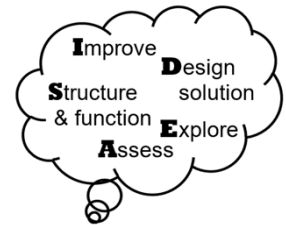


**NAU**  
**NORTHERN**  
**ARIZONA**  
**UNIVERSITY**



**STEM CHALLENGE**

## Better Than Bought Helicopter Prop



Engineer: \_\_\_\_\_

Additional Engineering Team Member(s)  
 \_\_\_\_\_

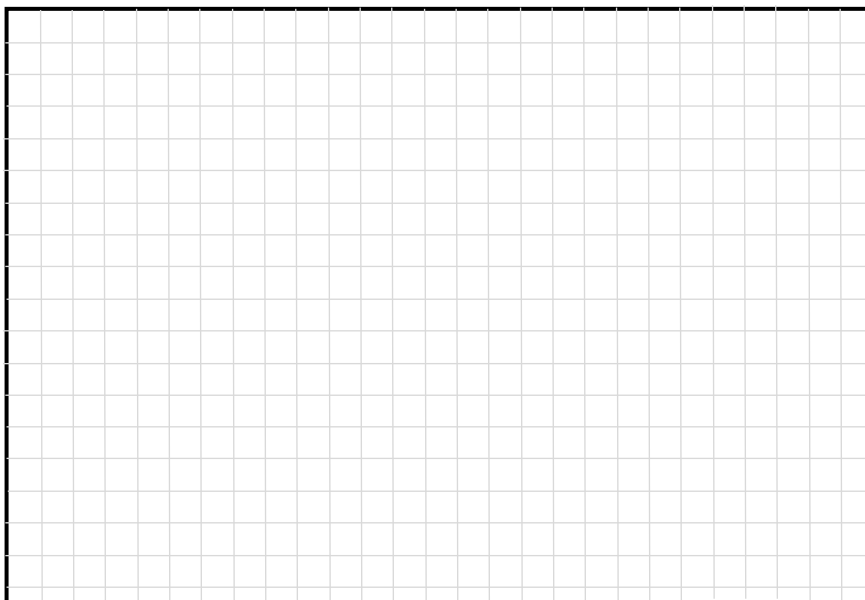


Designed by DaNel Hogan and Sherrie Dennis  
 with special thanks to Slater Harrison – the SciencetoyMaker  
 More STEMAZing Sciencing and Engineering Journals,  
 like this one, can be found here:  
<https://stemazing.org/stemazing-sciencing-and-engineering-journals/>



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## Original Purchased Propeller Design



## Peak Performance for Rubber Band

Record trials of various rubber bands under various conditions to determine which one gets the best performance out of the helicopter.

**Best performance = highest height**

Width	Length	# of Revs
Notes		
Width	Length	# of Revs
Notes		

## Engineering Never Ends!

If you were going to keep making your propeller prototype better, what modifications would you make next and why? \_\_\_\_\_

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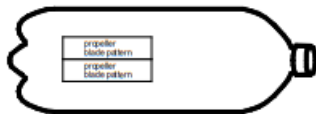
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propeller blade pattern 19 mm X 70 mm (3/4" X 2 3/4")
propeller blade pattern 19 mm X 70 mm (3/4" X 2 3/4")



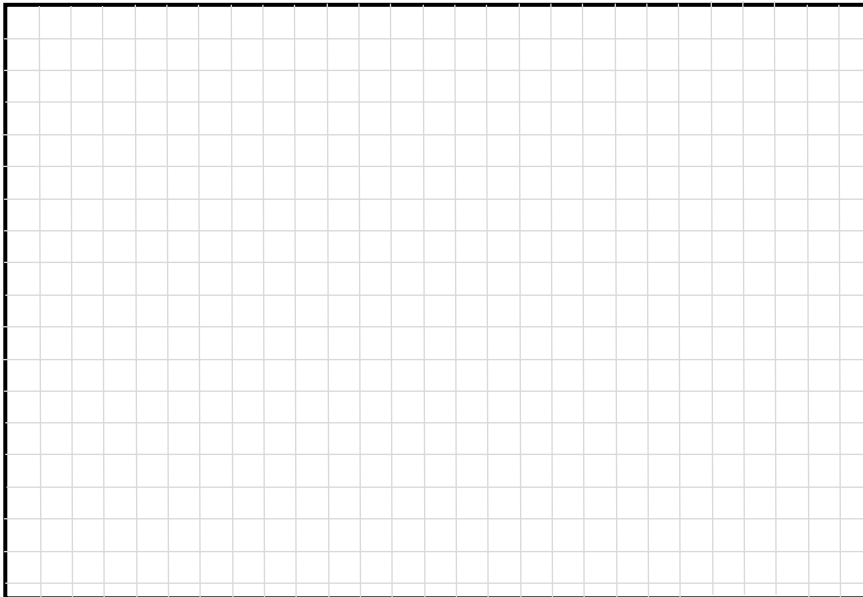
propeller patterns go on 2 liter bottle the long way

