

Meeting #1:

The course is introduced, with objectives, teaching methods, required materials, grading policy. This is an activity-based course where students will extract their conclusions and write them in a logbook, which is also a design tool. Teamwork in four main projects constitutes 60% of grades with every student being a leader and a webmaster at least once. Students then group in teams of four. The course is structured around four main projects with Project 0 due during meetings 4-6 and preparations discussed in meetings 1-3. Project 0 assignment is introduced, required items such as individual and team reports are explained.

Meeting #2:

As preparation for the Project 0 presentations, teams are assigned topics on teamwork (leadership skills) and are asked to find **what personal qualities will help develop these leadership skills**. The teams use 15 minutes to discuss, an results are commented by the instructor. Each team was handed out a report sheet as follows:

Engin 103

Date

Team number _____

Leadership skills _____

Personal qualities/background/knowledge that will help develop good leadership skills:

They returned the following:

Team	Leadership Skills	Personal qualities/background/knowledge
1	Good decision maker	Makes good observations; ability to notice different people; always willing to compromise/worked in many groups; worked in an office environment/completed two management courses at UMass
2	Resolution and determination	Determination: at the early stage of the project you make a plan and then stick to it. Change is possible but you have to stick to the plan/Resolution: when you start the project you can picture out reasonable results that correspond to your efforts; having clearness and open mind to change the resolution you made according to the team; determination is the ability to try your hardest
3	Conflict solver, negotiation	Diverse team background gives us ability to view keypoints differently and to determine the best course of action for the conflict resolution, allowing us to see the best course of action.
4	Communication	Equal representation of ideas among the group; experience working in groups; uninhibited discussion; clear expression of thoughts; everyone speaks the same language
5	Time and project management	Clear goals that is well communicated to team members; be organized; set small goals that lead up to the final objective; delegate responsibilities to team members and hold them accountable; follow up on each members progress without micromanaging; adjust schedule/work to stay on track for

		final goal; make sure all team members are participating and excited (no dead beats)
6	Good decision maker	Needs to be able to listen to the different views of the different members associated to the group; should be able to determine the positive attributes and negative attributes of every view and situations that come about or present; should have the knowledge to make a good distribution of tasks throughout the group based on the members strengths in different fields that may help the entire mission; should be able to find solutions to the problems that may come about during a specific project.; an assertive personality.
7		Being understanding to others' opinions; being respectful to other people's ideas; looking at the situation objectively to avoid subjectivism; keeping composure under pressure; working well with others; making decisions quickly and wisely.

Many relevant and important and new points have been made, when compared with the instructor's table:

Leadership skills	Personal qualities that help develop these skills
Good decision maker	Knowledge, analysis/synthesis, fast reaction
Resolution and determination	Experience, believing in what you are doing, knowledge
Conflict solver, negotiation	Knowing the team, openness, everybody-a-winner attitude, hard-working, innovation, persistence, goal focus
Communication	High-impact visual aids, verbal and non-verbal language, stress handling, use of cue cards, knowing personality types, talking for your audience
Time and project management	Goals, planning, step by step, first thing first, setting priorities

Meeting #3:

As continuation of preparation for Project 0, we introduced a person-related "tool": the brainstorming technique, generally used to generate ideas, possible solutions, etc. It is done in successive phases of increasing scrutiny and details. As an example, two past projects were introduced: a clay ball launcher, and a timer. Each team was handed the following report sheet in Phase I:

Engin 103

Date

Brainstorming Phase I

Team _____

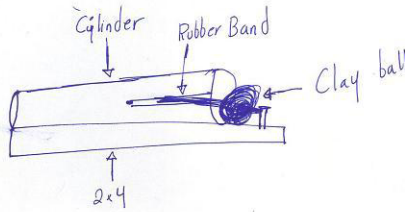
Topic _____

Please sketch the team model of the topic assigned.

The teams returned the following sketches:

Team 1
Topic Ball Launcher

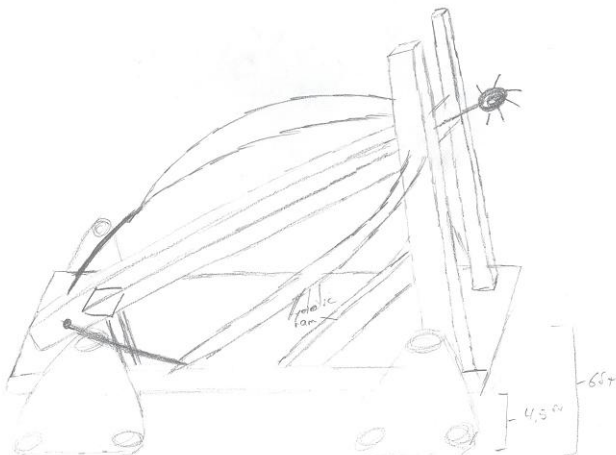
Please sketch the team model of the topic assigned.



