

**Randolph Township Schools
Randolph High School**

**HOME IMPROVEMENT
Curriculum**

**Department of Science, Technology,
Engineering and Math**
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**Randolph Township Schools
Department of STEM
Home Improvement**

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Randolph Township Schools

Mission Statement

We commit to inspiring and empowering all students in Randolph Schools to reach their full potential as unique, responsible and educated members of a global society.

Randolph Township Schools Affirmative Action Statement

Equality and Equity in Curriculum

The Randolph Township School district ensures that the district's curriculum and instruction are aligned to the state's standards. The curriculum addresses the elimination of discrimination and the achievement gap, as identified by underperforming school-level AYP reports for state assessments. The curriculum provides equity in instruction, educational programs and provides all students the opportunity to interact positively with others regardless of race, creed, color, national origin, ancestry, age, marital status, affectional or sexual orientation, gender, religion, disability or socioeconomic status.

N.J.A.C. 6A:7-1.7(b): Section 504, Rehabilitation Act of 1973; N.J.S.A. 10:5; Title IX, Education Amendments of 1972

RANDOLPH TOWNSHIP BOARD OF EDUCATION
EDUCATIONAL GOALS
VALUES IN EDUCATION

The statements represent the beliefs and values regarding our educational system. Education is the key to self-actualization which is realized through achievement and self-respect. We believe our entire system must not only represent these values, but also demonstrate them in all that we do as a school system.

We believe:

- The needs of the child come first.
- Mutual respect and trust are the cornerstones of a learning community.
- The learning community consists of students, educators, parents, administrators, educational support personnel, the community and Board of Education members.
- A successful learning community communicates honestly and openly in a non-threatening environment.
- Members of our learning community have different needs at different times. There is openness to the challenge of meeting those needs in professional and supportive ways.
- Assessment of professionals (i.e., educators, administrators and educational support personnel) is a dynamic process that requires review and revision based on evolving research, practices and experiences.
- Development of desired capabilities comes in stages and is achieved through hard work, reflection and ongoing growth.

**Randolph Township Schools
Department of STEM
Home Improvement**

Introduction

**Randolph Township Schools
Science, Technology, and Engineering and Math Department Introduction**

Randolph Township Schools is committed to excellence. We believe that all children are entitled to an education that will equip them to become productive citizens of the 21st century. We believe that an education grounded in the fundamental principles of science, technology, engineering, and math (STEM) will provide students with the skills and content necessary to become future leaders and lifelong learners.

A sound STEM education is grounded in the principles of inquiry, rigor, and relevance. Students will be actively engaged in learning as they use real-world STEM skills to construct knowledge. They will have ample opportunities to manipulate materials and solve problems in ways that are developmentally appropriate to their age. They will work in an environment that encourages them to take risks, think critically, build models, observe patterns, and recognize anomalies in those patterns. Students will be encouraged to ask questions, not just the “how” and the “what” of observed phenomena, but also the “why”. They will develop the ability, confidence, and motivation to succeed academically and personally.

STEM literacy requires understandings and habits of mind that enable students to make sense of how our world works. As described in Project 2061’s *Benchmarks in Science Literacy*, *The Standards for Technological Literacy*, and *Professional Standards for Teaching Mathematics*, literacy in these subject areas enables people to think critically and independently. Scientifically and technologically literate citizens deal sensibly with problems that involve mathematics, evidence, patterns, logical arguments, uncertainty, and problem-solving.

Randolph Township Schools
Department of STEM
HOME IMPROVEMENT

Course Introduction:

This is a full year elective course designed for any interested high school students. Throughout the course students will learn the fundamentals of home repair through project and materials planning, proper design fundamentals, and appropriate operation of hand and machine tools to execute a design. Students will practice with carpentry, blueprints, measurement, sheetrocking, painting, plumbing, electrical wiring, tile, and flooring. Technology and literacy are infused throughout the course, with connections made to a variety of subjects including geometry and physical science.

RANDOLPH TOWNSHIP SCHOOL DISTRICT
Curriculum Pacing Chart
Home Improvement

SUGGESTED TIME ALLOTMENT	UNIT NUMBER	CONTENT - UNIT OF STUDY
4 weeks	I	Green Technology
16 weeks	II	New Construction
16 weeks	III	Renovation and Repair

