Name_____ Period _____ Date _____

Dronopter

STEM Sims

Lesson 5: The Optimal Dronopter Design

Building the ideal dronopter requires choosing the best structure and motors for the job. The arrangement of the propellers is also a crucial part of the design. (Note that some spin clockwise and some spin counterclockwise.) You need a balanced design that accounts for weight and power.

Doing the Science

1. Start the Dronopter Simulation by clicking on the "Sim" tab.
2. To design your dronopter, click and drag one of the structures to the center of the table. Mark with an X in Table 1 which structure material you chose.
3. Drag a propeller to each corner of the body. Mark the number of each motor you used for your dronopter.
4. Click the "Test" button.
5. On the next screen, drag the red circular joystick handle to control the thrust. Attempt to navigate through the path without touching any edges or the stone in the center of the screen.
6. If your design does not work, click the "Build" button to return to the first screen and continue to experiment with different combinations of structures and motors. (You may need more trials than the table fits.)

Table 1.

	Structures				Motors						Did it work? (Y/N)
Trials	**Steel**	**Composite**	**Aluminum**	**Balsa Wood**	**80/8/CW**	**80/8/CCW**	**50/6/CW**	**50/6/CCW**	**45/4/CW**	**45/4/CCW**	
1	**X**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**-**	**4**	**N**

Do You Understand?

1. Which materials worked best in your test? Which materials did not work at all?

2. What is the ideal arrangement of propellers?