



Put the “T” in your STEM Education Program



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TRECA-Ohio CATC

January 31, 2011

Cisco | Networking Academy®
Mind Wide Open™



Tri-Rivers Educational Computer Association
TRECA
Information Technology Center for
Secondary Schools

<http://www.treca.org>

Cisco Academy Training Center

Supporting the states of
Michigan, Kentucky & Ohio



Harding Memorial

From Wikipedia, the free encyclopedia

The **Harding Memorial** is the burial location of President [Warren G. Harding](#) and First Lady [Florence Kling Harding](#) and is located in [Marion, Ohio](#) at the southeast corner of Vernon Heights Boulevard and Delaware Avenue.

Begun in 1926 and finished in the early winter of 1927, the structure is built of white marble. Designed by [Henry Hornbostel](#), Eric Fisher Wood and Edward Mellon, the structure is 103' in diameter and 53' in height. The open design honors the Hardings' wishes that they be buried outside.

At their deaths, the bodies of the Hardings were entombed in the "receiving vault" of the Marion Cemetery. Once the Harding Memorial was completed in 1927, the bodies were reinterred in the Memorial's sarcophagus and it was sealed. The Harding Memorial was dedicated in 1931 by President [Herbert Hoover](#).

Ownership of the Harding Memorial was transferred from the Harding Memorial Association to the [Ohio Historical Society](#) in the 1980s. A full restoration was undertaken in the mid 1980's.

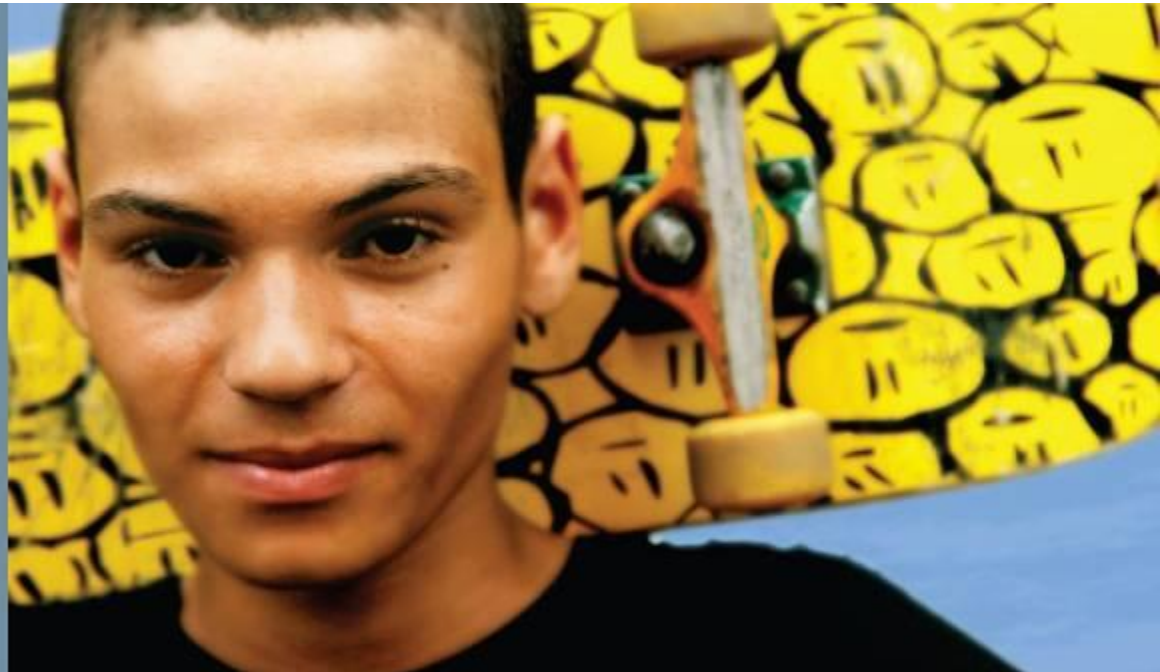
The memorial is also important in American History because it is the last of the elaborate presidential tombs, a trend that began with the burial of President [James A. Garfield](#) in 1881 in [Lake View Cemetery](#). Since President [Calvin Coolidge](#), Harding's successor, Presidents have chosen burial plot designs that are simpler, or combined those with their library sites.

A popular [myth](#) with the residents of Marion is that Harding's dog [Laddie Boy](#) is buried in the memorial with him. The dog is actually buried in [Boston, Massachusetts](#).



**Science,
Technology,
Engineering,
Math**

**STEM
Education**





Why the Demand for Improved STEM Education?

Governments and business community concerned:

- Workforce / Graduates not prepared with career-ready skills
- Not enough students choosing STEM-related careers and advanced degrees
- Low test scores in math and science

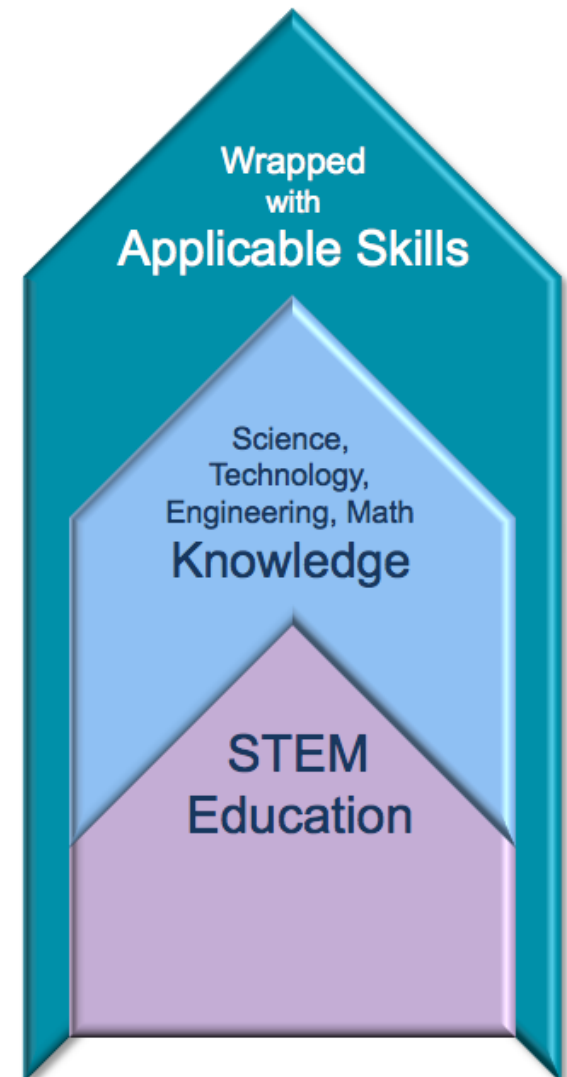
How will we meet the challenge of economic competition?