RANDOLPH TOWNSHIP SCHOOL DISTRICT

Basic Woods

UNIT I: Green Technology

ENDURING UNDERSTANDINGS	ESSENTIAL QUESTIONS	
As good stewards, we need to think carefully about how we use valuable resources.	<ul style="list-style-type: none"> What portion of the world's resources should a responsible homeowner be comfortable with using? Why? 	
There are many alternatives to traditional ways of building, heating, and powering homes.	<ul style="list-style-type: none"> How can we find new ways to replace non-renewable resources with sustainable ones? 	
KNOWLEDGE	SKILLS	NJCCCS
<p>Students will know:</p> <p>Renewable energy sources will play an increasing role in the way we construct, heat, cool, and power our homes.</p> <p>The footprint of a building is more than just the floor plan: it includes the environmental impact of the production of the materials used in its construction.</p> <p>Architectural strategies, such as passive solar technology and the use of berms can contribute dramatically to the thermal efficiency of a structure.</p> <p>When creating plans, consideration must be given to strategies for achieving the objectives safely, efficiently, and with regard to conserving valuable resources.</p>	<p>Students will be able to:</p> <p>Evaluate solar power, wind power, and geothermal power as viable alternatives to burning fossil fuels.</p> <p>Conduct and present research to demonstrate the relative merits of various sustainable building products.</p> <p>Create a plan for a dwelling that incorporates important principles of green architecture using both hand tools and technological applications.</p> <p>Design a green technology project in such a way as to conserve material, power, and cost.</p>	<p>Science: 5.1.12.C.1 5.3.12.A 5.3.12.B.1 5.4.12.C.1</p> <p>Technology: 8.2.12.B.1-3 8.2.12.B.5</p> <p>Math: S-1C.6 G-CO.1 G-CO.5 G-CO.12 G-MG.3</p> <p>ELA: RST.9-10.4 RST.11-12.4 WHST.9-10.7 WHST.11-12.7</p>

RANDOLPH TOWNSHIP SCHOOL DISTRICT
Curriculum Pacing Chart
Home Improvement

SUGGESTED TIME ALLOTMENT	CONTENT-UNIT OF STUDY	SUPPLEMENTAL UNIT RESOURCES
Green Technology-4 Weeks		
	Renewable Energy	
	Responsible and Sustainable Materials	<p style="text-align: center;"><u>BOOKS:</u> None Required Readings taken from various relevant sources.</p> <p style="text-align: center;"><u>SUGGESTED ACTIVITIES:</u></p> <p style="text-align: center;"> Student research sessions Research paper development Multimedia class presentation Sketches and drawings </p>
	Thermal Efficiency	

RANDOLPH TOWNSHIP SCHOOL DISTRICT
Home Improvement
UNIT II: New Construction

ENDURING UNDERSTANDINGS	ESSENTIAL QUESTIONS	
The subsystems in a building work together to create a livable, comfortable, functional, and attractive space.	<ul style="list-style-type: none"> With the inventions of new technologies, how do you think building methods will change in the next decade? 	
Safety, utility, and strength are vital considerations in designing a structure.	<ul style="list-style-type: none"> How does one evaluate needs and wants? 	
Building codes and safety standards have changed the construction process.	<ul style="list-style-type: none"> How can a contractor overcome challenges when renovating a historic home? 	
KNOWLEDGE	SKILLS	NJCCCS
<p>Students will know:</p> <p>Building permits need to be secured before starting work in order to ensure that the work will be properly done</p> <p>The structural parts of a deck include foundation, beams and girders, joists, deck planks, railings, and steps</p> <p>Proper wall framing includes using top and bottom plates, studs, headers, and cripples</p> <p>Given a geographical area, there are parameters for determining the correct pitch and materials necessary for roof installation.</p> <p>The correct and safe way to join plumbing components into a system includes using sweat solder in the case of copper pipes, cement when working with PVC, and a variety of compression and threaded fittings.</p> <p>Fixtures are wired into a system using Romex cable, plastic and metal boxes, wire nuts, and UL approved outlets and switches.</p> <p>The correct methods for installing drywall with drywall screws, tape, and spackle includes proper cutting techniques, depth of drywall screws, sealing joints with drywall tape and proper ways to apply and sand spackle.</p> <p>.</p>	<p>Students will be able to:</p> <p>Apply a rubric to successfully complete sample building permit for a project designed to comply with town code.</p> <p>Design and construct a model deck for a home.</p> <p>Safely construct a living space framed in dimensional lumber.</p> <p>Create a sealed, usable water supply and drainage system which functions properly.</p> <p>Provide electrical power in a manner consistent with current codes</p> <p>Develop a smooth continuous wall surface using appropriate supplies.</p>	<p>Science: 5.3.12.A 5.3.12.B.1 5.4.12.C.2</p> <p>Technology: 8.2.12.B.6</p> <p>Math: S-1C.6 G-CO.1 G-CO.5 G-CO.12 G-MG.3</p> <p>ELA: RST.9-10.4 RST.11-12.4 WHST.9-10.7 WHST.11-12.7</p>

RANDOLPH TOWNSHIP SCHOOL DISTRICT
Curriculum Pacing Chart
Home Improvement

SUGGESTED TIME ALLOTMENT	CONTENT-UNIT OF STUDY	SUPPLEMENTAL UNIT RESOURCES
16 weeks- New construction		
	Permits	
	Exterior Construction	<p style="text-align: center;"><u>BOOKS:</u> None Required Readings taken from various relevant sources.</p> <p style="text-align: center;"><u>SUGGESTED ACTIVITIES:</u></p> <p style="text-align: center;">Model Deck Frame Wall Section Sheet Rock and Spackle Connect Electrical Components “Finish” Wall Surface Sweat Solder Copper Pipe Connect PVC Pipe Build and Repair Water Closet Construct and Connect Sink</p>
	Home Construction	
	Electricity	
	Plumbing	

