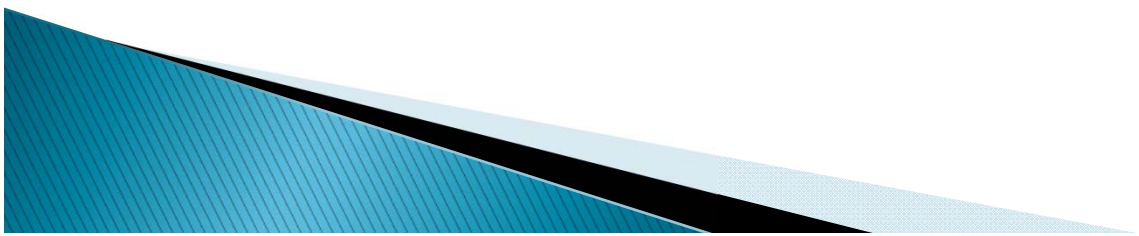
Build Your Foundations

Skills that will last you a Lifetime

Content

- Introduction
- Marketable Skills
- Additional Skills to Acquire
- Useful Web links
- Non Traditional Careers



Why I chose Physics?

- **Explains Natural Phenomena**
  - Smallest – Atoms and beyond
  - Largest – Universe, Cosmos, Everything
- **Relies on the Scientific Thought Process**
  - Math, Data & fact based
  - Proven and validated
  - Challenges existing theories and always asks WHY?
- **Is the FOUNDATION for all Sciences ☺**

Education/Career

- **Education**

  Ph.D in Physics from UIUC

- **Career**

  Failure Analysis & Yield Engineer – HP

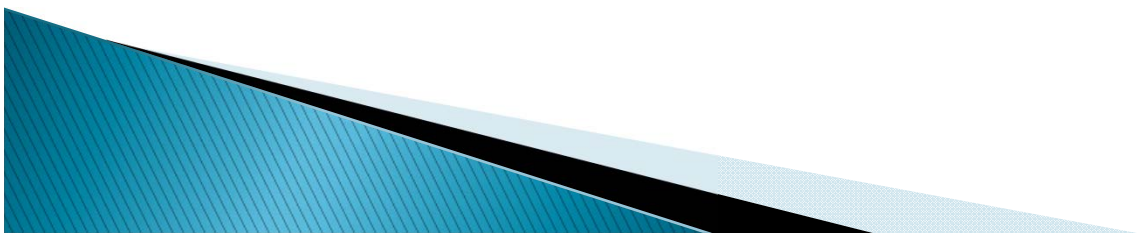
  Foundry Alliance Yield Engineer/Manager – Agilent & Avago

CAREER SHIFT

Focused Improvement Manager – Nestle Inc.,

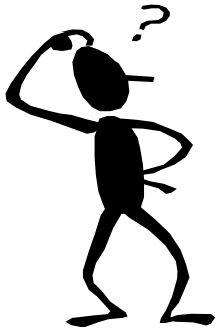
Goal Alignment Generalist – Nestle Inc.,

What Marketable Skills does *Physics* Teach You?



