Committee on Community Colleges and Workforce

Meeting
Tuesday, November 8, 2005
1:15 PM – 2:30 PM
Room 24, House Office Building

MEETING PACKET

Allan Bense
Speaker

Pat Patterson
Committee Chair

FLORIDA HOUSE OF REPRESENTATIVES

Allan G. Bense, Speaker

Community Colleges & Workforce Committee

Pat Patterson
Chair

Ed Jennings
Vice Chair

Meeting Agenda

Tuesday, November 8, 2005
24 HOB, 1:15 PM – 2:30 PM

I. Call to Order & Roll Call

II. Opening Remarks by Chair Patterson

III. Presentation:
Biotech Workforce Curriculum

Tom Cavanagh, Program Manager
Florida Space Research Institute (FSRI)

IV. Presentation:
Information and Communication Technology Literacy Assessment

Linda Tyler, Executive Director for New Product Development
Higher Education Division
Educational Testing Services (ETS)

Jon Alexiou, Ph.D., Director of Community College Initiatives
Educational Testing Services (ETS)

V. Closing Comments

VI. Meeting Adjourned

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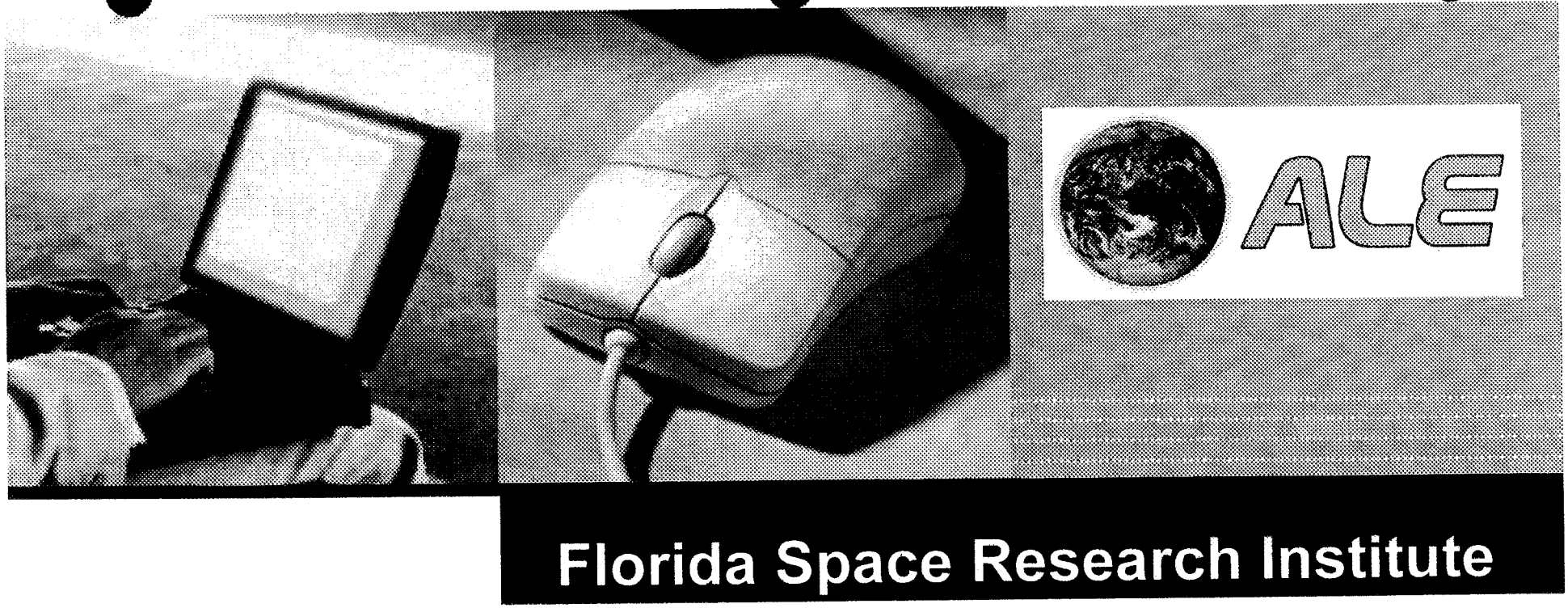
Biotech Workforce Curriculum PowerPoint Presentation .....Tab 1

Information and Communication Technology Literacy Assessment PowerPoint Presentation .....Tab 2

Tab 1



Workforce Initiatives Briefing

Tom Cavanagh
Program Manager, FSRI

tcavanagh@fsri.org

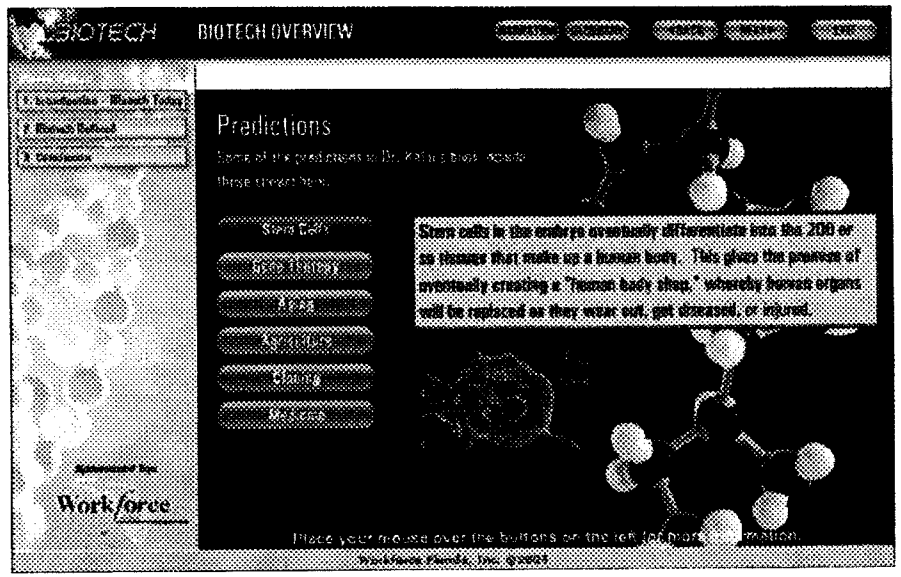
FSRI
Florida Space Research Institute

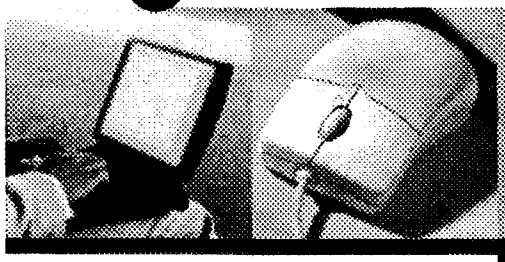
FSRI Background

- Created in 1999 under Ch. 331.368, F.S.
  - Implementing a recommendation of the 1988 Governor's Commission on Space
  - Annual OTTED funding with additional reporting to House, Senate, and Dept. of Education
- Industry-majority board of directors
  - Responsive to industry needs
- Legislative charter
  - Research & technology development
    - Diversifying Florida's role in space R&D
    - Leveraging statewide university strengths
  - Workforce development programs
    - Incumbent worker training
    - K-20 workforce pipeline
    - Specific support role to Workforce Florida

Advanced Learning Environment

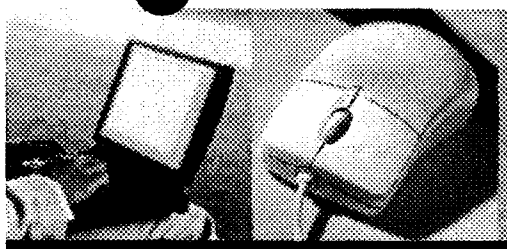
- Advanced Learning Environment (ALE)
  - Web-based interactive training and education system
  - Funded by Workforce Florida, NASA, U.S. Dept. of Labor, FDOE, ICUF/FICF, UCF
    - Over $3M total invested to date
  - Originally for incumbent aerospace workers (technicians & engineers)
  - Good working relationship with WFI
  - Expanded to support…
    - Teacher recruitment & training
    - Biotech workforce training
    - In-classroom and home-school aerospace education





ALE Content

- Content Highlights (100+ hrs online)
  - **K-12 Teacher Preparation / Support**
    - Yes Teach! 1st Class Tutorial (FICF/ICUF/FDOE) -- 10
    - Yes Teach! Math & Science (FICF/ICUF/FDOE) -- 30
    - Basic & Advanced/Technical Mathematics -- 25
  - **Aerospace**
    - Space Science (WFI) -- 13
    - Hydrogen Familiarization (UCF/NASA) -- 2
    - Cryogenics Engineering (NASA) -- 3
  - **Vocational / Technical**
    - Electronics & Instrumentation (WFI) -- 22
  - **Biotechnology** (WFI) -- 42
    - Laboratory Technology
    - Biomanufacturing
    - Regulatory Affairs / Quality Control



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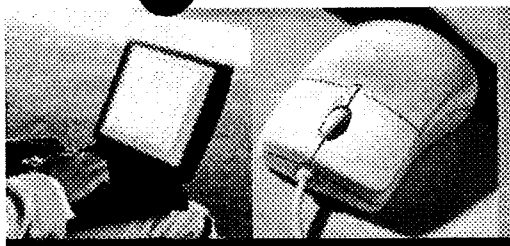


