

Career Clusters

Workforce Development Council
January 15, 2008



**Idaho
Professional-Technical
Education**



What Are Clusters?



Career Clusters are...

- Groups of occupations and industries
 - Shared business function
 - Requiring similar core knowledge and skills
- Represent *all* occupations from entry through management levels, including technical *and* professional careers.



16 National Career Clusters



Agriculture, Food and Natural Resources



Architecture and Construction



Arts, A/V Technology and Communications



Business, Management and Administration



Education and Training



Finance



Government and Public Administration



Health Science

...and more Clusters



Hospitality & Tourism



Human Services



Information Technology



Law, Public Safety & Security



Manufacturing



Marketing, Sales & Service



Science, Technology, Engineering & Math



Transportation, Distribution & Logistics

Career Clusters: *Goals*

- Prepare students for success in Careers (academic skills, technical skills, employability skills)
- Support Economic Development and workforce training
- Encourage Career Development (exploration/entry/change)
- Improve transitions
- Improve Academic Achievement (meet state requirements)

Career Clusters Framework

Sample Career Specialties / Occupations							
Pathways							
Foundation K&S	Foundation Knowledge and Skills						

Cluster Model



The production, processing, marketing, distribution, financing, and development of agricultural commodities and resources including food, fiber, wood products, natural resources, horticulture, and other plant and animal products/resources.

Sample Career Specialties / Occupations	<p>Agricultural Sales • Agricultural Communications Specialists • Business-Educators • Food Scientists • Meat Processors-Technologists • Biochemists-Nutritionists-Dietitians • Food Brokers-Food Inspectors • Meat Cutters-Meat Grinders • Meat Science Researchers • Food Meats Supervisors • Cheese Makers • Microbiologists • Produce Buyers • Bacteriologists • Food & Drug Inspectors • Bioprocessors • Biochemists • Food & Fiber Engineers • Food Processors • Storage Supervisors • Fieldmen • Quality Control Specialists</p>	<p>Bioinformation Specialists • Plant Breeders and Geneticists • Biotechnology Lab Technicians • Soil & Water Specialists • Crop Farm Managers • Agricultural Educators • Plant Pathologists • Apiculturists • Sales Representatives • Botanists • Tree Surgeons • Education & Extension Specialists • Agricultural Journalists • Commodity Marketing Specialists • Grain Operators/Supervisors • Custom Hay/Ridge Operators • Forest Geneticists • Golf Course Superintendents • Greenhouse Managers • Growers • Farmers • Ranchers</p>	<p>Agricultural Educators • Livestock Producers • AI Technicians-Aquaculturists • Animal Caretakers-Poultry Managers • Equine Managers-Veterinarians • Veterinary Assistants-Feedlot Specialists • Animal Scientists • Embryo Technologists • Livestock Buyers • Food Sales Representatives • Vivarium Technicians • Wildlife Biologists • Livestock Geneticists • Animal Nutritionists • Dairy Producers • Livestock Inspectors • Food Sales Specialists • Animal Health Salespersons • Meat Science Researcher • Reproductive Physiologists • Embryo Transfer Technicians • Pet Shop Operators • USDA Inspectors</p>	<p>Machine Operators • Electronic Systems Technicians • Agricultural Engineers • Agricultural Bioreactor Engineering Specialists • Heavy Equipment Maintenance Technicians • Recycling Technicians • Waste Water Treatment Plant Operators • Equipment/Parts Managers • Welders • Machinists • Communication Technicians • Agricultural Applications Software Developers/Programmers • Database Administrators • Computer Service Technical Support Technicians • Information Lab Specialists • GPS Technicians • Remote Sensing Specialists</p>	<p>Cartographers • Wildlife Managers • Range Technicians • Ecologists • Park Managers • Environmental Interpreters • Fish and Game Officers • Loggers • Forest Technicians • Log Graders • Pulp and Paper Manager • Soil Geology Technicians • Geologists • Mining Engineers • Fisheries Technicians • Water Monitoring Technicians • Hydrologists • Fish Hatchery Manager • Commercial Fisherman • Fishing Vessel Operator • Vessel Crew</p>	<p>Pollution Prevention and Control Managers • Pollution Prevention and Control Technicians • Environmental Sampling and Analysis Scientists/Technicians • Health and Safety Specialists • Environmental Compliance Assurance Managers • Hazardous Materials Handlers • Hazardous Materials Technicians / Managers • Water Environment Managers • Water Quality Managers • Waste Water Managers • Toxicologists • Solid Waste Disposers / Recyclers • Solid Waste Technicians • Solid Waste Managers • Solid Waste Specialists</p>	<p>Salespersons • Sales Manager • Business/Loss Officer • Field Representative for Bank, Insurance Company or Government Program • Farm Investment Manager • Agricultural Commodity Broker • Agricultural Economist • Farmer (Rancher/Feedlot Operator • Farm Manager • Livestock Rancher / Breeder • Dairy Herd Supervisor (DHA) • Agricultural Products Buyer • Animal Health Products Distributor • Livestock Seller • Food and Supply Store Manager • Produce Commission Agent • Ag Lenders • Agricultural Chemical Dealer • Field Service Representative • Chemical Sales Representative</p>
Pathways	<p>Food Products and Processing Systems (Food Processing and preserving, Packaging, Distribution, Government monitoring & regulation)</p>	<p>Plant Systems (Agronomic, Horticulture, Forestry, Turf, Viticulture, Soils, etc.)</p>	<p>Animal Systems (Large animals, small animals, wildlife animals, and research animals)</p>	<p>Power, Structural & Technical Systems (Power, Structures, Controls, Geospatial Technology, Computer Systems, Electronics, Hydraulics, Pneumatics, etc.)</p>	<p>Natural Resources Systems (Habitat Conservation, Forest Products, Parks and Recreation, Mining, Environmental Services, Fisheries, Soil Conservation, etc.)</p>	<p>Environmental Service Systems (Pollution Prevention, Water & Air Quality, Hazardous Materials, Solid Waste Management, Health & Safety Sanitation, etc.)</p>	<p>Agribusiness Systems (Sales, Service, Farm and Ranch Management, Entrepreneurship, Economics, etc.)</p>
Cluster Skills	<p>Cluster knowledge and skills: • Academic Foundations • Communications • Problem Solving and Critical Thinking • Information Technology • Systems • Safety, Health and Environment • Leadership and Teamwork • Ethics and Legal Responsibilities • Employability and Career Development • Technical Skills</p>						