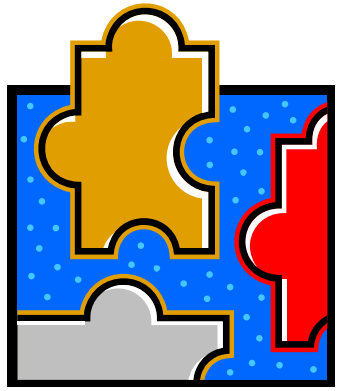
Technical Skills - Physics

Problem Solving

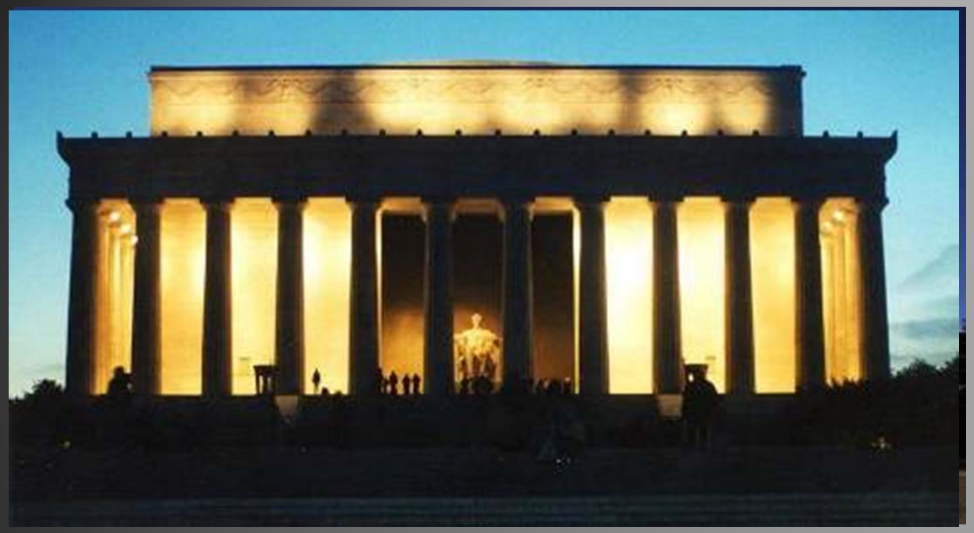


What, Where, When, Who, *Why*

The Why-Why Process



Example: 5 why Lincoln Memorial



...until the people asked themselves :

The Lincoln Memorial in Washington seemed to be destroyed step by step.

Very fast it was recognised, that pigeons were the cause of the damage and the people tried to kill the pigeons...however there appeared always new pigeons...

Why is the monument getting destroyed step by step?

As the excrements of the pigeons destroy the stone.

Why were there so many pigeons?

Because they like to eat so many spiders, as there are so many.

Why are there so many spiders?

Because they like to eat so many beetles, as there are so many..

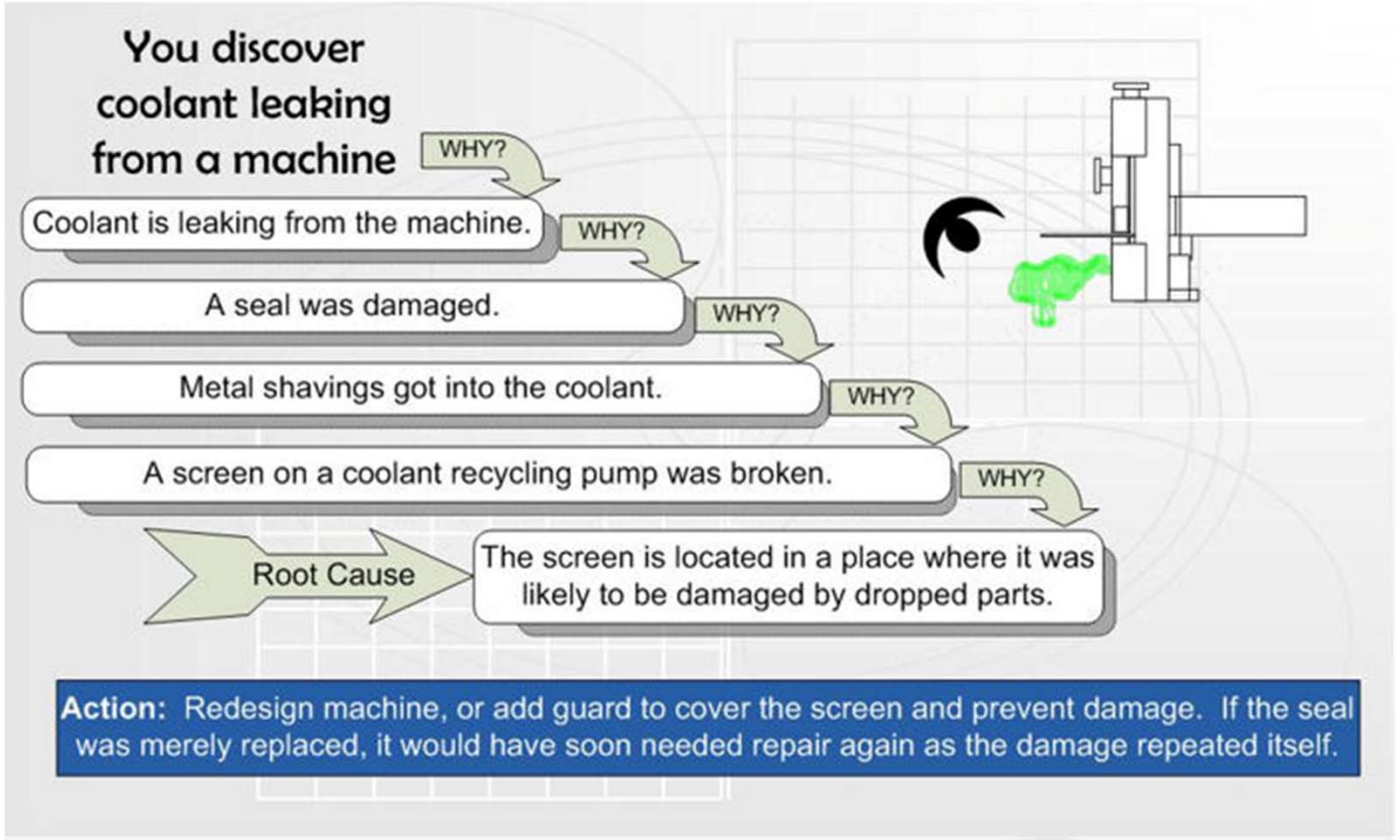
Why are there so many beetles?