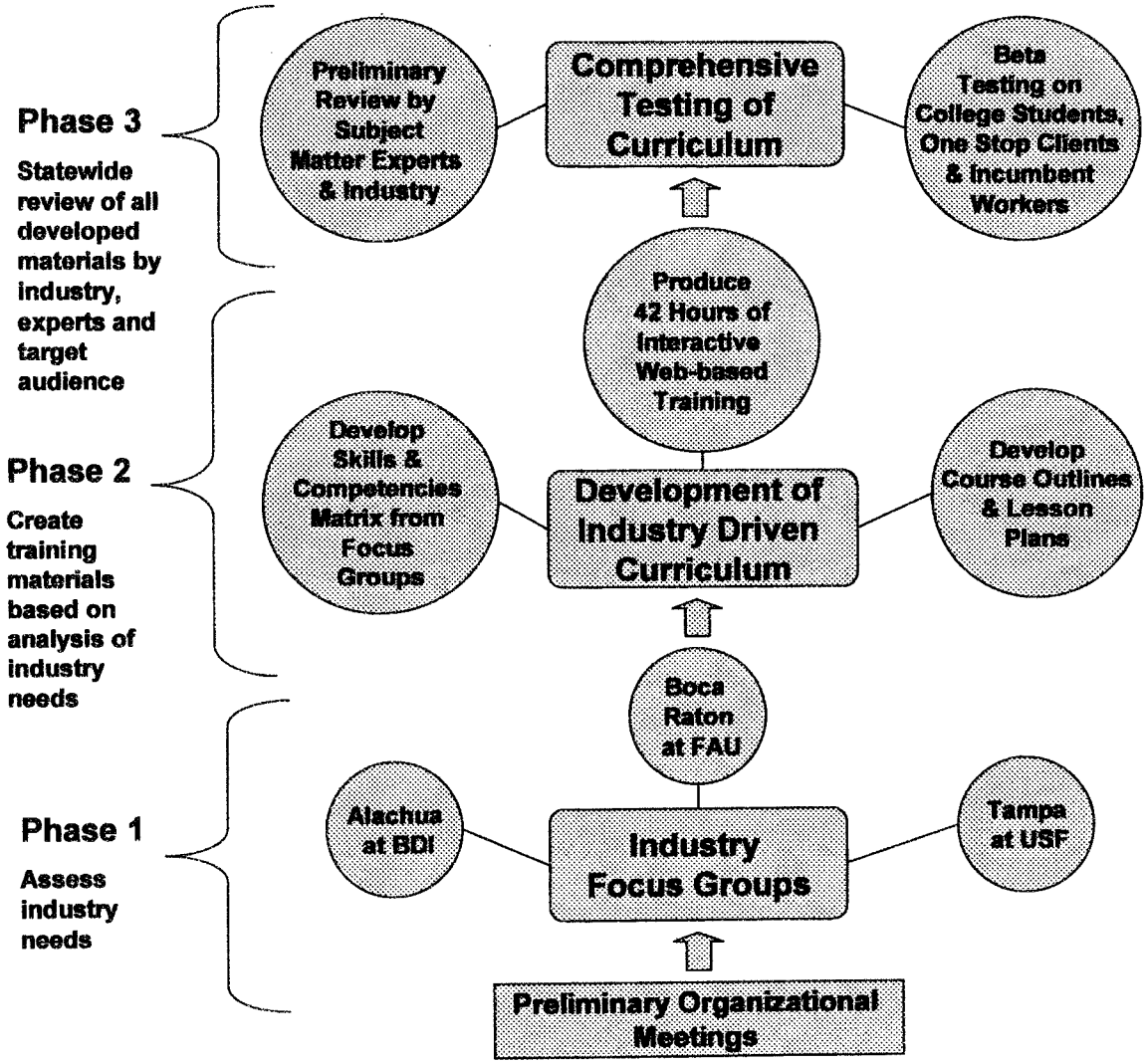
Biotech Curriculum Project

- WFI funded contract
  - $1.2 million to consortium via FCCJ
- Industry-Driven Curriculum Development
  - Identify jobs, skills, competencies for Florida's emerging biotech industry
  - Build modular, web-based curriculum
  - Build facilitator-led courses (e.g., hands-on lab requirements)

Biotech Curriculum Project

- **Contract Management and Fiscal Agent**
  - Florida Community College at Jacksonville (FCCJ)
- **Project Management**
  - Florida Space Research Institute (FSRI)
- **Development Team**
  - Florida Community College Jacksonville (FCCJ)
  - Hillsborough Community College (HCC)
  - Santa Fe Community College (SFCC)
- **University Partners**
  - University of Florida (UF)
  - University of South Florida (USF)
  - Florida Atlantic University (FAU)
- **Industry Partners**
  - BioFlorida
    - E.g., Scripps, Nabi, Boston Scientific, Cryo-Cell, Magellan BioScience, RTI, Aerotek Scientific, Osprey Pharm., Eco Array, Viragen, Bionetics, etc.
- **Production Partner**
  - Steel Beach Productions, Inc.

Biotech Curriculum Project

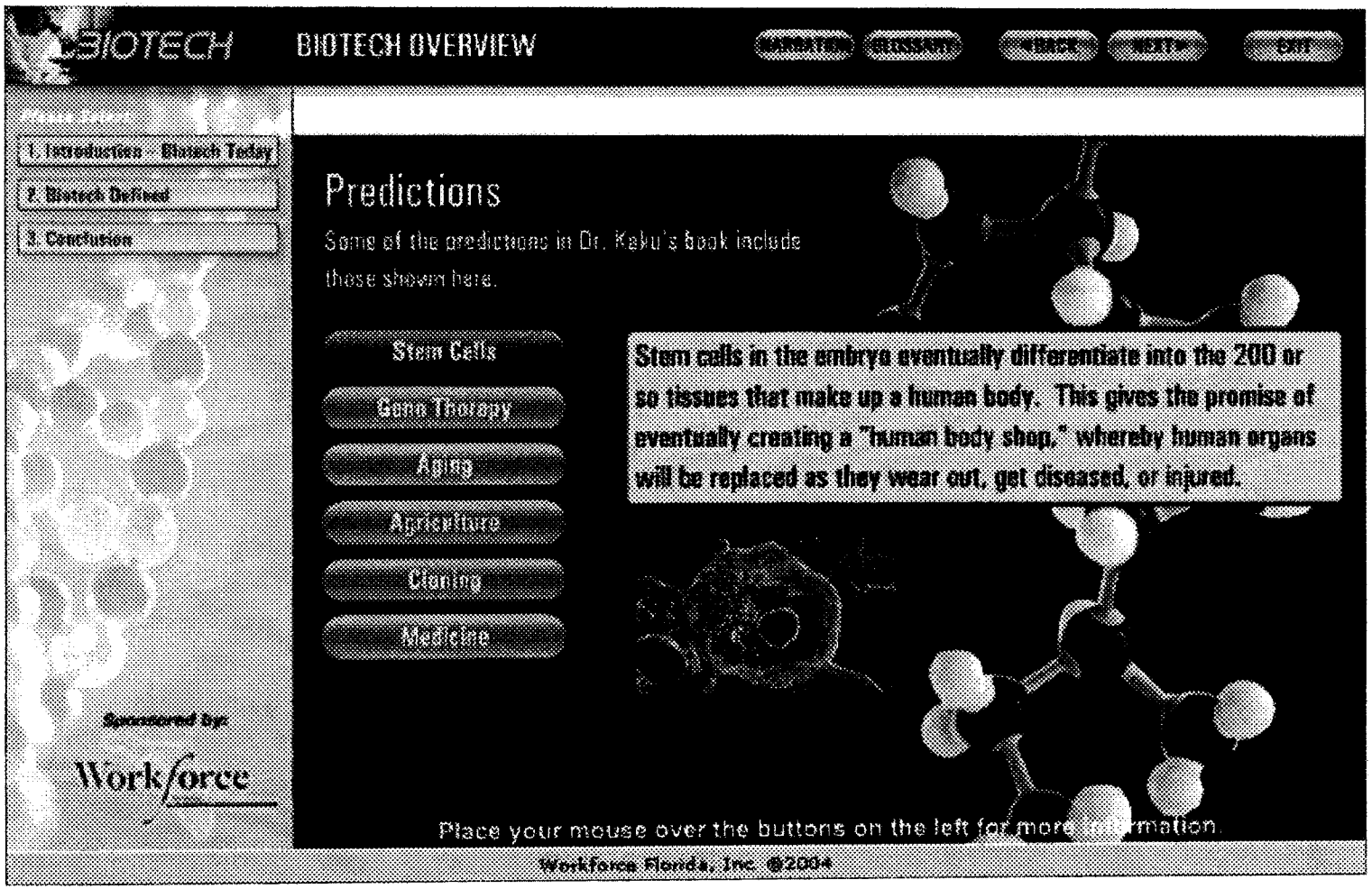


Biotech Curriculum Project

- Summary
  - 42+ hours of interactive online training
  - 6 instructor-led courses
  - Successful statewide beta test
    - 94% rated the online biotech curriculum as a positive experience (with 55% "Excellent"/"Strongly Agree")
    - 95% found the e-learning format to be an engaging instructional experience.
    - 97% would recommend the online curriculum to friends or colleagues interested in a biotech career.
  - WFI has been pleased – Board and other presentations

