Lunch With A..." Series @Cathedral HS

[Calum Torrie]

Introduction

Caltech Directory

Member of the
Professional Staff

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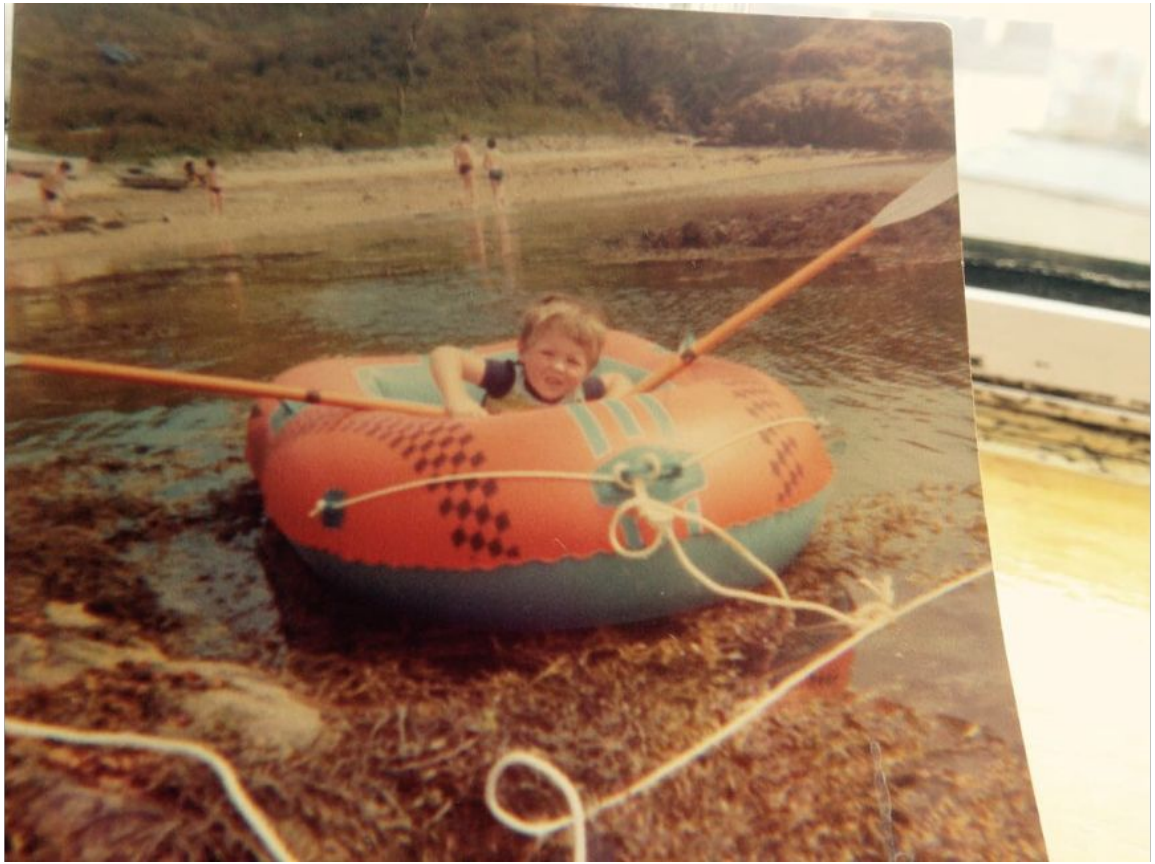
LIGO

The LIGO Project, Caltech

WHY AM I HERE?

To share my journey from high school to where I am now ...



Pre-High School Experience

{1981}

C-CORE

CENTRE FOR COLD OCEAN RESOURCES ENGINEERING
MEMORIAL UNIVERSITY OF NEWFOUNDLAND
ST. JOHN'S, NEWFOUNDLAND, CANADA A1B 3X5
(709) 737- /8354

