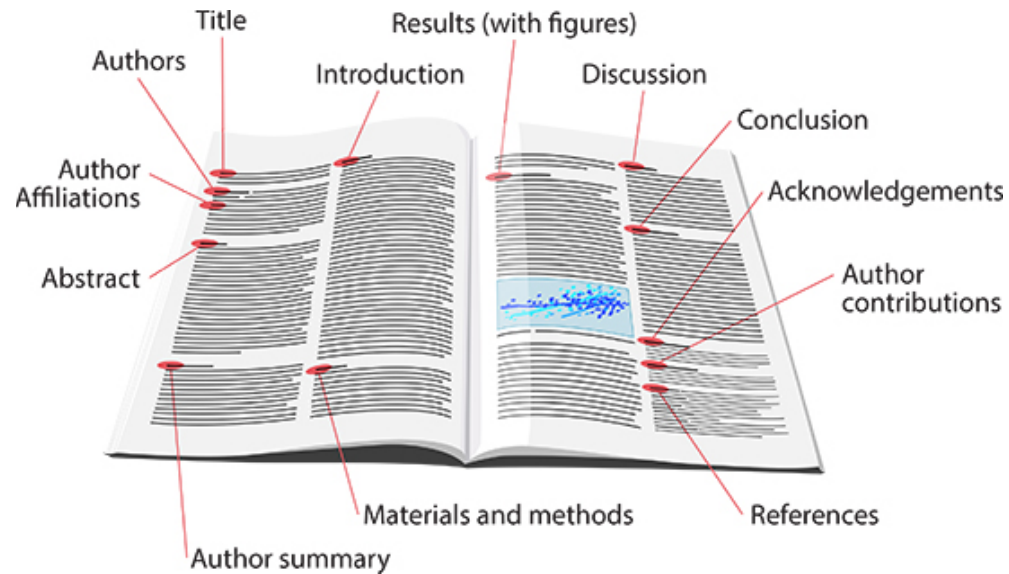
Writing a Paper vs. Writing a Manual

Anatomy of a Research Paper



<https://askbiologist.asu.edu/explore/anatomy-of-an-article>

Writing a Manual



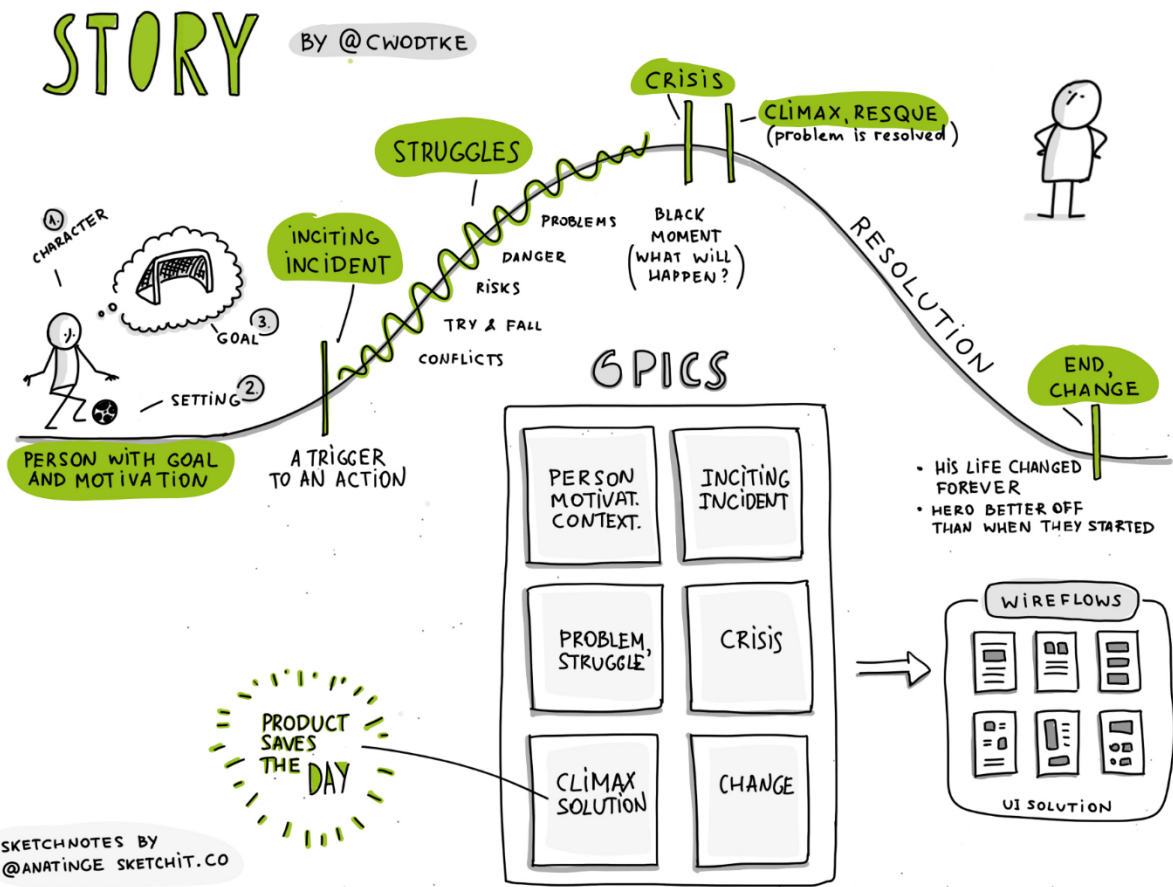
Must define

- Audience: High school students
- Delivery Format: Online

Should include

- Title containing “Amatria Moth”
- Author names
- Brief introduction, feel free to use text from <https://cns.iu.edu/amatria.html>
- Parts and tools
- Instructions for major assembly steps, tips and tricks, common mistakes
- Trouble shooting
- Acknowledgements
- Author contributions, e.g., photographer, copy-editor
- References, e.g., <https://cns.iu.edu/amatria.html>

Story Boarding



Story Parts + challenges!!

1. Receive Kit – EXCITEMENT!!! + make sure all parts are there!!
2. Build Electronics Sled + solder!!