ALE Demonstration

Example Biotech Module



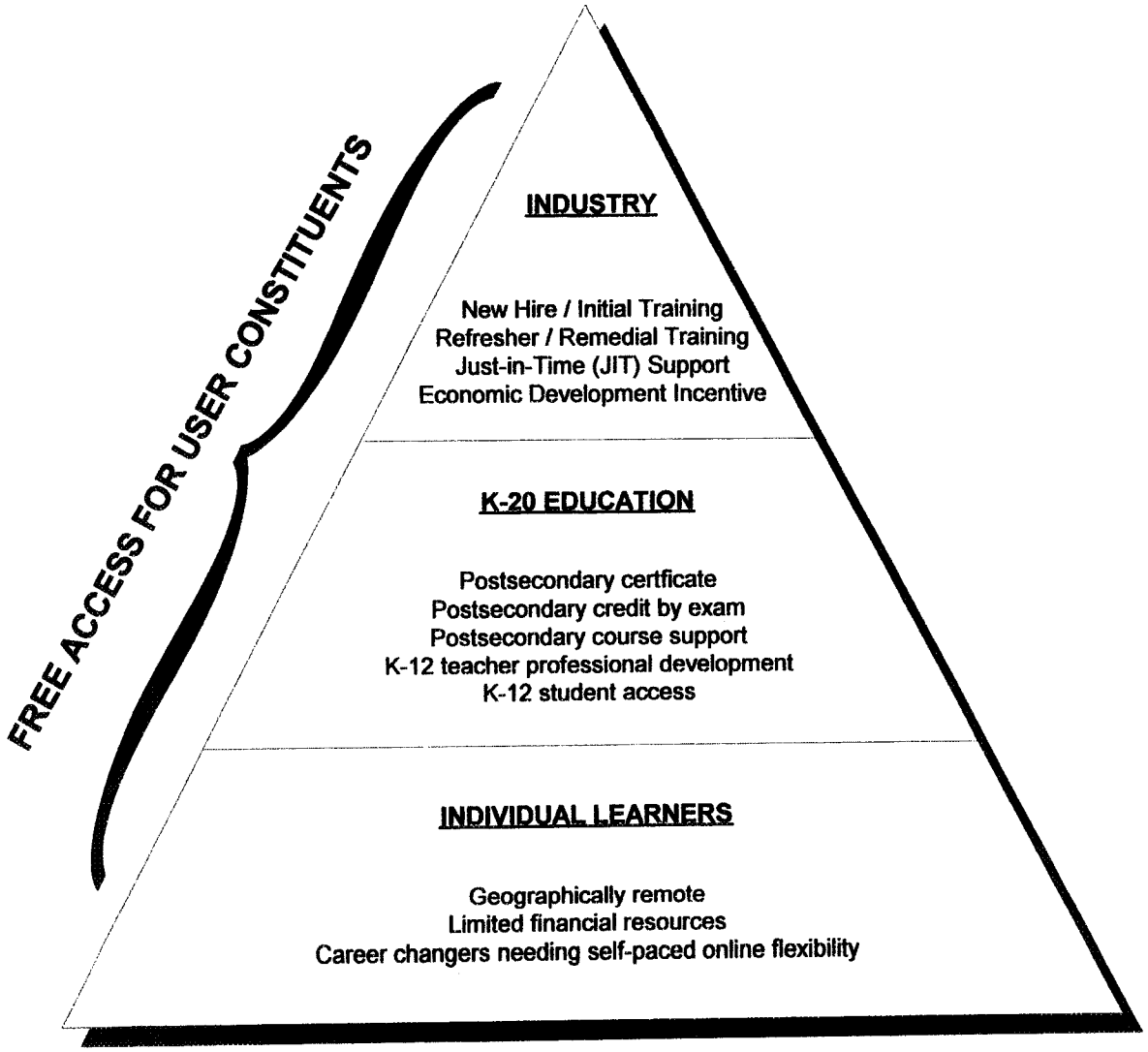
Biotechnician Training – 42 hrs

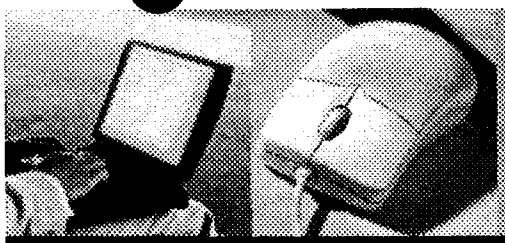
- Introduction
  - Biotech Overview
- Professional Communication in the Biotech Industry
  - Technical Vocabulary
  - SOPs and Protocols
  - Understanding Technical Reports
  - Research & Reference
  - Teamwork
- Safety Awareness
  - The Safe Work Environment
  - Handling Hazardous Materials
- Information Literacy for the Biotech Industry
  - Using the Computer for Biotech Applications
- Problem Solving and Decision Making
  - Problem-solving Techniques
  - Decision-making Techniques
- Technical Mathematics
  - Technical Math 1
  - Technical Math 2
  - Technical Math 3
- Common Biotech Skills
  - Sterilization
  - Biocompatibility Tests
- Quality Control
  - Inspection Procedures
  - Testing Methods
  - Sampling
  - Metrology
  - Product Identification and Traceability
  - QC Processes
- Quality Assurance
  - Basic Statistical Analysis
  - Statistical Process Control (SPC)
  - Validation
  - IQ/OQ/PQ
  - Applied Statistical Techniques
- Regulatory Compliance
  - Overview of Federal Regulations
  - Following the CFR – Overview
  - Following CFR 821 (Device Tracking)
  - Following Key Federal Standards & Guidance
  - Following State, Local, & Industry Regulations
  - Work Practices
- Biotech Facilities & Equipment
  - Environmental Conditions
  - Equipment Maintenance
  - Introduction to Cleanrooms
  - Controlled Environments & Utility Systems
  - Calibration 1
  - Calibration 2
- Preparing for the Biotech Workplace
  - Day in the Life of a Technician
- Basic Laboratory Interaction
  - Following the SOP
  - Monitoring Test Equipment
  - Solutions and Reagents
  - Laboratory Tests
  - Lab Equipment 1
  - Lab Equipment 2
  - Lab Equipment 3
  - Lab Equipment 4
- Specific Laboratory Interaction
  - Applied Biotech Microbiology 1
  - Applied Biotech Microbiology 2
  - Applied Cell Biology
  - Applied Immunology
  - Genetic Engineering for Technicians 1
  - Genetic Engineering for Technicians 2
  - Introduction to Working With Proteins
  - Precipitating Soluble Proteins
  - Chemical Assays

Bio Final Recommendations

- Implement statewide via ALE
  - Free to individuals, companies, K-20 Ed
  - Free hosting/licensing to WFI through 3/07
  - Free FSRI Admin through 2005
  - Already tested and ready to be immediately implemented
  - Leverages prior $1.4 million WFI aero investment with current $1.2 million bio investment

Bio Final Recommendations





Bio Final Recommendations

- Establish statewide Biotech Training and Education Council (BioTEC)
- Develop additional web-based materials
- Engage EFI to use Biotech Curriculum as economic development tool
  - E.g., ALE→EADS
- Plan for maintenance

Other ALE Content Highlights

- K-12 Teacher Preparation
- Space Science
- Technical / Vocational
- Mathematics
- Cryogenics

1st Class Tutorial (10 hrs +/-)

10 hours of e-learning tied to DOE's 12 accomplished practices. Each module includes a pretest and posttest.

- Introduction
- Student Assessment
- Communication
- Continuous Improvement
- Critical Thinking
- Diversity
- Ethics
- Human Growth & Development
- Knowledge of Subject Matter
- Learning Environment
- Planning
- Role of the Teacher
- Technology
- Classroom Readiness
- Conclusion
- Other resources
  - Self-Assessment, Internet

YT!M&S Content (30 hrs +/-)

Subjects / Disciplines

- Life Science
- Marine Bio 1
- Marine Bio 2
- Basic Electricity 1
- Basic Electricity 2
- Electrical DC Theory
- Using a Computer
- Oncology
- Drug Abuse Awareness: Ecstasy
- Aerodynamic Terms
- Aerodynamic Basics
- Women's Health: Breast Cancer Awareness
- The Brain: Anatomy & Diseases
- Mentoring

Instructional Pedagogy/Resources

- Health Education
- Math Ed – Elementary
- Math Ed – Middle & High
- Science Education
- Reading With Math & Science
- Math & Science for Special Populations
- Parent Homework Helper
- Math Teacher Toolkit
- Mentor Toolkit
- Be a Teacher Video (PBAU)