Mr. Calum Iain Torrie
152 Arbroath Ave
Cardonald
Glasgow
Scotland G52 3HH

Dear Calum,

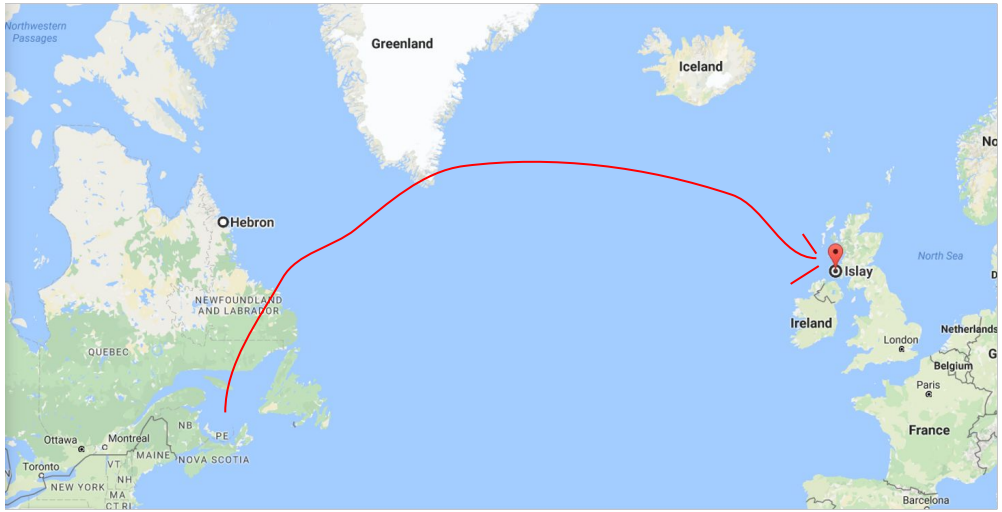
Thank you for returning the drift card. Two dollars (Canadian) are enclosed.

The card you found was released off the coast of Labrador about 100 miles SE of Hebron (57°20'N,60°20'W) on 22 August 1979 as part of an ocean current study. The information gained from the cards will be used to help predict the drift path of possible oilspills.