RANDOLPH TOWNSHIP SCHOOL DISTRICT
Home Improvement
UNIT III: Renovation and Repair

ENDURING UNDERSTANDINGS	ESSENTIAL QUESTIONS	
Repair and/or renovation of a structure may increase its value.	<ul style="list-style-type: none"> How does one determine the wisdom and efficacy of modifying an existing structure as opposed to replacing it? 	
Simple renovation and/or repair tasks can be performed by a non-professional in a cost effective way.	<ul style="list-style-type: none"> What renovations are prudent in order to improve the resale value of a home? 	
Existing spaces can be altered in a responsible way to provide for different uses.	<ul style="list-style-type: none"> How can current design trends be applied to renovation? 	
There are a variety of environmentally conscientious methods which can be used to improve the appearance of surfaces and spaces that have been allowed to degrade.	<ul style="list-style-type: none"> What sustainable, environmentally responsible methods should be used to make repairs to an existing space? 	
KNOWLEDGE	SKILLS	NJCCCS
<p>Students will know:</p> <p>A variety of materials and methods such as paint, ceramic tile, wallpaper, decorative moldings, and bamboo flooring improve the appearance of floor, wall, and ceiling surfaces.</p> <p>Clearing drains, removal of leaks, and installation of fixtures are essential homeowner skills necessary for maintaining an existing plumbing system.</p> <p>Homeowners need to diagnose and correct short circuits and overloads, replace breakers, and install additional fixtures in existing electrical systems to minimize out of pocket costs.</p>	<p>Students will be able to:</p> <p>Develop a smooth surface on an existing sheetrock wall using spackle</p> <p>Apply grout on a tile surface in a proper manner</p> <p>Apply paint to an unfinished surface to carry out the aesthetics of a design.</p> <p>Sweat solder copper pipes to create watertight joints.</p> <p>Install feed lines to a faucet for proper functioning.</p> <p>Correctly install a water closet using a wax ring</p> <p>Fabricate a drain system using pvc pipe and a “J” trap</p> <p>Measure, cut, strip and install Romex cable</p> <p>Install wire junction boxes, light fixtures, switches, and outlets on a mock surface</p>	<p>Science: 5.3.12.A 5.3.12.B.1 5.4.12.C.1</p> <p>Technology: 8.2.8.B.5 8.2.12.B.6</p> <p>Math: S-1C.6 G-CO.1 G-CO.5 G-CO.12 G-MG.3</p> <p>ELA: RST.9-10.4 RST.11-12.4 WHST.9-10.7 WHST.11-12.7</p>

Caulk, exterior paint, vinyl siding, and foundation coatings seal, protect and insulate the outer envelope of a house.	Obtain a watertight seal between two surfaces with caulk Install roofing shingles to a pitched surface Correctly install vinyl siding to a mock surface	
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RANDOLPH TOWNSHIP SCHOOL DISTRICT
Curriculum Pacing Chart
Home Improvement

SUGGESTED TIME ALLOTMENT	CONTENT-UNIT OF STUDY	SUPPLEMENTAL UNIT RESOURCES
Renovation and Repair- 16 Weeks		
	Repairing Drywall	<p style="text-align: center;"><u>BOOKS:</u> None Required Readings taken from various relevant sources.</p> <p style="text-align: center;"><u>SUGGESTED ACTIVITIES:</u></p> <p style="text-align: center;"> Finishing and Decorating Housing Module Installing Flooring in Housing Module Installing Vinyl Siding on Housing Module Retrofitting Plumbing and Electrical Fixtures in Housing Module Service Learning Project: Renovation and Repair in the Community </p>
	Paint and Wallpaper	
	Decorative Moldings	
	Ceramic Tile and Bamboo Flooring	
	Plumbing Leaks and Clogs	
	Retrofitting Plumbing Fixtures	
	Electrical Shorts and Overloads	
	Retrofitting Electrical Fixtures	
	Exterior Applications	

RANDOLPH TOWNSHIP SCHOOL DISTRICT

APPENDIX A

SOFTWARE NAMES:

Total 3-D Home Design Deluxe
Google Sketch Up

APPENDIX B

ASSESSMENT:

LIST OF ASSEMENT/TYPE

Assigned Projects
Optional Projects
Portfolio: Plans, Bills of Materials, Product
Formative Assessments: question/answer, discussions, written tasks
Performance Assessments

SUGGESTED RUBRICS TBD

APPENDIX C

SAMPLE INTERDISCIPLINARY UNITS

All topics of study will explore the connections between various disciplines within STEM education. Students will be required to read and analyze articles as well as write documents, thereby including a literacy component. In addition, students will be using technology in the course to construct and share their work.

APPENDIX D

PLACEMENT CRITERIA

Any high school student who has an interest in the course may enroll.