Space Science – 15 hrs

- Space History & Fundamentals
  - History of Rocketry
  - The Space Race: Space Flight-The Early Years
  - Early Launch Complexes
  - Orbital Science
- Propulsion Theory & Application
  - Introduction to Propulsion
  - Newton's Laws of Motion
  - The Forces of Propulsion
  - Solid Fuel Rockets
  - Liquid Fuel Rockets
- Hydrogen Familiarization
  - The Basics
  - Liquid Hydrogen
  - Manufacturing Processes
  - Storage Methods
  - Into the 21st Century
- Current & Future Space Applications
  - The Shuttle Program
  - The International Space Station
  - Military Space Programs (U.S. Military Satellites)
  - Weather & Navigational Satellites
  - U.S. Space Operations
  - Current Launch Complexes (CCAFS/KSC)
  - International Aspects of Space Technology and Commerce
  - Living and Working in Space
  - Unmanned Exploratory Spacecraft: Planetary and Lunar Exploration
  - Future Space Exploration
  - Introduction to Cleanrooms
    - 3D Virtual Cleanroom-Payload Changeout Room
    - 3D Virtual Cleanroom-Space Station Processing Facility

Technical/Vocational – 22 hrs

- Digital Electronics
  - Introduction to Digital Electronics
  - Introduction to Boolean Algebra
  - Characteristics of Logic Circuits
  - 'AND' Logic
  - 'OR' Logic
  - Buffer and Inverter Amplifiers
  - 'NAND' Logic
  - 'NOR' Logic
  - Exclusive 'OR' Logic

- Fundamentals of Instrumentation
  - Instrumentation Definitions
  - Fundamentals
  - Understanding Instrument Symbols
  - Instrument Calibration
  - Understanding Instrument Calibration Procedures
  - Flow
  - Pressure
  - Level
  - Temperature
  - Control Valves
  - Pneumatics
  - Controllers
  - Control (Part 1)
  - Control (Part 2)
  - Smart Instrument Calibration
  - Smart Instrument Calibrators
  - Instrument Installation (Part 1)
  - Instrument Installation (Part 2)
  - Instrument Maintenance
  - Control Valve Maintenance
  - Instrument Tubing
  - Documentation
  - Application

Mathematics – 25 hrs

- Basic
  - Algebra-Basic Concepts
  - Decimal Fractions
  - Fractions
  - Geometry
  - Percentage
  - Powers and Roots
  - Ratio and Proportion
  - Signed Numbers
  - Solving Equations
  - Units and Measurements
  - Whole Numbers
- Advanced
  - Binary, Octal, and Hexadecimal Number Systems
  - Boolean Algebra
  - More Powers and Roots - Logarithms
  - Simultaneous Equations
  - Trigonometry
  - Vectors

Cryogenics - 3 hrs

Advanced Level

- Intro to Cryogenics
- What is Cryogenics?
- Thermodynamic States
- L02 Tanker Off-Load Operation Preparations
  - Tanker Support Preparations
  - Tanker Safety Preparations
  - Tanker LOX Storage Preparations
- L02 Tanker Off-Load Operation Procedures
  - LO2 Tanker Off-Load: Pre-fill
  - LO2 Tanker Off-Load: Fill
  - LO2 Tanker Off-Load: Post-fill

Teacher Development Plan

- Working with…
  - Individual districts (e.g., Volusia, Brevard)
    - Inservice
  - Consortia (e.g., Heartland, PAEC, NEFEC)
    - Inservice
  - Universities (e.g., NSU)

11	Mathematics - Basic	Math Education for Educators
12	Yes Teach! 1st Class Tutorial of Teaching Skills	Classroom competencies for today's teachers
14	Cryogenics Engineering	Graduate level cryogenic instruction
15	Mathematics -Advanced	Advanced and Technical Math Education for Educator
17	NSU SLS and Inquiry-Based Space Science	NSU Course Support
18	SLS Lab Training	SLS Lab Training

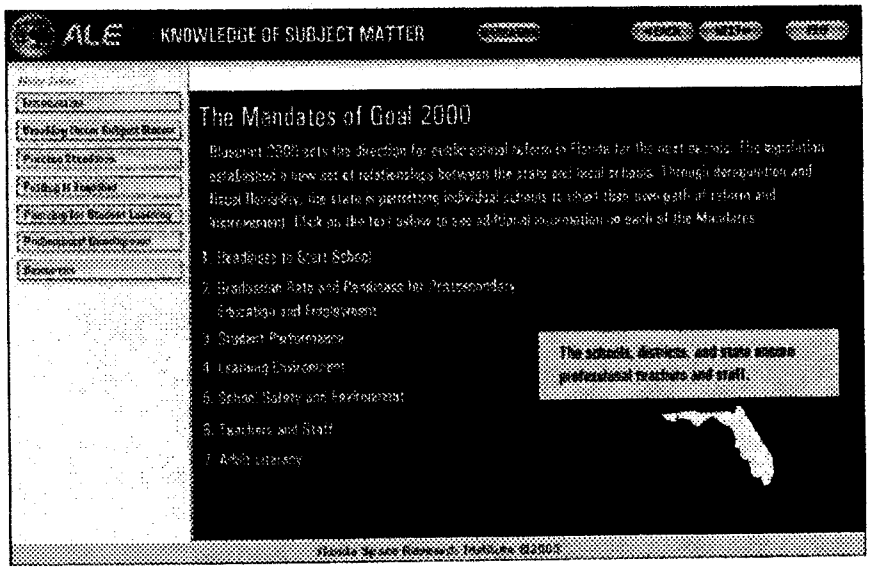
1

Courses

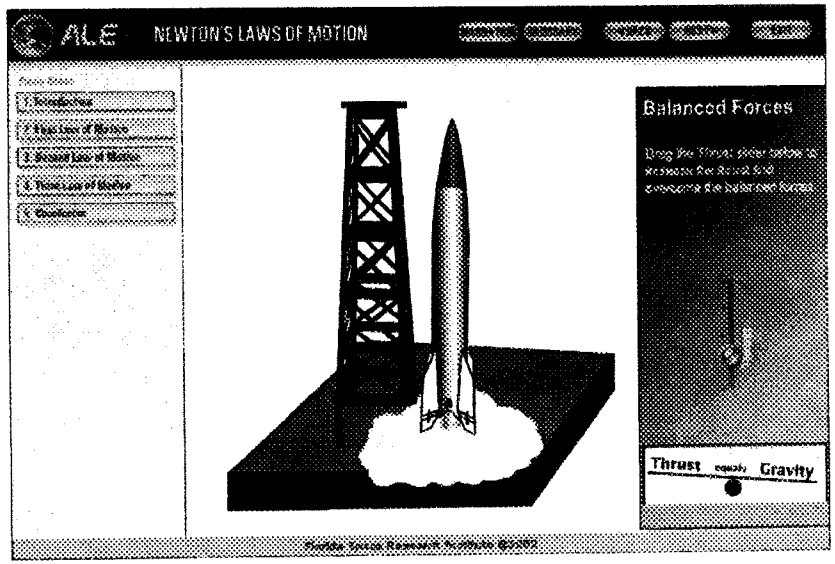
Id	Start Date	End Date	Title	Subject	Register	Request
50	1/27/2005 12:00 AM	12/30/2010 12:00 AM	Space History and Fundamentals- Space Flight - The Early Years	Space History & Fundamentals	Register	Request
57	1/27/2005 12:00 AM	12/30/2010 12:00 AM	Current and Future Space Applications- Weather and Navigational Satellites	Current and Future Space Applications	Already Registered	Request
62	1/27/2005 12:00 AM	12/30/2010 12:00 AM	Current and Future Space Applications- Unmanned Exploratory Spacecraft - Planetary and Lunar Exploration	Current and Future Space Applications	Register	Request
184	1/27/2005 12:00 AM	12/30/2010 12:00 AM	Yes Teach! - Introduction	Yes Teach! Math & Science	Register	Request
28	1/27/2005 12:00 AM	12/30/2010 12:00 AM	Yes Teach! - Assessment	Yes Teach! 1st Class Tutorial	Already Registered	Request
29	1/27/2005 12:00 AM	12/30/2010 12:00 AM	Yes Teach! - Communication	Yes Teach! 1st Class Tutorial	Register	Request
30	1/27/2005 12:00 AM	12/30/2010 12:00 AM	Yes Teach! - Continuous Improvement	Yes Teach! 1st Class Tutorial	Already Registered	Request
31	1/27/2005 12:00 AM	12/30/2010 12:00 AM	Yes Teach! - Critical Thinking	Yes Teach! 1st Class Tutorial	Already Registered	Request
32	1/27/2005 12:00 AM	12/30/2010 12:00 AM	Yes Teach! - Diversity	Yes Teach! 1st Class Tutorial	Register	Request
33	1/27/2005 12:00 AM	12/30/2010 12:00 AM	Yes Teach! - Ethics	Yes Teach! 1st Class Tutorial	Already Registered	Request