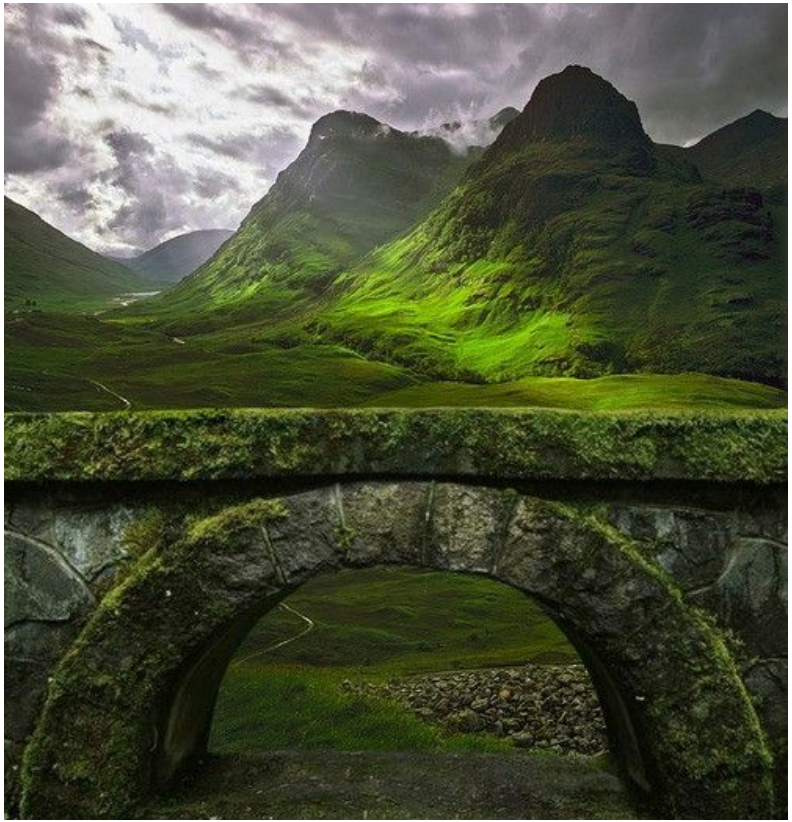
Yours Sincerely,

Deborah Diemand

5 November 1981



High School in Scotland, but I didn't go to school here



Green Grass

or here

Castles

High School Experience
{1986-1992}

Not very Glamorous … If it looks like the 1980's that is because it was …

High School Experience

{1986-1992}

Soccer team

Prefect & School Captain

Academic Journey

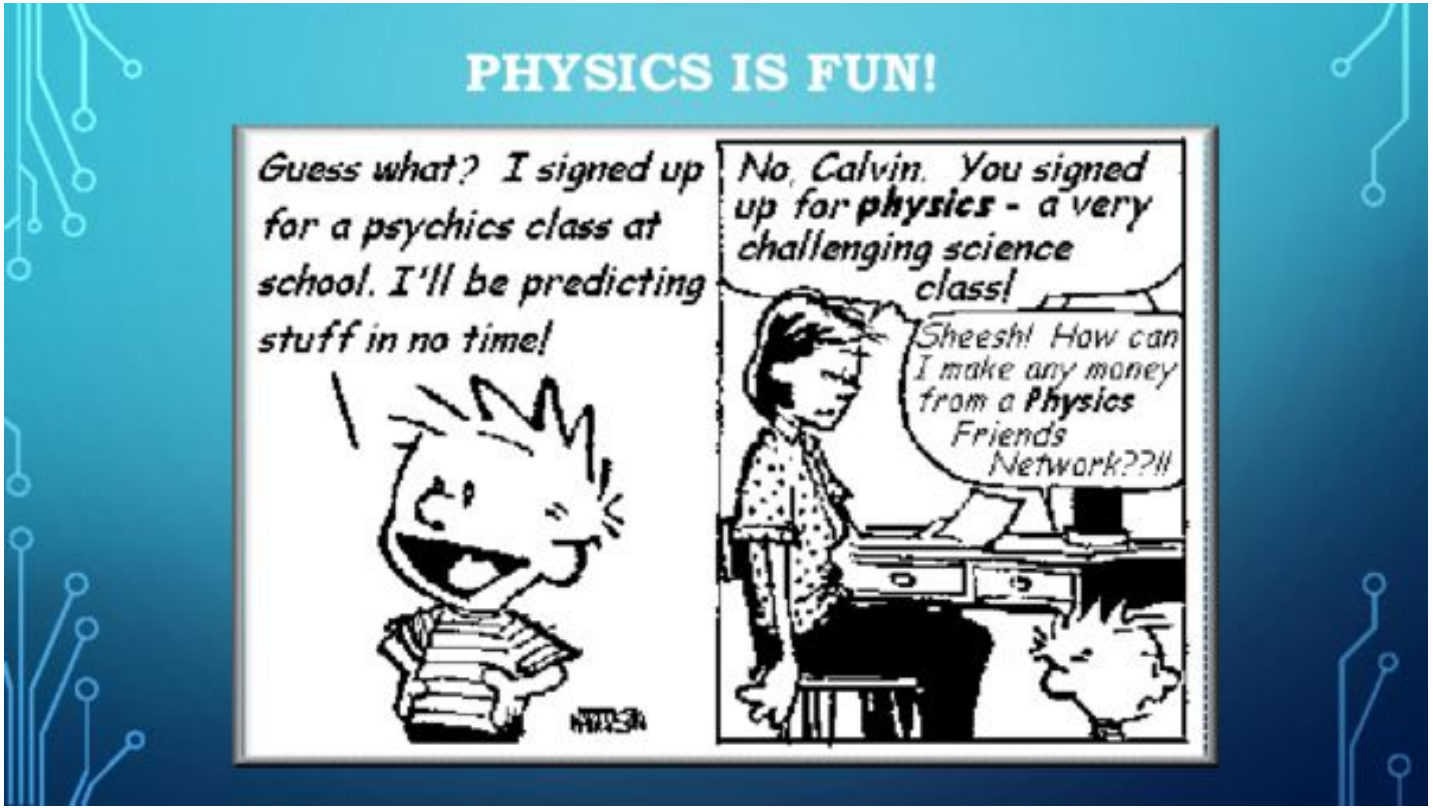
- At High School {1986-1992}
  - Favorite subject - Physics
  - Final grades 1x **A** & 4x **B**'s
    - *A in English; English teacher almost resigned in protest!*
- *Leaving High School? {1991}*
  - *I was 16 years old*
  - *Original plan was to go and study Architecture*
  - *I panicked / changed my mind*
- Now Leaving High School {1992}
  - Specialized Courses: additional subjects to prepare for University

Career Exploration

{During High School}

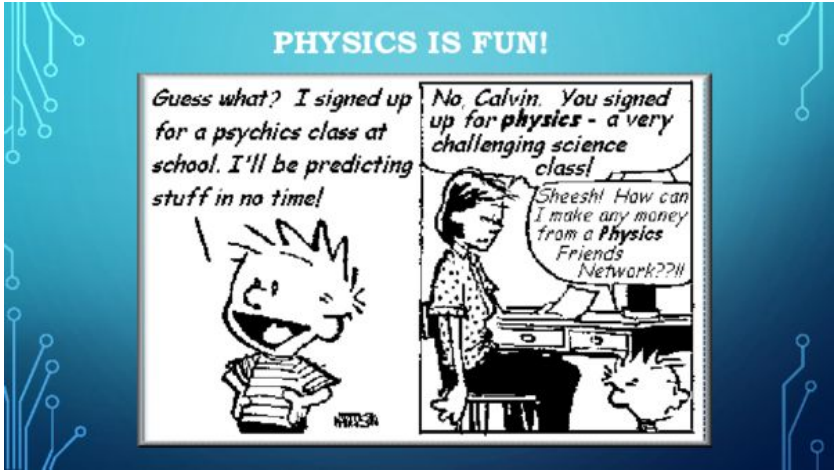
- Job Shadowing
  - Statistics group with Power Company
  - Architecture firm
- Really important
  - Try lots of different ones
  - Even in your p/t time job - think could I do this for 20+ years

