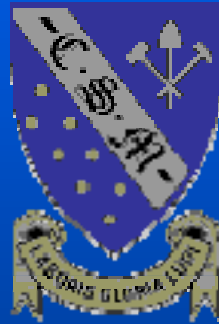


The Global Need for Education



Patrick J Foster

Lecturer in Mining Engineering

Camborne School of Mines

Contents

- What Higher Education does for Quarrying
- Higher Education in the UK from a mining/quarrying perspective
- Worldwide Perspective
- What can/is being done to increase student numbers

What does HE do for the quarrying industry?

- Specialised Degree Courses;
 - Quarry Management, Mining Engineering
- Continued Professional Development;
 - Leading to PG Cert, PG Dip or MSc
- Short Courses;
- Products
- Research

Competence

- Quarries Regs (Reg 2) “*with sufficient training, experience, knowledge and other qualities to enable them to properly undertake the duties assigned to them*”.
- Our intention is to produce the high quality, competent managers of tomorrow.
- Design and manage quarry operations safely and efficiently.

Higher Education – Mining Engineering (1989)

- University of Nottingham;
- University of Leeds;
- Camborne School of Mines;
- Royal School of Mines;
- University of Strathclyde;
- University of Newcastle;
- University of Cardiff;
- North Staffs Polytechnic

Higher Education – Mining Engineering (1992)

- University of Nottingham;
- University of Leeds;
- Camborne School of Mines;
- Royal School of Mines;
- ~~• University of Strathclyde;~~
- ~~• University of Newcastle;~~
- ~~• University of Cardiff;~~
- ~~• North Staffs Polytechnic~~

Higher Education – Mining Engineering (2001)

- ~~• University of Nottingham;~~
- University of Leeds;
- Camborne School of Mines;
- ~~• Royal School of Mines;~~
- ~~• University of Strathclyde;~~
- ~~• University of Newcastle;~~
- ~~• University of Cardiff;~~
- ~~• North Staffs Polytechnic~~

Graduate Demand

- The big five quarrying companies take on between 25-30 graduates per year (combined);
- Smaller companies – unknown

Higher Education (Quarrying) 2002

- **Camborne School of Mines**
 - BEng(Hons) Mine & Quarry Engineering
 - BEng(Hons) Mineral Surveying & Resource Management
- **Doncaster College**
 - BSc Quarry Roadsurface & Design (stopped 01/02)
 - DAPS Course
- **Nottingham University**
 - BSc Quarry Management (stopped 01/02)
- **Leeds University**
 - BSc Quarry Management

Higher Education (Quarrying) 2004

- **Camborne School of Mines**
 - BEng(Hons) Mining Engineering
- **Doncaster College**
 - DAPS Course
- **Leeds University**
 - BSc Quarry Management
 - BEng(Hons) Mining & Minerals Engineering
 - Foundation Degree – Quarry Management & Tech

Short Courses & CPD

- Run EPIC approved Shotfiring & Blast Design Courses for Industry (CSM);
- Foundation Degree (Leeds)
- CPD Environmental Management (CSM)
- Joint MSc

H&S cd rom



Research

“Accident Aetiology in the Quarrying Industry”



Looking at root causes from statistics
(reactive) and potential risks/errors
(proactive)

