The Engineering Design Cycle
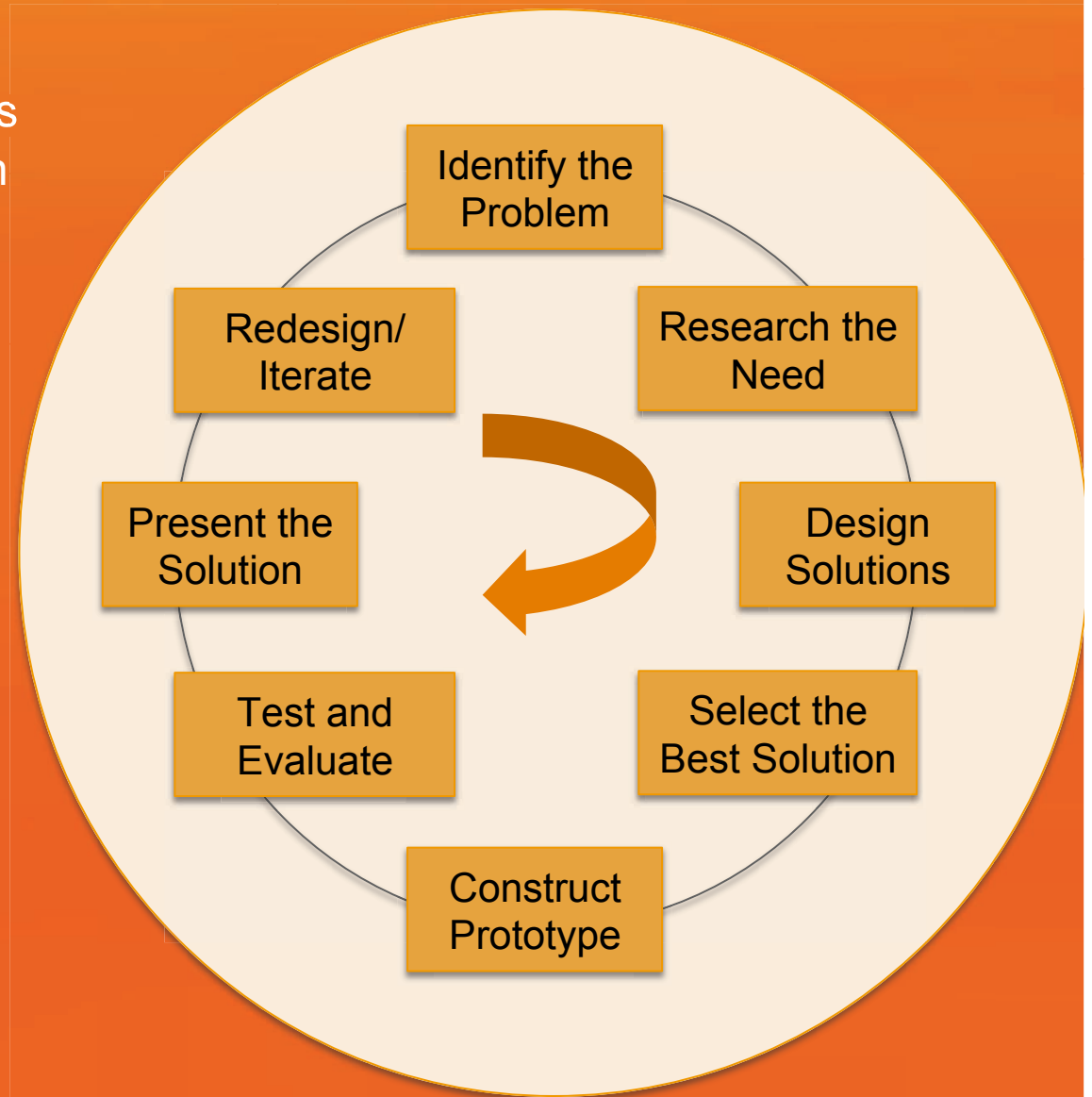
Identify the Problem
Choosing the Team

The composition of the team is CRITICAL to its success!

