Climate Engineering Teaching Module

Lesson 3 – Climate Engineering Design

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Objective

Select and Revise your Climate Engineering Technology

Climate Engineering: Marine Cloud Brightening

https://www.youtube.com/watch?v=cgJyw2cTrW4

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Features

- Utilizes environmental systems (clouds and seawater)
- Works to reduce global warming by brightening clouds in order to reflect incoming solar radiation
- A relatively inexpensive technology that can be scaled from local- to global-scale

Review

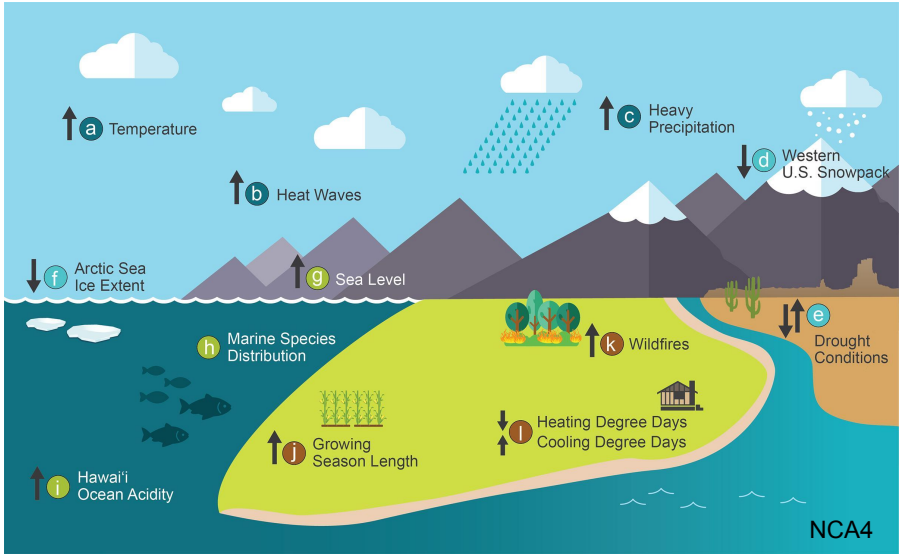
Limitations:

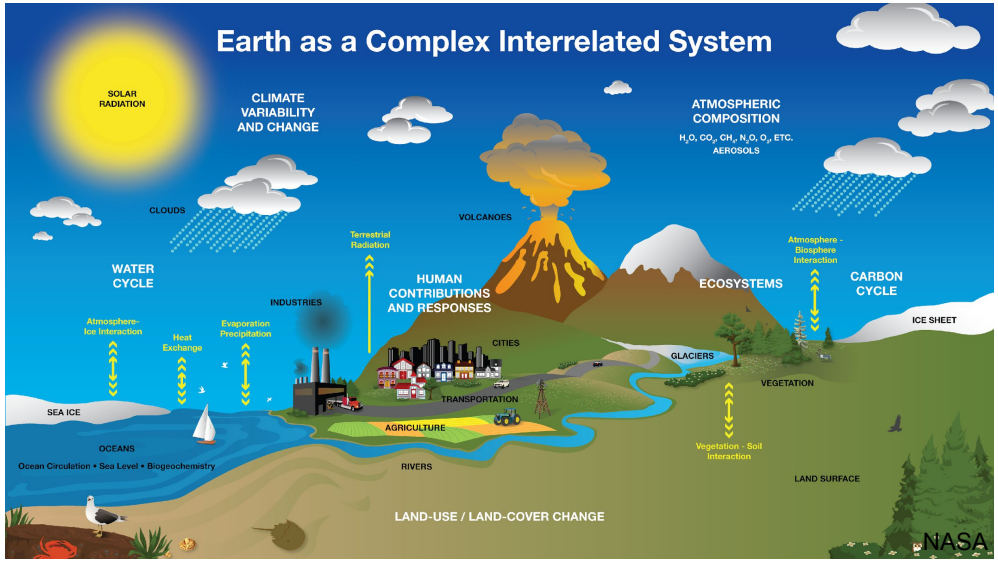
- Cost
- Preferred ocean environment (low clouds, low background aerosols, far from land)
- Will greatly benefit from global cooperation and support
- Does not address increasing atmospheric greenhouse gases nor ocean acidification

Risks:

- Regional to global changes in precipitation amounts and patterns
- Regional changes to atmospheric and oceanic chemistry
- Impacts on biology and ecosystems
- Potential for rapid change if abruptly terminated

Revisit your three climate engineering designs.





How well do your designs modify environmental systems in order to slow global warming and/or climate change?

