Bull in the Ring

Group Members
Name
Name
Name

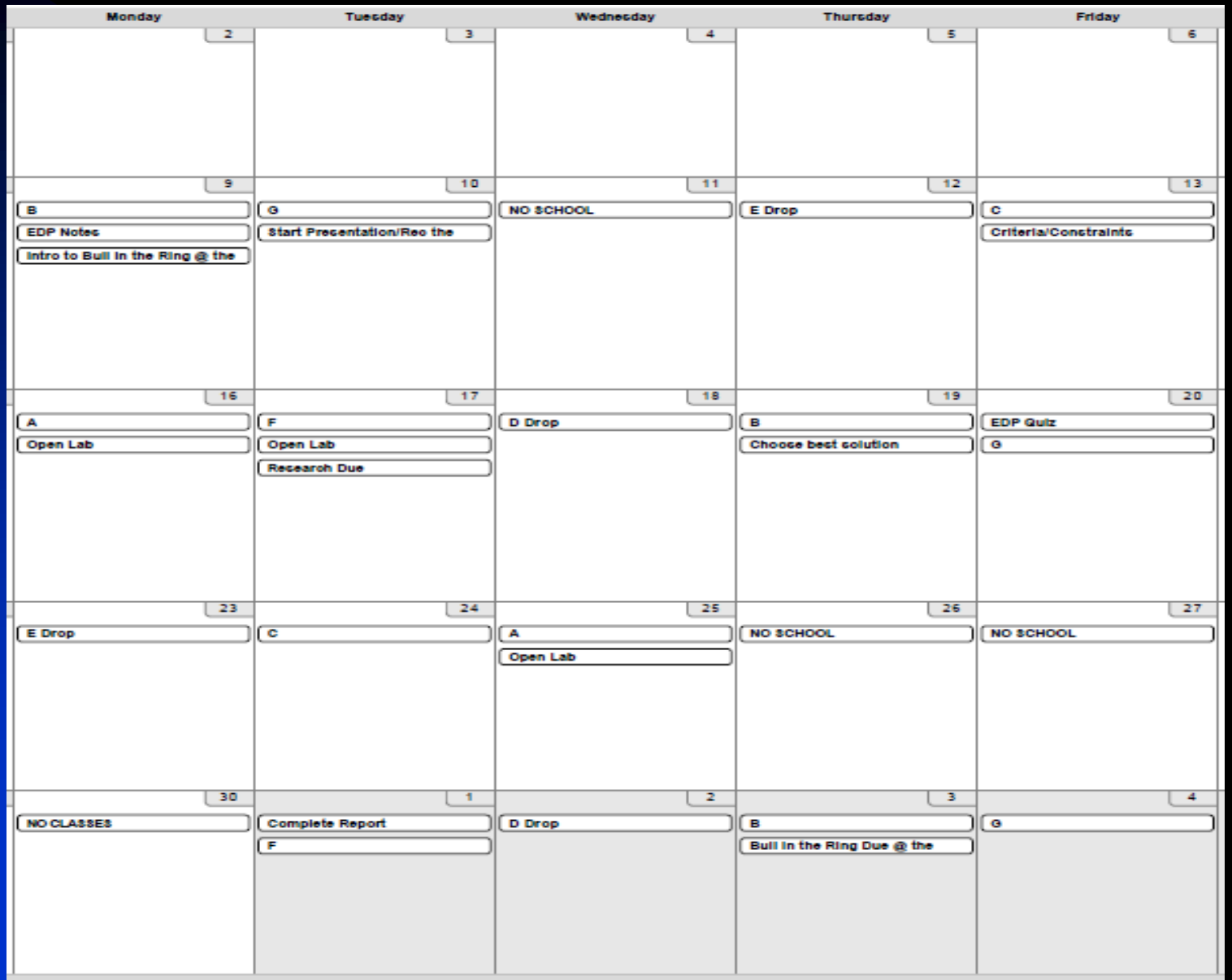
Don't be afraid to insert picture of your initial robot or your final robot here

Place Due Date Here
Due

Bull in the Ring
Understanding Goals (Don't put in Presentation)