The Engineering Design Cycle

In parallel with brainstorming ideas to Identify the Problem, the design team must also be defined and selected. A group of people does not by itself ensure a team. To succeed, teams must have:

1. Synergy: no one individual has all the necessary skills to succeed

2. Harmony: working together with a positive attitude and productive working environment

3. Understanding: clear agreement on the common goal/task to be accomplished

Identify the Problem

Research the Need

Design Solutions

Select the Best Solution

Construct Prototype

Test and Evaluate

Present the Solution

Redesign/ Iterate

Meet Potential Team Members

Choosing the Team during the

Identify the Problem

phase of the Engineering Design Cycle

In some situations, you can meet prospective team members as part of an in-class or in-project meet and greet opportunity, or ...

In other situations, you may have to create an opportunity to meet potential members of a team (coffee anyone?)

The Importance of Networking

Whether in class or in a job, ongoing networking and getting to know others in the workplace is a must. At teambuilding time, it gives you a rich, valuable starting point for identifying potential group members!

Identify Strengths

As you meet each of your potential team members, endeavor to understand their strengths in terms of:

- Skills: what can they do?
- Knowledge: what do they know?
- Personality: how do they work best?

	Helpful to achieving the objective	Harmful to achieving the objective
Internal origin (attributes of the organization)	**S** Strengths	**W** Weaknesses

When talking to a potential team member:

- Ask a combination of direct and indirect questions to draw out the strengths of each individual candidate for your team.
- If someone appears to have no weaknesses at all, it's likely too good to be true.

Find the right people

Choosing the Team during the

Identify the Problem

phase of the Engineering Design Cycle

By Work Ethic:
Look at what people do **not** what they say

By Personality:
Watch people working and interacting together

By Manager:
Talk to those who are managing, supervising, teaching, or otherwise monitoring potential team members.

By Networking:
Talk to others who know candidates for the team

The "Wrong" Team

Choosing the Team during the

Identify the Problem

phase of the Engineering Design Cycle

Failure

No Results

No Accountability

No Commitment

No Conflict

No Trust

Choosing the Team during the

Identify the Problem

phase of the Engineering Design Cycle

The "Right" Team

Success

Results

Strong Accountability

Solid Commitment

Healthy Conflict

Trust

Avoid:
- Teams of Convenience: people you know and work with regularly
- Representative teams: teams where the titles of individuals determine diversity or skill level

The "Right" Team

Choosing the Team during the

Identify the Problem

phase of the Engineering Design Cycle

Success

Results

Strong Accountability

Solid Commitment

Healthy Conflict

Trust

Be ready to:

- Identify the Project Goals and Outcomes clearly and specifically, before selecting a team.
- Be willing to say NO to friends and various assertive others

The "Right" Team

Choosing the Team during the

Identify the Problem

phase of the Engineering Design Cycle

Success

Results

Strong Accountability

Solid Commitment

Healthy Conflict

Trust

Choose:
- Carefully Selected Team Members – by personality, by work ethic, by attitude who make up --
- Well Matched Teams – by skill

Select Team Members

How to say NO to the wrong candidate:

1. Listen to the candidate's request respectfully; don't interrupt
2. Say no as simply as possible; use a well modulated voice
3. Do not be upset (or do not express upset)
4. Transfer "ownership" of the no to something or someone else
5. Don't feel obligated to explain, but if you do, keep it simple

2 + 2 = 5

Select Team Members

Choosing the Team during the

Identify the Problem

phase of the Engineering Design Cycle

Member	Skills	Knowledge	Personality	Reason
John Doe	Builds Circuits	-	Quiet, Thoughtful	Can build circuits without dominating team
Mary Smith	-	Matlab, Programming	Outgoing, Positive	Good leader and presenter for the team
Alex Jones	-	Chemical Sensors	Detail Oriented	Select and explain sensors to support system

The Engineering Design Cycle

Identify the Problem:
Choosing the Team

1. Meet potential team members
2. Identify Skills, Knowledge, and Personality strengths of each
3. Avoid common pitfalls
4. Select team members

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