Career Exploration



Career Exploration

- Experiences influenced college subject choice
  - Why Physics?
    - Keep it Simple
    - Favorite subject
    - Soccer coach = Physics teacher
  - Why simple?
    - Meant I didn't need to specialize; I found that really scary (e.g. Architect)!!
- More on this later …
  - when I introduce pro / con table



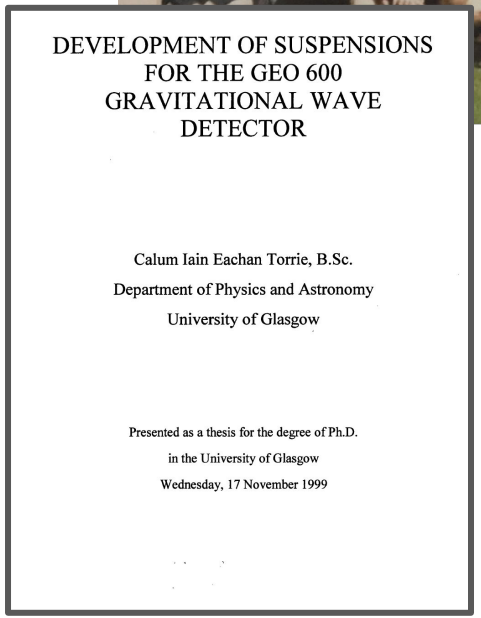
College or Post-High School Education

- Undergrad {1992-1996}
  - Subject [Physics]
  - College Choice [University of Glasgow]
    - I applied to 5 and got down to 2
    - selection based on nice buildings
- Summer interns at your college important
- Final year {1996}
  - When I 1st learned how to study & how to make time for study
    - Stopped p/t job (was at home to keep down costs)
    - Treated it like a f/t job
    - Asked questions / asked for help
    - Made my first proper schedule / plan
    - Learned memory tricks (I can share some)
      - *It is okay to learn some of it (10%)*

Further Education

Post-Grad Studies {1996-1999}

- Subject [Mechanical Engineering]
- College Choice [University of Glasgow]
  - I did visit others all over UK, choice in the end was down to a good feeling from Professor who reached out and took time to talk to me
- Doctorate Thesis



DEVELOPMENT OF SUSPENSIONS
FOR THE GEO 600
GRAVITATIONAL WAVE
DETECTOR

Calum Iain Eachan Torrie, B.Sc.
Department of Physics and Astronomy
University of Glasgow

Presented as a thesis for the degree of Ph.D.
in the University of Glasgow
Wednesday, 17 November 1999