7

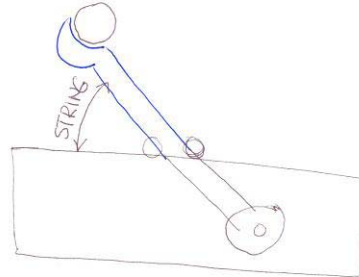
Team 3
Topic Design a device that can launch a clay ball to hit a specific target.

Please sketch the team model of the topic assigned.



Team #2
Topic Design a device that can launch a clay ball to hit a specific target.

Please sketch the team model of the topic assigned.



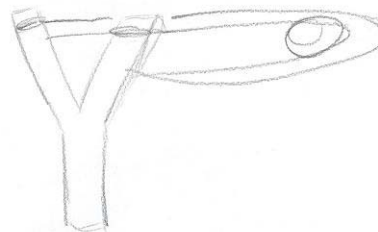
2

Team 4
Topic Launch Device

Please sketch the team model of the topic assigned.

Source of Power
Spring
rubber band
air
CO₂
Weight/leverage
combustion
water pressure
hydraulics

launching device
• catapult
• sling shot
• pressure through tube
~~rocket~~

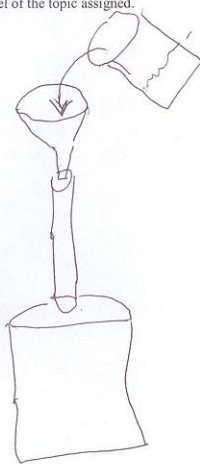


6

Team 5

Topic 2 Minute Measuring device

Please sketch the team model of the topic assigned.

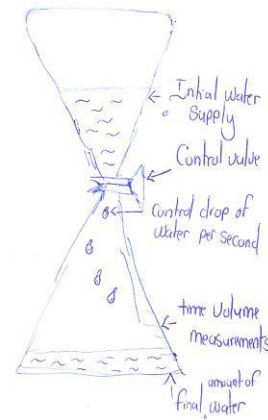


Team 6

Topic Time

Please sketch the team model of the topic assigned.

device to measure Time



A bucket of sand poured into a funnel through a straw into another bucket. Count ten seconds to allow bottom bucket to fill. Multiply first amount by 12 to get 2 minutes.

Team 8

Topic A device to measure time

Please sketch the team model of the topic assigned.



Students were then asked to vote for the best choice in each project, using as criteria: simple (or easy to build); cheap (should cost less than \$20); precision (ball needs to hit target in one shot; timer provides accurate time). The numeric results are shown with the sketches. In Phase II the teams will work on these best choices and provide more elaborate sketches that include specifications of materials and dimensions for the different parts. Each team was handed the following report sheet for Phase II results:

Engin 103

Date

Brainstorming Phase II

Team _____

Topic _____

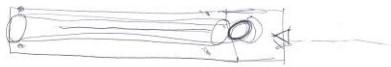
Please sketch the new version of the team model, including specifications on materials and dimensions.

The teams returned the following more detailed sketches:

Engin 103
Feb. 1, 2005
Brainstorming Phase II

Team 1
Topic Ball Launcher

Please sketch the new version of the team model, including specifications on materials and dimensions.

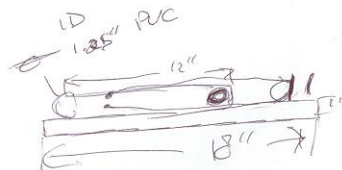


1. 2x4
2. Rubber Band
3. Card board cylinder
4. Nails
5. paper clip
6. String

Engin 103
Feb. 1, 2005
Brainstorming Phase II

Team 2
Topic Ball Launcher Sketch
Materials

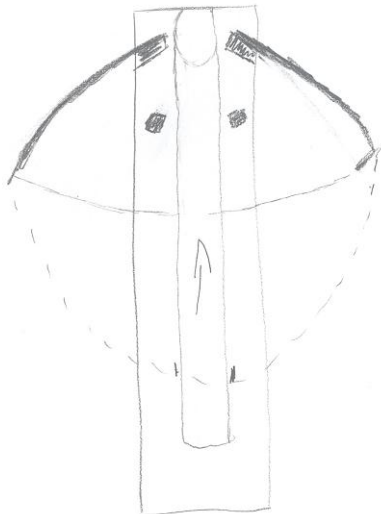
Please sketch the new version of the team model, including specifications on materials and dimensions.