Pathways

- Groupings of professions that require similar talents, knowledge and skills.

Occupational Specialties

- Specific occupations organized by pathway within the Career Cluster
- May not be exclusive to one Career Cluster

Organization of Knowledge and Skill Statements

Grouped in 10 Topic Areas:

- Academics
- Communications
- Problem Solving and Critical Thinking
- Information Technology
- Systems
- Safety, Health and Environment
- Leadership and Teamwork
- Ethics and Legal Responsibility
- Employability and Career Development
- Technical Skills

Questions about the Career Cluster Structure?



Idaho's Cluster Model

-6 Super Clusters

■ 16 National Clusters

-Pathways

■ Occupations



Super Cluster ► Cluster Match

Arts &
Communications



Health Care



Agriculture
& Natural
Resources



Super Cluster ► Cluster Match

Business & Management



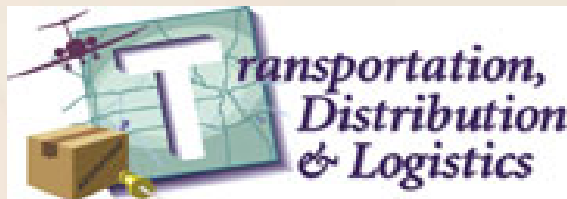
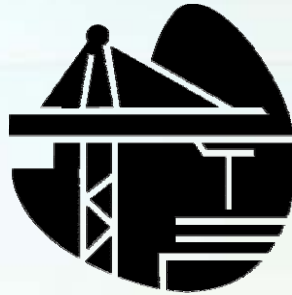
Super Cluster ► Cluster Match

Human Resources



Super Cluster ► Cluster Match

**Engineering
& Industrial
Systems**



Career Clusters *Implemented Through a* Program of Study (POS)

Individual Graduation Plan

- Recommended sequence of courses
 - organized around Career Cluster Pathway(s)
 - grades 9-14/16, for academic, elective, and professional-technical offerings

Program of Study Components

(Continued)

- Articulated courses between high school and college and/or recognized industry certifications
- Learning opportunities through student organizations and community opportunities

Foundation Knowledge and Skills

Academics • Communications
 Problem Solving • Information Technology
 Systems • Safety, Health and Environment
 Teamwork • Ethics
 Employability and Career Development
 Technical Skills



Agriculture, Food, and Natural Resources Individual Graduation Plan

PLANT SYSTEMS

This career cluster plan of study is a source of information as you develop your own personal learning plan. This plan lists EXAMPLES of suggested coursework. Courses will vary according to the availability in each school district. Plans of study should meet high school graduation requirements as well as entrance requirements for a variety of postsecondary options within this career cluster.