1 2

Examples



Knowledge of Subject Matter



Newton's Laws

Module Examples

ALE INTRODUCTION TO CLEANROOMS

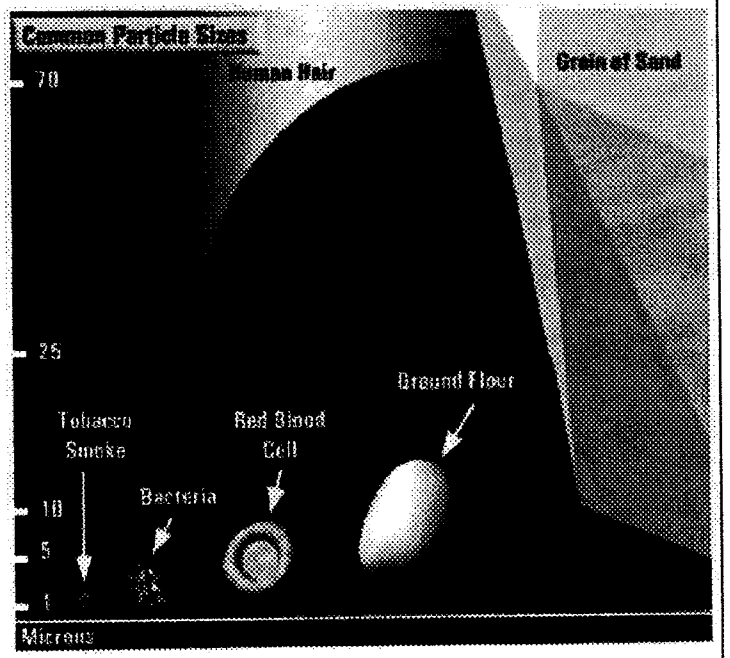
GLOSSARY BACK NEXT EXIT

Please Select:

1. Introduction
2. Definitions & History
3. Particulate Contaminants
4. Control & Design Standards
5. Rules & Regulations
6. Proper Entry Procedures
7. Exam

Particulate Contaminants: Particulate Contaminants

Here are some familiar contaminants. A single strand of hair will run roughly from 70 to 100 microns in diameter. As we work our way down the scale, you can see the relative sizes of particles such as ground flour, red blood cells, bacteria, and tobacco smoke. To filter out particulates as small as these (and often smaller), a filtration system using high efficiency filters is necessary.



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Module Examples

ALE SOLID FUEL ROCKETS

NARRATION GLOSSARY <BACK NEXT> EXIT

Please Select

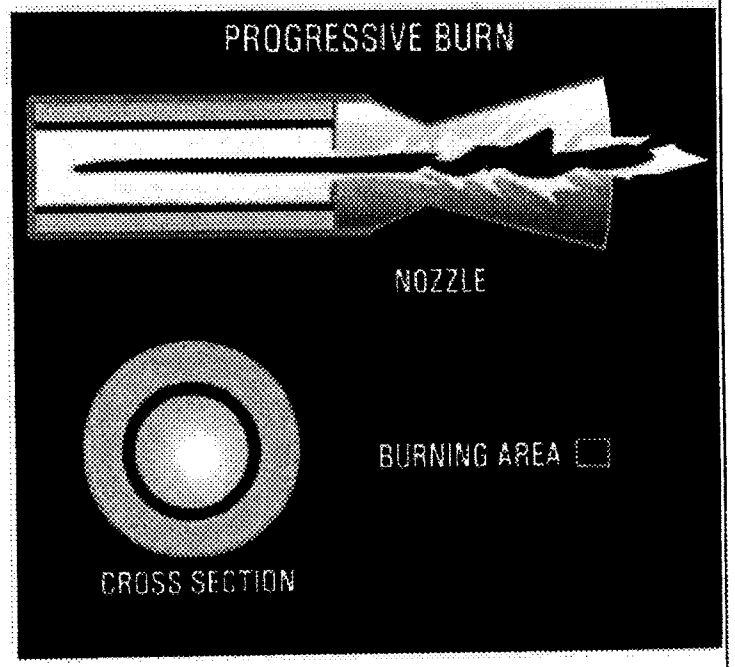
1. Introduction
2. Solid Rocket Propellants
3. Space Shuttle's Booster

SOLID ROCKET PROPELLANTS: Progressive Burn Pattern

A progressive burn pattern features a center-perforated grain.

With this arrangement, an immediate jump in thrust is produced at ignition. Because the exposed grain area increases as the propellant is consumed, thrust continues to build at a steady rate throughout the motor operation.

Once the propellant supply has been consumed, there is an almost immediate drop off in thrust output.



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Module Examples

ALE THE SHUTTLE PROGRAM

NARRATION GLOSSARY ◄BACK NEXT► EXIT

Please Select

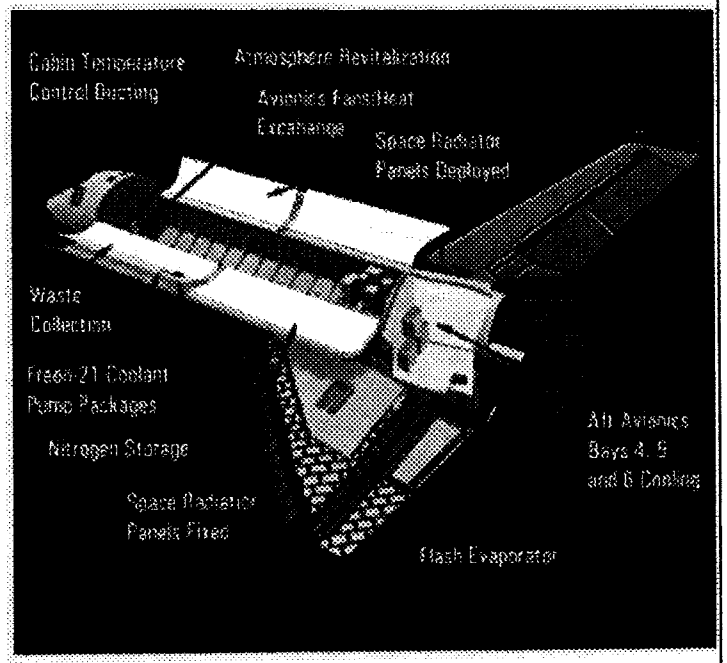
1. Introduction
2. Concept Moves To Reality
3. Shuttle System Components
4. The Fleet
5. Orbiter Vehicle Airframe
6. Critical Flight Systems

The Shuttle Program: Critical Flight Systems

The ECLSS provides a life-sustaining environment for a flight crew of eight aboard the shuttle for mission durations of up to 21 days. It is composed of five smaller systems: Air Revitalization, Thermal Control, Water Coolant, Pressure Control, and Water Management (potable).

First is the air revitalization system (ARS), which maintains humidity levels at between 30% and 75%. The ARS removes CO and CO2 from the air and controls temperature and ventilation in the crew compartment.

The second part of the ECLSS is the active thermal control system (ATCS), which provides heat removal during all phases of the orbiter mission. The ATCS also has payload bay radiators for heat removal while in orbit.



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Module Examples

ALE LIVING AND WORKING IN SPACE

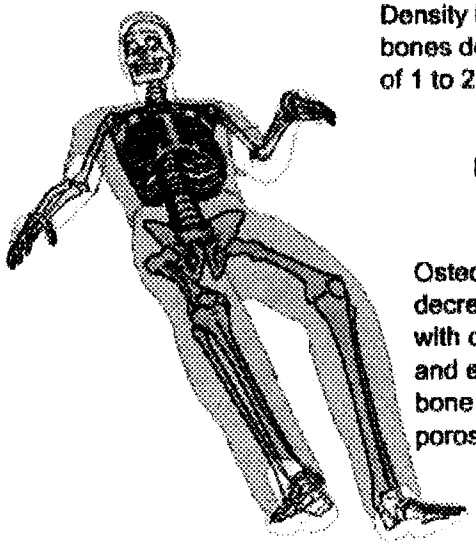
1. Module Objectives
2. Health Effects
3. Problems of Zero G
4. Simulating Gravity
5. Living in Space
6. Equipment
7. Suited for Space
8. Habitability

Living and Working in Space: Health Effects

Bone Loss - Weightlessness triggers bone loss. Density in weight-bearing bones declines at the rate of 1 to 2 percent a month. During a mission to Mars, a 45-year old could see bone deterioration reach the weakened state of severe osteoporosis, if this does not stabilize.

Risk of bone fracture is greater as the bones weaken; this would be dangerous in space, since the bones would not repair correctly (requires gravity to orient). Osteoporosis seems to be the only permanent negative effect of space travel; drugs may eventually be used to counteract these effects.

Sensory Conflict, Bone Loss



Density in weight-bearing bones declines at the rate of 1 to 2 percent a month.

Osteoporosis: decrease in bone mass with decreased density and enlargement of bone spaces producing porosity and fragility

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Module Examples

ALE ASSESSMENT

NAVIGATION BACK NEXT EXIT

Please Select

- Introduction
- Assessment Types
- Examples
- Assessing
- Communicating
- Conclusion
- Resources

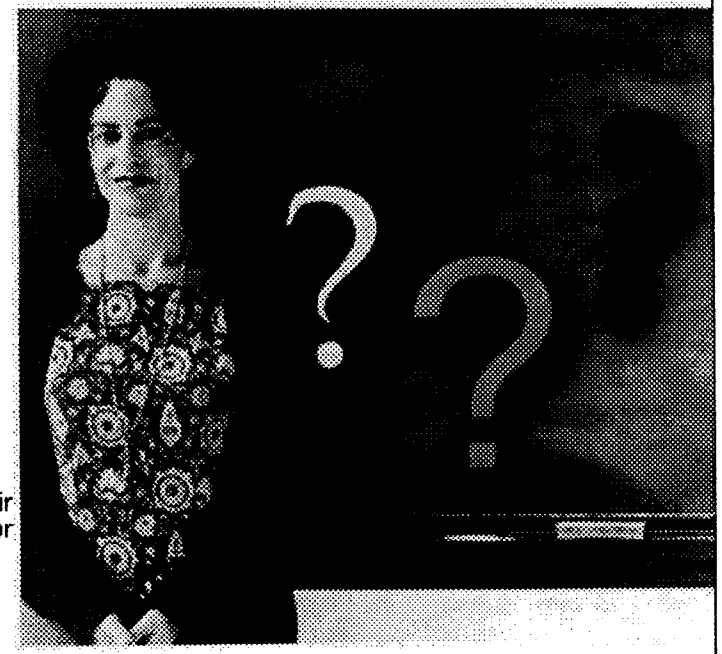
POP QUIZ

Select the best answer available.

