ROVe pack

ENGINEERING AN ROV

TEAM PACKET

go.wisc.edu/ROVe

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

☐ 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.

Name of ROV design

Name of ROV design

☐ 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 _____

PROS	CONS

Name of Design _____

PROS	CONS

☐ 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_____

_____

_____

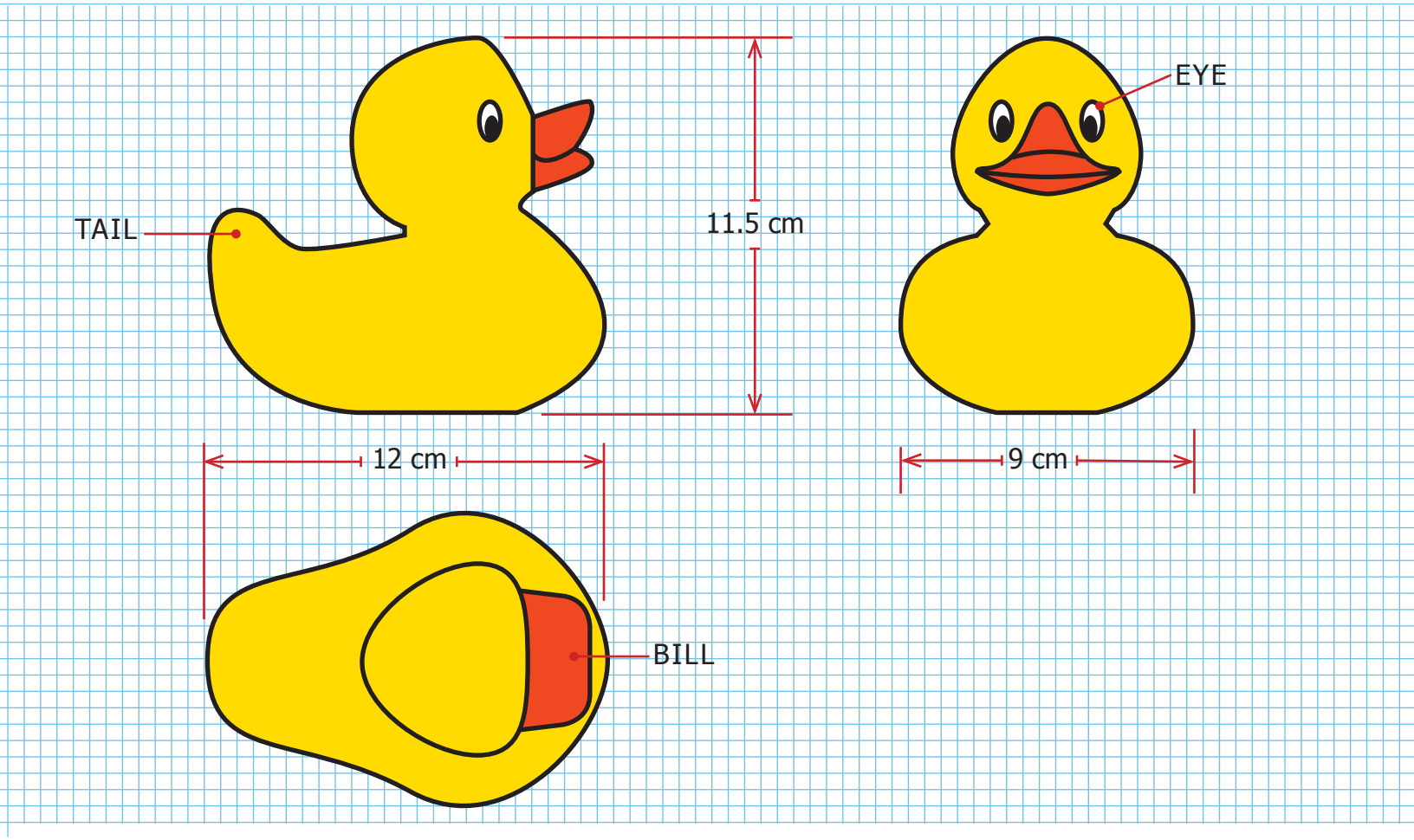
_____

_____

_____

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:_____



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. _____

_____

_____

_____

2. _____

_____

_____

_____

3. _____

_____

_____

_____

4_____

_____

_____

_____

5. _____

_____

_____

_____

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?

If you were going to continue to work on this, what would you change or improve?

RUBRIC

RUBRIC TEAM PROJECT: ENGINEERING AN ROV

Student name: _____

	The Packet	ROV Design Drawing	Design Revisions	Function	Team Collaboration
4	Packet is 100% complete and shows student went beyond general expectations.	Technical drawing is neat with clear measurements and labeling for all components.	Three or more design revisions were made with reasons for the change.	Structure functions extraordinarily well, and meets all design requirements.	Almost always listens to, shares with, and supports the efforts of others. Tries to keep people working well together.
3	Packet is 100% complete and shows students met the expectations.	Technical drawing is neat with clear measurements and labeling for most components.	Two design revisions were made with reasons for the change.	Structure functions well, holding up under and meets most of the design requirements.	Usually listens to, shares, with, and supports the efforts of others. Does not cause "waves" in the group.
2	Packet is approximately 75% OR student did not meet expectations.	Technical drawing provides clear measurements and labeling for most components.	One design revision was made with reasons for the change. OR, design revisions were made without reasons.	Structure functions pretty well, but only meets few design requirements.	Often listens to, shares with, and supports the efforts of others, but sometimes is not a good team member.
1	Packet is incomplete and student did not meet expectations.	Technical drawing does not show measurements clearly or is otherwise inadequately labeled.	No revisions were made.	Fatal flaws in function and does not meet design requirements.	Rarely listens to, shares with, and supports the efforts of others. Often is not a good team player.