



# Effective Group Work for Design

Mr. Amory Wong

Carson Graham Secondary School

May 22, 2015

## Success

- Common goal
- Teamwork
- Timeline



Common goal – everyone needs to have the same objective so that everyone has the same commitment, does everyone want to be the best or just average. Try to set your goal as high as possible.

Teamwork – don't always have to agree, have a discussion but at some point a decision needs to be made

- Everyone needs to pull their weight otherwise there will be resentment
- Something to keep in mind: for many people, it's easier to work by themselves than it is to work in a team. Successful teamwork doesn't happen by itself; it takes work and communication.

Timeline – create a timeline, try to put the most difficult goals first to minimize risk at the end

- Do as much work as early as possible to remove the deadline stress

## Roles

- Manager
- Morale Leader
- Decision Maker



Manager – takes notes, tracks everyone’s progress to keep them accountable and looks for impact on dependencies. Take weekly pictures to track progress, you’ve probably accomplished more than you think – and it’s a good record of what you have tried.

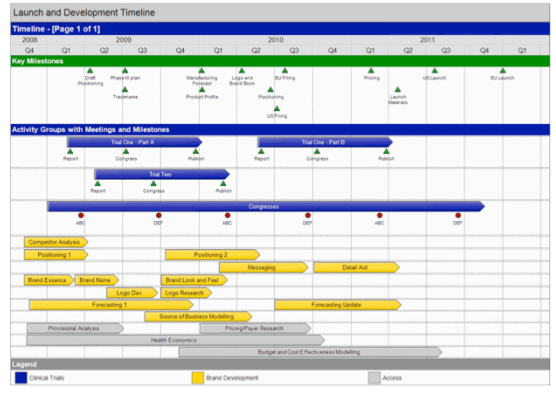
Morale Leader – it is important for the team to feel positive, negativity will hinder progress. Tell the team that they are doing good work and that they will succeed.

Decision maker – does not necessarily have to be the manager. A decision maker is there in case the team cannot come to a consensus.

It is not necessary or good for one person to keep the role from beginning to end, it is probably better to switch so that one person doesn’t feel overburdened.

# Timeline

- Minimize dependencies
- Don't break the project
- Honest and Realistic
- Simplify
- Testing



Dependencies – are when one piece of the project relies on another, so we want to minimize them. For example, the end-effector needs to be placed on the base; to minimize, we can build a non-functional base to test the end-effector.

Don't break – breaking the project will hamper the rest of the team from testing. For instance, programming the robot; keep backups of working versions so that the team can drive and test the robot. This is especially important in the week before a competition. If you have a broken robot, you can't compete.

Honest and Realistic – be honest and realistic about what you can achieve individually, don't make promises you can't keep; it will hurt the team and will result in an unfinished product.

If the deadline is getting tight, look to simplify your goals – a partial product is better than no product.

Testing – is an important part of building. Even if the components work separately, they may not work well together.

## Engineering

- Simple first
- Refine after
- Stable structure
- Don't break the project!



Try a simple solution first (this generally reduces parts/fabrication/time)  
Once it's working, then you can experiment to make it better/faster/stronger  
There is a tendency, especially if you are doing something new, to just prototype and never design. Doing some prototyping before design is okay, but don't skip the design – this is what is used to have a unified vision and divide the tasks as evenly as possible.  
Make sure that your structure is stable, generally cross-bracing will help. Also keep the center of mass low to prevent tipping. A structure may be stable when stopped, but make sure it's also stable when moving.

## Meetings

- Don't have them just because
- Agenda
- Brainstorm problems
- Check Timeline
- Check Vision



Don't have them just because – can you have the discussion with just one person or does it require the team?

Agenda – create one BEFORE the meeting even if it is just a list on a piece of paper.

This will stop time wasting and digressing.

If someone is stuck on one of their tasks, it's a good time to have a meeting and brainstorm a solution or at least a work-around.

A meeting can be used to check the timeline and/or vision. Don't try to have a meeting while people are working because they won't think about things seriously. Remember a common vision is extremely important.

# Questions?

