Name_____ Period _____ Date _____

Dronopter

STEM Sims

Lesson 1: Finding the Best Frame

To build the best dronopter, you must have a strong but light frame. The frame must firmly hold the motors in place. If the frame is too heavy, the dronopter may not be able to lift off the ground. Can you find out which frame or frames let the dronopter fly?

Here are some definitions to help you in your investigation.

Dronopter - a quadcopter drone

Force - a push or pull on something

Gravity - a downward pull on things due to Earth's mass

Lift - an upward force that allows flight

Doing the Science

1. Start the Dronopter Simulation by clicking on the "Sim" tab.

2. To design your dronopter, click and drag the Balsa frame to the center of the table.

3. Select and drag the top left motor labeled 80/8/CW to a corner of the frame.

4. Repeat step 3 until all four corners of the frame have a motor attached.

5. Click the "Test" button.

6. On the next screen, drag the red circular joystick handle to control the thrust. Note and record in Table 1 whether the dronopter lifted off the ground or not.

7. Select the "Build" button to return to the first screen.

8. Repeat steps 2–7 until all four frame materials have been tested.

Table 1.

Frame Material Tested	Flight Results
Balsa	
Composite	
Aluminum	
Steel	

Do You Understand?

1. Why do you think the dronopter is called a quadcopter?

2. Which frame material(s) allowed the dronopter to fly?

3. Which frame material(s) did not let the dronopter leave the launch pad?

4. What quality of the frame let the dronopter fly or not fly?

5. What part of the dronopter supplied the lift?

6. What force did the dronopter have to overcome to lift off the launch pad?