As they like a warm place at the Lincoln Memorial.

Why is it such a warm place?

As the illumination at night heats up the stones.

Example of a 5 Why Process

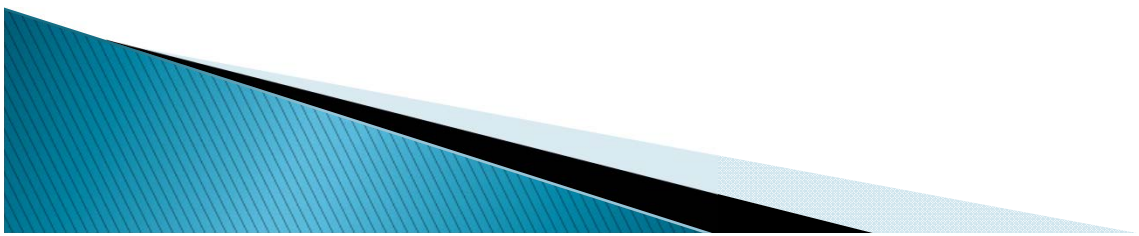


Helps Identify *True Root Cause*, so that the correct Counter Measures can be implemented to *Eliminate the problem*

Technical Skills - Physics

Analytical Skills

Data Analysis
Statistics
Tools Like: Excel, MiniTAB, MS Access



Technical Skills - Physics

Unique Process Knowledge

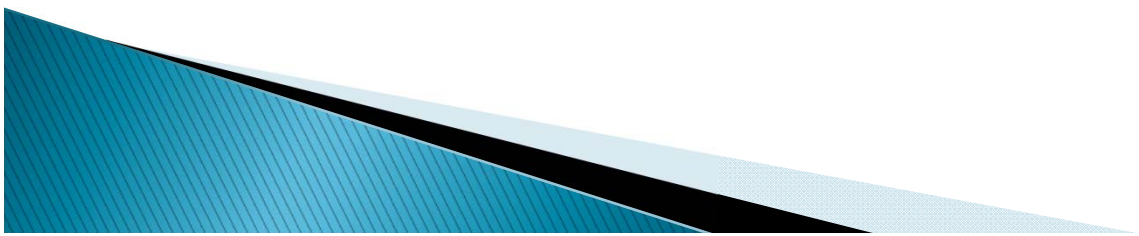
Micro/Nano Device Fabrication

Experience with Analytical Equipment like

Electron Microscopes

Surface Analysis (EDAX, Auger etc)