3. Connect Electronics Sled to Spar + zip ties!!
4. Connect Moth Sled to Spar – crazy screw driver, way too crazy ...
5. Assemble Moth Sled + heat shrink tubing!!
6. Turn it on + WORKS= EXTASY or Does NOT work – what now?

- Daisy chain
- Explore IoT data
- Make your own kit



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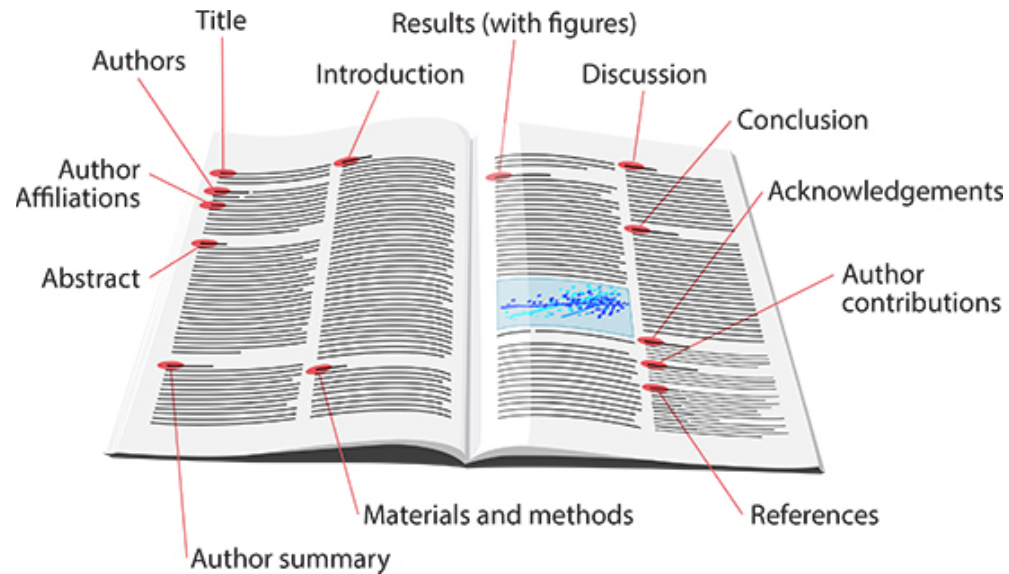
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Divide and Conquer

Let's Make 5 Teams:

- Photographers—light, composition, purpose
- Story Tellers—Also Title, Author names, Intro, FAQ, etc.
- Content Developers
 1. Build Electronics Sled + solder, Connect Electronics Sled to Spar + zip ties
 2. Assemble Moth Sled + heat shrink tubing
- Testers/Editors/Printers—assemble all parts into one ppt, also prepare group presentation on Sun.