### INTRO. TO ROTOCOPTER

<table>
<thead>
<tr>
<th>SCIENTIFIC METHOD</th>
<th>ROTOCOPTER</th>
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<tbody>
<tr>
<td>1. Ask a Question</td>
<td>What factors affect the rate at which a rotocopter falls?</td>
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<tr>
<td>2. Background Research</td>
<td>Read text, do internet search.</td>
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<td>3. Hypothesis</td>
<td>Longer wings will make the rotocopter fall slower.</td>
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<td>4. Experiment</td>
<td>Plan/conduct an experiment of 3 trials with wings of different lengths to determine if wing length is a factor. All other factors are kept constant.</td>
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<td>5. Collect Data/Observations</td>
<td>Observe/record the time it takes for rotocopters to fall to the ground from a fixed distance. Generate data table and graph.</td>
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<td>6. Draw Conclusions/Analyze</td>
<td>Examine all the data and decide if your hypothesis about longer wings was correct.</td>
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<td>7. Repeat/Revise Experiment</td>
<td>To be valid, the exp’t must be able to be repeated. It also might need to be changed.</td>
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**Variables:**

The word **variable** basically means something can change or vary. There are 3 main variables used in science.

**Independent Variable**
- what the investigator decides to do in the experiment
- ie. change the mass of the rotocopter

**Dependent Variable**
- the outcome of the experiment
- ie. how the rotocopter is affected by a change in mass

**Controlled Variable(s)**
- conditions kept constant so as to not influence the outcome
- ie. length of wings, shape of wings, height of drop, etc.
**ROTOCOPTER LAB**

**Experiment:**
- Build and decorate a rotocopter and perform 3 trials (time to fall to the ground)
- Change one variable and perform another 3 trials
- Change a different variable and do 3 more trials

**Poster (use computer, attach to poster):**
- Attach rotocopter
- Create a data table to record all trials and averages with title, units, and data
- Create a bar graph with title, axes names and units “Avg. Time to Fall (y) vs. Indep. Variable (x)” (3 bars, 1 for each rotocopter)
- Write a few paragraphs about your experiment and discuss:
  - your initial hypothesis (for both changed variables)
  - how the 3 scientific variables were represented in your experiment
  - results and how they relate to your hypothesis
  - possible sources of error (at least 3) and how they could be reduced