

Module 1: NeuroMaker HAND Guided Assembly



Overview:

Students will translate written and visual instructions while collaborating with peers to assemble a prosthetic hand. Students gain skills that are closely aligned with the Engineering & Technology, Manufacturing Production Process Development, and Production CTE Pathways. Students are exposed to careers such as Mechatronics Engineer, Medical Appliance Technician, and Electrical Engineer.

What will my students be doing during this Module?

Students will discover the processes for assembling a real-life prototype in teams.

What skills will my students gain from engaging in this Module?

Students are introduced to mechanical and electrical engineering concepts and skills.

What 21st Century Skills will my students practice while engaging in this Module?

Critical Thinking • Communication
Perseverance • Collaboration
Information Literacy • Self-Direction
Thinking Skills

What Career Technical Education pathways does this Module guide students toward?

- Engineering & Technology
- Manufacturing Production
- Process Development
- Production

What career paths might this content expose my students to?

What are the education trends for this career path?

**What are the potential salaries of those career paths?
National Median Wage (2021)**

What are the overall outlooks for those career paths?

Bioengineer & Biomedical Engineer

Bachelor's Degree	53%
Master's Degree	30%
Doctoral Degree	7%

\$46.83/hour
\$97,410 annually

Projected growth (2021 – 31)
8 – 10%

Medical Appliance Technician

High School Diploma	21%
Associate's Degree	26%
Bachelor's Degree	18%

\$21.77/hour
\$45,280 annually

Projected growth (2021 – 31)
4 – 7%

Manufacturing Engineer

Some college, no degree	4%
Associate's Degree	16%
Bachelor's Degree	76%

\$45.82/hour
\$95,300 annually

Projected growth (2021 – 31)
8 – 10%

Electrical Engineer

High School Diploma	3%
Bachelor's Degree	70%
Master's Degree	23%

\$48.28/hour
\$100,420 annually

Projected growth (2021 – 31)
2 – 3%

Mechatronics Engineer

Some college, no degree	21%
Associate's Degree	10%
Bachelor's Degree	66%

\$48.38/hour
\$100,640 annually

Projected growth (2021 – 31)
1–5%

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Module 2: Biomedical Exploration



NEUROMAKER

Overview:

Students will engage in oral communication while creatively problem solving with peers to develop, engineer, and present a solution to a global biomedical issue. Students gain skills that are closely aligned with the Therapeutic Services, Biotechnology Research & Development, and Engineering & Technology CTE Pathways. Students are exposed to careers such as Biomedical Engineer, Clinical Research Coordinator, and Neurodiagnostic Technologist.

What will my students be doing during this Module?

Students will explore Biotechnology concepts and brainstorm solutions to real world problems.

What skills will my students gain from engaging in this Module?

Students are introduced to neuroscientific, biomedical, and prosthetic design concepts and skills.

What 21st Century Skills will my students practice while engaging in this Module?

Critical Thinking • Communication Creativity
Problem Solving • Perseverance
Collaboration • Technology and Digital
Literacy • Global Awareness • Self-Direction
Literacy Skills • Civic Literacy
Social Responsibility • Information Literacy

What Career Technical Education pathways does this Module guide students toward?

- Therapeutic Services
- Biotechnology Research & Development
- Engineering & Technology
- Counseling & Mental Health Services

What career paths might this content expose my students to?

What are the education trends for this career path?

What are the potential salaries of those career paths? National Median Wage (2021)

What are the overall outlooks for those career paths?

Bioengineer & Biomedical Engineer

Bachelor's Degree	53%
Master's Degree	30%
Doctoral Degree	7%

\$46.83/hour
\$97,410 annually

Projected growth (2021 – 31)
8 – 10%

Clinical Research Coordinator

Some college, no degree	9%
Post-Secondary Cert.	12%
Bachelor's Degree	60%

\$66.30/hour
\$137,900 annually

Projected growth (2021 – 31)
4 – 7%

Neurodiagnostic Technologist

Post-Secondary Cert.	35%
Associate's Degree	48%
Bachelor's Degree	16%

\$21.98/hour
\$45,720 annually

Projected growth (2021 – 31)
4 – 7%

Neuropsychologists

Most of these occupations require graduate school. Some require master's degree, Ph.D., M.D., or J.D (law degree.)

\$49.47/hour
\$102,900 annually

Projected growth (2021 – 31)
2 – 3%

Medical and Clinical Laboratory Technician

Associate's Degree	31%
Bachelor's Degree	46%
Post-Baccalaureate Cert.	10%

\$27.79/hour
\$57,800 annually

Projected growth (2021 – 31)
4 – 7%

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Module 3: Engineering Design



NEUROMAKER

Overview:

Students will employ the engineering design process while exercising critical thinking and innovation skills to develop and present their own prosthetic hand prototype. Students gain skills that are closely aligned with the Biotechnology Research & Development, Diagnostic Services, and Quality Assurance CTE Pathways. Students are exposed to careers such as Orthotists and Prosthetists, Robotics Engineer, and Quality Control Analyst.