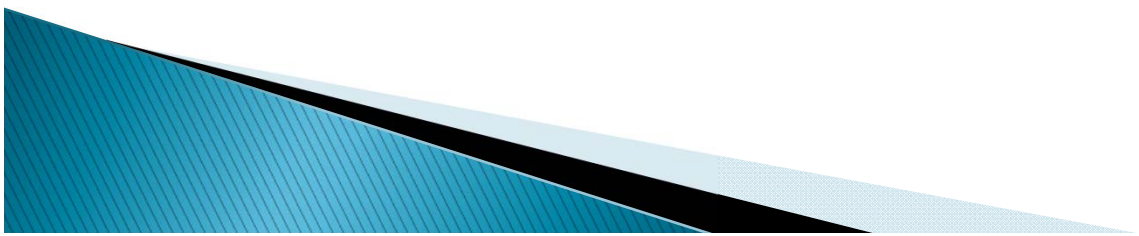
Cryogenics



Non-Technical Skills - Physics

Presentations

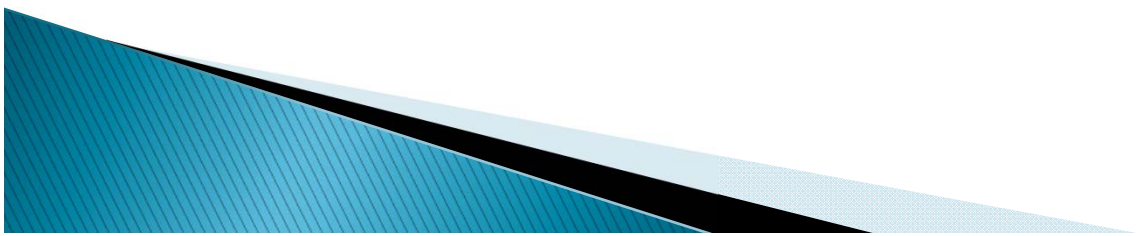
PowerPoint presentations
Public speaking



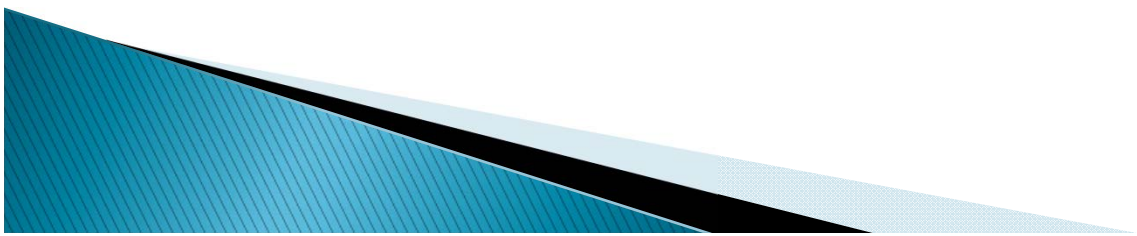
Non-Technical Skills - Physics

Teaching/Coaching
(Teaching Assistant)