Width	Length	# of Revs
Notes		
Width	Length	# of Revs
Notes		
Width	Length	# of Revs
Notes		
Width	Length	# of Revs
Notes		
Width	Length	# of Revs
Notes		
Width	Length	# of Revs
Notes		

**Prediction:** Which propeller do you think will perform the best, reach the highest height, when twisted up the same number of revolutions?

**Manufactured Prop** or **#STEMonththeCheap Prop**

### #STEMonththeCheap Propeller Design



Was #STEMonththeCheap propeller **Design 1** better than **purchased propeller?** (circle one) **YES** **NO**

Explain evidence to support your claim above.

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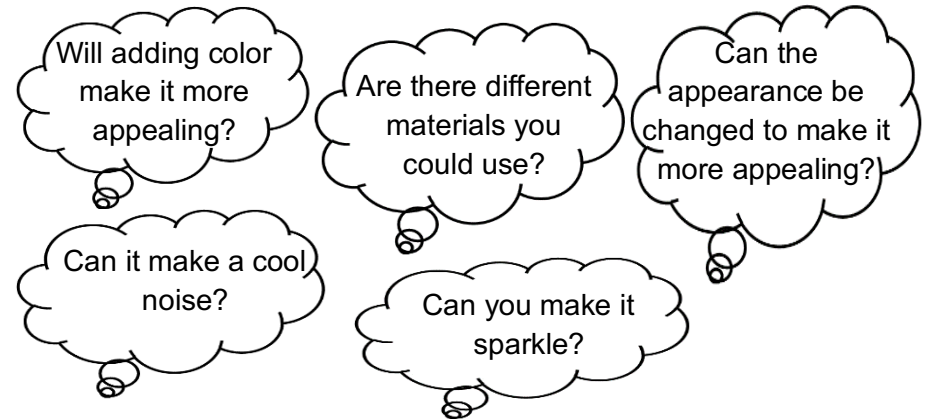
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## **IDEAS** for Form Modifications



Using the questions above, explain modifications you could make to your helicopter design to make it look fancy and fun!

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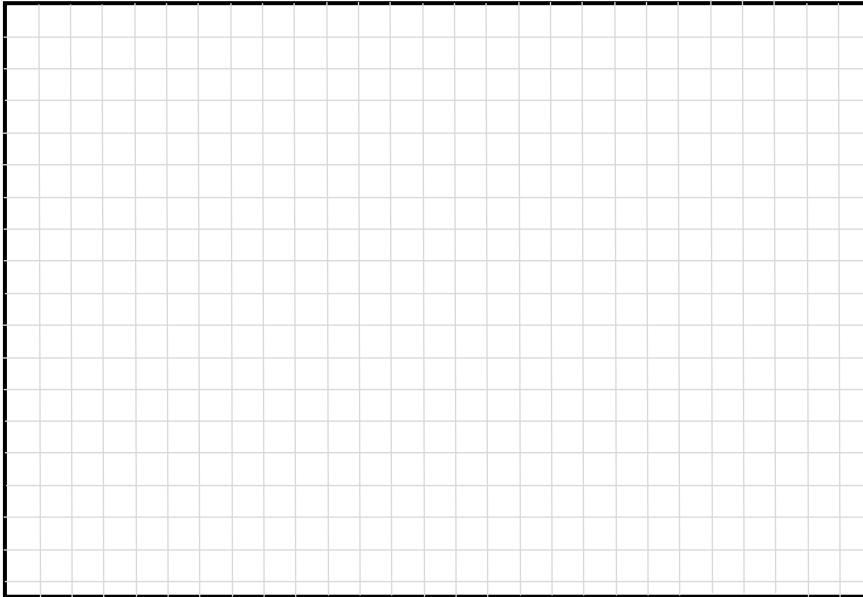
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## #STEMontheCheap Best Propeller Design



Why do you think this propeller design produced better results than the other designs you tested? \_\_\_\_\_

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How did you work as a team to develop your best propeller design? \_\_\_\_\_