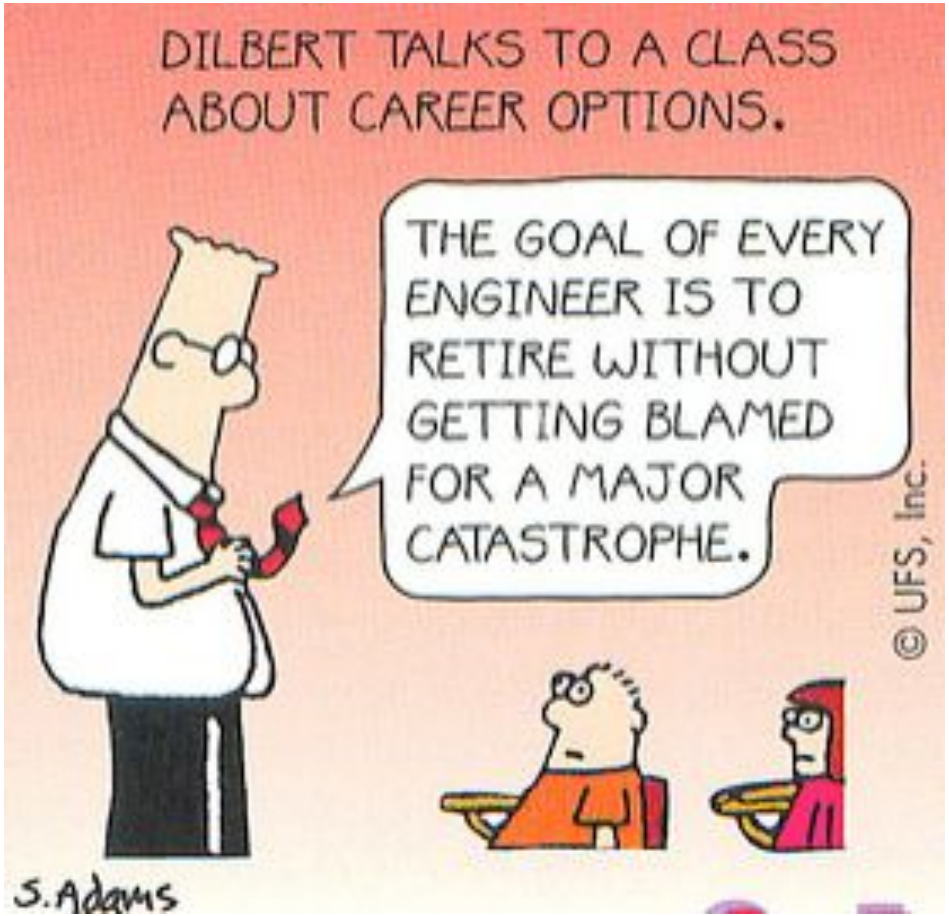
Early Professional Experience

- 1st job {1999-2001}
  - At the University as a trainee Mechanical Engineer
    - Yes same place where I did my undergrad and Phd
  - First time working away from home (Germany and USA)

- 2nd job {2001-2005}
  - Mechanical Engineer at Caltech (in Pasadena)
  - Working on a large telescope project
  - Moving to America with my girlfriend (now wife)

Almost took a job with an investment bank

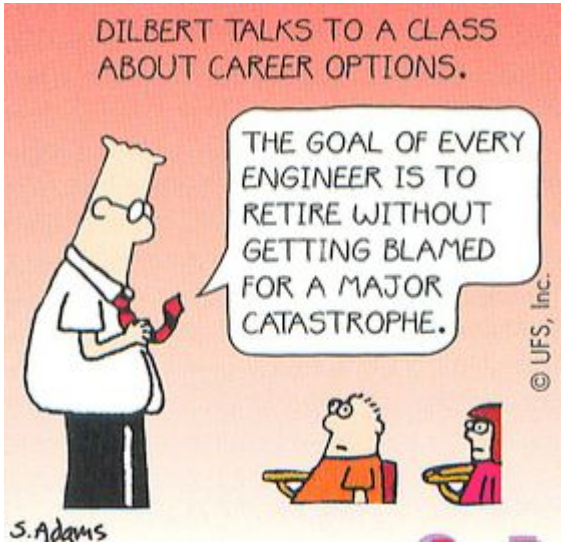
- Skills
  - At any and every opportunity I took the chance to add a skill or a certificate
    - From fork-lift licence to SolidWorks (CAD) Certification


DILBERT TALKS TO A CLASS ABOUT CAREER OPTIONS.
THE GOAL OF EVERY ENGINEER IS TO RETIRE WITHOUT GETTING BLAMED FOR A MAJOR CATASTROPHE.
© UFS, Inc.
S. Adams

Wait, how did I know what career to go into?

- How did I choose Mechanical Engineer?
  - As mentioned I could have worked in finance (more money) but no interest, I wouldn't be making anything?

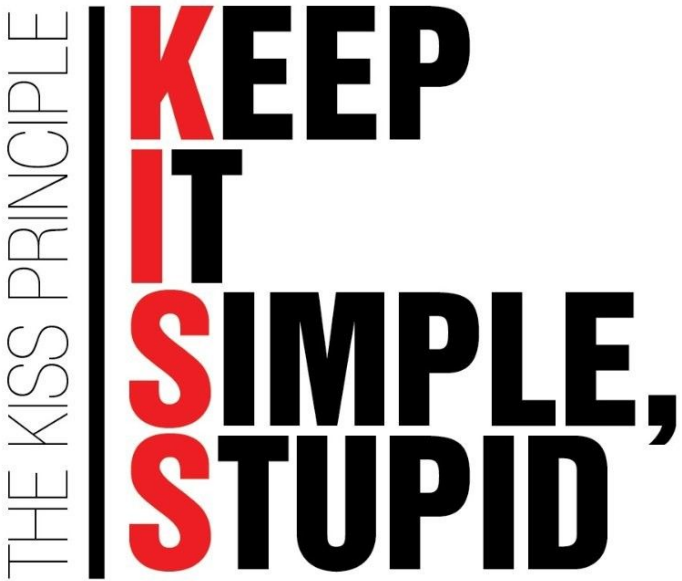
- Why work on a Large Telescope Project?
  - Could have worked for military contractor
    - didn't want to make bombs
  - I could have worked for GCHQ (like the CIA) and honestly I have no idea why I didn't do that
    - *I did mess up the interview!!*
  - I wanted to be involved in something unique



Back to Caltech: My First day

- Imposter syndrome (for sure)
  - then I saw this sign on my boss's wall

- The KISS Principle
  - *The principle is best exemplified by the story of Kelly Johnson^ handing a team of design engineers a handful of hand tools, with the challenge that the jet aircraft they were designing must be repairable by an average mechanic in the field under combat conditions with only these tools.*
    - Hence, the "stupid" refers to the relationship between the way things break and the sophistication available to repair them.