Teaching classroom setting –Adult learning
Coaching/mentoring co-workers



The Differentiators



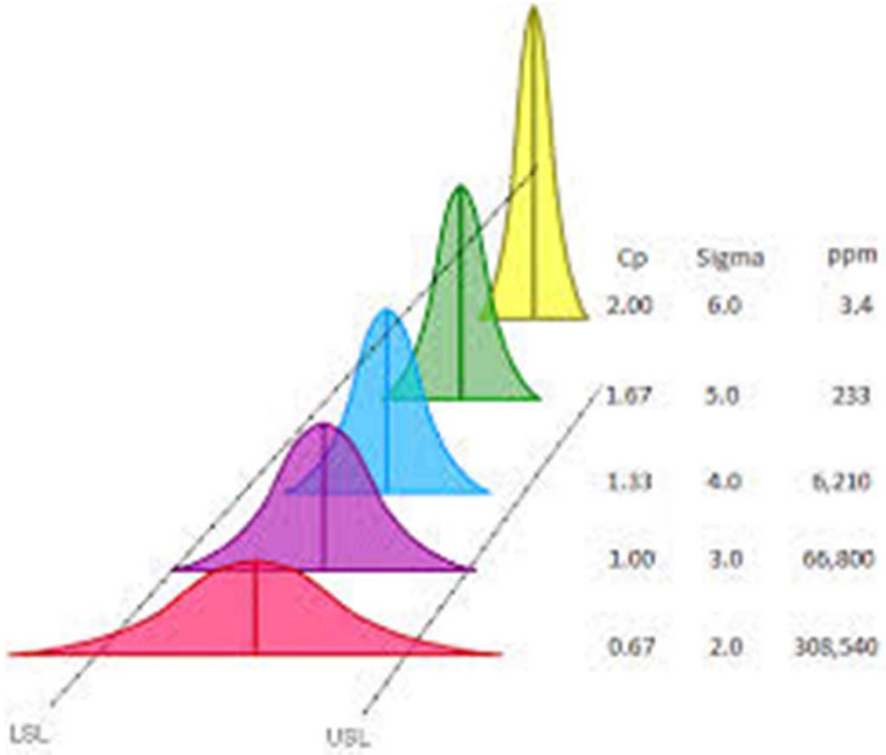
Specific Skills that are Valued

- **Statistical Process Control (SPC)**
  - **It** is a method of quality control which uses statistical methods. SPC is applied in order to monitor and control a process.
- **Expert level in MS Applications (Ex: MS Excel, MS Access etc)**
- **Lean and Six Sigma Methodologies**
- **Programming (C++, Unix, Excel Basic)**

Six Sigma

5 Step Process to reduce Process Variation

- Problem Solving to understand root cause of failures & implement Counter Measures

