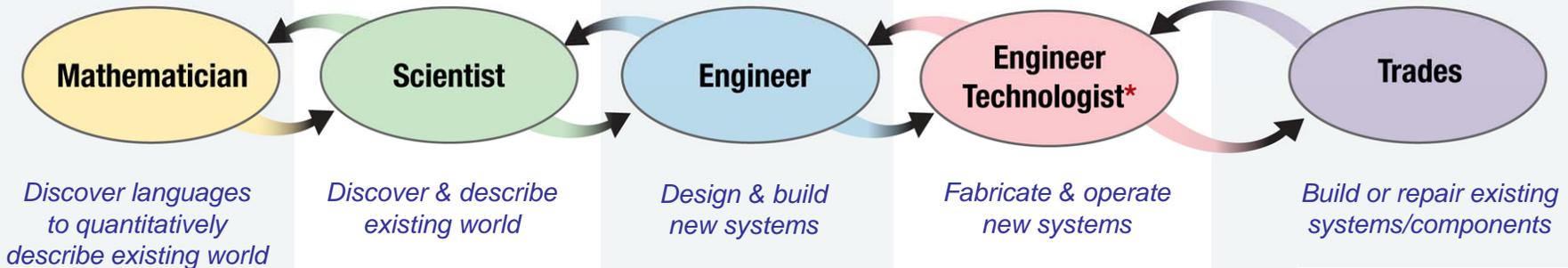




Theoretical Physics  $\longleftrightarrow$  Experimental Physics



Algebraist  
Geometer  
Topologist  
Statistician

Physicist  
Chemist  
Biologist  
Research MD  
Astronomer  
Geologist

Aerospace  
Automotive  
Chemical  
Electronics  
Computer  
Civil  
Model & Simulation  
Research Surgeon

Wind Tunnel  
Aircraft Maintenance  
Airframe/Powerplant  
Particle Detectors  
Integrated Circuits

**Traditional**

Welding  
HVAC  
Electricity  
Plumbing  
Electronics  
Manufacturing  
(Surgeon 19<sup>th</sup> C.)

**21st Century**

A+ Comp Repair  
Comp Network Admin  
CISCO Network  
ORACLE Internet  
CAD  
Model & Simulation

4-yr College (+)

4-yr College (+)

4-yr College (+)

2-yr college/OJT

HS with National  
Certifications

Traditional Academic

Current K-12 "Gap"

CTE

FROM THE SLIDE:

This chart shows a K-12 STEM “continuum” from mathematics to the trades. At the top of the page, on the left, one sees that mathematics is taught as all theory and trades while at the other end of the spectrum is almost all hands-on with very little theory. Science is only hands-on to the extent that labs are included. In the middle of the chart, we find engineering – the “E” of STEM - and the parent of innovation. Engineering is an even blend of hands-on and theory. Unfortunately, there are only a few school divisions in the Commonwealth that teach engineering or even the engineering design process.

Mathematics and science are found in the “traditional academic” division of K-12 while the trades are found in Career and Technical Education (CTE), formerly known as “shop” or “vocational education”. In Virginia, to the limited extent that engineering is taught, it is classified as CTE and thus often perceived by parents and students as not being for the college-bound student. Hopefully, that perception could be corrected by a subject matter expert-informed approach to carrying out the direction of SJ308, passed in February 2011 by the VA General Assembly.