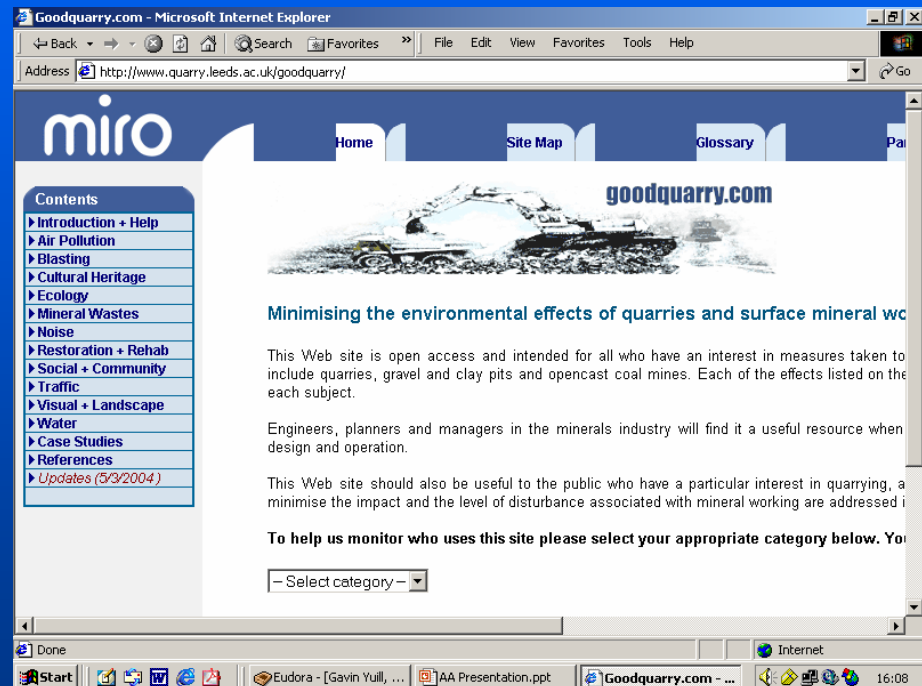
Research

Feasibility Study into use of Electronic Detonators to minimise vibration from blasting



Research

- Good-quarry website



www.goodquarry.com

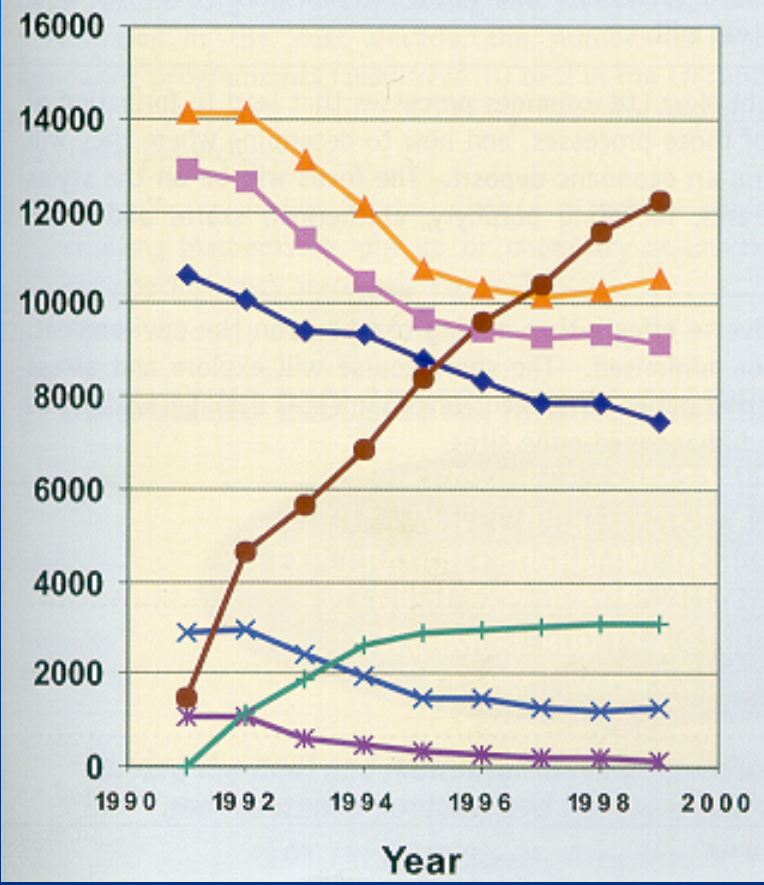
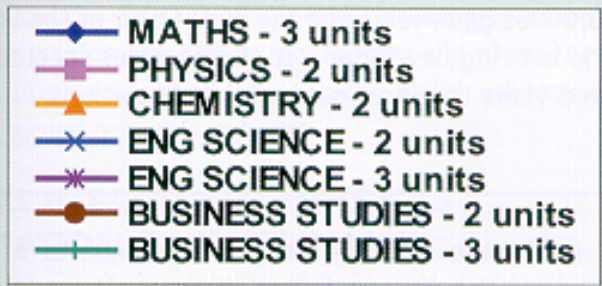
The Problem

Supply vs Demand

- Demand for Jobs in the Minerals Resources Industry (UK & overseas);
- Students don't want to study the subject;
- Less than 25 students in year 1 mining engineering in the UK.

