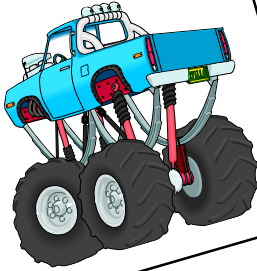


# TECHNOLOGY MODULES

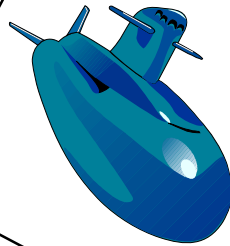
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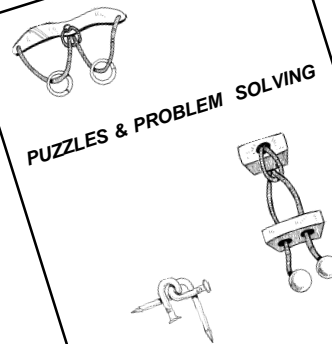
CO<sub>2</sub> CAR DESIGN & TESTING



HOVERCRAFT



PUZZLES & PROBLEM SOLVING



- ◆ Puzzles & Problem Solving ◆ Mass Production ◆ Materials & Processing
- ◆ Measurement ◆ Bridge Design & Construction ◆ Transmission of Power
- ◆ King of the Ring ◆ Dome Construction ◆ CO<sub>2</sub> Car Design & Testing ◆ Rocketry
- ◆ MagLev Vehicle Design ◆ Flight Exploration ◆ Submarines & Submersibles
- ◆ Hovercraft ◆ Video Production ◆ Lasers ◆ Pneumatics & Hydraulics
- ◆ Machines and Work ◆ Mechanisms Producing Motion ◆ Electricity & Electronics
- ◆ Rocket Cars ◆ Brake Car ◆ Brake Car Challenge ◆ Solar Power ◆ Hydroponics



## Rocket Cars

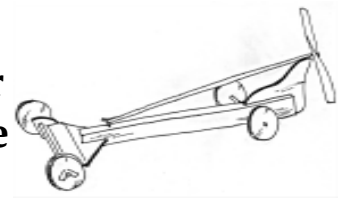
**Rocket Cars** is an 'eye-opening' spinoff of the very successful CO2 Car Design learning activity.

Students will design, build, test, and modify rocket car designs that are fueled by model rocket engines, and run over a 200 foot outdoor track.

CCM-048      Modular Learning Package cost... \$75

*Additional apparatus needed... Estes Rocket launcher, rocket engines, 400 foot of 1/8" cable and a supply of car parts.*

*Estimated cost of apparatus... \$150*



## Brake Car Challenge

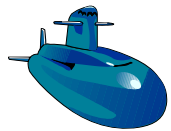
**Brake Car Challenge** is an intriguing problem solving unit that invites students to use math and interpret data having a lot of fun!

Students will build a rubberband-powered vehicle and then be challenged to determine where to set the braking system in order to stop at predetermined distances.

CCM-049      Modular Learning Package cost... \$75

*Additional apparatus & supplies needed... Late Brake Aero - Racer class pack (25 kits)*

*Estimated cost of apparatus and supplies... \$175*



## Submarines & Submersibles

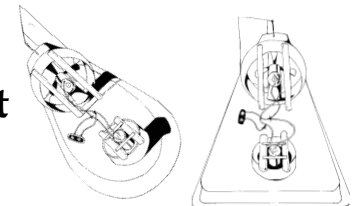
**Submarines/Submersibles** is an interesting module which allows students to explore first-hand the principles of buoyancy, ballast, and displacement in submersibles.

Students will use what they have learned about submersibles to design, build, and test a submarine capable of traveling a predetermined course in water.

CCM-011      Modular Learning Package cost... \$75

*Additional apparatus & supplies needed... large water trough (200 gallons) and a supply of sub motors*

*Estimated cost of apparatus and supplies... \$175*



## Hovercraft

**Hovercraft** is a very popular module which introduces students to pneumatic principles that defy gravity and allow a hovercraft to work.

Students will operate a simple hovercraft model and build their own hovercraft designed to produce and control forward motion over water.

CCM-020      Modular Learning Package cost... \$75

*Additional apparatus & supplies needed... supply of small DC Motors, 3 blade propellers, and styrofoam trays*

*Estimated cost of supplies... \$45*

## CO<sub>2</sub> Car Design & Testing



**CO<sub>2</sub> Car Design & Testing** is a proven learning package which has been re-worked to add a new wrinkle or two to this age-old favorite.

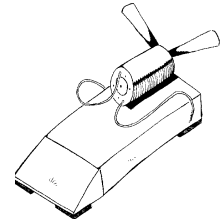
Students will design, build, test, and modify CO<sub>2</sub> car designs. New testing and racing tips include fluid-mapping and rain gutter racing.