Use the Decision Matrix to help decide which of your designs to further develop. Can you combine features from multiple designs to better meet the criteria? Provide feedback to your group members.

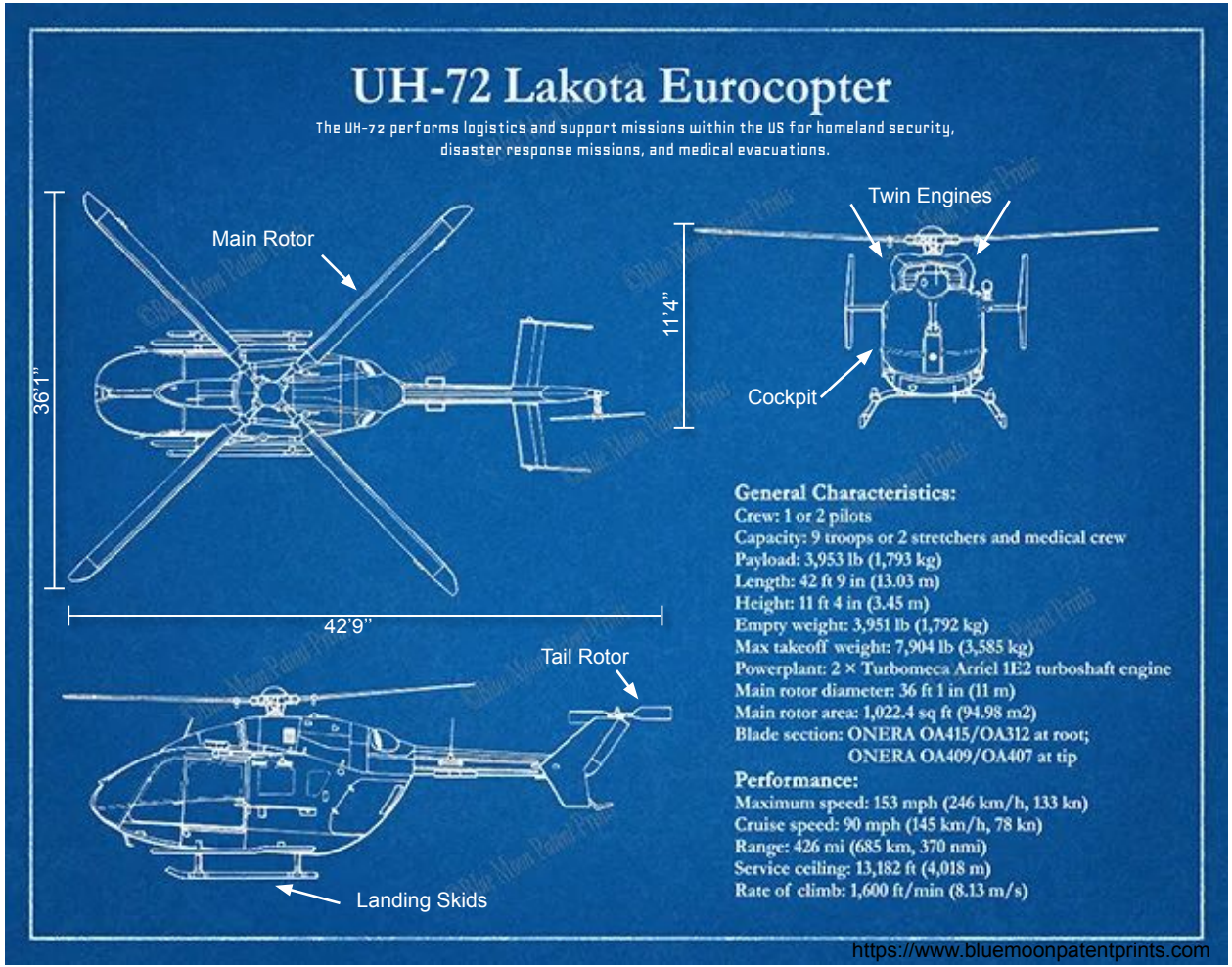
Criteria to Consider when Selecting and Revising your Designs	Score 1-5
How well does your design slow global warming and/or climate change? (1 - not well, 5 - very well)	
Does your technology modify or work with an environmental system? (1 - does not, 5 - perfect match)	
What is the cost of your technology (consider materials, resources, and upkeep)? (1 - high cost, 5 - low cost)	
Does your design scale well (can you test your technology on a small-scale, then expand to large-scale deployment)? (1 - not well, 5 - very well)	
Rate the amount of unintended negative consequences of deploying your technology? (1 - many, 5 - few)	
Is your design unique? (1 – other students have similar designs, 5 – it's one-of-a-kind!)	
Total (max 30 points)	