The Problem

- Significant decline in school leavers studying maths, physics & chemistry
- Fewer students electing to study engineering
- Fewer choosing to study 'resource' related disciplines
- Introduction of Student Fees



The Problem

- Significant decline in school leavers studying maths, physics & chemistry
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Miners overtake City in pay league

By Angela Jameson
Industrial Correspondent

THE dearth of deals in the City during the past three years has cost financiers their lucrative position as the best-paid workers in Britain.

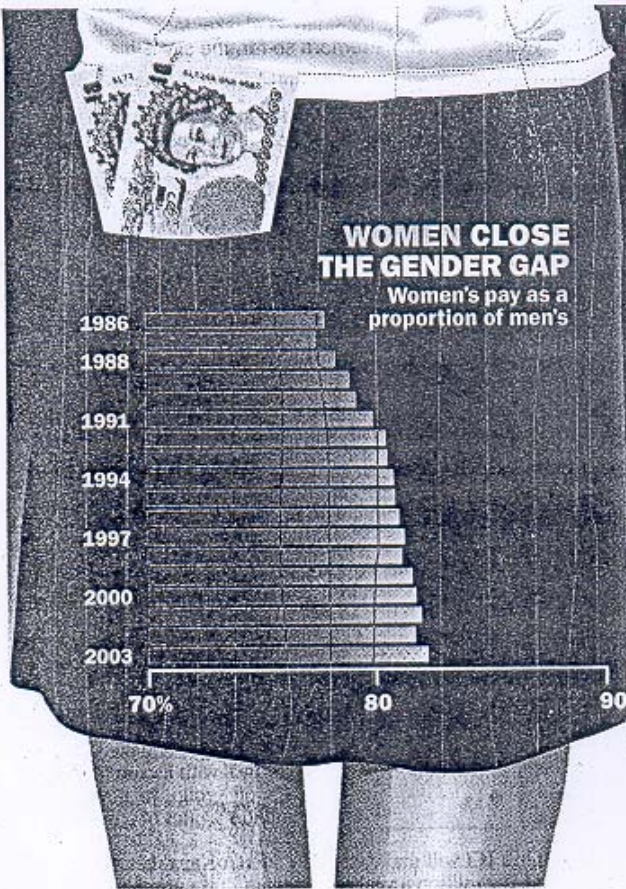
As once profligate City bonuses dried up, oil workers and employees elsewhere in the mining and quarrying industry ranked as the best paid across the country last year.

The UK's 70,000 mining and quarrying workers earned on average £652 a week in the year to April 2003, up 10.3 per cent on the previous year.

In contrast, gross weekly earnings for those employed by financial services companies fell by 1.9 per cent to £625, according to official figures.

The difference in fortunes of the two highest-paid industries in the Office for National Statistics' New Earnings Survey was attributed to changes in bonuses and the fact that the mining sector includes workers within the well-paid offshore oil business.

Patrick Carragher, director-general of BACM-TEAM, the union that represents colliery management, expressed sur-



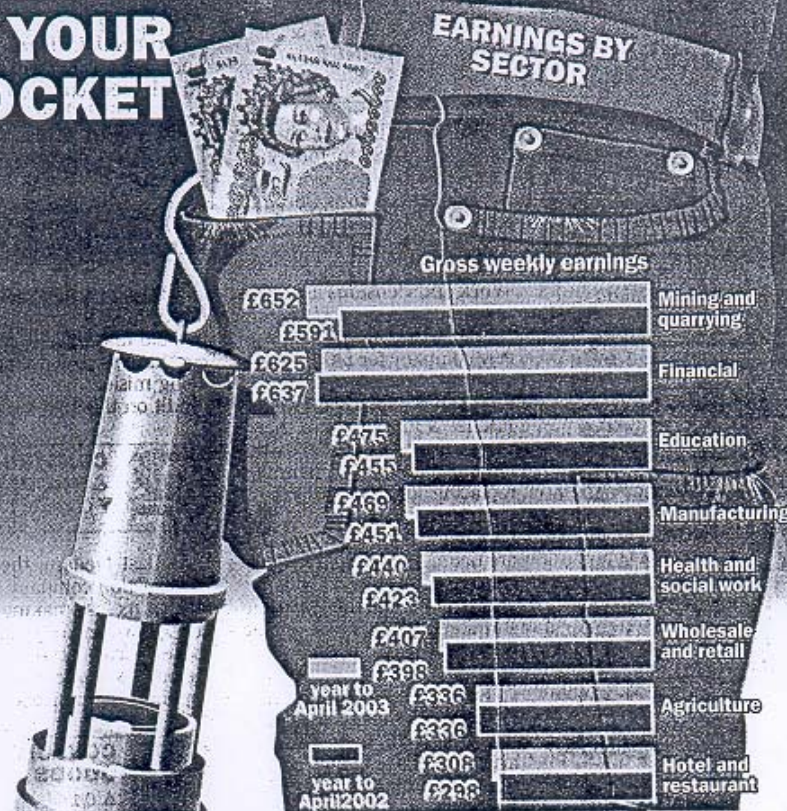
prise that his industry appeared to be better paid than the financial sector.

