

## Why Cyber is STEM



Digital Technologies Hub webinar  
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## About Steve

- Background
  - ITM, Accounting, Psychology
  - University 13 years
  - 10 years secondary @ Loyola Blakefield
- Start with why
- Enhance and Complement
- Foundations and Fundamentals
- Our Opportunity and Responsibility



## What is Cyber?

**Cyber Science** is an interdisciplinary field of study developed at the intersection of cyber technology and human behavior, which impacts the world's leading industries, like mobile, energy, healthcare, and finance



## Poll Questions

1. Were you trained as a CS/IT/Computing Teacher?
2. Have you previously taught Cyber?
3. What tools do you currently use in your classes?
  - Scratch, Hour of Code, Code Academy, Robotics, Raspberry Pi, Kodu, Code.org



## School Structure

- 180 total school days per year
- Students have nine 40 minute periods per day (including lunch)
- School day from 8am to 3pm
- Core classes meet every day – Math, English, Science, History, Theology,
- 3 year requirement of modern language (Spanish or Italian)
- Arts Core (1 cr Fine Art) (History of Art, Music Appreciation, Core)
- 1 core credit of computer science at high school level



## Current Course Progression

- Year 6 (13yrs) (Core) Intro to Computers 1 semester
- Year 7 (Core) Scratch Projects 1 semester
- Year 7 Elective Intro to Coding 1 semester
- Year 8 Elective Coding II 1 semester
- Year 9 (Core) Foundations of CS - Full Year
- Years 9 to12 Elective - Ruby, Python – Full Year
- Years 9 to12 Elective - Cyber Science – Full Year
- Years 11 to12 – Elective AP Computer Science (JAVA)



## Foundations & Fundamentals


- Items for Cyber Science
  - How and Why things work
  - Logic
  - OSI (networking)
  - Operating Systems
  - Secure Coding
  - Encoding and Encryption
  - Cyber Hygiene (not the silicon unit on the desk, but the carbon unit in the chair)

## Basic Example

- Cyber Camp for Year 6 & 7
  - Decoding messages

?em daer uoy naC  
Can you read me?

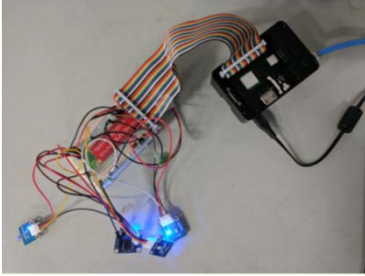
Frr fcbg eha  
See spot run -ROT13



... / -.- -- ..- / -.- .- .-.- --  
See you Tuesday - Morse Code

## Advanced Example

- Raspberry Pi Industrial Control System Lab



## Lab Setup


- ICS Sensors
  - Light
  - Temp
  - Pressure
  - Camera
- Trust in the environment

## Cyber Concepts Year 9 +

- Hardware
  - Device Drivers
- Linux commands
- Operating System
  - Stability
  - Reliability
  - User Account Control
- Network Stack
- Web Server
- Custom Code
  - PHP
  - Python
  - HTML
  - JAVA Script

## Custom Front End ICS Control Center

Pressure Reading: 100120.00 Pa  
Temperature: 76.10 F  
Light: 192



## Resources for you and your students

- Students:
- <https://dayofstem.com.au/>

## What is the Day of STEM?

- Day Of STEM is a national initiative designed to build awareness and inspire Australia's STEM/CYBER generation.
- Free, self-guided, interactive, virtual mentoring experience for students, teachers, parents and schools.
- Designed for students Year 7 - University.
- Enables students to test-drive their futures by living a day in the life of Australia's STEM mentors.
- The Day of STEM consists of 8 uniquely themed programs that are designed to be completed within 60 minutes in school or outside the classroom.
- Day of STEM is implemented by LifeJourney, a U.S. based technology company with a growing Australia team.

## The Australian Day of STEM is a series of 8 thematic programs that equip teachers in mathematics, science, technology and career counseling with a powerful way to connect what they're teaching in the classroom to growing career fields within the Australian economy.

- PROGRAM 1: SPORTS ANALYTICS**  
Explores career pathways in sports science, data analytics and the Internet of Things (IoT) and is designed for mathematics teachers.
- PROGRAM 2: INNOVATION**  
Explores career pathways in innovation in Australia's future such as automated vehicles, drone delivery, secure banking, and wireless technologies.
- PROGRAM 3: WOMEN IN STEM**  
Explores the opinions of STEM leaders from Australia's leading companies and organizations. The experience is designed to inspire young women in STEM through inspirational female mentors.
- PROGRAM 4: CYBER SECURITY**  
Students will be able to live a day in the life of Australia's Cyber Security leaders and experience an interactive "Cyber Situation".
- PROGRAM 5: FINANCIAL TECHNOLOGY**  
Futures allow students into the field of financial services and explore career pathways from a range of banking solutions and technology companies within the digital bank. The program is designed for mathematics teachers.
- PROGRAM 6: INTERNET OF THINGS (IOT)**  
As the connectivity of devices and information become interconnected, a broad range of careers will be impacted by the power of IoT, and the ability to harness that power, grows will grow.
- PROGRAM 7: MEDICAL TECHNOLOGY**  
The "MedTech" program is designed for students interested in exploring potential opportunities in their related to health and medicine.
- PROGRAM 8: SUSTAINABILITY**  
Explores industry mentors working on innovative solutions that mitigate the harmful environmental impacts of human activities. In addition the program will explore action plans by Australian organizations, are taking to decrease their own environmental footprints.