^Clarence Leonard "Kelly" Johnson *(February 27, 1910 – December 21, 1990) was an American aeronautical and systems engineer. He is recognized for his contributions to a series of important aircraft designs, most notably the Lockheed U-2 and SR-71 Blackbird. Besides the first production aircraft to exceed Mach 3, he also produced the first fighter capable of Mach 2, the United States' first operational jet fighter, as well as the first fighter to exceed 400 mph, and many other contributions to various aircraft.*

Challenges & Learning Opportunities

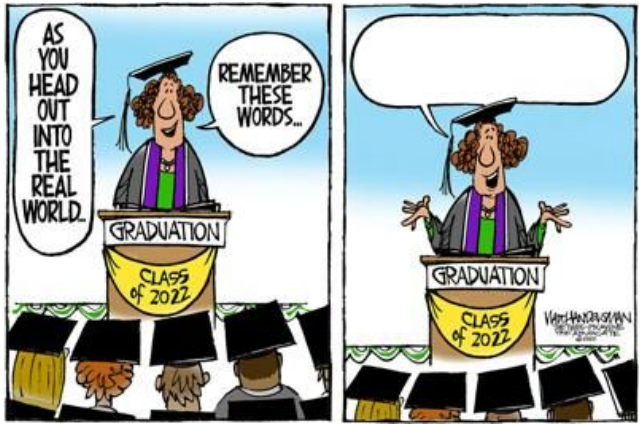
- Lost my job {2005}
  - Funding ran out
  - If this happens don't burn bridges (more on this later)
  - New job
    - Ended up moving back to the UK
- Lost my job again {2007}
  - Funding ran out
  - Wife Pregnant
  - New Job
    - Back to USA
- With LIGO @ Caltech, current employer {2008-2023}
  - Worked for Caltech non-stop during this period
  - Still married (to same girlfriend who came with me in 2001)
  - Now have 3 children

My beach

My beach


AS YOU HEAD OUT INTO THE REAL WORLD..
REMEMBER THESE WORDS...
GRADUATION
CLASS of 2022
GRADUATION
CLASS of 2022

Advice for High School Students



- Different interests and activities.
  - I heard it's easier for piccolo players to get into college of choice?
    - > Become the piccolo player!*
- Setting goals
  - Should you apply to the big schools?
    - > SURE!!!
    - If it a NO (don't get disappointed) - it could just come down to reasons outwith your control
  - 5%
    - If I was to tell you there was only a 5% chance I was going to show up today
      - would you have shown up, let alone get annoyed??*
  - College entry, build a list in table form with up to 20 schools
    - example to follow
- Remember if your goal is to get rich, you don't just get rich from attending the IVY schools!!*

*Extracts from https://nymag.com/intelligencer/article/college-acceptance-rates-ivy-league-schools-wealth.html

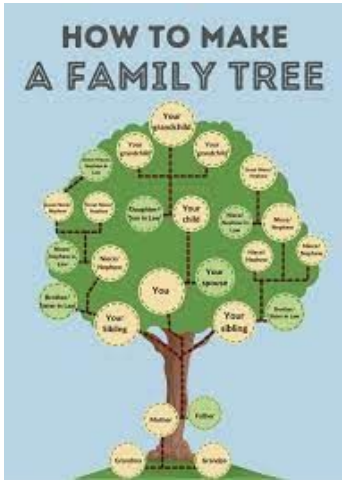
Closing

Key point of the presentation

- Pursue your passions
- Embrace the learning journey ahead (it will have ups and downs).
  - It is okay to fail and then to grow and learn.
- Coldplay found inspiration for “Don’t Panic” during a period when they were grappling with the pressures of early fame.
  - The song served as a reminder to keep calm amidst chaos and embrace the present moment.

Building your Network: Extended Family Tree & Beyond

Search everywhere and use all that you get even just to add contacts to your conversation



>>> Remember not to only use them when you need them …

Start with a Simple School list table with Pros and Cons:

Find the right balance between the **head and heart** requires **sound reasoning**.

