

DeRuyter Central School District

Introduction to Technology

Grade 8

30 Benchmarks

► **Standard 1: Students will use mathematical analysis, scientific inquiry, and engineering designs, as appropriate, to pose questions, seek answers, and develop solutions.**

INTECHA8.1.1 Knows basic math analysis to seek answers and develop solutions

- Capital estimates or requirements related to material lists for construction projects
- Wood projects: bird houses, shelves, Christmas tree etc.
- Figure cost of project
- Finished project: construct and finish the project.
- Maple Syrup Operation

INTECH8.1.2. Knows measurement tools and applies their use

- Uses rulers and other measurement tools to plan and construct a project

INTECH8.1.3 Identifies articles related to technology in the news

- Selection of appropriate articles for Technology from current newspaper or periodical

► **Standard 2: Students will access, generate, process and transfer information using appropriate technologies.**

INTECH8.2.1 Knows how to access, generate, process and transfer information

- Research invention and impacts using books or internet sources
- Research technology articles for knowledge and capital production

INTECH8.2.2 Knows how to use directions appropriately for construction of projects

- Mousetrap car
- Birdhouse Model
- Wood Project

► **Standard 3: Students will understand mathematics and become mathematically confident by communicating and reasoning mathematically, by applying mathematics in real-world settings, and by solving problems through the integrated study of number systems, geometry, algebra, data analysis, probability, and trigonometry.**

INTECH8.3.1 Know to select and use the tools needed to measure correctly

Construction activities

- Maple syrup production: hydrometers, thermometers
- Use a ruler for measurement during construction
- Use a pattern for alignments
- Use a ruler for measurement during construction: yard stick, tape measure, meter stick

INTECH8.3.2 Know basic math skills to calculate costs and estimate goal for required capital management using a materials list.

- Maple sugar operation
- Construction activities
- Estimate costs of materials through addition

INTECH8.3.3 Know and understand gear relationships/mechanical advantages

- Gear ratio
- Gear size and speed relationship
- Hydraulic systems

INTECH8.3.4 Know mathematic concepts related to structures and geometric shape

- Triangle compared to rectangle-Christmas tree project
- Flexible compared to stable and rigid

►Standard 4: Students will understand and apply scientific concepts, principles, and theories pertaining to the physical setting and living environment and recognize the historical development of ideas in science-----weather to maple syrup operation

INTECH8.4.1 Know the basic science theory related to:

- Friction, aerodynamics, drag, gravity ----mousetrap cars
- Newton's laws of motion----wind cars

INTECH8.4.2 Know potential and kinetic energy theories

- Car construction power supplies, mousetrap car
- Wind car activities

INTECH 8.4.3 Knows science concepts related to structures and geometric shape

- Triangle compared to rectangle
- Flexible compared to stable and rigid
- Properties of material

►Standard 5: Students will apply technical knowledge and skills to design, construct, use and evaluate products and systems to satisfy human and environmental needs.

INTECH8.5.1 Know the seven resources of technology and how they impact technology systems and activities

- People, materials, information, time, capital, energy, tools and machines

INTECH8.5.2 Know the definition of Technology and can identify a technology system and reflect on the impacts of the system or tool

- Expected and desirable impacts
- Unexpected and undesirable impacts
- Disadvantages of technology

INTECH8.5.3 Use basic safety skills to operate power equipment safely to construct a wood product to create a useable device.

- Construct project
- Safety guideline and power equipment skills
- Safety glasses, safety shield and placement
- Tool selection and application of the tools
- Tool identification and selection for the job need for construction

INTECH8.5.4 Know skills to design and assemble usable project

- Selection of designs and size for projects
- Tool selection and application of the tools need for construction
- Safe operation of tools and equipment

INTECH8.5.5 Use computer systems to design a flyer to satisfy a human need

- Application to design a maple syrup advertisement flyer
- Graphic images insertion

INTECH8.5.6 Use a computer system to plan a model car

- Car Builder

INTECH8.5.7 Use computer system to generate a presentation related to the impacts of technology.

- Research
- Word processing
- Image selection
- Output device selection

INTECH8.5.8 Uses lumber to demonstrate construction goals to model real/current items in our environment

- Structures – birdhouse, wind car, mousetrap car
- Swing ride efficiency of pulley systems and gear systems

- Car construction power supplies: kinetic and potential energy, battery powered
- Control systems (elevator, alarm, sub-system, light sensor)

INTECH8.5.9 Know technology skills to construct model to demonstrate structure techniques and mathematical theories.

- Bridge Builder

►Standard 6: Students will understand the relationships and common themes that connect mathematics, science, and technology and apply the themes to these and other areas of learning.

INTECH8.6.1: Know science principles and applies them to build a successful project

- Thrust, lift, drag and buoyancy
- Newton's Laws
- Material selection for construction purposes
- Hydraulic systems
- Pneumatic system

INTECH8.6.2: Know the relationship between measurement and successful construction process

- Measurement skill and tool selection

INTECH8.6.3: Know mathematic techniques to estimate capital needs for construction processes.

- Reference skills used reading materials list
- Estimate capital needs through addition
- Measurement skills for accurate construction
- Cost of production of project

►Standard 7: Students will apply the knowledge and thinking skills of mathematics, science, and technology to address real-life problems and make informed decisions.

INTECH8.7.1. Uses problem solving skills related to time and capital management efficiently constructs a project.

- Cost effective distance/money spent
- Shelf construction project
- Reference skills used reading a materials list
 - 1) Estimate capital needs through addition
 - 2) Planning activities or task to be completed on time
 - 3) Work ethic and clean-up
- Christmas Tree
 - 1) Reference skills used reading a materials list

- 2) Estimate capital needs through addition
- 3) Planning activities or task to be completed on time
- 4) Work ethic and clean-up

INTECH8.7.2 Know measurement skills to construct a project

- Shelf
- Christmas tree

INTECH8.7.3 Know computer software and computer system operations to effectively complete tasks for required project.

- Word processing
- CAD: car builder, bridge builder
- Impacts of Technology essay: Internet access and information retrieval
Word Processing

INTECH8.7.4 Know problem solving procedures to follow construction procedures demonstrated in class or researched.

Shelf

- Machine operation
- Tool selection and use
- Assembly procedures

Vehicle

- Machine operation
- Tool selection and use
- Assembly procedures

INCH8.7.5 Know current activities or trends in technology and system in our world

- Sensor and control systems
 - a. Touch sensors
 - b. Light sensors
- Solar energy systems
- Technology in the News