## Program 4 - Optus Cyber Security Experience

**EXECUTIVE WELCOME INTRO**

**Classroom Use**

**Key Features:** Executive Welcome, Live Mentoring, Interactive Content, Career Advice, Self-Directed Learning, Interactive Content, Self-Directed Learning, Interactive Content, Self-Directed Learning, Interactive Content.

**Industry Members:** A list of logos for various industry partners including Optus, Telstra, and others.

## Introduction of the Cyber Resume...

## First mentor selection ...

Career skills breakdown for Jack Wilson...

Optus  
I am the D

Sophie Brown mentor trailer...

OPTUS CYBER SECURITY EXPERIENCE HOST  
JACK WILSON, OPTUS

SOPHIE BROWN  
Optus Cyber Host, Graduate

Career Roadmap...

Journey Roadmap

Awareness Building Competency Application

Intro to UJourney Insider Threat IT Fundamentals Data Theory Networking Basics Digital Forensics Security & Cybersecurity CompTIA Network+ Internship

1. AWARENESS: Material or introductory activities that expose you to the career.  
2. BUILDING COMPETENCY: Assignments, exercises, or courses that develop skills and knowledge.  
3. APPLICATION: Applying knowledge and skills to real world problems that prepare you for a career.

Get it!

Cyber Situation...

THREAT DETECTED

Cyber challenges - build your cyber skills...

Search Challenges

Optus 0/25

Understanding Malware 0/5

Cracking Passwords 0/1

WiFi Network Overview 0/1

Email Hacking 0/1

Log Analysis 0/1

Cyber Risk Assessment 0/1

Understanding Malware

Available choices: "Virus", "Worm", "Spam", "Trojan Horse", "Denial of Service", "Advanced", "Central of Service"

Question: "Spam" is a type of malware that automatically forwards or distributes advertising material to other users without their consent.

Answer: 10

Question: "Denial of Service" is a type of malware that causes a computer to crash or become unusable by sending it a flood of data.

Answer: 10

Question: "Advanced" is a type of malware that is designed to be difficult to detect and remove.

Answer: 10

Question: "Central of Service" is a type of malware that is designed to be difficult to detect and remove.

Answer: 10

## Resources - Students

- CompTIA Series
  - Network +
    - Year 8 and up
  - Security +
- Internationally recognized industry based certification
- Employment Requirement (Internships)

# Resources - Faculty PD

**Cyber Teacher Program**

**LEARN ABOUT BECOMING A CYBER TEACHER**

Already registered as a teacher in Day of STEM?

Just added the Dallas Cyber Security Experience as an approved provider account? Start by enrolling in our mandatory Day of STEM LUNCH & LEARN CYBER TEACHER program and when you're ready, enroll in our Cyber Teacher Cap Course.

Do not already have an account in Day of STEM?

Click here to learn more and register to join the Cyber Teacher program.

# Step 3 - Take the Cyber Teacher Mentor Journey

**STEP 3 - TAKE THE CYBER TEACHER MENTOR JOURNEY**

**LEARN ABOUT THE CYBER TEACHER MENTOR JOURNEY**

Learn about the Cyber Teacher Mentor Journey and how it will help you become a Cyber Teacher.

**WHAT YOU WILL LEARN**

- How to become a Cyber Teacher Mentor
- How to mentor a Cyber Teacher
- How to track your progress
- How to receive feedback

# Teachers Develop Cyber Security Knowledge & Learn How to Introduce Cyber into the Classroom

**TEACHERS DEVELOP CYBER SECURITY KNOWLEDGE & LEARN HOW TO INTRODUCE CYBER INTO THE CLASSROOM**

Get your Cyber Teacher Cap Course done. Complete the following four steps in any order:

1. Preview Optus Cyber Security Experience in Teacher Mode
2. Run Optus Cyber Security Experience with your students in the Classroom
3. Take the Cyber Teacher Mentor Journey
4. Complete the Fundamentals of Cyber Online Learning Course

**CERTIFICATE OF COMPLETION**

Optus Cyber Security Experience  
Cyber Teacher Cap Course

# Example Uni course mapping

**Example Uni course mapping**

Uni Course	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
Introduction to Cyber Security	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
Advanced Cyber Security	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40

# Step 4 - Fundamentals of Cyber Online Course

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**Fundamentals of Cyber**

Learn messages

Welcome to Fundamentals of Cyber, provided by CompTIA CertMaster adaptive learning platform in partnership with LifeJourney. Complete Fundamentals of Cyber is a great addition to your Cyber Teacher certification.

When you finish the course, click here to return to your [Dashboard](#) to check your overall completion status for the Cyber Teacher Certification.

**your modules**

- 1 Fundamentals (F01-101)
- 1.5 Software
- 2.0 Hardware
- 2.5 Security
- 4.0 Networking
- 5.0 Basic IT Literacy

**your progress**

0% completed

12 hours 15 minutes estimated time remaining

# Cyber Challenges Overview & Guide

**Cyber Challenges Overview & Guide**

**Cyber Challenges Overview**

**Beginner Cyber Challenge Inspiration**

## What's Next?

- Don't be afraid to try new things
- Learn with your students – students can do more than we think they can
- Find an industry cert in your area of interest
  - Net +, Sec +, CCNA