Science, Technology, Engineering, Math

STEM Education Objectives

- Improve math and science test scores
- Better prepare students for scientific and technological careers
- Expose students to related subjects to encourage STEM career paths
- Increase sophisticated skills in technology, science, math and engineering
- Prepare students with career-ready skills: problem-solving, analysis, communication, intellectual curiosity
- Increase qualified educators





Challenges for STEM Stakeholders

- Defining what qualifies as a STEM course or program
- Keeping track of many related initiatives
 - STEM, Common Core Standards, P21, etc.
- Identifying and deploying curricula that:
 - meets STEM requirements
 - qualifies for funding opportunities
 - develops students **and** instructors
 - substantiates education alignment





A Course of Action with Cisco Networking Academy

- Largest and longest running social responsibility program at Cisco
- Cisco expertise in technology
- Innovative teaching techniques
- Highly effective in-classroom and online experience
- Combines academic rigor with 21st Century work and thinking skills
- Use of technology positively impacts STEM formal and informal learning
- Development and community support for instructors and students
- Unique private and public

Worlds Largest Classroom

- 900,000+ students annually
- 3+ million students since 1997
- 165+ countries
- Diverse students and communities
- 88% use skills routinely
- 73% pursue more ICT education
- 40% improve career outcomes in a significant way





Meeting the “T” in STEM

Technology studies for more than just the “T”

Cisco
Networking
Academy

A comprehensive,
cost-effective
STEM Education
program

- Online coursework, detailed lesson plans, assessments, teacher professional development
- Free curriculum to non profit schools, large hardware discount
- Technology studies for Career- and College-Ready Students
- Applied Technology Learning reinforces skills in Technology, math, science and engineering
- 21st Century STEM work and thinking
- Education standards alignment: STEM, Common Core Standards
- Use of technology in coursework
STEM learning
- Student Engagement in STEM Studies
- Training for Qualified STEM Teachers





Meeting the “T” in STEM

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Academy

A comprehensive,
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STEM Education
program

Technology studies for Career- and College-Ready Students

- Basic to advanced information communications technology (ICT) and networking skills
- Build important system and process thinking skills
- Coursework covers all STEM Cluster Topics, and
- Teaches many of the reading and writing Common Core Standards
- Career-ready students:
 - prepare for globally recognized certifications
 - qualify for high-demand, high-wage jobs
- College-ready students
 - strengthen understanding of technology, as well as math, science and engineering



Meeting the “T” in STEM

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Networking
Academy

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21ST Century Skills

- Coursework includes practicing thinking skills essential for innovative technologists, mathematicians, scientists and engineers, including:
 - Information handling
 - Problem-solving and analysis
 - Reflection and creativity
 - Intellectual curiosity
 - Communication and collaboration
 - Decision making and negotiation



Meeting the “T” in STEM

Technology studies for more than just the “T”

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Networking
Academy

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cost-effective
STEM Education
program

Student Engagement in STEM Studies

- Instruction with real world content and hands on labs increases student relevancy.
- Varied teaching enhancements increase student engagement:
 - Online instruction
 - Project-based tasks
 - video
 - Web based games
 - Lab and job simulations
 - Social networking



Meeting the “T” in STEM

Technology studies for more than just the “T”

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Networking
Academy

A comprehensive,
cost-effective
STEM Education
program

More Qualified STEM Teachers

- Initial professional development on coursework
- Ongoing support for teaching and technical growth
 - Webinars, physical and virtual conferences
- Global teacher community
 - Shared resources and best practices
 - Online communities



How Do We Validate?

Global Relevance

- ❖ 900,000+ students annually
- ❖ 3+ million students since 1997
- ❖ 165+ countries
- ❖ Diverse students and communities

U.S. Relevance

- ❖ 2,100+ Academies
- ❖ 130,000+ Students since beginning
- ❖ 3,600+ Instructors
- ❖ Over 330 million In-Kind Contributions
- ❖ Average: 15% Girls

Impact

- In a diverse range of students' lives
- ❖ Endorsements from state and federal leaders
- ❖ Interaction with education organizations on outcomes
- ❖ Business community collaboration



How Do We Validate?

Course Alignment to STEM Cluster Topics

	SCC01 Academic Foundations	SCC02 Communications	SCC03 Problem-Solving and Critical Thinking	SCC04 Information Technology Applications	SCC05 Systems	SCC06 Safety, Health and Environmental	SCC07 Leadership and Teamwork	SCC08 Ethics and Legal Responsibilities	SCC09 Employability and Career Development	SCC10 Technical Skills
IT Essentials, Chapters 1-10	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
CCNA Discovery 1: Networking for Home and Small Business, Chapters 1-10	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
CCNA Discovery 2: Working at a Small Business or Internet Service Provider (ISP), Chapters 1-10	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
CCNA Discovery 3: Introducing Routing and Switching in the Enterprise, Chapters 1-10	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓
CCNA Discovery 4: Designing and Supporting Computer Networks, Chapters 1-10	✓	✓	✓	✓	✓	✓	✓	✓	✓	✓



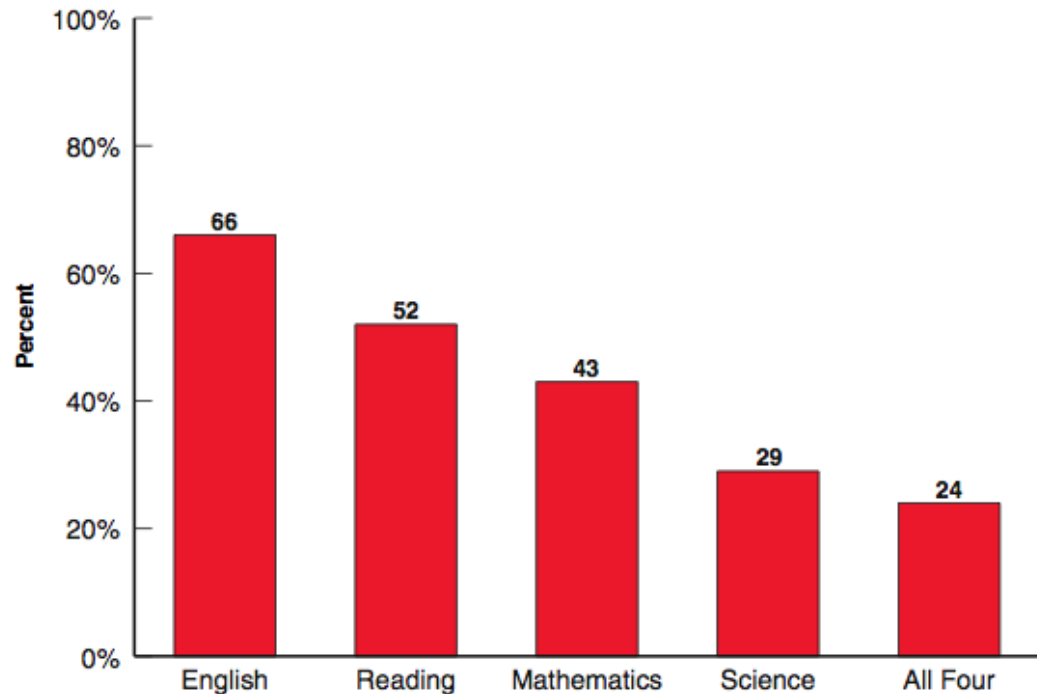
College Readiness

College Readiness Benchmarks by Subject

Sixty-six percent of all ACT-tested high school graduates met the English College Readiness Benchmark in 2010. Just under 1 in 4 (24%) met all four College Readiness Benchmarks.