Which of the following best describes a preferred accommodation?

A. Adaptation of teaching strategies and inclusion of existing support systems
B. Modification in the curriculum
C. Request to change the student's teacher
D. Strategy to help teachers assess student work

You are correct! The answer is A. Accommodations for students with special needs are techniques to help the students work around their ability, not to lower the standard for performance.



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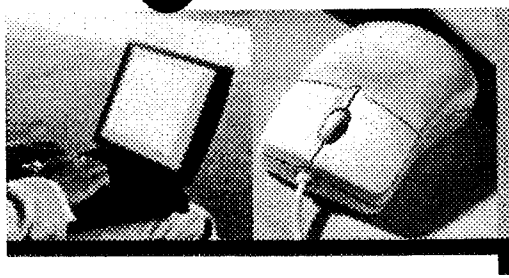


Module Examples

YES TEACH! MARINE BIOLOGY I

NARRATION GLOSSARY ◄BACK NEXT► EXIT

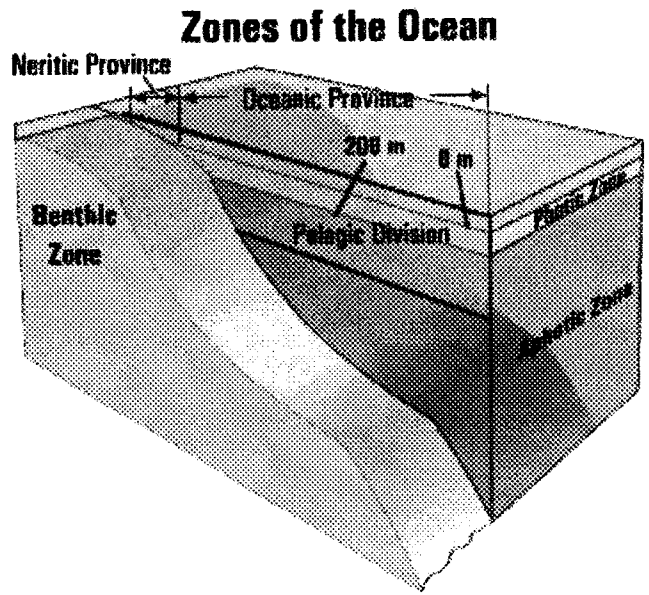
Please Select:

1. Introduction
2. Subdividing the Oceans
3. Chem. Properties - Seawater
4. Ocean Circulation
5. Waves and Tides
6. Conclusion

SUBDIVIDING THE OCEANS - DIVISIONS BASED ON HABITAT

The water above the ocean floor makes up the **Pelagic Division** and is divided into two provinces. The **Neritic Province** includes the water above the continental shelf (see below) and is most closely associated with the continents.

The **Oceanic Province** lies beyond this region and overlies the deeper regions of the Benthic Division. Each region is inhabited by vastly different collections of organisms with very different lifestyles, physiologies, and ecologies.



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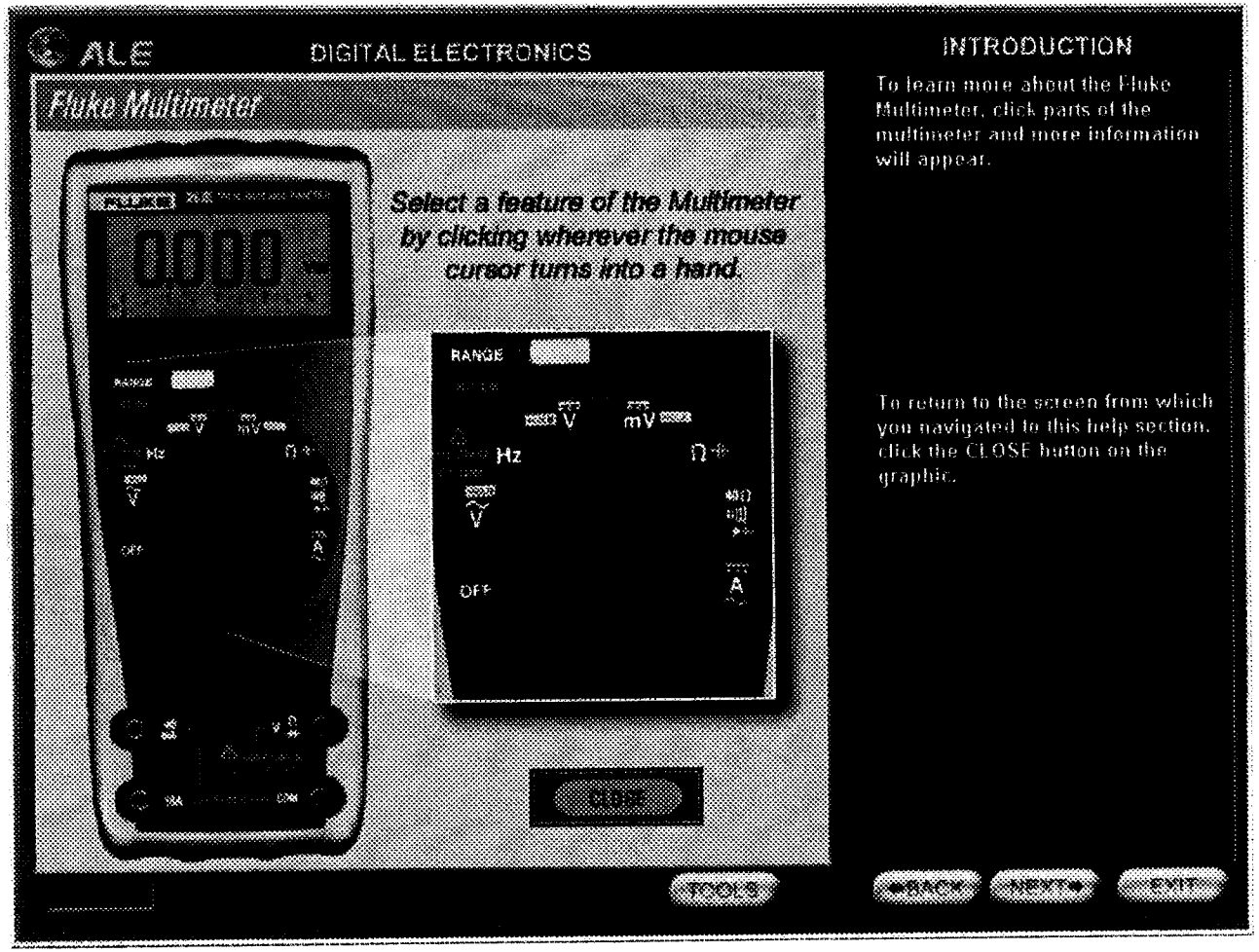
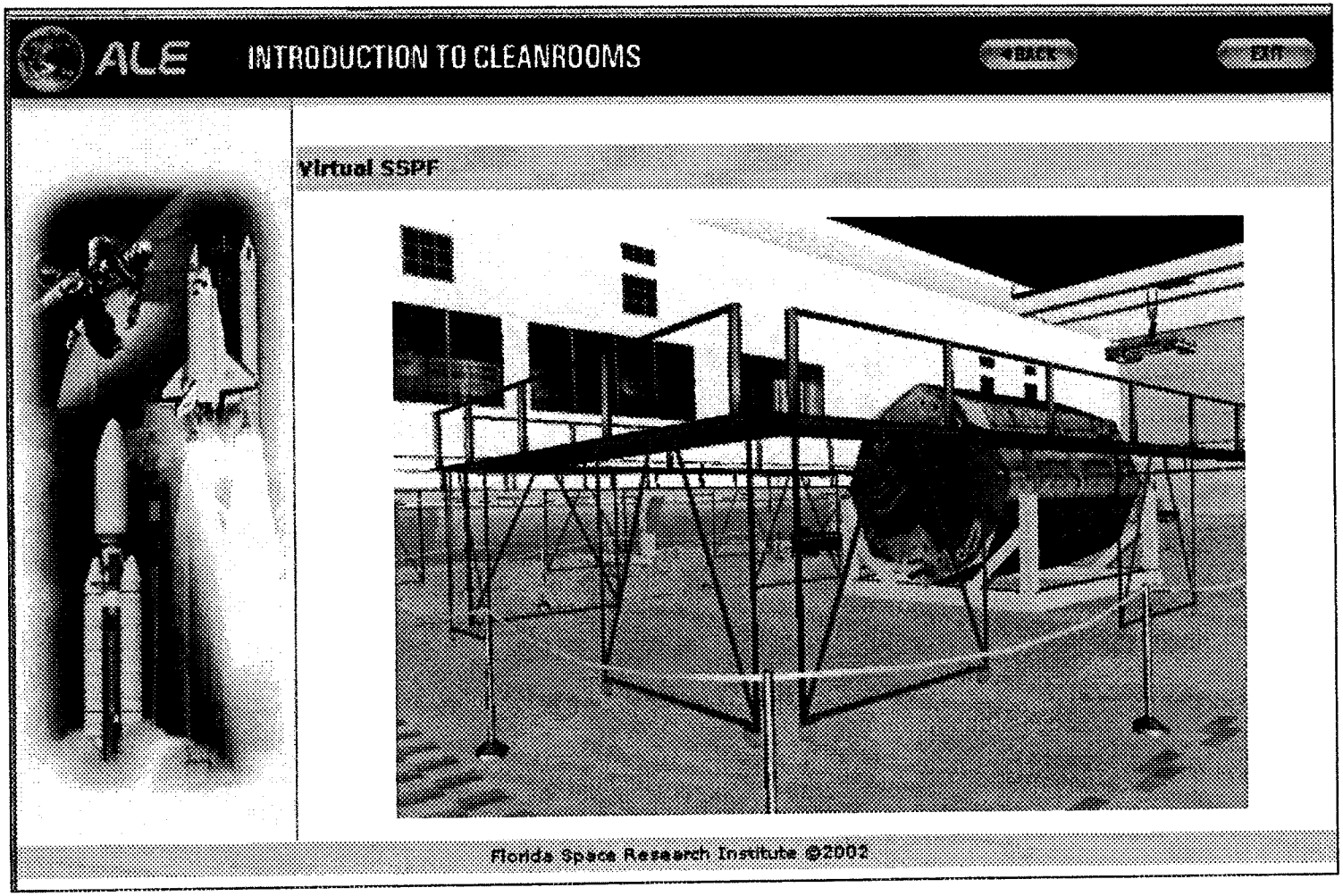
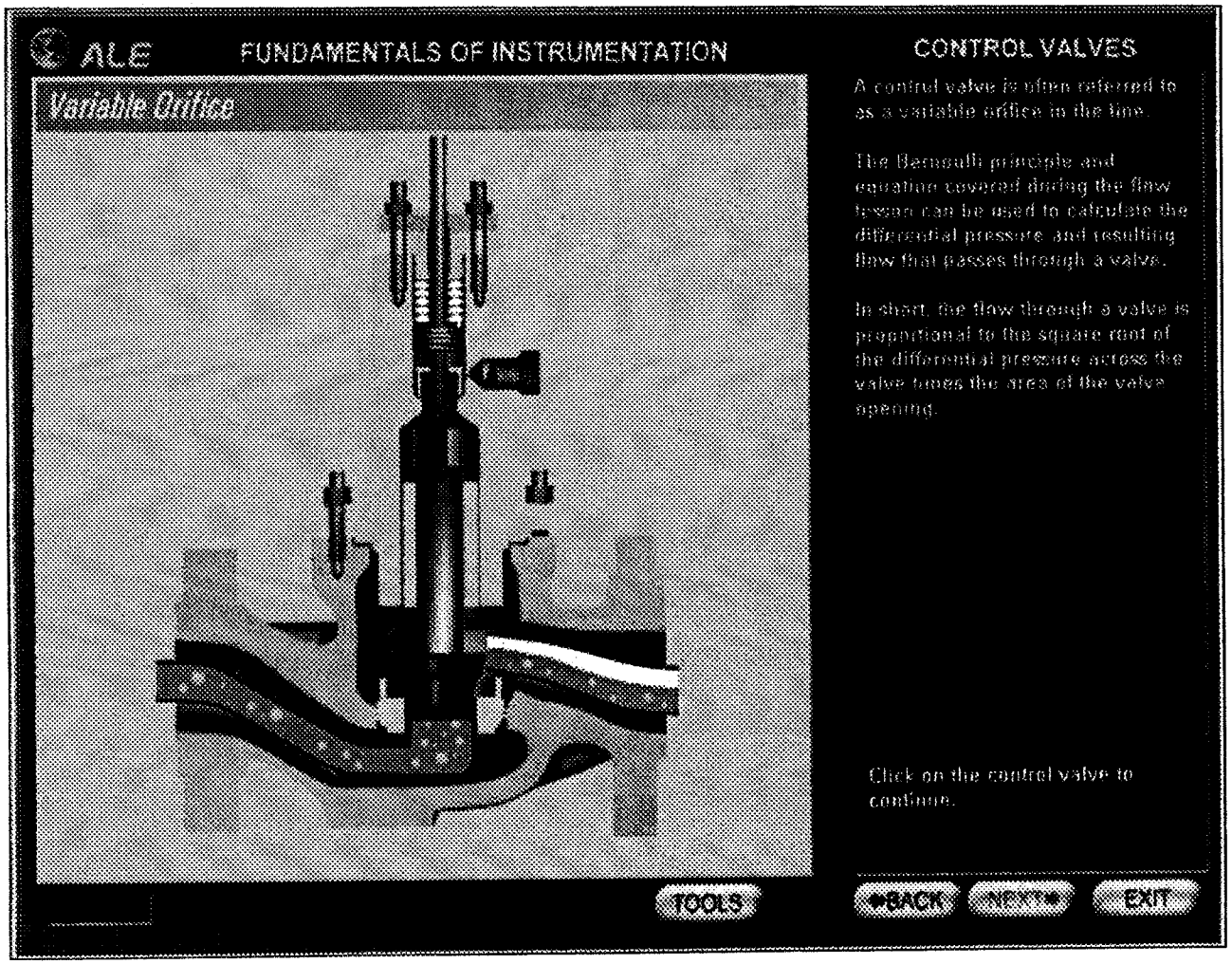
Module Examples



