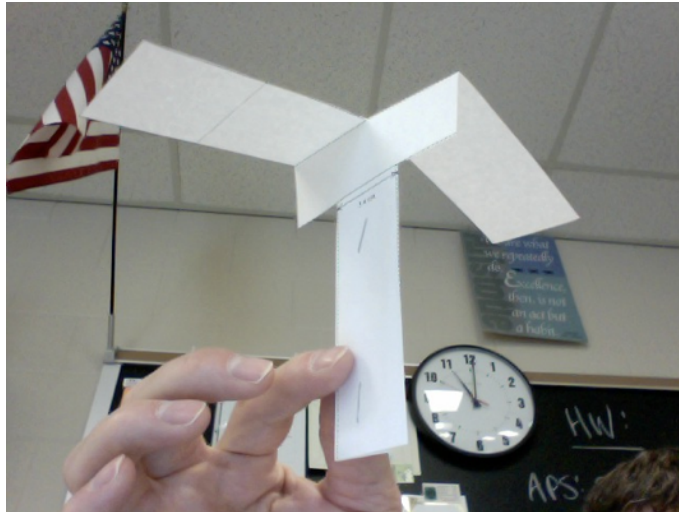


Paper Helicopter Experiment

Name: _____

1. Make a paper helicopter according to the directions and the photo below. You will need scissors, two staples, and a template from which to cut out the helicopter.



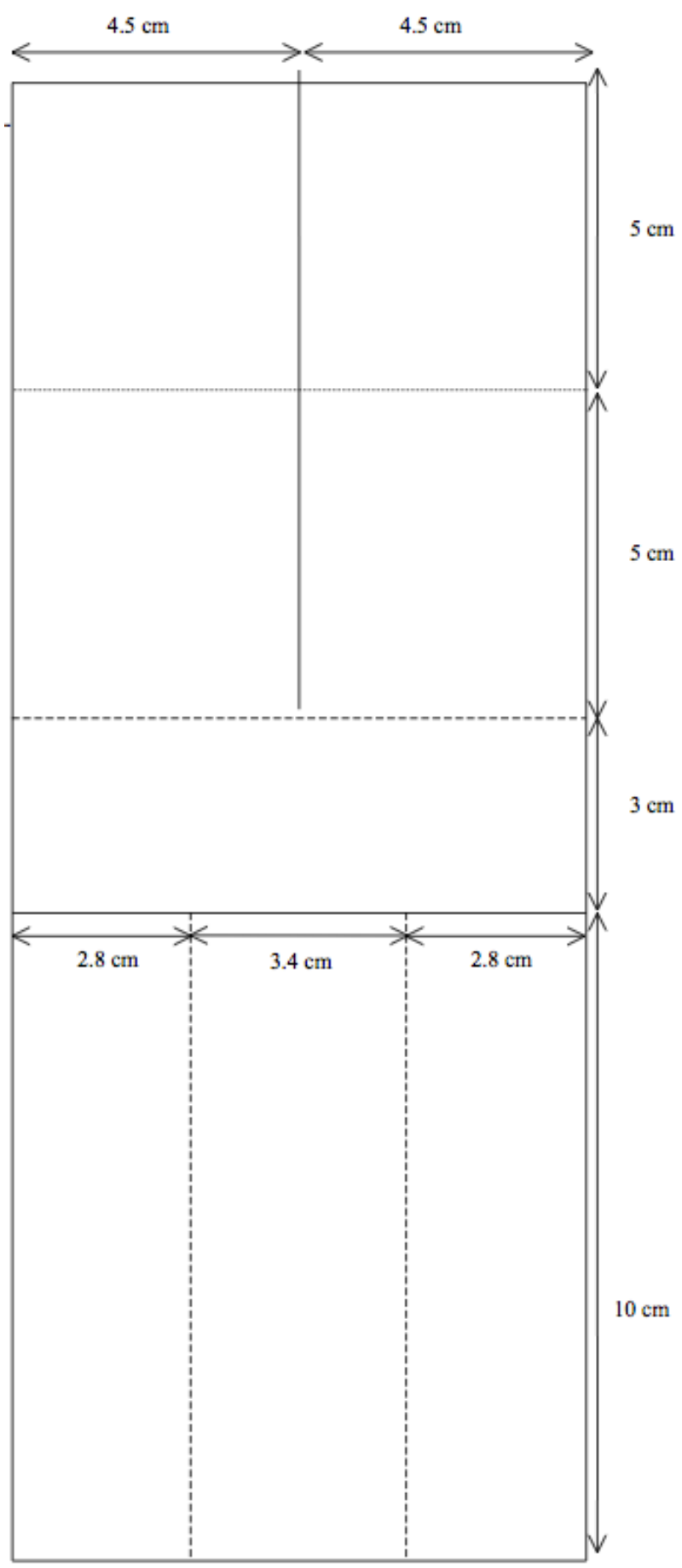
| Type | Height | Distance from target | Mean | SD |
|-------------|----------|----------------------|------|----|
| Long rotor | (Low) | | | |
| Short rotor | (Low) | | | |
| Long rotor | (Medium) | | | |
| Short rotor | (Medium) | | | |
| Long rotor | (High) | | | |
| Short rotor | (High) | | | |

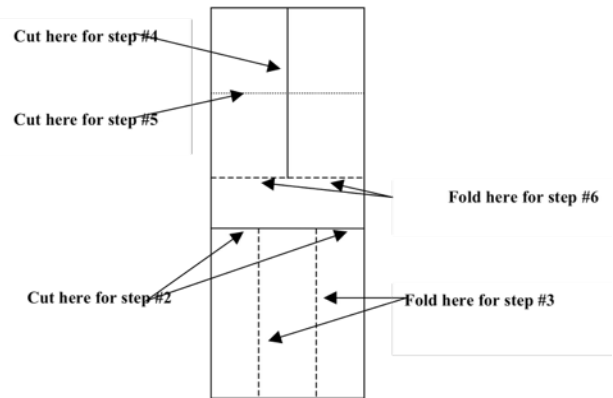
2. Using three different heights (low, medium and high—you choose the distances) and two different helicopters (short rotor and long rotor), launch helicopters and measure how far they land from a target point on the floor. Conduct four launches at each position for each type of helicopter. This will give you 24 total launches. Collect the data in the table below, and answer the questions on the next page.

(Long rotor helicopter pictured above.)

Helicopter Activity Questions

1. The distances you recorded were not all exactly the same—there was a lot of variation. What were some of the sources (causes) of this variation?
2. These sources of variation can be categorized into three broad types. What are they?
3. How could you have “accounted for” the two “non-expected” general sources of variation?
4. What are the factors in the experiment?
5. What are the levels of each factor?
6. How many total treatments did you have? _____
7. Name at least three possible sources of bias in this experiment (be sure to remember the definition of bias).





1. Cut out the rectangular shape of the helicopter on the solid lines.
2. Cut one-third of the way in from each side of the helicopter to the vertical dashed lines on the solid line.
3. Fold both sides toward the center creating the base. The base can be stapled at the top and bottom. Try to be consistent about where the staples are placed. Use a paper clip to add some weight to the body.
4. For long-rotor helicopters, cut down from the top along the solid center line to the horizontal dashed line.
5. For short-rotor helicopters, proceed as in step 4, but cut the rotors off along the horizontal line marked.
6. Fold the rotors in opposite directions.