School	Subjects / Courses	Location (Weather)	School Ranking	School Size	Class Sizes	School Values	**Rates: Acceptance / Retention / Graduation**	Competition	Scholarship opportunities	Notes from visit	Your Ranking
Glasgow	Physics	Home		small	big	Aligned with mine	AR: RR: GR:	Medium spicy	same	Nice buildings. People waved at me and one even said hello. Easy to get to.	1
Edinburgh	Physics	East		big	big	?	AR: RR: GR:	hundreds	same	1 train, rained when I was there.	2
St. Andrews	Physics	North East		small	small	?	AR: RR: GR:	Lots and lots	none	1 trains and 2 buses.	4
Aberdeen	Physics with Math	Near north pole		big	big	Not sure common	AR: RR: GR:	?	none	Far away and cold. Horrible underpass, was a bit scary.	3

I had 4. Probably need 8. Like me need a "Hollywood" one a couple of reach goals, a few in the middle and a safety net

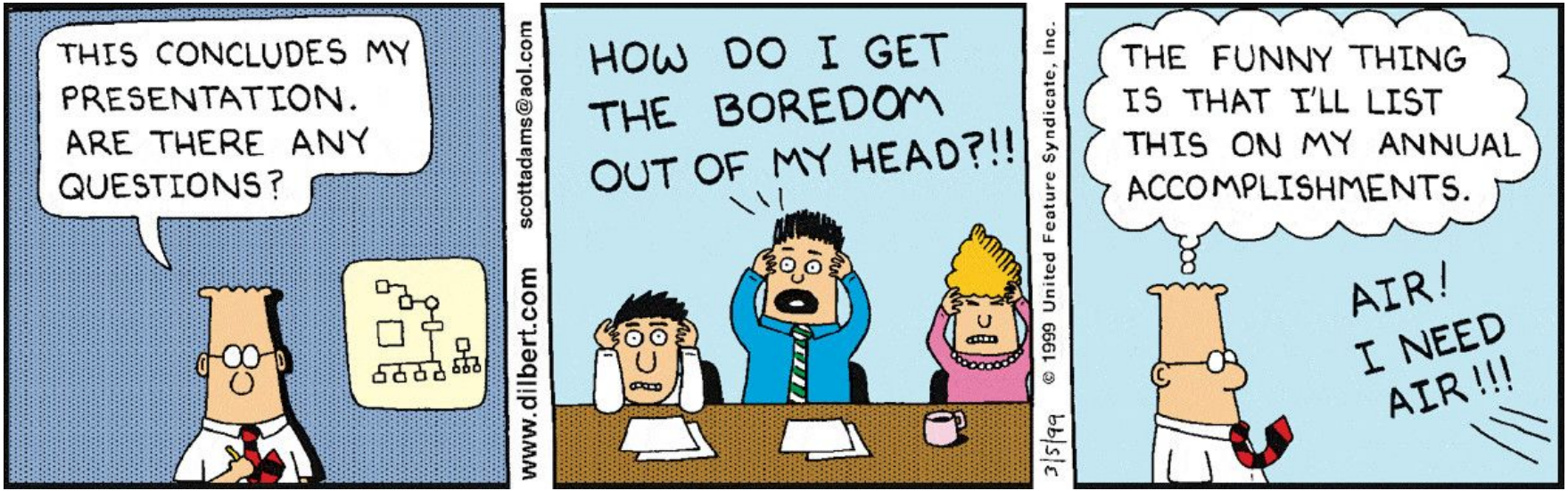
Next (if needed) move onto a Decision Matrix or Weight and Rate Method

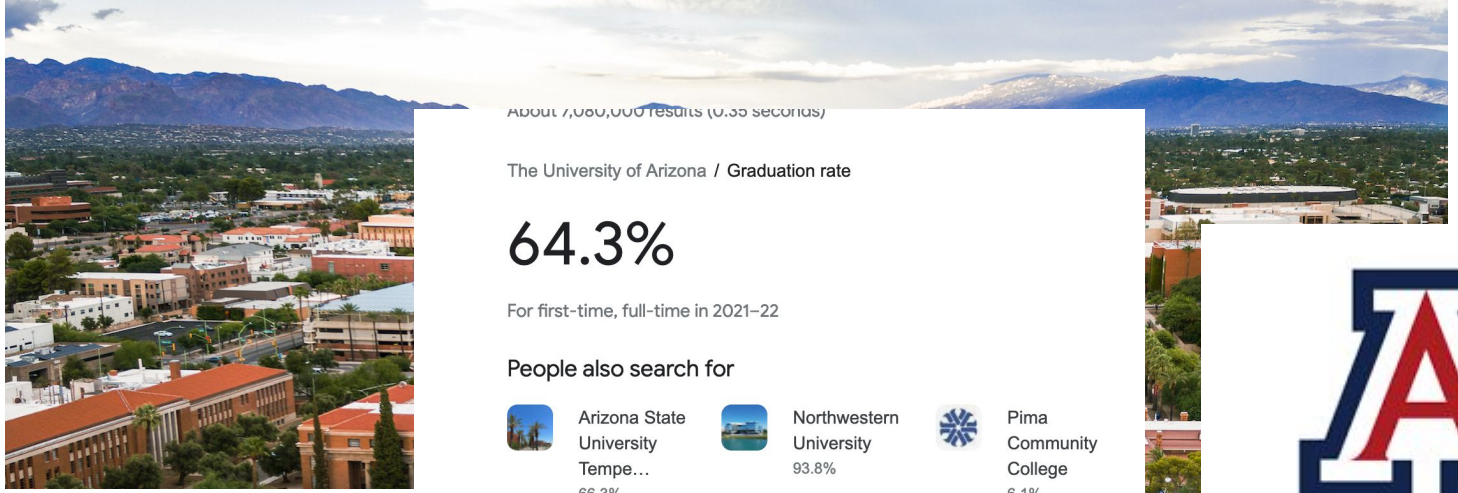
Criteria	Weights	Peru	Scores	Ghana	Scores	Italy	Scores
Friends	14	1	14	1	14	3	42
Resume	5	2	10	3	10	1	5
Travel	18	2	36	3	54	2	36
Costs	12	3	36	1	12	2	24
Safety	7	2	14	1	7	3	21
Medical	5	1	5	1	5	3	15
Service	9	2	18	3	27	1	9
Total			133		129		152