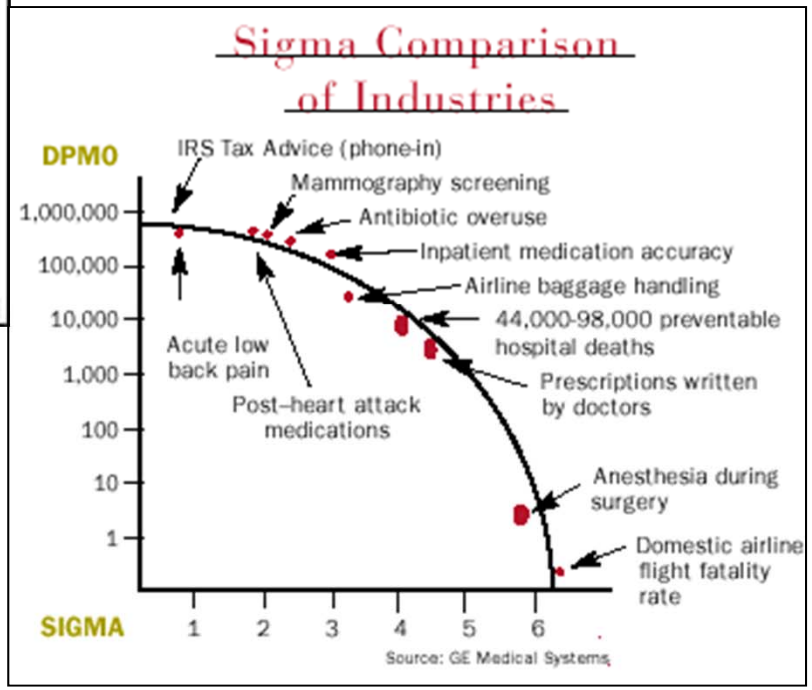


Six Sigma

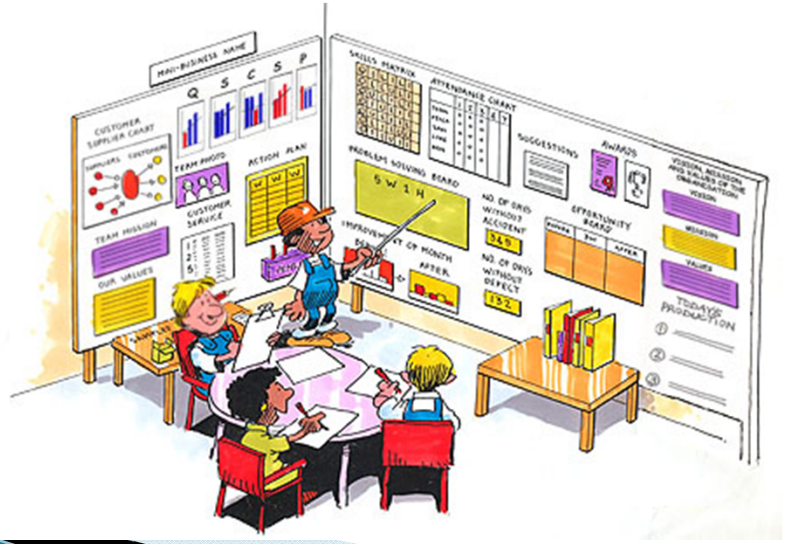
What is Six Sigma Levels of Quality?

(3.4 defects per 1 million opportunities)

99% Good (3.8 Sigma)		99.99966% Good (6 Sigma)
Unsafe drinking water for almost 15 minutes each day	→	One unsafe minute every seven months
2 short or long landings at most major airports each day	→	1 short or long landing every 5 years at each airport
No electricity for seven hours each month	→	1 hour without electricity every 34 years.
5,000 incorrect surgical operations per week	→	1.7 incorrect operations per week



Continous Improvement - Goal Alignment



Soft Skills

People Skills

Empathy
Good Communication Skills
Active Listening
Leadership Skills

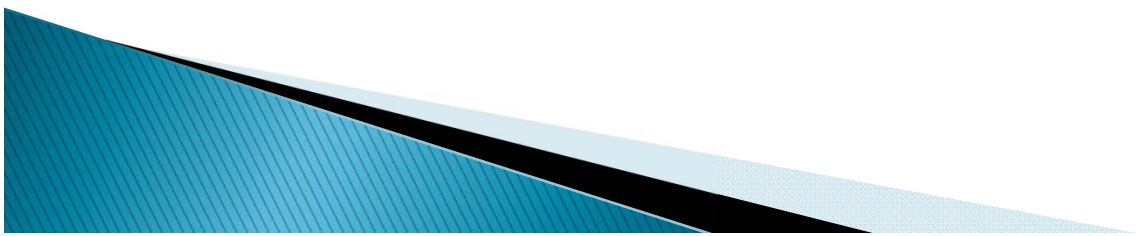
Networking

The Importance of Networking should not be underestimated!

Networking Ideas

- Conferences, Colleagues, Past Students
- Professional/Social Media
- Industry Specific Recruiters
- Industries in your Geographical Area
  - Find out what they do
  - Consider Interning with one
  - Read papers/journals/trade magazines in your area of interest

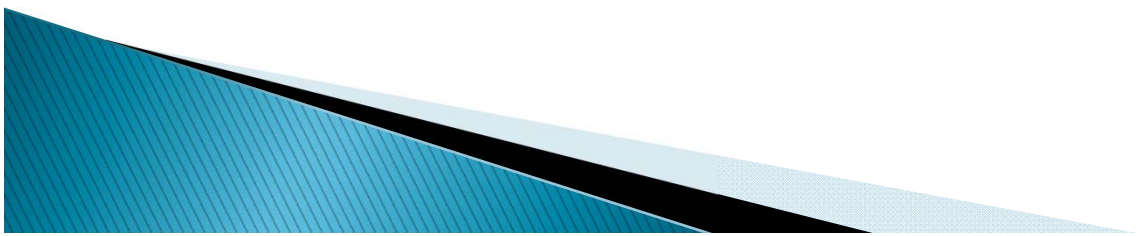
Non Traditional Careers



Industries

- Any Manufacturing Industry
- Software Programming/Modeling
- Financial Forecasting and Analysis
- Market Research

Useful Links for Career Development



Websites for Reference

- American Management Association
  - www.amanet.org
- American Society for Quality
  - www.asq.org
- Six Sigma
  - www.isixsigma.com
- Linkedin
  - www.linkedin.com