What will my students be doing during this Module?

Students will employ the engineering design process to discover the different phases of development when engineering their own prosthetic hand prototype.

What skills will my students gain from engaging in this Module?

Students are introduced to computer programming skills as well as critical evaluation skills.

What 21st Century Skills will my students practice while engaging in this Module?

Critical Thinking • Communication
Creativity • Problem Solving • Perseverance
Collaboration • Technology and Digital
Literacy • Global Awareness • Self-
Direction Literacy Skills • Civic Literacy
Social Responsibility • Information Literacy
Innovation Skills • Thinking Skills

What Career Technical Education pathways does this Module guide students toward?

- Biotechnology Research & Development
- Diagnostic Services
- Programming & Software Development
- Manufacturing Production
- Process Development
- Quality Assurance
- Engineering & Technology

What career paths might this content expose my students to?

What are the education trends for this career path?

What are the potential salaries of those career paths?
National Median Wage (2021)

What are the overall outlooks for those career paths?

Orthotists and Prosthetists

Bachelor's Degree	13%
Post-Baccalaureate Cert.	22%
Master's Degree	43%

\$36.27/hour
\$75,440 annually

Projected growth (2021 – 31)
11%+

Clinical Research Coordinator

Some college, no degree	9%
Post-Secondary Cert.	12%
Bachelor's Degree	60%

\$66.30/hour
\$137,900 annually

Projected growth (2021 – 31)
4 – 7%

Quality Control Analyst

High School Diploma	38%
Post-Secondary Cert.	10%
Bachelor's Degree	28%

\$23.57/hour
\$49,030 annually

Projected growth (2021 – 31)
4 – 7%

Mechanical Engineering Technologist and Technician

Post-Secondary Cert.	33%
Associate's Degree	14%
Bachelor's Degree	37%

\$29.07/hour
\$60,460 annually

Projected growth (2021 – 31)
2 – 3%

Occupational Therapist

Bachelor's Degree	14%
Masters Degree	86%

\$41.14/hour
\$85,570 annually

Projected growth (2021 – 31)
11%+

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Module 4: Life and Physical Sciences Exploration



NEUROMAKER

Overview:

Students will explore physical forces on objects while comparing the relative friction of different materials to improve the grip of their prosthetic hand. Students gain skills that are closely aligned with the Manufacturing Production Process Development, Production, and Engineering & Technology CTE Pathways. Students are exposed to careers such as Physicist, Post Secondary Physics Teacher, and Materials Engineer.

What will my students be doing during this Module?

Students will use their NeuroMaker HANDs to learn about physics, energy, and the human body. (Teachers find this module really valuable because each lesson is a stand alone activity.)

What skills will my students gain from engaging in this Module?

Students are introduced to scientific hypothesis testing and will be able to recognize the affect that physical forces have on items.

What 21st Century Skills will my students practice while engaging in this Module?

Critical Thinking • Communication Problem Solving • Information Literacy • Technology & Digital Literacy • Self-Direction • Literacy • Innovation • Thinking

What Career Technical Education pathways does this Module guide students toward?

- Manufacturing Production Process Development
- Production
- Quality Assurance
- Engineering & Technology

What career paths might this content expose my students to?

What are the education trends for this career path?

What are the potential salaries of those career paths? National Median Wage (2021)

What are the overall outlooks for those career paths?

Physicist

Post-Master's Cert.	8%
Doctoral Degree	49%
Post-Doctoral Training	39%

\$73.29/hour
\$152,430 annually

Projected growth (2021 – 31)
8 – 10%

Physics Teacher, Postsecondary

Master's Degree	25%
Doctoral Degree	54%
Post-Doctoral Training	21%

\$93,070 annually

Projected growth (2021 – 31)
8 – 10%

Materials Scientist

Bachelor's Degree	38%
Master's Degree	24%
Doctoral Degree	24%

\$48.12/hour
\$100,090 annually

Projected growth (2021 – 31)
4 – 7%

Materials Engineer

Bachelor's Degree	48%
Master's Degree	10%
Doctoral Degree	33%

\$47.26/hour
\$98,300 annually

Projected growth (2021 – 31)
4 – 7%

Mechanical Drafter

Post-Secondary Cert.	8%
Associate's Degree	61%
Bachelor's Degree	20%

\$28.94/hour
\$60,200 annually

Projected growth (2021 – 31)
Decline (–2% or Lower)

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Module 5: Introduction to Programming



Overview:

Students will learn block-based and/or text-based coding while applying logic and critical thinking skills to program their prosthetic hand to perform specified actions. Students gain skills that are closely aligned with the Information Support & Services, Network Systems, and Programming & Software Development CTE Pathways. Students are exposed to careers such as Computer Systems Analyst, Database Administrators, and Web Developers.