- There are three Understanding Goals for this unit
  - Understand how a light sensor works and how to program them
  - Understand the Engineering Design Process
  - Understand the usefulness of record keeping throughout an engineering project

Project Calendar (Don't put in Presentation)



Monday	Tuesday	Wednesday	Thursday	Friday
2	3	4	5	6
9 B EDP Notes Intro to Bull in the Ring @ the	10 G Start Presentation/Rec the	11 NO SCHOOL	12 E Drop	13 C Criteria/Constraints
16 A Open Lab	17 F Open Lab Research Due	18 D Drop	19 B Choose best solution	20 EDP Quiz G
23 E Drop	24 C	25 A Open Lab	26 NO SCHOOL	27 NO SCHOOL
30 NO CLASSES	1 Complete Report F	2 D Drop	3 B Bull in the Ring Due @ the	4 G

Design Challenge (Don't put in Presentation)

- You are to develop a robot capable of knocking all of the 6 blue solo cups out of the black circle on the robotics board. The robot must start and fit on the construction paper taped to the board and can not be any higher than 8.5 inches. You must use at least one sensor and your robot must shut down after 45 seconds. You are limited to the pieces you have been provided and other materials ***APPROVED BY THE TEACHER*** in advance.

Identify The Problem
(Do put in Presentation)

- Be sure to fully articulate a thorough, clearly developed statement which fully describes the problem as your group believes it to be.

- The problem for this challenge is……

Activities to be completed and due dates

Activity	Due date	Teacher Initials
Complete line tracking program in Robotics Educator	Completed	
Set up Presentation. Title Slide, Definition of Problem,	11-10	
Criteria and Constraints Research of Problem	11-13	
Development of possible solutions	11-19	
Quiz on Engineering Design Process and light sensor use	11-20	**NOT REQUIRED**
Project Due Presentation Due	**12-3**	

Criteria and Constraints

- The criteria to successfully complete this challenge are
  - Criteria 1
  - Criteria 2
  - Criteria 3
  - Etc….

Criteria are the guidelines or rules that are used to judge performance.

Criteria and Constraints *cont.*

- The constraints for this challenge are
  - Constraint 1
  - Constraint 2
  - Etc…

Constraints are limitations that are outside the control of the project team and need to be managed around.

Research the Problem

- Research for this project was completed by…..
  - Use of the internet
    - Site one
    - Site two
    - Etc…..
  - Robotics Educator
  - Books?

Possible Solutions

- **Based on our research**, possible solutions for this Challenge include
  - Solution 1
    - Strategy
      - (How are you going to attempt to solve the challenge)
    - Bot Style
      - Tank, wheeled, etc….
    - Sensors

You must provide one solution per group member.

Minimum of THREE possible solutions

This would be a perfect place to include pictures

Possible Solutions cont.

- Solution 2
  - Strategy
    - (How are you going to attempt to solve the challenge)
  - Bot Style
    - Tank, wheeled, etc….
  - Sensors

Solution Chosen

- We have chosen to move forward with the Solution……
  - Final strategy
  - Final bot design
- **YOUR SOLUTION COULD BE A HYBRID OF ALL YOUR POSSIBLE SOLUTIONS.**
- This decision was based on the following tradeoffs.
  - TO 1
  - TO 2

  A trade-off usually refers to losing one quality or aspect of something in return for gaining another quality or aspect

Prototype Development

- Prototype 1
  - (Place picture here)
  - Include Program with comments
  - Performance
    - What did it do well
    - What did it do not so well
    - Rate according to criteria (Use a scale of 1-10) Ten being the highest. Why did you rate the bot this way?

Prototype Development

- Prototype 2
  - (Place picture here)
  - Performance
    - What did it do well
    - What did it do not so well
    - Rate according to criteria (Use a scale of 1-10) Ten being the highest. Why did you rate the bot this way?