In 2010, 52% of graduates met the Reading Benchmark, while 43% met the Mathematics Benchmark. Over 1 in 4 (29%) met the College Readiness Benchmark in Science.

Percent of ACT-tested High School Graduates Meeting College Readiness Benchmarks by Subject, 2010



Graph reads: In 2010, 66% of ACT-tested high school graduates met the ACT College Readiness Benchmark in English.

□



“Genealogy” of the project

American Competitiveness Initiative

States’ Career Clusters Initiative

Common Core State Standards Initiative

“create an educated workforce that is globally competitive”

“high learner achievement”

“successful transition between education and employment”

“robust and relevant to the real world”

“knowledge and skills...for success in college and careers”

2006: Cisco hosts ACI Presidential panel

2002: Career Cluster debut

2010: Govs and State Ed Chiefs launch CC standards

Common goals: rigor and relevance



Information Technology

Pathway: Network Systems

Code	Topic	Course	Knowledge and Skill	Performance Element
ITPA01.01	Network Systems Pathway	#4: Introduction to Network Systems	Identify and analyze customer/organizational network system needs and requirements.	Gather data to identify customer/organizational requirements.



States' Career Clusters Initiative - 2002

16 career cluster pathways: groupings of occupations and industries requiring common skills

Information Technology pathway (ITPA)

- Network systems
- Information support and services
- Web and digital communications
- Programming and software development

Science, Technology, Engineering & Mathematics (SCPA)

- Engineering and Technology
- Science and Math

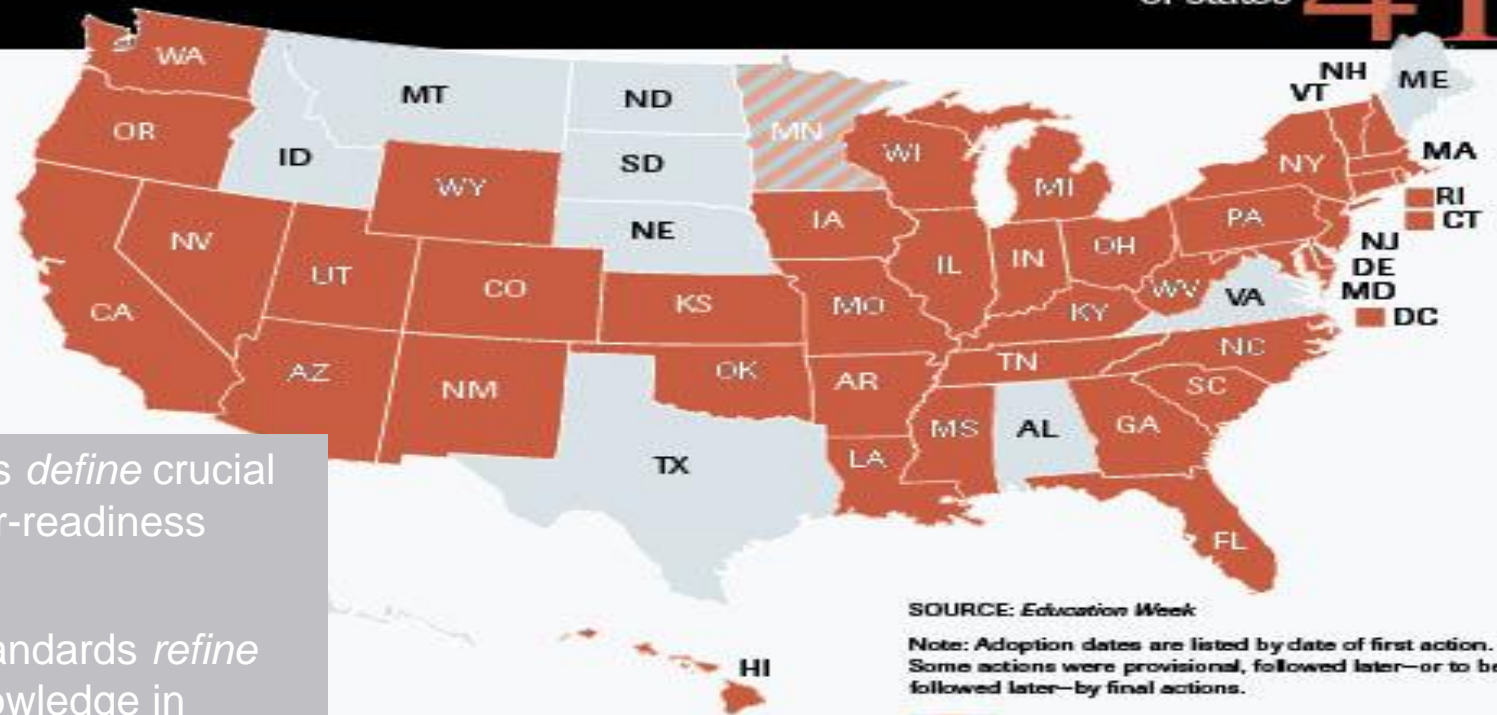


"Students who participate in the IT cluster at the high school level and meet the required standards - in information support and services, interactive media, network systems, or programming and software development - are better prepared than other students to enter the workforce and to continue their education at the post-secondary level."

-John L. Hall, Senior Vice President, Oracle University

Common-Core Adoptions

Number of states **41**



SOURCE: Education Week

Note: Adoption dates are listed by date of first action. Some actions were provisional, followed later—or to be followed later—by final actions.

State adopted standards in only one subject

JUNE

- 2 Wisconsin
- 3 North Carolina
- 4 Utah
- 7 Ohio
- 15 Michigan
- 15 Missouri
- 16 New Jersey
- 16 Wyoming
- 18 Nevada
- 24 Illinois
- 24 Oklahoma
- 25 Mississippi
- 28 Arizona

July

- 1 Louisiana
- 1 Pennsylvania
- 1 Rhode Island
- 7 Connecticut
- 8 Georgia
- 8 New Hampshire
- 12 Arkansas
- 14 South Carolina
- 19 New York
- 19 Washington
- 21 Massachusetts
- 21 Washington, D.C.
- 27 Florida
- 29 Iowa
- 30 Tennessee

August

- 2 Colorado
- 2 California
- 3 Indiana
- 17 Vermont
- 19 Delaware

September

- 27 Minnesota

October

- 12 Kansas
- 19 New Mexico
- 28 Oregon

National standards *define* crucial college and career-readiness knowledge.

State and local standards *refine and apply* that knowledge in depth.



STEM & Common Core: RttT partners

Develop curriculum in STEM to address Common Core standards

Support innovation in instruction

- Cross-curricular
- Multi-dimensional
- In-depth practical application



STEM Pathway organization

Cluster topic:

COMMUNICATIONS: *Use oral and written communication skills in creating, expressing and interpreting information and ideas including technical terminology and information.*

SCC02

Subtopic: Prepare STEM material in oral, written, or visual formats that provide information to an intended audience to fulfill specific communication need of an audience.

SCC02.01

Skills and knowledge: Use effective methods to communicate concepts of STEM to a broadly represented audience.