What will my students be doing during this Module?

Students will experience block-based coding as they connect and test the capabilities of their NeuroMaker HAND.

What skills will my students gain from engaging in this Module?

Students are introduced to critical thinking and logic skills and potentially gain critical and transferable career technical coding skills.

What 21st Century Skills will my students practice while engaging in this Module?

Critical Thinking • Communication
Creativity • Problem Solving
Perseverance • Collaboration
Technology & Digital Literacy
Self-Direction • Thinking

What Career Technical Education pathways does this Module guide students toward?

- Information Support & Services
- Network Systems
- Programming & Software Development

What career paths might this content expose my students to?

What are the education trends for this career path?

What are the potential salaries of those career paths?
National Median Wage (2021)

What are the overall outlooks for those career paths?

Computer Programmer

Some college, no degree	3%
Associate's Degree	9%
Bachelor's Degree	88%

\$44.71/hour
\$93,000 annually

Projected growth (2021 – 31)
Decline (–2% or Lower)

Computer Systems Analyst

Associate's Degree	29%
Bachelor's Degree	33%
Master's Degree	14%

\$47.73/hour
\$99,270 annually

Projected growth (2021 – 31)
8 – 10%

Database Administrator

Associate's Degree	7%
Bachelor's Degree	77%
Professional Degree	11%

\$46.50/hour
\$96,710 annually

Projected growth (2021 – 31)
8 – 10%

Software Quality Assurance Analyst or Tester

Post-Secondary Cert.	9%
Associate's Degree	26%
Bachelor's Degree	50%

\$47.22/hour
\$98,220 annually

Projected growth (2021 – 31)
11%+

Web Developer

Post-Secondary Cert.	17%
Associate's Degree	17%
Bachelor's Degree	46%

\$37.03/hour
\$77,030 annually

Projected growth (2021 – 31)
11%+

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Module 6: Applied Artificial Intelligence Exploration



NEUROMAKER

Overview:

Students will examine the applications and ethical implications of Machine Learning and Artificial Intelligence by applying the lens of global citizenship and privacy by using available technology to run Machine Learning tests on predetermined data. Students gain skills that are closely aligned with the Information Support & Services, Programming & Software Development, and Web & Digital Communications CTE Pathways. Students are exposed to careers such as Data Scientist, Business Intelligence Analyst, and Software Developer

What will my students be doing during this Module?

Students will explore, present, and apply the concepts involved in AI to prepare them for future careers in the AI field.

What skills will my students gain from engaging in this Module?

Students are introduced to ethics, logical processing, and creative implementation skills.

What 21st Century Skills will my students practice while engaging in this Module?

Critical Thinking • Communication
Perseverance • Problem Solving
Collaboration • Technology & Digital Literacy • Global Awareness
Self-Direction • Social Responsibility
Innovation • Thinking

What Career Technical Education pathways does this Module guide students toward?

- Consumer Services
- Information Support & Services
- Programming & Software Services
- Programming & Software Development
- Web & Digital Communications
- Engineering & Technology*

What career paths might this content expose my students to?

What are the education trends for this career path?

What are the potential salaries of those career paths?
National Median Wage (2021)

What are the overall outlooks for those career paths?

Data Scientist

Most of these occupations require a four-year bachelor's degree, but some do not

\$48.52/hour
\$100,910 annually

Projected growth (2021 – 31)
11%+

Clinical Data Managers

Associate's Degree	5%
Bachelor's Degree	85%
Post-Baccalaureate Cert.	5%

\$48.52/hour
\$100,910 annually

Projected growth (2021 – 31)
11%+

Software Developer

Most of these occupations require a four-year bachelor's degree, but some do not

\$58.05/hour
\$120,730 annually

Projected growth (2021 – 31)
11%+

Computer and Information Research Scientist

Most of these occupations require graduate school. Some require master's degree, Ph.D., M.D., or J.D (law degree)

\$63.22/hour
\$131,490 annually

Projected growth (2021 – 31)
11%+

Business Intelligence Analyst

Bachelor's Degree	76%
Post-Baccalaureate Cert.	5%
Master's Degree	14%

\$48.52
\$100,910 annually

Projected growth (2021 – 31)
11%+

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