"In the period since privatisation, wages in the pits have struggled to keep up with inflation. Some specific groups, like supervisors, have done better than others, but these figures

do not tally with the general experience," Mr Carragher said.

Weekly pay in both mining and the financial sector far outstrips that in the lowest-paid industry, hotels and restaurants, where the average gross weekly wage is just £308.

THE PAY IN YOUR POCKET



The fall in City bonuses also helped women to close the pay gap on men, which began to open up again last year for the first time in four years. Women's average hourly pay is now 82 per cent of men's, up from 81 per cent last year.

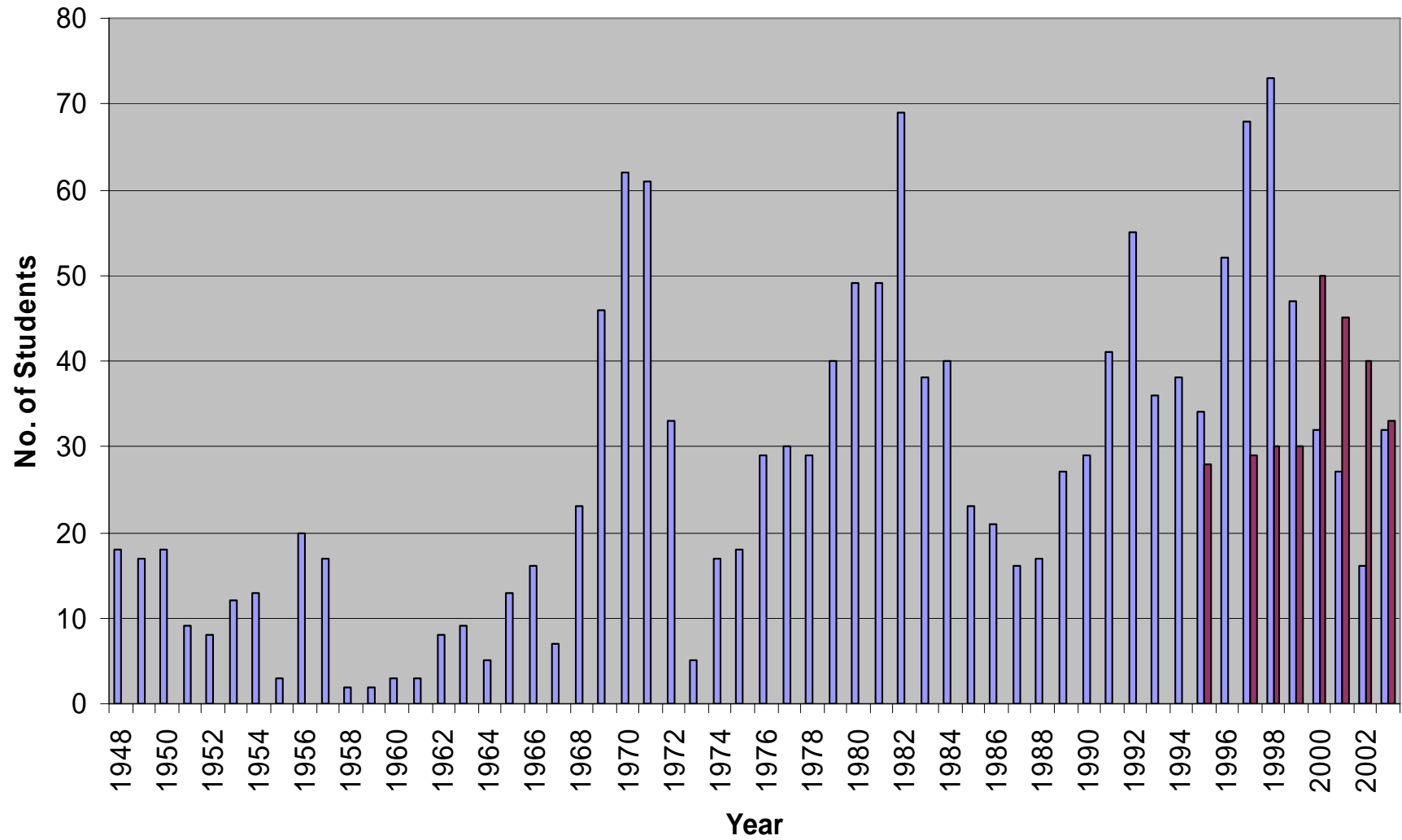
Women's average full-time

earnings have topped the £20,000 mark for the first time, but women still earn only 72 per cent of men's annual salaries. Male average earnings, which are more likely to be inflated by overtime, reached £28,065 in the year.

Katherine Rake, director of

the Fawcett Society, which campaigns for equality between men and women, said "Even if the pay gap continue to close at the same rate as it has over the past five years, it will take a further 85 years for the gap for full-timers to close completely."

UNSW Mining Enrolments & Graduates (to 2003)



UNSW Statistics

- UNSW trends are reflected nationally (similar trends at UQ & WASM)
- Supply is well short of demand (estimated national demand is 120-140 pa – current supply <100)
- Current shortage will continue at least until 2007/2008

The Future?

Industry need for:

- Competent Graduates;
- More focused CPD

The Learning Process

Old	New
Conducted at fixed locations	Receive in own space
Conducted at fixed times	Receive in own time
Conducted at fixed pace	Learn at own pace
Fixed presenters	Presenters can be sourced globally