CCM-035      Modular Learning Package cost... \$75

*Additional apparatus needed... CO<sub>2</sub> Car track, fluid mapping table, and a supply of car kits*

*Estimated cost of apparatus... \$150*

## MagLev Vehicle Design



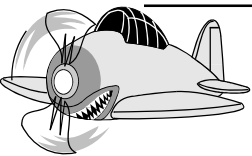
**MagLev** is an exciting module which delicately weaves critical thinking skills with an introduction to the concepts of magnetic levitation and electric motors.

Students will dabble with models of magnetic levitation vehicles, investigate how electric motors produce work, and build a small magnetic levitation vehicle which travels eight feet in under three seconds.

CCM-002      Modular Learning Package cost... \$45

*Additional apparatus & supplies needed... 2 MagLev tracks, power supply, assortment of small DC motors, 3 blade propellers, self-propelled car kit, and magnets*

*Estimated cost of apparatus... \$270      Supplies... \$75*



## Flight Exploration

**Flight** is a challenging and fun-filled module that takes students through hands-on activities which explore Bernoulli's Principle of flight and how airplanes are controlled during flight.

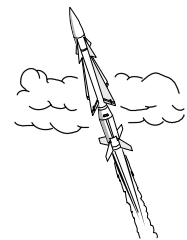
Students will design, build, and test airfoils which produce lift and assemble a rubber band powered airplane designed to be controlled during flight.

CCM-015      Modular Learning Package cost... \$75

*Additional apparatus & supplies needed... wind tunnel, and supply of Delta Dart kits*

*Estimated cost of apparatus... wind tunnel \$800 or build your own for under \$150 Supplies... \$55*

## Rocketry



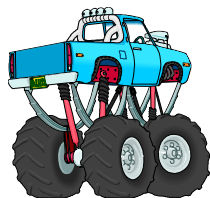
**Rocketry** is a highly motivational module which gives students a thorough understanding of the basic principles of rocketry and what makes a rocket stable in flight.

Students will design, build, and test inexpensive air-powered pop bottle rockets capable of reaching heights in excess of 400 feet.

CCM-007      Modular Learning Package cost... \$75

*Additional apparatus needed... pop bottle rocket launcher and air compressor*

*Estimated cost of apparatus, not including air compressor... rocket launcher \$235 or build your own launcher for \$50*



## King of the Ring

**King of the Ring** an extremely popular design and problem solving unit that culminates in a competition to see who reigns as class champion.

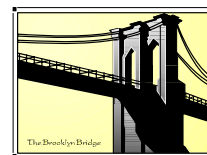
Students will utilize creativity and critical thinking skills to design, build, test, and modify sumo wrestling vehicles for competition against other student vehicles in a six foot ring! Concepts learned include DC motors, power transmission, gear ratios, materials processing, fabrication, and fasteners.

CCM-043      Modular Learning Package cost... \$75

*Additional apparatus & supplies needed... Sumo Car Wrestler™ I Controller, Tripod, Sumo Wrestler™ I Trainer, supply of casters, motors, pulleys, & wheels*

*Estimated cost of apparatus and supplies ... \$280*

## Bridge Design & Construction



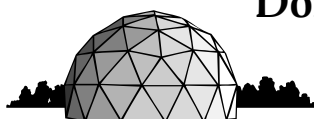
**Bridge Design & Construction** is a popular module designed to explore different types of bridge structures and develop skills in building structures which support weight.

Students will design, build, and test a bridge structure made from balsa strips and other construction materials. Designs are tested to determine efficiency in terms of weight held versus weight of structure.

CCM-018      Modular Learning Package cost... \$75

*Additional apparatus & supplies needed... bridge tester, supply of balsa strips, string, and glue*

*Estimated cost of apparatus... bridge tester \$650 or build your own for less than \$50      Supplies ... \$45*



## Dome Construction

**Dome Construction** is an interesting module that has been developed to introduce students to the many uses of Buckminster Fuller's geodesic dome.

Students will use model dome building kits to explore the concepts which make geodesic domes strong, and they will create applications of those concepts using those small building kits.

CCM-001      Modular Learning Package cost... \$75

*Additional apparatus & supplies needed... 2 - Dome Kit I*

*Estimated cost of apparatus... \$30*

## Electricity & Electronics



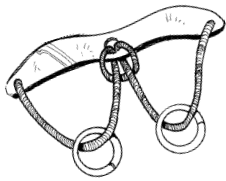
**Electricity & Electronics** is an active module designed to introduce students to basic principles of electricity and electronics.

Students will use several different solderless electronic kits to construct a variety of circuits and have the opportunity to create circuits for specific purposes.

CCM-004      Modular Learning Package cost... \$75

*Additional apparatus & supplies needed... electronic modular component kit and 2 solderless electronic kits*

*Estimated cost of apparatus... \$160*



## Puzzles & Problem Solving

**Puzzles & Problem Solving** is an exciting, fun-filled learning package for both the student and teacher alike..

Students will explore problem-solving strategies, through challenging puzzles, after they have used mass production techniques to produce a variety of puzzles. We suggest that you purchase our **Mass Production** learning package to go with this unit.