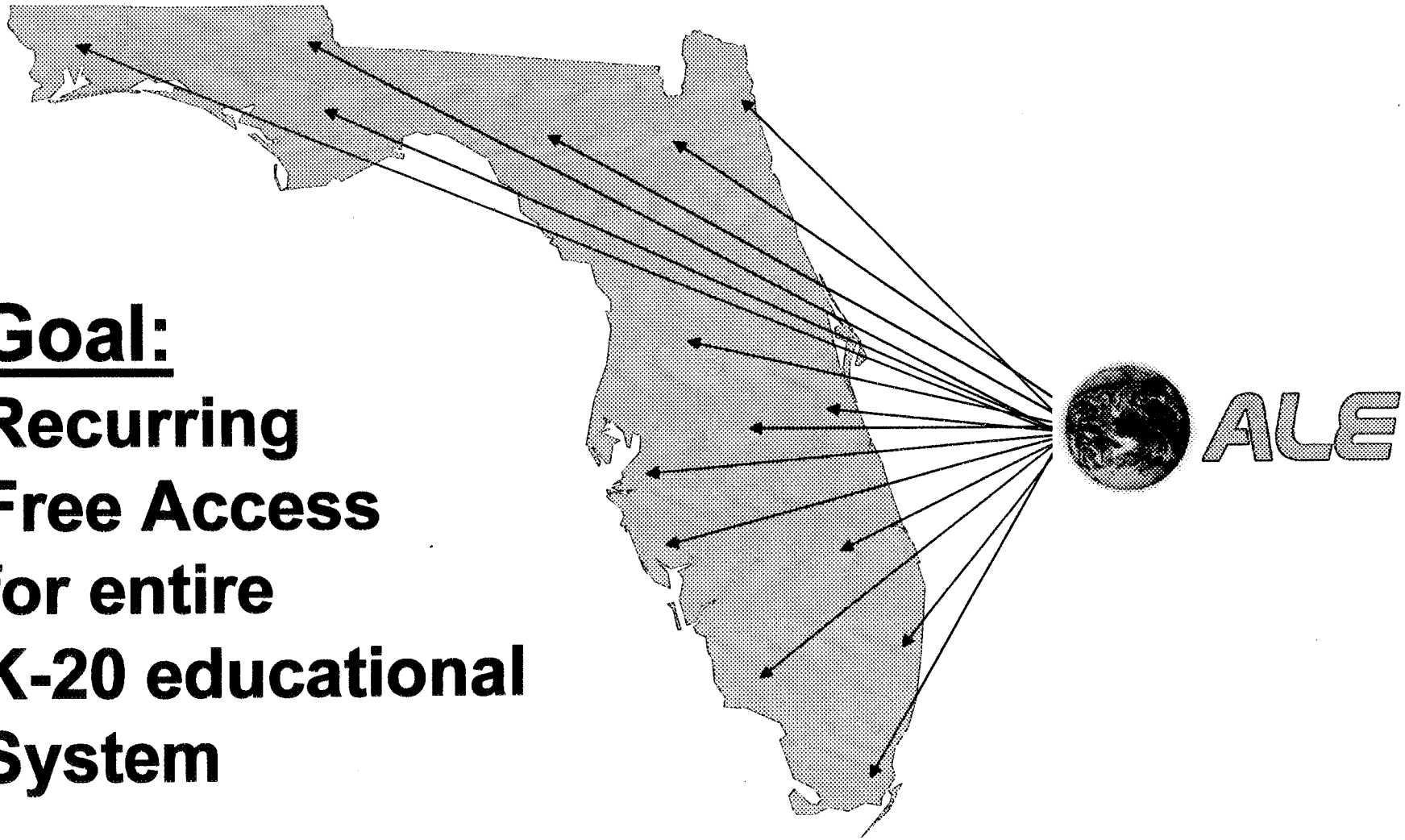
Virtual Environments



Module Examples



Unlocking the Value



Goal:

Recurring Free Access for entire K-20 educational System

Implementation

- Access includes all 100+ hours of content
  - Biotech workforce
  - Teacher training
  - Aerospace workforce

- Supported infrastructure for additional high-need / high-impact areas:
  - Nursing
  - Manufacturing
  - Information technology
  - Other…

Questions / Discussion

Tom Cavanagh

Florida Space Research Institute

321-452-2653, ext. 211

tcavanagh@fsri.org

www.advancedlearningenvironment.org

ale.fsri.org

www.fsri.org

ALE ACCESS

www.advancedlearningenvironment.org

or via link at

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Tab 2

ICT Literacy Assessment

Thinking Beyond Technology

Linda Tyler, Ph.D.
Exec. Dir., Higher Education Div.
November 8, 2005
For the Florida Community Colleges & Workforce Committee

Listening. Learning. Leading.