Calculate Scores. Score = Weight X Rate, e.g. 18 × 2 = 36. Then sum columns for Total Score

Q&A

- It is now time to open the floor for questions from you the audience.
- I'd be happy to try & provide insights into specific areas of interest or curiosity.





About 7,080,000 results (0.35 seconds)

The University of Arizona / Graduation rate

64.3%

For first-time, full-time in 2021–22

People also search for

Arizona State University Tempe…
66.3%

Northwestern University
93.8%

Pima Community College
6.1%

The University of Arizona / Acceptance rate

87.3%

2021

People also search for

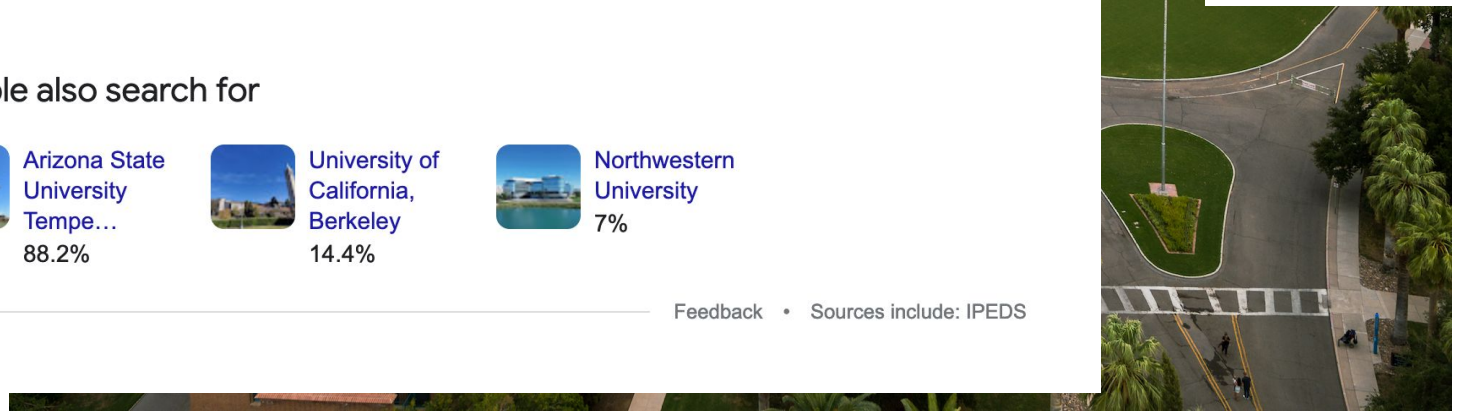
Arizona State University Tempe…
88.2%

University of California, Berkeley
14.4%

Northwestern University
7%

Feedback • Sources include: IPEDS

THE UNIVERSITY OF ARIZONA



Why is Penn State graduation rate?

What is the graduation rate at The Pennsylvania State University? 72% of students who start at The Pennsylvania State University end up finishing their degree. This is 14% more than the national median. A higher graduation rate indicates that students have better experiences at an institution.

scholarships360.org
https://scholarships360.org › colleges › outcomes

2015

People also search for

University of Pennsylvania
5.9%

Pennsylvania State University,…
92.3%

Harvard University
4%

About

Loyola University Chicago is a private research university in Chicago, Illinois. Founded in 1870 by the Society of Jesus, Loyola is one of the largest Catholic universities in the United States. Its namesake is Saint Ignatius of Loyola.
Wikipedia

Avg cost after aid	Graduation rate	Acceptance rate
$27K	74%	77%

Graduation rate is for first-time, full-time undergraduate studer more
From US Dept of Education · Learn more

Feedback