SCC02.01.01

Sample indicators:

- *Report subjective and objective information.*
- *Report information with the intent of being persuasive.*
- *Report information with the intent of being informational.*
- *Report information with the intent of being instructional.*



Common Core standards organization

Skill area

- Anchor Standards for College and Career Readiness—Reading

Subtopics/areas of skill development

- Key Ideas and Details
 - *Determine central ideas or themes of a text and analyze their development; summarize the key supporting details and ideas.*
- Craft and Structure
 - *Assess how point of view or purpose shapes the content and style of a text.*
- Integration of Knowledge and Ideas
 - *Delineate and evaluate the argument and specific claims in a text, including the validity of the reasoning as well as the relevance and sufficiency of the evidence.*

Similar skill areas:

- Anchor Standards for College and Career Readiness—Writing
- Anchor Standards for College and Career Readiness—Speaking and Listening
- Anchor Standards for College and Career Readiness—Language



Common Core standards organization

Mathematics

- “Mathematical Practices”: habits of mind, thinking processes
- 1. Make sense of problems and persevere in solving them.
- 2. Reason abstractly and quantitatively.
- 3. Construct viable arguments and critique the reasoning of others.
- 4. Model with mathematics.
- 5. Use appropriate tools strategically.
- 6. Attend to precision.
- 7. Look for and make use of structure.
- 8. Look for and express regularity in repeated reasoning.

Science and Technical Literacy: derived from “Next Generation Science”



Crosswalk construction: aligning STEM & CC

STEM Career Cluster Engineering and Technology Pathway		Related Common Core Standards Science/Technical Literacy from "Next Generation Science"
Cluster Knowledge & Skills Topics	Students preparing for STEM cluster careers should be able to demonstrate these skills	
SCC02 Communications	Use oral and written communication skills in creating, expressing and interpreting information and ideas including technical terminology and information.	Anchor College and Career Readiness--Writing: Conduct short as well as more sustained research projects based on focused questions, demonstrating understanding of the subject under investigation.
		Anchor College and Career Readiness--Language: Demonstrate understanding of word relationships and nuances in word meanings.
		Anchor College and Career Readiness--Speaking and Listening: Adapt speech to a variety of contexts and communicative tasks, demonstrating command of formal English when indicated or appropriate.
SCC01 Academic Foundations	Achieve additional academic knowledge and skills required to pursue the full range of career and postsecondary education opportunities within a career cluster.	Anchor College and Career Readiness--Language: Demonstrate command of standard English capitalization, punctuation, and spelling when writing.
		Anchor College and Career Readiness--Writing: Conduct short as well as more sustained research projects based on focused questions, demonstrating understanding of the subject under investigation.
		Anchor College and Career Readiness--Speaking and Listening: Adapt speech to a variety of contexts and communicative tasks, demonstrating command of formal English when indicated or appropriate.



Crosswalk construction: sample content relevant to aligned STEM and CC standards

Cisco Networking Academy Course Alignment:
Sample Discovery 1 content demonstrating
skills & standards

Ch. 4.5.6: Identify best practices to be used in working with cabling

***Demonstrating
STEM academic
foundations
through writing***

Ch. 10 Capstone Project: Devise a technical solution for a small office environment

Ch. 4.2.3: Interpret command outputs to learn more about how packets travel through a network

***Demonstrating
STEM
communications
skills through
language,
speaking and
listening***

Ch. 10 Capstone Project: Gather relevant information through stakeholder interviews and devise a technical solution to a problem.

Ch. 10 Capstone Project: Prepare and present a technical report to a diverse group.



Conclusions from the project:

All

All



Conclusions from the project:

Cisco curricula put the “T” in STEM *and* demonstrate Common Core academic standards

Cisco learning environment supports and nurtures STEM thinking and learning *and* rigorous academic standards

- Process- and design-oriented
- Real-world problem-solving

Cisco students are better prepared for success in secondary/post-secondary education and careers



How you can use this information:

Messaging to stakeholders: local, education community, employers, policy-makers

Implementing standards-based instruction models

Documenting knowledge and skills delivered and acquired in Cisco programs

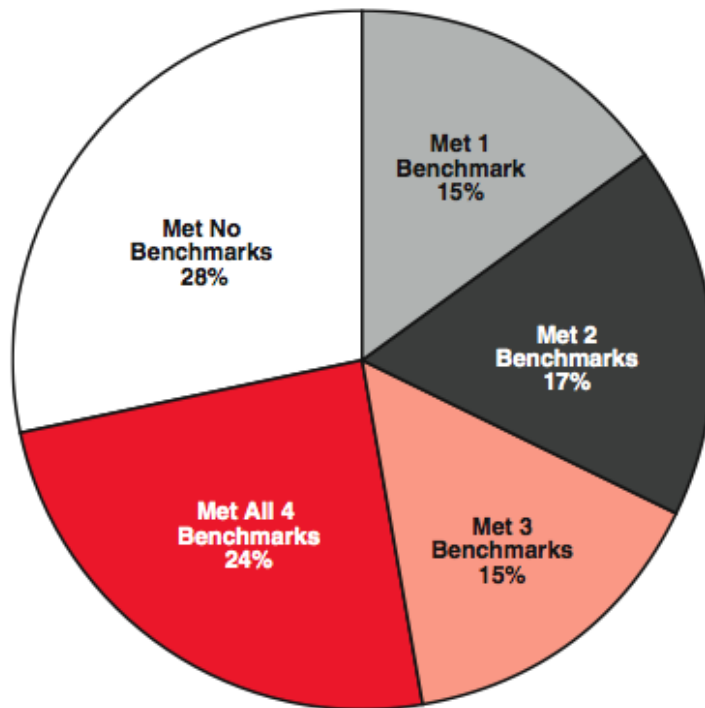
Supporting interdisciplinary instruction models



College Readiness

Number of College Readiness Benchmarks Attained

Percent of ACT-tested Graduates by Number of ACT College Readiness Benchmarks Attained, 2010



About 71% of all ACT-tested 2010 high school graduates met at least one of the four College Readiness Benchmarks in English, Mathematics, Reading, or Science.

Approximately 28% of all graduates met no College Readiness Benchmarks, while 47% met between 1 and 3 Benchmarks. Twenty-four percent of all 2010 ACT-tested high school graduates met all four College Readiness Benchmarks, meaning that less than 1 in 4 were academically ready for college coursework in all four subject areas.

Graph reads: In 2010, 24% of ACT-tested high school graduates met all four College Readiness Benchmarks, 15% met 3 Benchmarks, 17% met 2 Benchmarks, 15% met 1 Benchmark, and 28% met none of the Benchmarks.
 Note: Percentages may not sum to 100% due to rounding.