Face to face tutoring	Audio visual, chat room, etc tutoring
Fixed number of times delivered	Multiple replays
Linear/sequential programs	Non sequential programs
One to many	One to one, many to one, one to many
Practice confined to labs	Practice by labs, simulations, on the job
Students had limited interaction with academics and other institutions	Students have global interaction with learning providers, other students, other institutions, business
Fixed resources – lectures, books	Multi-media resources
Restricted library hours	24 hour access to resources
Class room based assessments	On line assessment
Fixed entry and exit	Flexible entry and exit
One size fits all	Learning tailored to student
Academic as teacher, judge and jury of learning process	Academic as facilitator of the learning process

The Future?

Industry need for:

- Competent Graduates;
- More focused CPD

- Pitch at MSc Level

Planned MSc

- *MSc Quarry Operations & Management*
- Developed by Leeds University & Camborne School of Mines;
- Flexible/Distance Learning;
- Provision for non-engineering/science based graduates;
- Modules are small enough for CPD;
- Underpinning knowledge.
- Initially EPSRC funded through MTA's.

Modules

- Quarry Operations (CSM)
 - Quarry design, equipment, products
- Health & Safety Management (CSM)
 - Legislation , H&S management
- Finance (Leeds)
 - Management & financial accounting
- Materials Processing (Leeds);
 - Processing,

Modules

- Mineral Resources (Leeds);
 - Geology & marketing
- Geotechnics & Site Investigation (CSM)
 - Geotechnics, hazard appraisal
- Environmental Impact (Leeds);
 - Hazards, impacts, remediation, EMS
- Quarry Engineering & Blasting (CSM).

Quarry Education

- DAPS Course
- Foundation Degree
- Undergraduate Degree
- Masters Degree

What can we do?