What is ICT Literacy . . .

and why measure it?

ICT (Information and Communication Technology) Literacy is...

... the ability to use digital technology, communication tools, and/or networks to

- define,
- access,
- manage,
- integrate,
- evaluate,
- create, and
- communicate

information

- ethically and legally

in order to function in a knowledge society.

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Information and Communication Technology Literacy: a bridge between

Technical Literacy

Database	Word Processing	Presentation

- Can you bold a word?
- Can you open a database?

Information Literacy

Access	Evaluate	Use

- Can you find information?
- Can you evaluate authority?

ICT Literacy

- Can you find authoritative information on the web?
- Can you create a persuasive presentation?

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Why measure ICT literacy?

- The availability of all kinds of information has increased enormously.
- Knowing how to use hardware and software isn't enough.
- Almost all workers are now "knowledge workers"

To succeed academically and in the workplace, you must know how to use technology tools to support critical thinking and problem-solving within an information-rich environment.

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How did ETS develop the ICT Literacy Assessment and what is the timeline, past and future?

Assessment Development Process and Timeline

- 2001 - International panel (education and industry leaders) met to define ICT Literacy; they published *Digital Transformation*
- 2003 - Higher Education ICT Literacy consortium was formed
- 2003-2004 – The ETS ICT Literacy Assessment was developed
- 2004 - Field trials conducted
- 2005 - Institution-level test delivered
- 2006 – Individual-level test will be launched

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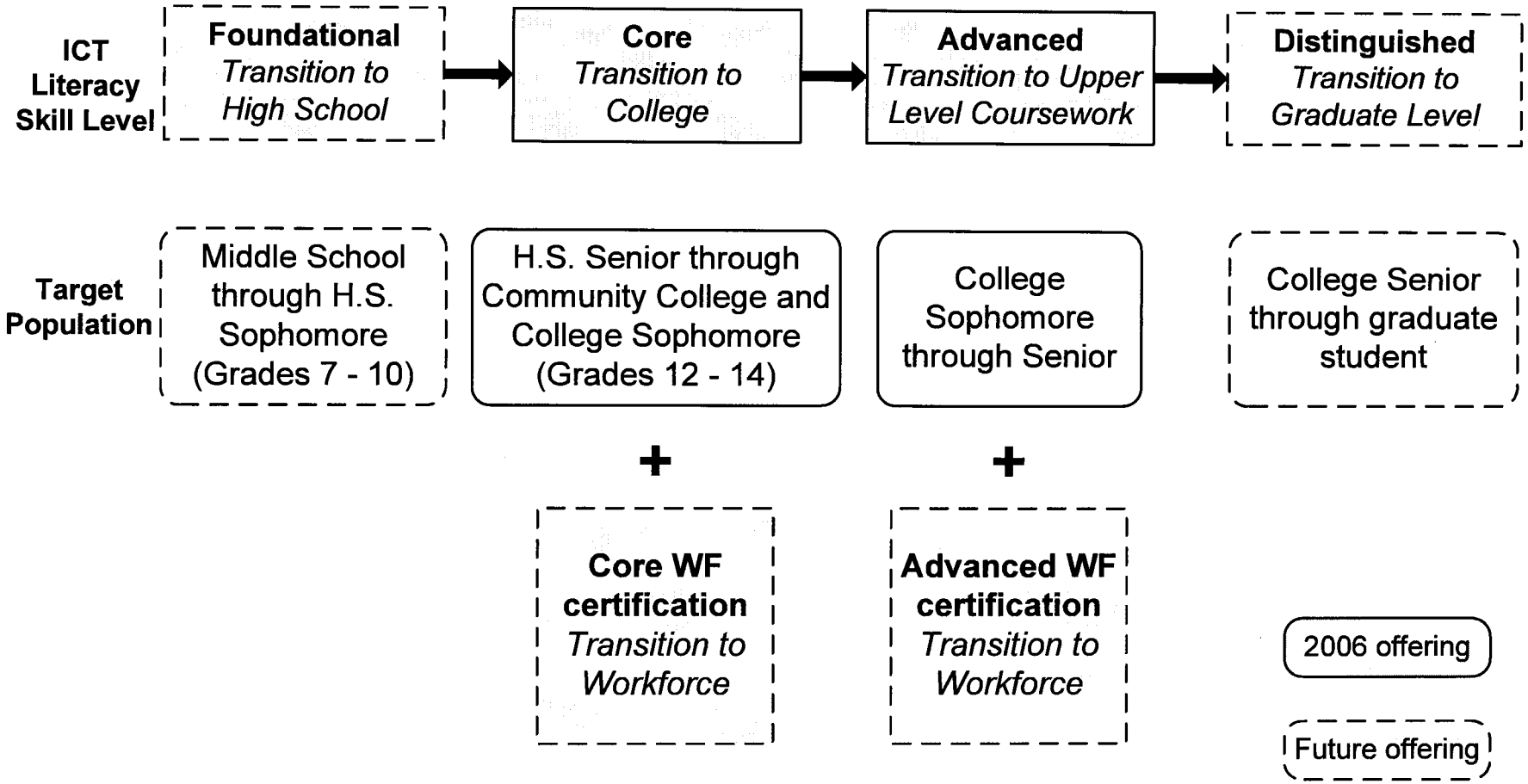
2006 and Beyond

Model for a Continuum of ICT Literacy Skills Assessment (each level assesses the 7 proficiencies identified in the ICT Literacy construct)



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Higher Education Consortium Member Institutions

Charter Clients

- California Community Colleges
- The California State University
- UCLA
- University of Louisville
- University of North Alabama
- University of Texas
- University of Washington

Expanded Consortium

- Arkansas State University
- Bowling Green State University
- Miami Dade College
- Oklahoma State University/Defense Ammunition Center
- Portland State University
- Purdue University
- University of Memphis

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What are the basic design features of the assessment?

Authentic problem-solving, not multiple-choice

- Interactive tasks
  - Simulated software, with look and feel of typical applications (databases, search engines, spreadsheets, email, etc.)
- 4-minute and 15-minute tasks
- Real-life scenarios
- Not just "right" or "wrong": multiple elements per task
- Online score reporting

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Assessment Content

- Content Areas
  - Humanities
  - Social Sciences
  - Natural Sciences
  - Practical Affairs
  - Popular Culture
- Contexts
  - Academic
  - Business
  - Personal
- Technology Tools
  - Word Processor
  - Presentation Software
  - Email
  - Database Search Engine
  - Web Browser/Search Engine
  - Spreadsheet or Table
  - Graphing Software
  - File Manager
  - Electronic Bulletin Board
  - Instant Messenger
  - Concept Mapping Software

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Two versions for 2006

- **Advanced Level**
  - For students transitioning to upper-level coursework
  - College sophomore through graduating seniors
- **Core Level**
  - For high school students transitioning to community colleges or 4-year institutions
  - High school junior through college sophomore

Each level:

- 75 minutes of testing time
- 14 short (3 to 5 minute) and 1 medium (15 min.) task

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Possible uses for the ICT Assessment in community colleges

- Incoming "readiness" check for college-level courses
- Requirement for associates degree
- Requirement for certificates in knowledge-work fields
- Requirement for transfer to four-year college (Advanced level)
- Institution-wide benchmarking for accountability and curriculum evaluation
- Featured assessment in non-credit courses

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What does a sample task look like?

How is this assessment scored?

Sample ICT Task

- Demo will be shown here.

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Individual Performance Feedback

Performance Feedback

The feedback below describes your performance on the tasks you took on the ICT Literacy Assessment – Advanced Level Academic. These descriptions are particular to the delivered tasks and the actions being evaluated for your administration. Your performance on similar tasks at another time may differ from what is reported below.

Define: *Formulate a research statement to facilitate the search for information.*

What was I asked to do?	How did I do?
Clarify a class assignment	• Selected the best initial question to help focus the topic • Chose a follow-up question that was reasonable but not the best • Selected the best additional information to clarify the topic
Choose a research topic according to specific criteria	• Chose a research topic that did not fulfill one of the criteria given • Correctly reported the criteria fulfilled by the topic selected

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For more information, visit the ICT website:

http://www.ets.org/ictliteracy

Send questions to:

ltyler@ets.org

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