Communicating Final Product

- Summarize your project success based on the criteria and constraints
  - Did your team meet the criteria and constraints laid out for them?
    - How?
    - If not, why?
  - Was your robot success?
    - Why?
    - Why not?
  - Provide enough information so that another team could copy your plans and accomplish the same task

Rubric for Success

Rubric – Robotics

	4 (Advanced)	3 (Proficient)	2 (Basic)	1 (Below Basic)
Engineering Design Process **Critical Thinking**	• Accurately Identify Problem • Research the problem using Robotics Educator, Web research or relevant periodicals or books • Develop possible solutions based on research, prior knowledge of available resources and time constraints. • Choice of "best" solution takes into consideration criteria and constraints and tradeoffs • Solution is tested and redeveloped until it works as intended and is accurately recorded during process	• Accurately Identify Problem • Research the problem using Robotics Educator • Develop possible solutions based on three of the four criteria set in the advanced column. • Choice of "best" solution takes into consideration criteria and constraints • Solution is tested and redeveloped until it works as intended but is not fully recorded during process	• Problem nearly Identified • Some data gathered and recorded from Web and/or Robotics Educator. • Develop possible solutions based some criteria set in the advanced column. • Choice of "best" solution takes some consideration of the criteria and constraints • Solution is tested and redeveloped until it works but there is no record of the process	• Little or no Problem Identified • Little or no Research completed • Development of solution based on one or less of the criteria in the advanced column. • Choice of "best" solution fails to take into consideration the criteria and constraints • Little evidence the solution was tested and/or redeveloped and it fails to work. There is no record of the process
Presentation **Writing and Critical thinking**	Presentation includes: • Dated daily entries • Detailed Explanation of what was accomplished (complete accounting of ideas through the use of, technical sketches and drawings) • Detailed description of primary issues to be addressed immediately along with how and when they may be completed. • Redevelopment in design recorded and rationale covered • A concluding entry that summarizes results of the project, including issues that could not be overcome.	Presentation includes: • Dated entries • Explanation of what was accomplished (some use of pictures, sketches) • Description of primary issues to be addressed immediately and how they may be completed • Redevelopment in design recorded • A concluding entry that summarizes results of the project.	Presentation includes: • Greater than 50% of required entries • Some explanation of what was accomplished • Some description of issues to be addressed • Some redevelopment in design recorded and rationale described	Presentation includes: • Inconsistent entries • Little explanation • Little or no explanation of what was accomplished • Little or no redevelopment in design recorded and no rationale described
Building/ Programming Testing Robot	• Robot is built accurately with no mistakes and resembles design developed during process. • Pseudocode is correctly developed and matches program • Flowchart demonstrates behaviors robot is to complete • Program is commented	• Robot is built with few mistakes, but still resembles design developed during process. • Pseudocode is correctly developed and nearly matches final program • Flowchart matches most of the behaviors robot is to complete. • Robot is programmed with few errors	• Robot is built with some mistakes, somewhat resembles design developed during process. • Robot is programmed with some errors • Pseudocode attempted • Flowchart attempted • Robot is programmed with many errors, but does something	• Robot is built with many mistakes • No Pseudocode • No flowchart • Robot is programmed with many errors

FAQ's

- How many slides are required for the report?
  - Your report should contain enough slides to fully describe the entire Engineering Design Process AND records of daily progress including:
    - Dated daily entries (a slide per class day)
    - Criteria and constraints (slides as needed)
    - Tradeoffs (slides as needed)
    - Pictures of each prototype or change (enough to convey information)
    - All programs and a flow chart of initial strategy and final program
    - Communication of final product

Example of Dated Daily Entry

- Date
- Goal for the day
  - The Goals for today are
    - Construct basic robot chassis
    - Write “shell” code
- Tasks accomplished
  - Robot was constructed
  - Program written
- Problems to be addressed next class
  - Addition of sensors
  - Testing and evaluation

FAQ's continued

- How many pictures or diagrams should be included in the report?
  - Pictures and diagrams are worth a thousand words. Include as many pictures as you feel believe your report requires. At a minimum, you should include a picture of every iteration of your robot.
  - Including a picture of what you are basing your design on is not a bad idea (Bull dozer?)
  - You could also include a diagram to assist you in describing your strategy (how the robot will move)