College Readiness

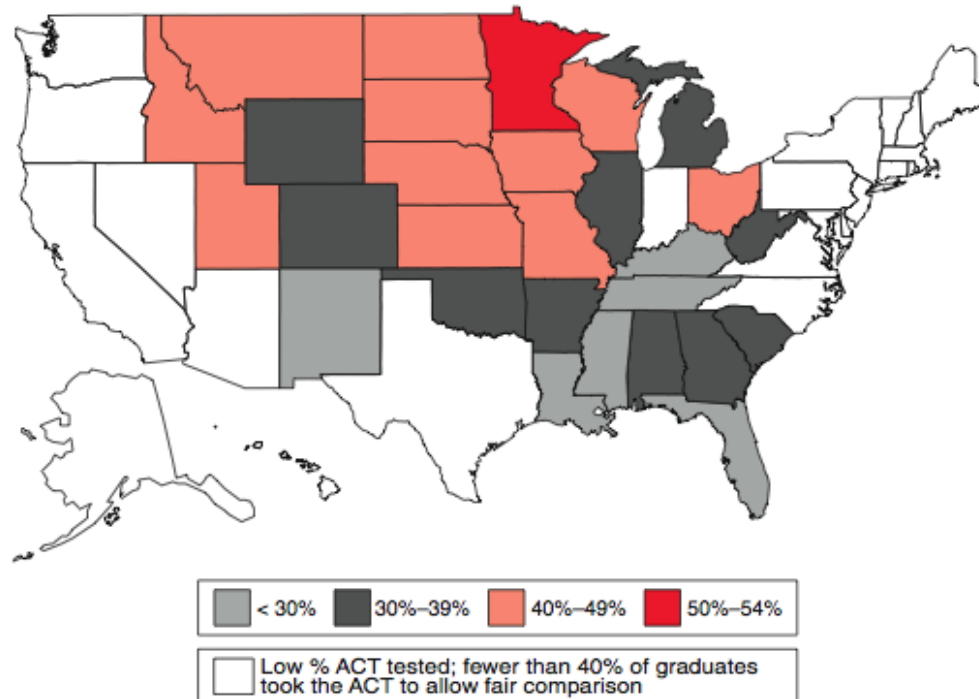
College Readiness Benchmarks by State

Of the 28 states where at least 40% of all 2010 high school graduates took the ACT, in only 1 did more than 50% of their ACT-tested graduates meet at least three College Readiness Benchmarks. In no state did more than 54% of ACT-tested graduates meet three or four Benchmarks.

In 11 states, 40%–49% of their graduates met at least three of the four Benchmarks. In another 10 states, 30%–39% of graduates met at least three of the four College Readiness Benchmarks in 2010, while less than 30% of graduates did so in 6 states.

Graph reads: In 2010, less than 30% of the ACT-tested high school graduates in 6 states (e.g., Florida) met three or four College Readiness Benchmarks. Results are not shown for 22 states (e.g., Washington) within which fewer than 40% of graduates took the ACT.

Percent of ACT-tested High School Graduates Meeting Three or Four College Readiness Benchmarks by State, 2010

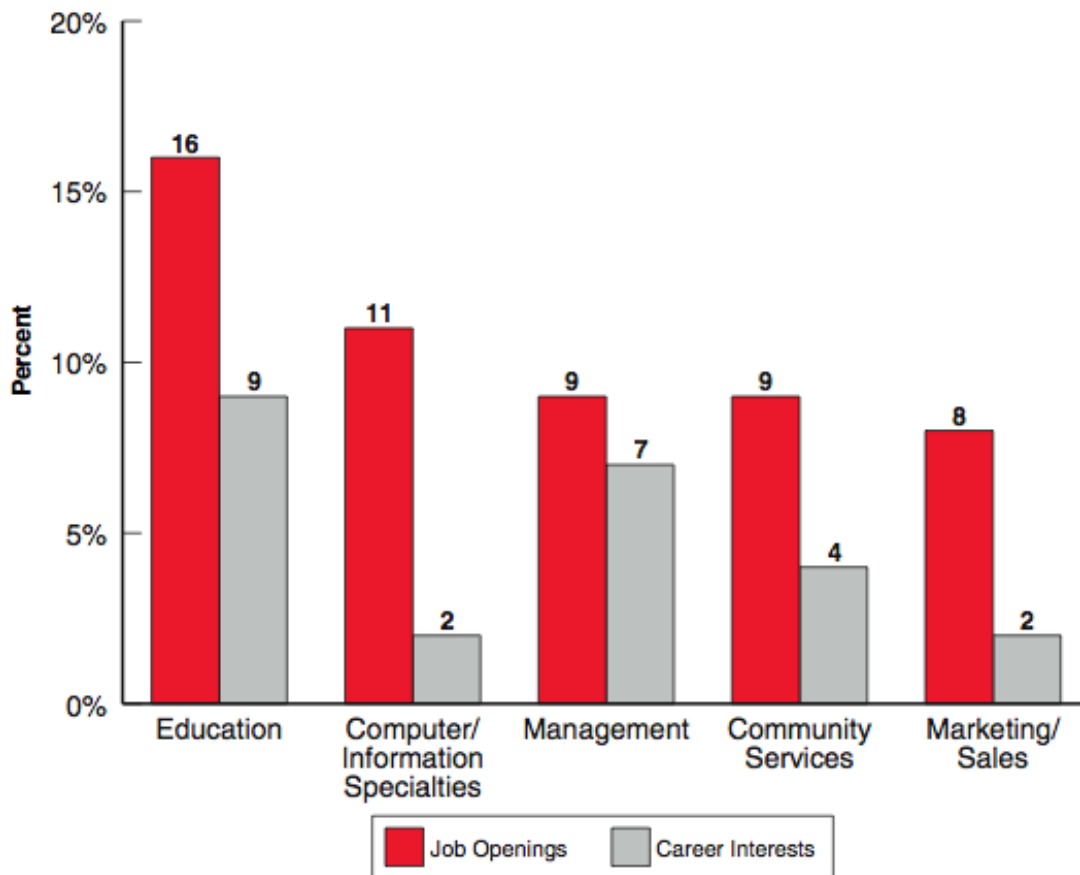




Educational/Career Aspirations & Economic Development

Career Interests & Projected Job Openings

Percent of ACT-tested 2010 High School Graduates with Career Interests and Projected 2018 Annual Job Openings by Career Field



The five fastest-growing career fields based on 2008–2018 annual projected job openings account for 53% of the demand for jobs requiring at least a 2-year degree. The percentage of 2010 high school graduates interested in careers in these fields was less than the projected demand.

For Computer/Information Specialties, Community Services, and Marketing/Sales, the projected demand was from 2.3 to 5.5 times the potential supply. For Education and Management fields, the projected demand was 1.8 and 1.3 times the potential supply, respectively.