■ Coursework					
Subject	9 th Grade	10 th Grade	11 th Grade	12 th Grade	Advanced Coursework for Postsecondary Credit
Language Arts (9 credits)	English 9	English 10	English 11 Speech	English 12	Honors Courses
Mathematics (6 credits)	Algebra I	Geometry Algebra II	Algebra II Pre-Calculus	Pre-Calculus Calculus	Honors Courses Advanced Placement
Science (6 credits)	Earth Science	Biology	Chemistry Anatomy/Physiology		Honors Courses Tech Prep Advanced Placement
Social Studies (5 credits)			US History 11	American Government Economics	Honors Courses Tech Prep Advanced Placement
Idaho Professional-Technical Education Classes	Ag 110 Intro to Ag Education Ag 120 Intro to Ag Industry •Ag 130 Intro to Ag Mechanics Ag 150 Intro to Plant Industry	•Ag 130 Intro to Ag Mechanics Ag 150 Intro to Plant Industry Ag 320 Applied Crop Mgmt •Ag 330 Landscape Design •Ag 335 Floral Design/Marketing •Ag 340 Applied GH Mgmt	Ag 460 Ag Business Mgmt/Mktng Ag 470 Ag Sales •Ag 510 Botany/Plant Science •Ag 412 Science of Plant Growth •Ag 514 Horticulture Ag 660 Ag Business/Economics	Ag 410 Personal Skills Ag 516 Forestry Science Ag 517 Adv Forestry Science Ag 518 Range Science Ag 540 Ag Biotechnology Ag 660 Ag Business/Economics Ag 9800 Occ/Career Exploration Ag 9900 Cooperative Education	Tech Prep
Additional Requirements or Electives	World History Physical Education Computer Technology Physical Education	US History 10 Physical Education Health Foreign Language Computer Technology	Physical Education Health Foreign Language Computer Technology	Physics Computer Technology	Advanced Placement
■ Extended Learning					
School-Based	FFA Career Research	Supervised Ag Experience Career Interviews	Career Days Job Shadowing	Service Learning Project Internships	Senior Project
Community-Based	4-H	Mentorships	Volunteer	Part-Time Employment	

*540 course hours and/or six (6) course credits qualify as meeting a program sequence.

italized courses represent repeat offering (Take once); □ Either course satisfies economics requirement; □ Either course satisfies speech requirement; □ Satisfies Biological Science/Lab Credit if teacher is science certified; • Often qualify for dual credit/tech prep college credits; Underlined courses are highly recommended for this pathway

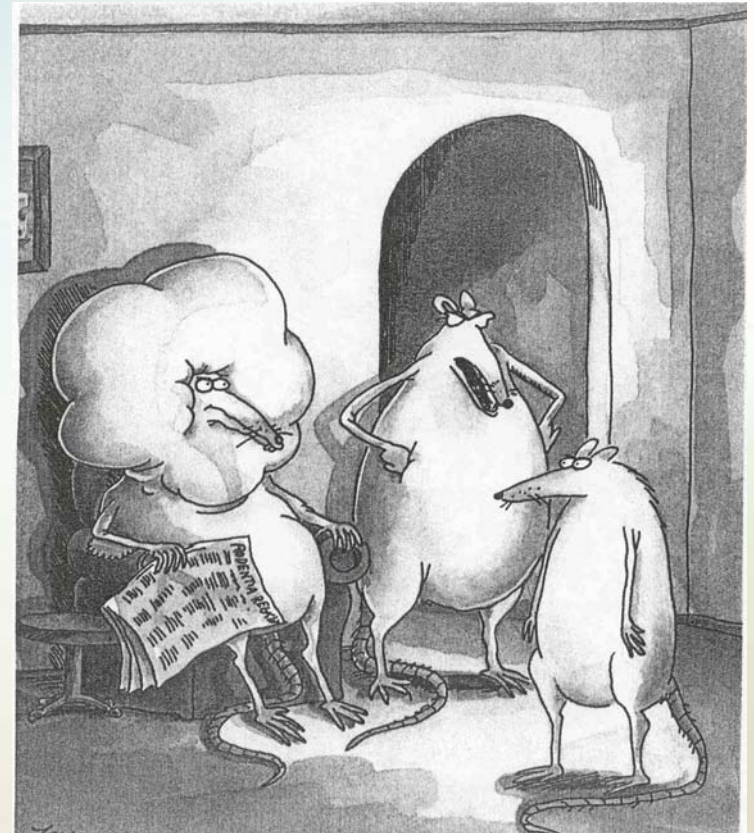
POS Example...