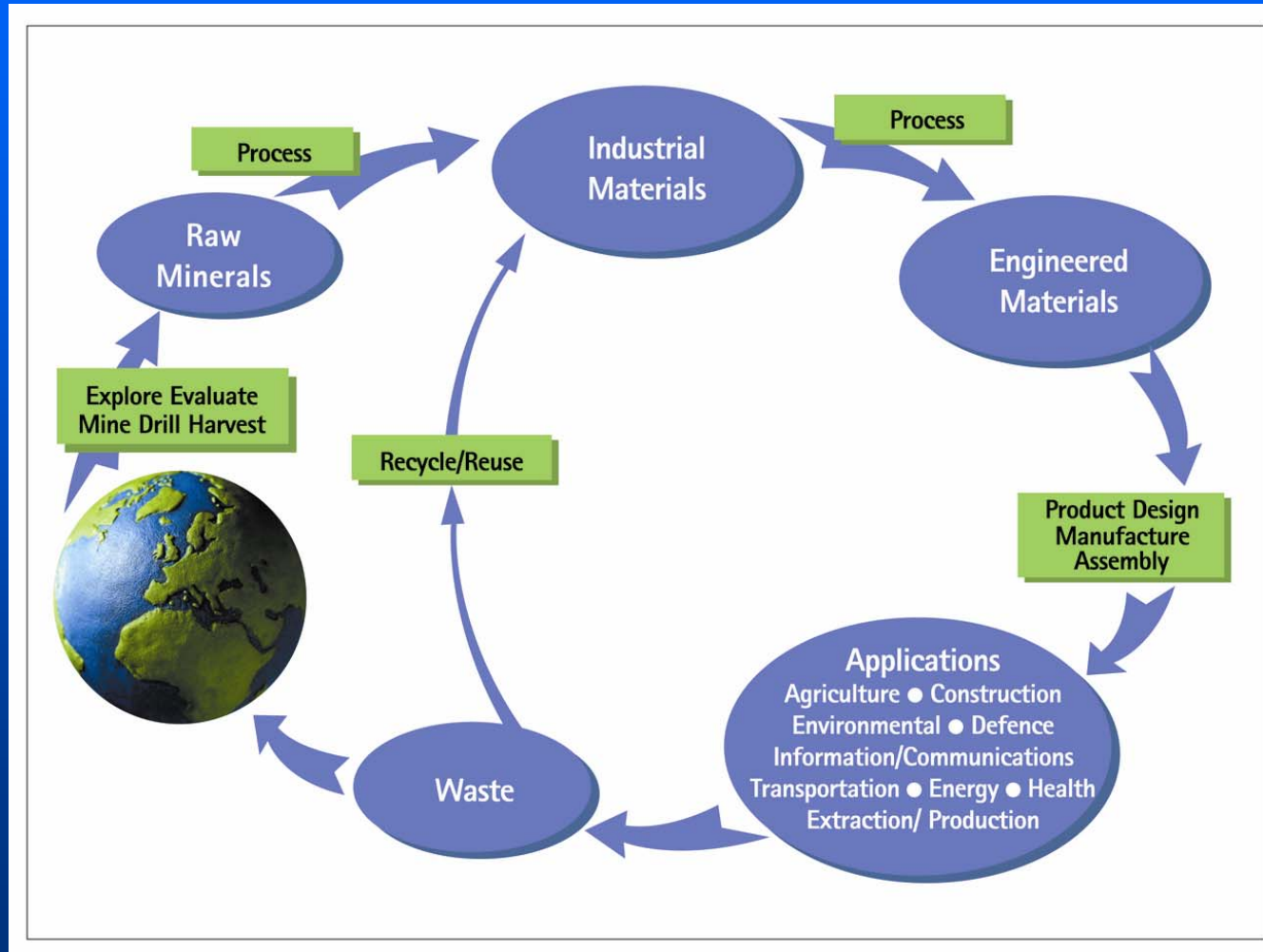
Possible Industry Action

15	Knowing	Contact with Local Schools (Vocational Training/Hillhead)
16	A Level Choices	
17	HE Choices	Industry representation on University Taster Courses
18	HE & Career Choices	Scholarships & Bursaries
18-21		Vocational Training/Vacation Employment & Projects

The Future?

- **Short Term:**
 - Taster Courses
 - More dialogue with Industry;
 - Careers Sheets
 - Scholarships/Sponsorships.
- **Longer Term:**
 - Institute of Materials, Minerals & Mining;
 - A Level in Materials
 - Schools Affiliate Scheme
 - Earth Sciences Education Forum

Materials A Level



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