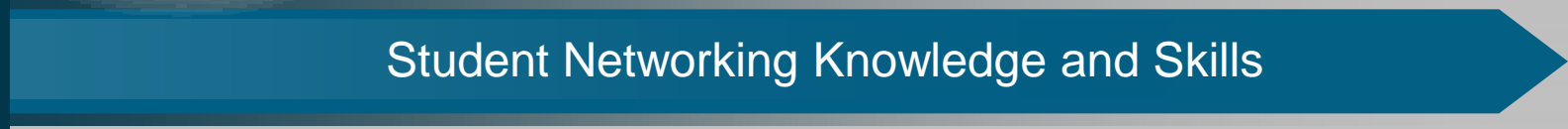
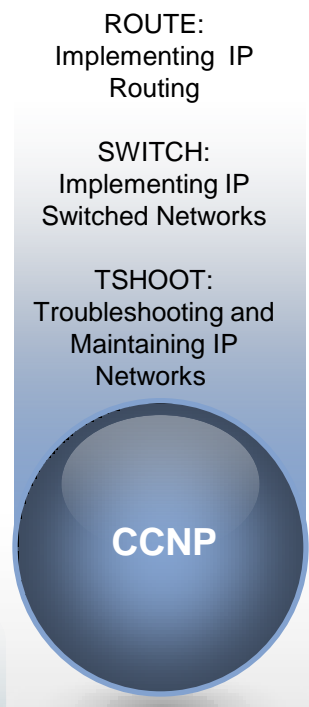
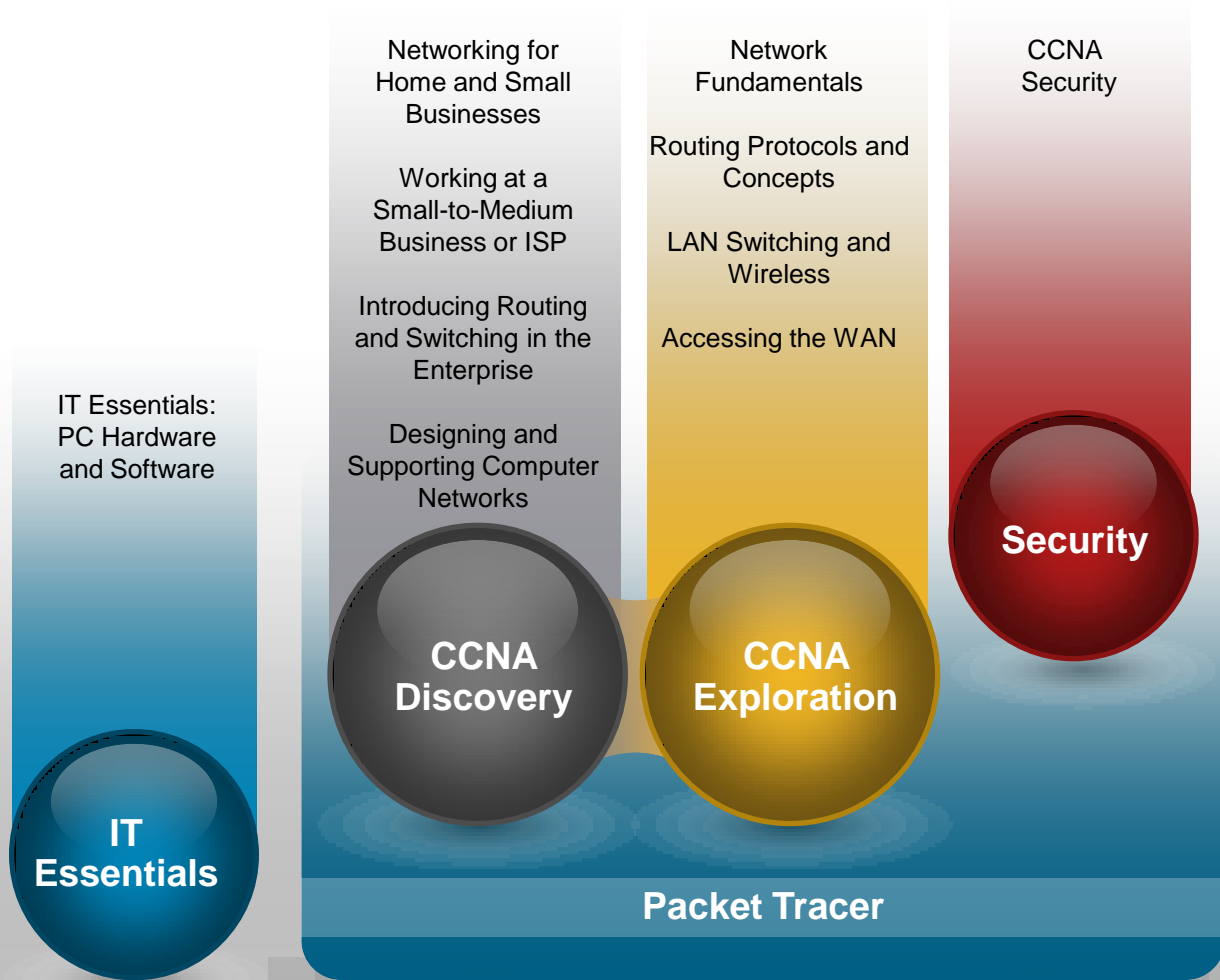
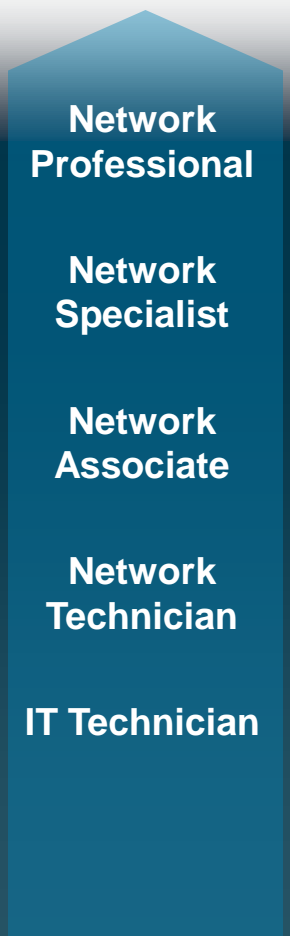
Graph reads: In 2010, Education was projected to be one of the five fastest-growing career fields, accounting for 16% of all job openings in 2018. About 9% of all ACT-tested 2010 high school graduates indicated a career interest in Education.

Note: 2008–2018 projected job openings data are from the U.S. Department of Labor, Bureau of Labor Statistics.