The College Connection

■ Coursework					
Major	Year 13	Year 14	Year 15	Year 16	Occupations Relating to This Pathway
Horticulture/ Crop Science Plant Protection Option	Core 103-149 Core Discovery Eng101 College Writing Biol 211 Insect Biology Math 143 Pre-Calculus Algebra PISc 102 Science of Plants Biol115 Cells and Evolution Chem101 Introduction to Chemistry I Comm101 Public Speaking Core 153-199 Core Discovery Eng102 College Writing	Biol116 Organisms & Environ Chem275 Carbon Compounds Soils205 Soil Ecosystems <i>(Elective—Core)</i> <i>(Elective—Ecology)</i> Biol213 Principles Biological Struct PISc205 General Botany MMBB154 Intro to Microbiology Stats251 Statistical Methods <i>(Elective—Core)</i> <i>(Elective—Specialization Course)</i>	Ent322 Economic Entomology PISc338 Weed Control PISc398 Internship PISc415 Plant Pathology PISc410 Biology of Weeds Ent447 Fund of Biological Control Gene314 General Genetics PISc407 Field Crop Production <i>(Elective—Core)</i> <i>(Elective—Specialization Course)</i>	PISc400 Seminar Eng313 Business Writing MMBB300 Survey of Biochemistry Eng446 Host Plant Resistance Eng491 Principles of IPM <i>(Elective—Specialization Course)</i> PISc401 Plant Growth/Development PISc438 Pesticides Environment Soil446 Soil Fertility <i>(Elective—Core)</i> <i>(Elective—Specialization Course)</i>	Occupations Requiring Less than Baccalaureate Degree <ul style="list-style-type: none"> ■ Agriculture Journalist ■ Biotech Lab Technician ■ Commodity Marketing Specialist ■ Custom Hay/Silage Operator ■ Farmer ■ Golf Course Manager ■ Grain Operation Supt ■ Greenhouse Manager ■ Rancher ■ Tree Surgeon
Horticulture/ Crop Science Crop Management Option	Comm101 Public Speaking Core 103-149 Core Discovery Eng101 College Writing Math 143 Pre-Calculus Algebra PISc 102 Science of Plants Biol115 Cells and Evolution Chem101 Introduction to Chemistry I Core 153-199 Core Discovery Eng102 College Writing <i>(Elective—Specialization Course)</i>	Biol116 Organisms & Environ Chem275 Carbon Compounds Soils205 Soil Ecosystems <i>(Core Cluster Course)</i> <i>(Elective Ecology)</i> Biol213 Principles Biological Struct PISc205 General Botany MMBB154 Intro to Microbiology Stats251 Statistical Methods <i>(Elective—Core)</i> <i>(Elective—Crops)</i>	Ent322 Economic Entomology PISc338 Weed Control PISc398 Internship PISc415 Plant Pathology <i>(Elective—Specialization Course)</i> Gene314 General Genetics PISc407 Field Crop Production <i>(Elective—Biotechnology)</i> <i>(Elective—Core)</i> <i>(Elective—Crops)</i>	Eng313 Business Writing MMBB300 Survey of Biochemistry PISc400 Seminar <i>(Elective Crop)</i> <i>(Elective—Specialization Course)</i> <i>(Elective—Specialization Course)</i> PISc401 Crop Physiology Eng491 Principles of IPM PISc438 Pesticides Environment Soil446 Soil Fertility <i>(Elective—Core)</i> <i>(Elective—Crops)</i>	Occupations Requiring Baccalaureate Degree <ul style="list-style-type: none"> ■ Agricultural Educator ■ Bioinformatics Specialist ■ Botanist ■ Plant Breeder/Geneticist ■ Plant Pathologist ■ Soil/Water Specialist ■ Invasive Species Specialists ■ Agricultural Consultant ■ Horticultural Consultant ■ Farm Chemical Sales Rep ■ Farm Manager ■ Research Technician

Benefits for Students and Parents

- **Relevance**
 - academic achievement
- **Connections**
 - school, college, workplace, life-long learning
- **Opportunities**
 - multiple career pathways
- **College preparedness**
 - less remediation/\$



“Quit school? Quit School? You wanna end up like your father? A career lab rat?”

Benefits for Educators That Impact Industry

- Connection between school and the 21st century workplace
- Knowledge and skill statements for aligning curriculum
- Common language with business

Benefits for Business and Workforce Development

- **Linked with labor market data**
- **Skills gap identification**
 - Knowledge and skills needed in the workplace
- **Common language with education**
- **Curriculum input to education/ training providers**

Career Clusters

How can they be used by business?

-Promote economic development
-Identify knowledge and skills needed in the workplace
-Communicate training needs to education providers

Contacts & Resources

- **State Division of Professional-Technical Education**
 - Ann Stephens, Associate Administrator
 - Sally Harris, Curriculum Coordinator
 - Kristi Enger, Career Guidance Coordinator
 - www.pte.idaho.gov
- **States Career Clusters Initiative**
 - www.careerclusters.org