Objective

Create an Engineering Blueprint

Final Product

Create an Engineering Blueprint

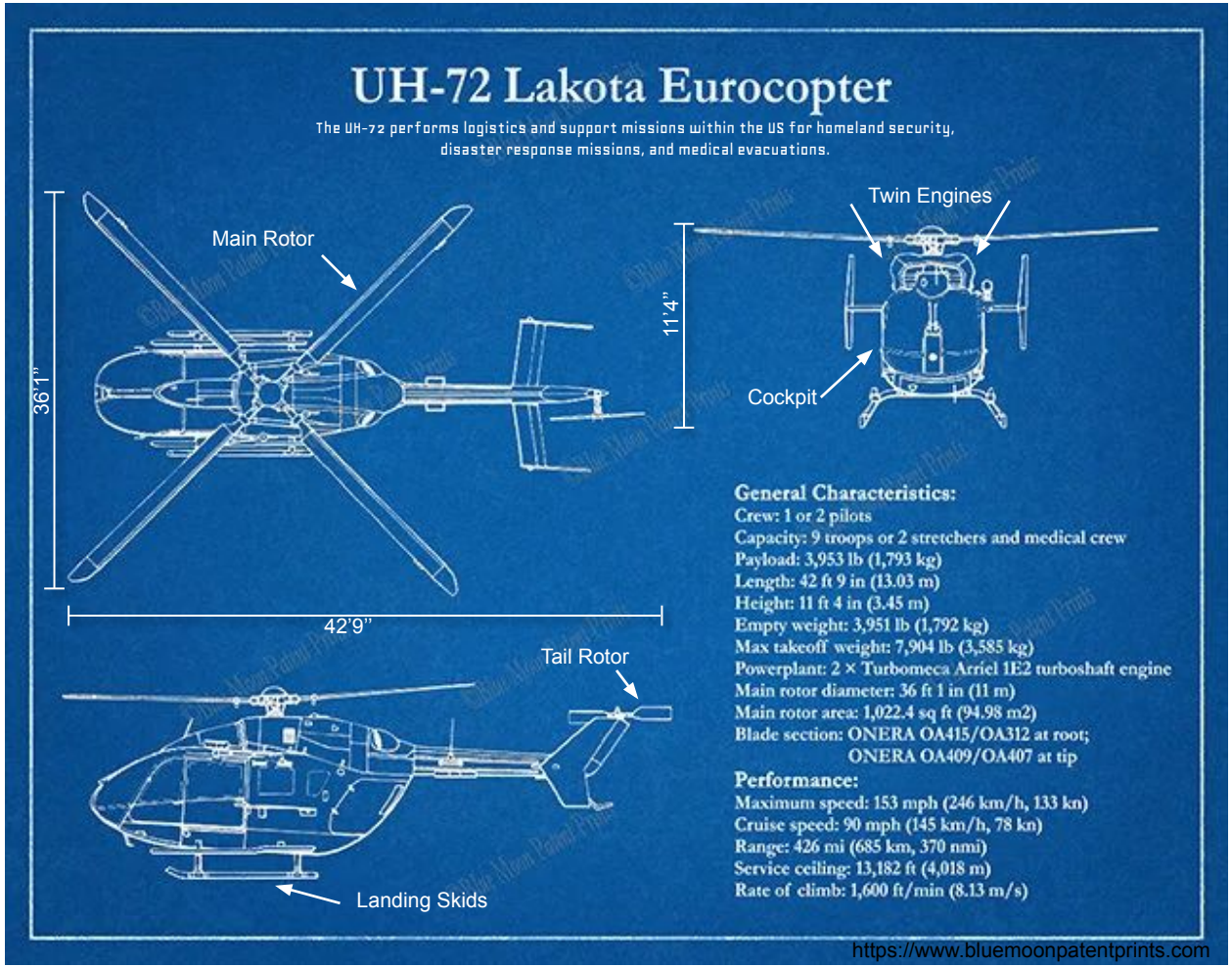


Final Product

Create an Engineering Blueprint

Checklist

- ☑ Title
- ☑ A descriptive subtitle
- ☑ Drawings from at least two perspectives
- ☑ Label & a Table of features
- ☑ Label & a Table of the size
- ☑ Meets all criteria



Prepare for Lesson 4

This lesson develops the students' engineering blueprints to meet specific criteria and considerations.

In the next lesson we will conduct a Model U.N. to debate the deployment of Climate Engineering

Questions/Comments/Thoughts/Ideas welcome!

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