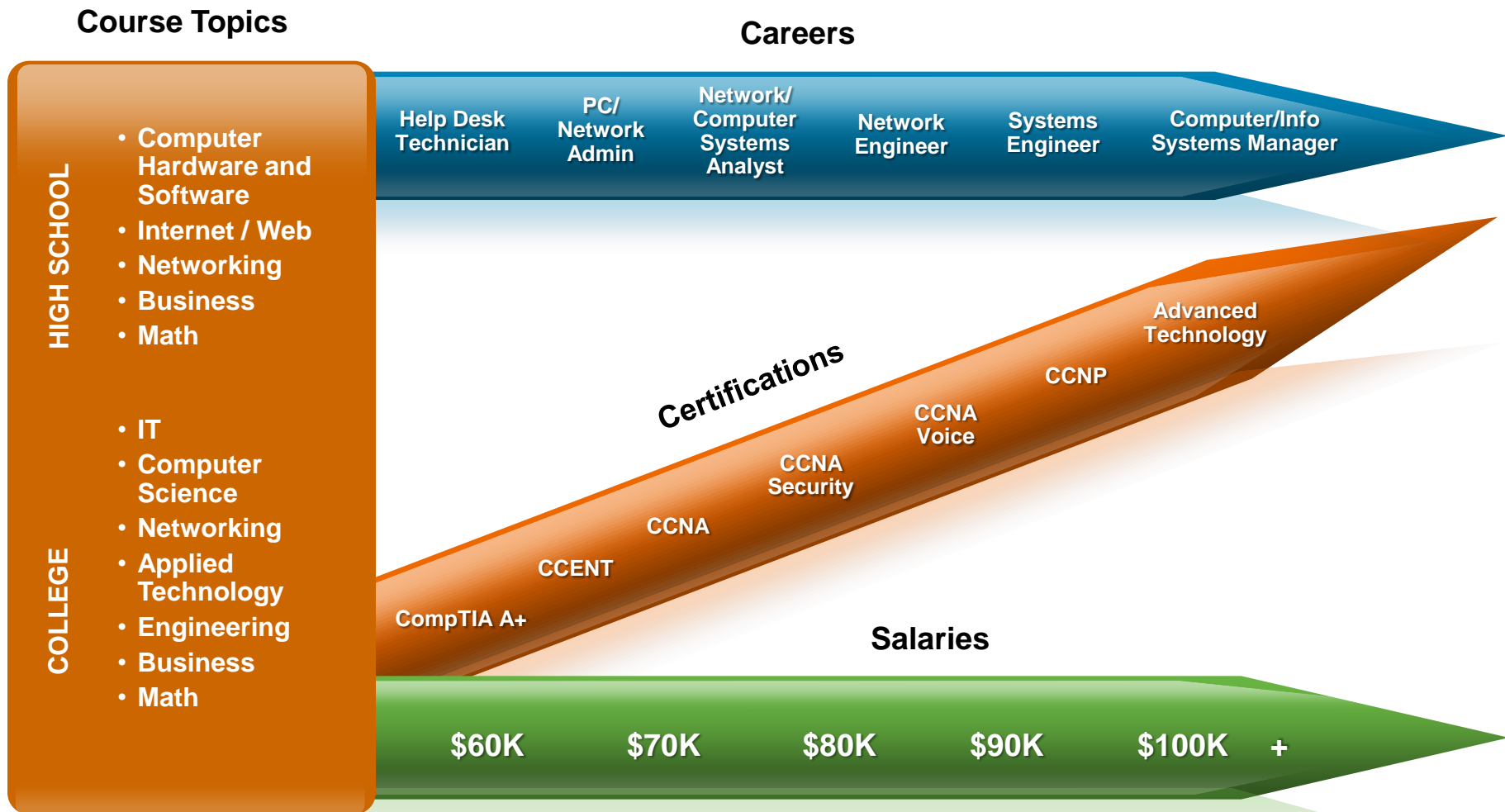
Cisco Networking Academy

Curricula Portfolio





Courses > Certifications > Careers > Salaries !



Many high schools provide college credit, duplicate enrollment and other forms of articulation to save students time and expense.



Cisco Networking Academy

Curricula Portfolio

Alignment to Certifications

CompTIA A+

CCNA
CCENT

CCNA

CCNA
Security

CCNP

IT
Essentials

CCNA
Discovery

CCNA
Exploration

Security

CCNP

Student Networking Knowledge and Skills



Networking Academy Curricula Updates



Cisco | Networking Academy®
Mind Wide Open™



ITE: PC Hardware and Software v4.1 Course

ITE

Version 4.1 aligns with the new CompTIA A+ 700 series certification

Approved as CompTIA Authorized Quality Curriculum

No changes to equipment bundle or PC requirements

Integrates virtual learning tools and Cisco Packet Tracer activities to supplement classroom learning and provide an interactive “hands-on” experience

BOTH the 2009 A+ Essentials and 2009 A+ Practical Application exams must be passed for CompTIA A+ certification

Student vouchers are available for 2009 exams, same process as v4.0



ITE: PC Hardware and Software v4.1 Course





For More Information

- Latest documents are posted on [IT Essentials Course Catalog page](#) on Academy Connection
 - IT Essentials Scope and Sequence
 - IT Essentials FAQs
 - IT Essentials Datasheet
 - IT Essentials At A Glance
 - IT Essentials Overview Presentation

Certification information

- [CompTIA A+ certification](#)

**ITE v4.1
Chapter
Demo**

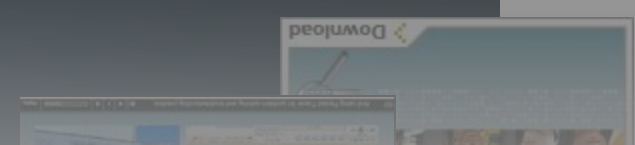
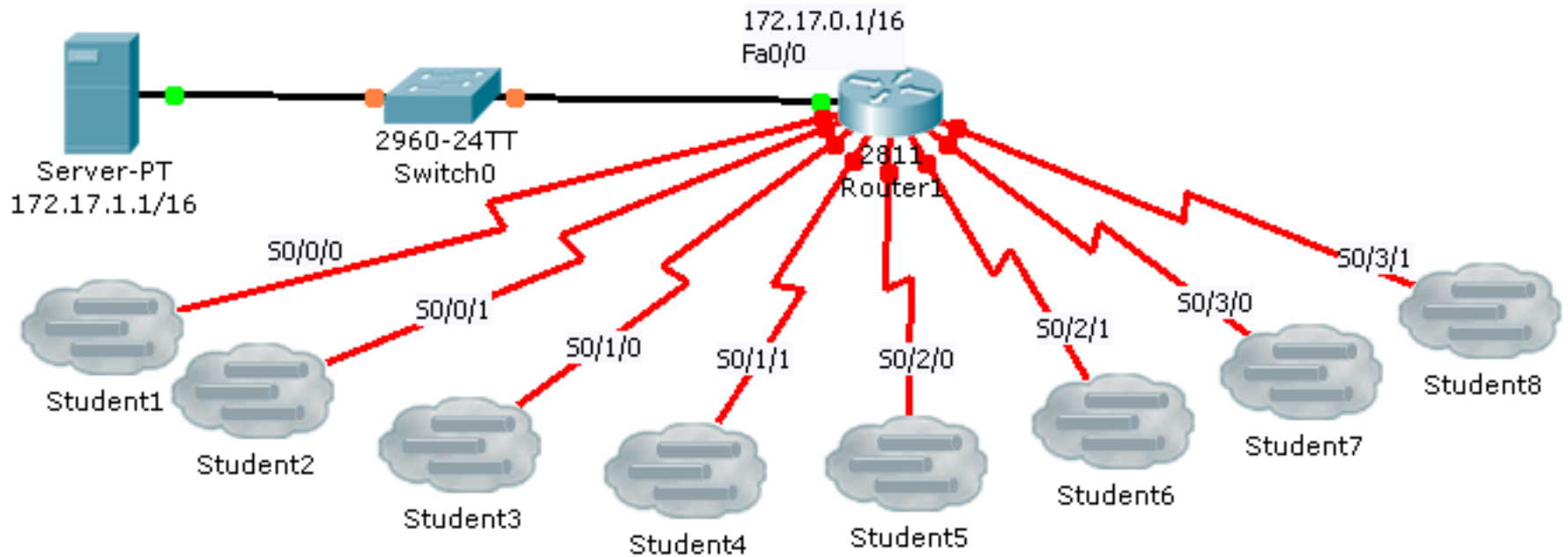


