ENGINEERING AN ROV

TEAM PACKET

go.wisc.edu/ROVe

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ENGINEERING AN ROV

All work must be completed in pencil and each step must be checked and initialed by your teacher or peer before you can proceed to the next step.

TEAM MEMBERS

1. _____________________________________________________________ (SELF)
2. _____________________________________________________________
3. _____________________________________________________________
4. _____________________________________________________________
**STEP ONE DEFINE THE PROBLEM**
What do you want to find out? Identify your problem in the form of a question.

How can I design a ROV that will

__________________________________________________________________________

__________________________________________________________________________

__________________________________________________________________________

**STEP TWO IDENTIFY DESIGN REQUIREMENTS**
Specify the design requirements (criteria). This would include size and availability of resources.

Additional criteria to include
1. Battery must be in hand and act as your on/off switch
2. Must travel backwards and forwards
3. Coat hangers may not be cut, altered or glued

As a group, determine what you want the ROV to accomplish

Depth ________________________________________________________________________

Travel Distance ________________________________________________________________________

Length of ROV ________________________________________________________________________

Width of ROV ________________________________________________________________________

ROV Kit Materials

☐ motor with propeller and wire

☐ 9V snap battery

☐ One meter of duct tape

☐ 5 popsicle sticks

☐ One coat hanger (large)

☐ 2 bobbers

☐ 2 meters of kite string

☐ 15 washers

☐ 25 centimeters of insulation foam

☐ 10 Paper clips

☐ 3 items from home per group

ROVe TEAM PACKET
**STEP THREE BRAINSTORM AND SKETCH POSSIBLE SOLUTIONS**

Work on your own for **15-20 minutes** to make two quick sketches of your own ideas. Each design idea should be given a name, and **labels/arrows** should be included to identify parts and how they might move.
**STEP FOUR ANALYZE THE PROS AND CONS OF EACH SOLUTION**

The group will discuss the ideas that were developed during the brainstorm session. Team members should record the pros and cons of each design idea developed in step 3.

Name of Design
_____________________________________________________________________________

<table>
<thead>
<tr>
<th>PROS</th>
<th>CONS</th>
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<tbody>
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**STEP FIVE SELECT A DESIGN AND DRAW**

Work with your team and identify the design features that appear to solve the problem the best. The best solution may be a combination of designs. Write a statement that describes why you choose that solution.

This design is the most suitable because

_____________________________________________________________________________________________

_____________________________________________________________________________________________

_____________________________________________________________________________________________

_____________________________________________________________________________________________

_____________________________________________________________________________________________

Determine a scale for your final drawing and create two detailed scale drawings of your final design plan. Create drawings that are (orthographic: multiple views showing the top, front and one side). These drawings are to be drawn neatly, using rulers to draw straight lines and the parts should be proportional. Parts and measurements should be labeled clearly.

SCALE: _______________________________
☐ **STEP SIX BUILD A PROTOTYPE**
Construct a full-size design based on your drawings.

☐ **STEP SEVEN TEST IT AND REFINE YOUR DESIGN**
Evaluate your design after testing it in the pool. Based on your design requirements, teams must identify problems and propose solutions.

Changes made to design after testing and why they were necessary:

1. __________________________________________________________
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2. __________________________________________________________
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4. __________________________________________________________
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5. __________________________________________________________
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EVALUATION
Summarize your test results (i.e., list what was satisfactory in your design)
__________________________________________________________________________________________________
__________________________________________________________________________________________________
__________________________________________________________________________________________________
__________________________________________________________________________________________________
__________________________________________________________________________________________________
__________________________________________________________________________________________________
__________________________________________________________________________________________________

What did your group struggle with? List what did not work well or was unsatisfactory in your design?
__________________________________________________________________________________________________
__________________________________________________________________________________________________
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If you were going to continue to work on this, what would you change or improve?
__________________________________________________________________________________________________
__________________________________________________________________________________________________
__________________________________________________________________________________________________
__________________________________________________________________________________________________
__________________________________________________________________________________________________
__________________________________________________________________________________________________
__________________________________________________________________________________________________
# RUBRIC TEAM PROJECT: ENGINEERING AN ROV

**Student name:**

<table>
<thead>
<tr>
<th>The Packet</th>
<th>ROV Design Drawing</th>
<th>Design Revisions</th>
<th>Function</th>
<th>Team Collaboration</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>Packet is 100% complete and shows student went beyond general expectations.</td>
<td>Technical drawing is neat with clear measurements and labeling for all components.</td>
<td>Three or more design revisions were made with reasons for the change.</td>
<td>Structure functions extra ordinarily well, and meets all design requirements.</td>
</tr>
<tr>
<td>3</td>
<td>Packet is 100% complete and shows students met the expectations.</td>
<td>Technical drawing is neat with clear measurements and labeling for most components.</td>
<td>Two design revisions were made with reasons for the change.</td>
<td>Structure functions well, holding up and meets most of the design requirements.</td>
</tr>
<tr>
<td>2</td>
<td>Packet is approximately 75% OR student did not meet expectations.</td>
<td>Technical drawing provides clear measurements and labeling for most components.</td>
<td>One design revision was made with reasons for the change. OR, design revisions were made without reasons.</td>
<td>Structure functions pretty well, but only meets few design requirements.</td>
</tr>
<tr>
<td>1</td>
<td>Packet is incomplete and student did not meet expectations.</td>
<td>Technical drawing does not show measurements clearly or is otherwise inadequately labeled.</td>
<td>No revisions were made.</td>
<td>Fatal flaws in function and does not meet design requirements.</td>
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