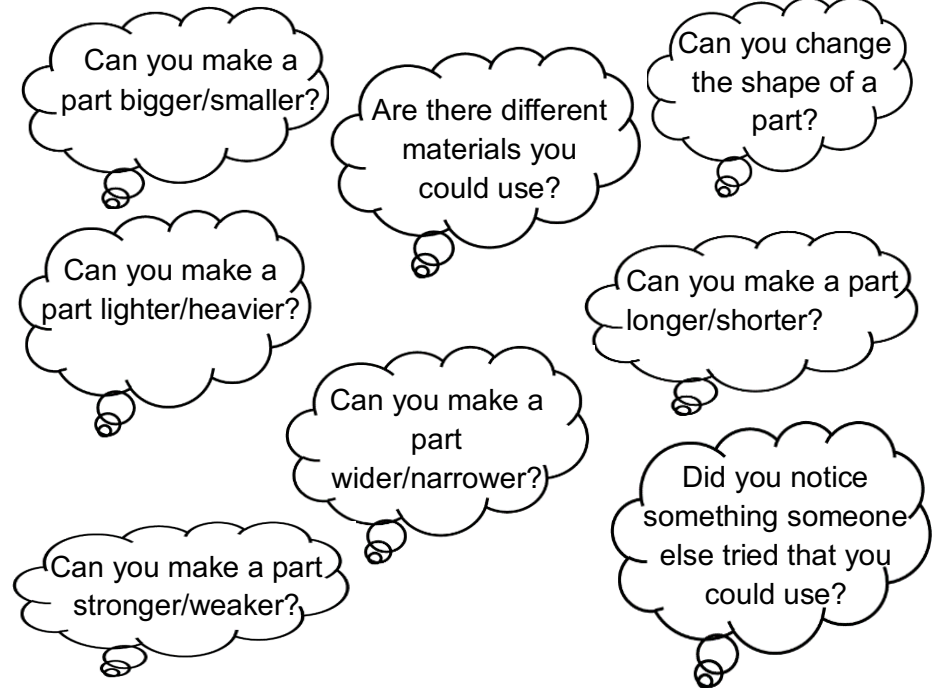
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## **IDEAS** for Function Modifications



What modification did you make to #STEMontheCheap propeller **Design 2**? \_\_\_\_\_

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Was #STEMontheCheap propeller **Design 2** better than **purchased propeller**? (circle one) **YES** **NO**

Explain evidence to support your claim above.

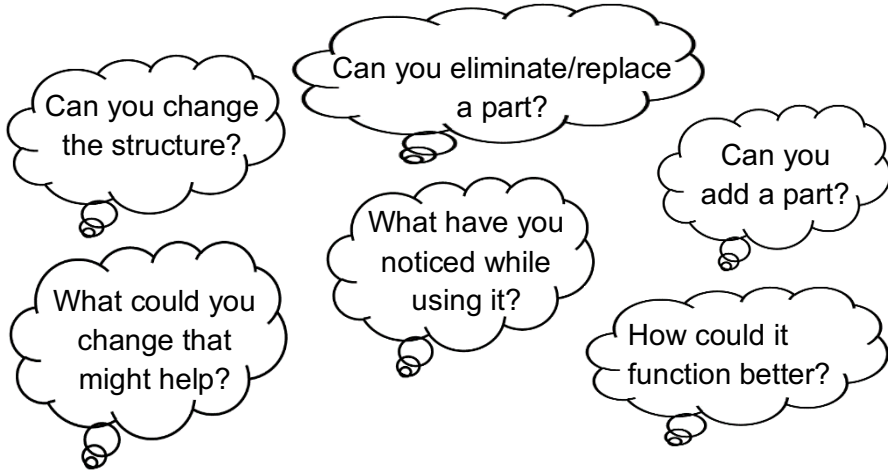
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# IDEAS for Function Modifications



What modification did you make to #STEMontheCheap propeller **Design 3**? \_\_\_\_\_

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Was #STEMontheCheap propeller **Design 3** better than **purchased propeller**? (circle one) **YES** **NO**

Explain evidence to support your claim above.

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What modification did you make to #STEMontheCheap propeller **Design 4**? \_\_\_\_\_

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Was #STEMontheCheap propeller **Design 4** better than **purchased propeller**? (circle one) **YES** **NO**

Explain evidence to support your claim above.

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What modification did you make to #STEMontheCheap propeller **Design 5**? \_\_\_\_\_

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Was #STEMontheCheap propeller **Design 5** better than **purchased propeller**? (circle one) **YES** **NO**

Explain evidence to support your claim above.

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