Cisco Packet Tracer





What's Old in Cisco Packet Tracer





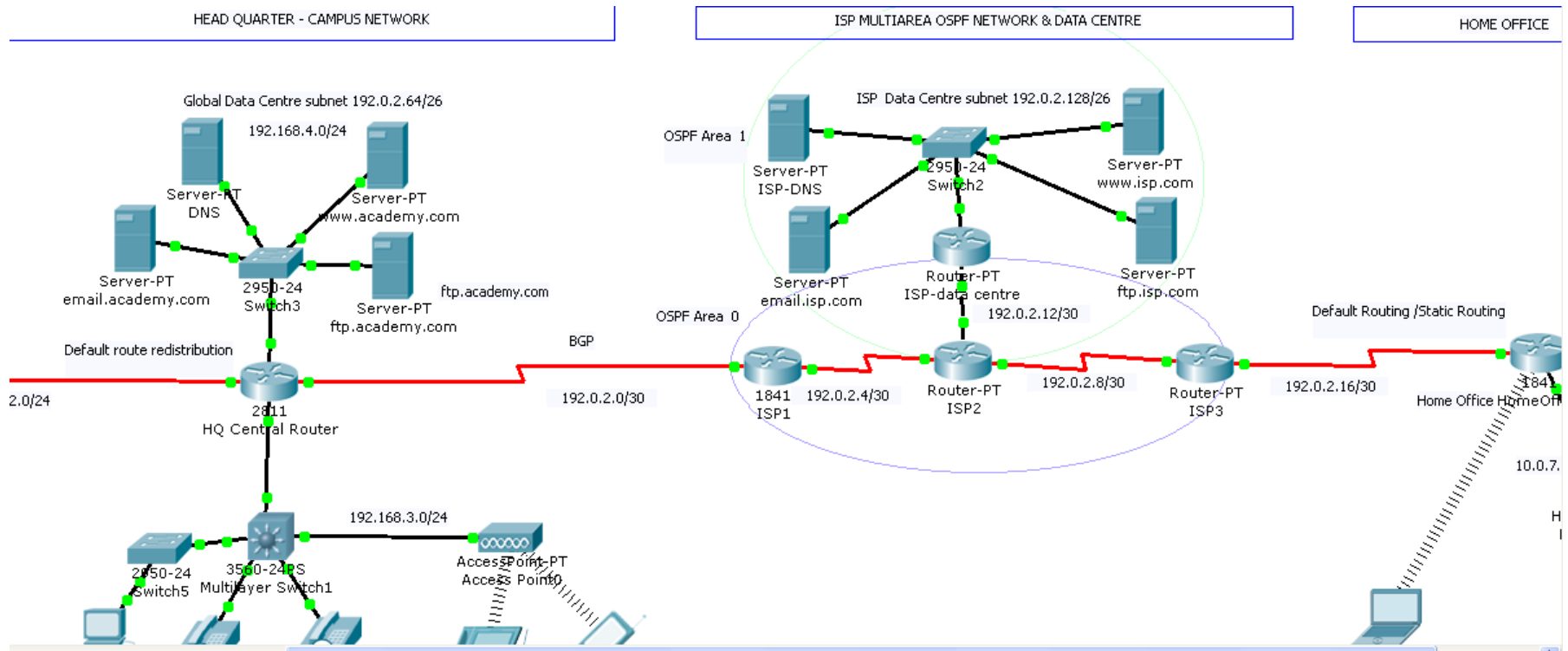
Cisco Packet Tracer Practice Skills-Based Assessments

- Cisco Packet Tracer built-in practice exams align to 21st century learning
- Test competency and knowledge of networking concepts and skills in the familiar Packet Tracer simulation learning environment
- Provide immediate, detailed feedback to help students and instructors identify areas that need improvement
- Increase student confidence when preparing for the final hands-on skills exams





Master Topology



Instructor Excellence



Program Updates





NetRiders Skills Challenge 2010



- US and Canada high school competition, in 3 phases
- Promotes networking and IT skills
- Challenges students to achieve high standards of competence in Networking and IT
- Virtual and in-person
- Provides visibility for Cisco, Networking Academies, students and instructors
- Identifies top talent for potential employers



Academy Summer Conferences



Cisco | Networking Academy®
Mind Wide Open™

What's Coming





Expanding 21st Century Skills

Provide supplemental learning materials that enhance core ICT and networking curricula

- Case Studies with realistic scenarios
- Simulation-based educational game

Optional content to use in a class

Help students discover career opportunities, initially in:

- Entrepreneurship
- Broadband



The Game

An Engaging Game for Experiential Learning Within the Context of Realistic Scenarios

The screenshot shows a 3D isometric view of a city grid with various buildings. On the left, there is a user interface for a character named 'fred'. At the top left, it says 'Day 1' with a calendar showing 'Mo Tu We Th Fr Sa Su Mo Tu We Th Fr Sa Su'. Below this is a table of skills and their current values:

Money Management	0	Business Sense	0
Troubleshooting	0	Configuration	0
Reputation	0	Grunt Work	0

Below the table, there is a notification: 'Maria is calling ...' with two buttons: 'Answer' and 'Ignore'. On the far left, there are icons for a phone, a checkmark, and a gear. On the right side of the image, there are two bulleted lists:

- Multiple levels (4), multiple paths
- Multiple contract choices
- Simulated time and economy

- Skills proficiency indicator
- Networking simulation
- Leaderboard and telemetry

Networking Academy and Social Networking





Networking Academy and Social Networking



Find us
everywhere...

 main page

www.facebook.com/group.php?gid=2348029702



 Academy NetSpace page

www.facebook.com/pages/Academy-NetSpace/32395566318

 <http://twitter.com/CiscoSystems>

 www.youtube.com/CSCOPR

 www.flickr.com/photos/25679159@N03/



RSS feed - <http://blogs.cisco.com/rss/tag/>



Academy NetSpace

<https://www.academynetspace.com/>



- Social networking
- Skills competitions
- Challenges and prizes
- Videos
- Academy profiles



Examples of Cisco Technology in Entertainment

Videos (click on links while in presentation mode)

Hologram



CNN 2008 Election: Will.I.Am (1st time on TV)

<http://www.youtube.com/watch?v=deoOTqT-SMI>

Hologram buzz and “how it’s done”

<http://www.youtube.com/watch?v=iRck4hpWRKs&feature=related>

TelePresence



24

http://www.cisco.com/web/solution/s/telepresence/fox/index.html?Referring_site=PrintTV&Country_Site=US&Campaign=HN&Position=URL&Creative=http://www.cisco.com/go/fox/&Where=solutions/telepresence/fox/



Vanished

http://www.cisco.com/marketing/corporate/sponsorships/product_placement/files/Vanished_636x360.wmv



CSI: NY

<http://www.cisco.com/web/entertainment/cbs/index.html>



Second Life
CSI: NY
virtual lab

http://www.cbs.com/prietime/csi_ny/secondlife/#

WebEx



<http://www.cisco.com/web/consumer/rockband/index.html>

Video Surveillance



Heroes

http://www.cisco.com/web/entertainment/nbc/index.html?Referring_site=PrintTV&Country_Site=US&Campaign=Product+Integrations&Position=Vanity&Creative=http://www.cisco.com/go/nbc

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