Team 3

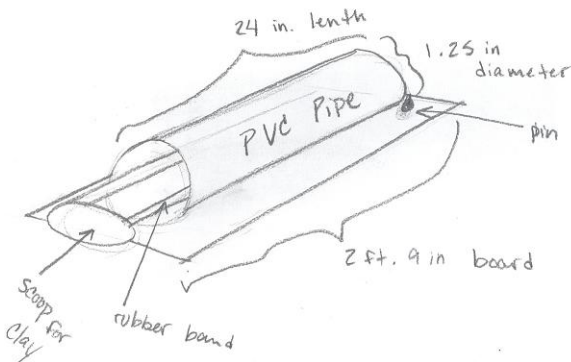
Topic _____

Please sketch the new version of the team model, including specifications on materials and dimensions.



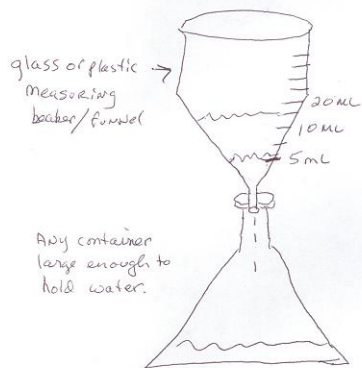
Team 4
Topic Launch Device

Please sketch the new version of the team model, including specifications on materials and dimensions.



Team 5
Topic TIME

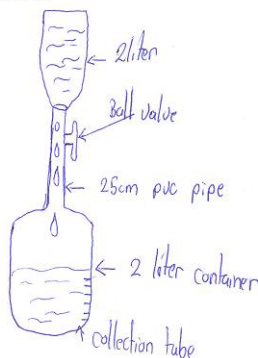
Please sketch the new version of the team model, including specifications on materials and dimensions.



Pick A point to fill water ~~time~~ (count) how long it takes to empty beaker, then increase or decrease amount of water until you get to 2 minutes.

Team 6
Topic Time

Please sketch the new version of the team model, including specifications on materials and dimensions.



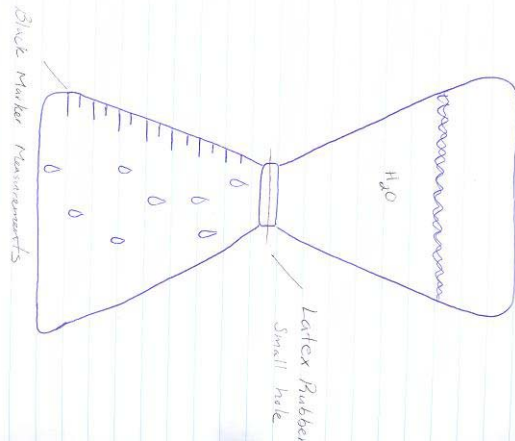
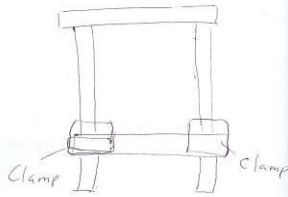
Engin 103
Feb. 1, 2005
Brainstorming Phase II

Team 8

Topic _____

Please sketch the new version of the test and dimensions.

- water (1 cup)
- Black marker
- watch



For Phase III the report sheets are

Engin 103

Date _____

Brainstorming Phase III

Team _____

Topic _____

Please sketch the latest version, prototype-ready sketch, of the team device.

It can be concluded that the goal of a brainstorming technique is to repeat the process of ideas generation and scrutiny/selection several times, building on previous results, to arrive at the best one, a prototype-ready one. It is also important to notice that the best idea is not just the nicest but the nicest that fit into the criteria imposed by the project specifications, and that frequently an engineer would work on other people's idea, while an artist can always work on his own idea.

Before searching for information on the Internet, the question is **how to find the information I need that is reliable and up to date?** As an example of Internet search, whose strategies are made available on the course syllabus, the teams were asked to research for information to answer the following questions:

1) Which US company employs the highest number of mechanical engineers? 2) Which industrial sector employs the highest number of electrical engineers?

Each team was handed the following report sheet for this example:

Engin 103

Date _____

Internet search

Team _____

Topic _____

Please indicate results from Internet search of the assigned topic.