CCM-038      Modular Learning Package cost... \$75

*Additional apparatus & supplies needed... 8-10 different puzzles, misc. wood, harness rings, rope, rod, and power tools*

*Estimated cost of apparatus & supplies... \$150*



## Mass Production

**Mass Production** is a classic, unit-based learning package which compares and contrasts custom manufacturing with modern batch or mass production techniques.

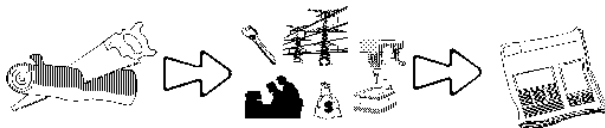
Students will design, build and test jigs, fixtures, and templates for an actual production run. Assembly line and packaging skills are also introduced.

CCM-037      Modular Learning Package cost... \$75

*Additional apparatus & supplies needed... wood supplies, power tools, and production jigs*

*Estimated cost of apparatus & supplies... \$100*

## Materials & Processing



**Materials and Processing** is an insightful module which takes a look at some common manufacturing processes used in industry today.

Students will explore the basic processes of injection molding and lamination and produce basic products that they can take home.

CCM-017      Modular Learning Package cost... \$75

*Additional apparatus & supplies needed... manual plastic injection molding kit, laminating kit, and extra laminating materials.*

*Estimated cost of apparatus & supplies... \$100*

## Measurement



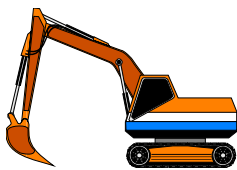
**Measurement** is a classic module which takes an unconventional approach toward teaching students the basic principles of the "customary" measurement system.

Students will have the opportunity to apply their measurement skills by building a block puzzle that will not fit together unless the parts are precisely made.

CCM-024      Modular Learning Package cost... \$75

*Additional apparatus & supplies needed... miscellaneous wood, dowels, and hand tools*

*Estimated cost of supplies... \$30*



## Pneumatics & Hydraulics

**Pneumatics/Hydraulics** is a nifty module fashioned to acquaint students with the roles pneumatics and hydraulics have in the construction and manufacturing industries.

Students will use the LEGO DACTA® Pneumatics sets to construct models of pneumatic applications and use what they have learned to create pneumatic mechanisms designed to produce work.

CCM-025      *Modular Learning Package cost... \$75*

*Additional apparatus & supplies needed... 2 LEGO DACTA® Pneumatics sets*

*Estimated cost of apparatus... \$70*



## Machines and Work

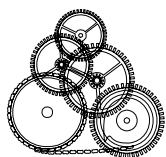
**Machines and Work** is another popular module which was created to give students an opportunity to explore how simple machines can be used to create mechanical advantage.

Students will use a LEGO DACTA® Technics I set to build models of simple machines and test those models for mechanical advantage. Students will also be asked to combine simple machines to produce work.

CCM-003      *Modular Learning Package cost... \$75*

*Additional apparatus & supplies needed... LEGO DACTA® Technics I set*

*Estimated cost of apparatus... \$95*



## Transmission of Power

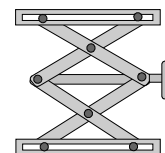
**Transmission of Power** is a fun-filled module where students use CAPSELA® kits to learn about gear ratios, torque, and the transfer of power.

Students will explore the different parts of the kit and assemble those parts into a variety of mechanisms aimed at solving problems presented by the teacher.

CCM-009      *Modular Learning Package cost... \$75*

*Additional apparatus & supplies needed... CAPSELA® Scientific kit*

*Estimated cost of apparatus... \$160*



## Mechanisms Producing Motion

**Mechanisms Producing Motion** is a challenging module intended to introduce students to mechanisms that are combined with simple machines to produce motion.

Students will use the LEGO DACTA® Technics Resource set to build mechanisms that actually produce motion. These mechanisms are then combined to create models of machines designed to produce work.

CCM-023      *Modular Learning Package cost... \$75*

*Additional apparatus & supplies needed... LEGO DACTA® Technics Resource set*

*Estimated cost of apparatus... \$200*



## Video Production

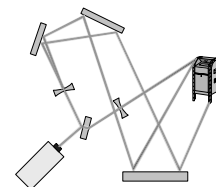
**Video Production** is a rewarding module that provides students an opportunity to learn about the *Do's* and *Don'ts* of video and basic camera techniques necessary in the world of video.

Students will shoot, produce, and edit a short video demonstrating their knowledge of the many different types of camera shots and angles. They will also edit and add audio narration.

CCM-027      Modular Learning Package cost... \$75

*Additional apparatus & supplies needed... Video Camcorder, TV, VCR with audio insert, microphone, cassette player, and supply of blank tapes*

*Estimated cost of apparatus not including TV, VCR, or Camcorder... \$200*



## Lasers

**Lasers** is a colorful module which explores the basic properties of laser light and focuses upon the use of lasers and fiber optics as they are used in modern communications systems.

Students will investigate beam splitting and directing, commercial uses of laser light, and voice transmission along fiber optic cables.

CCM-010      Modular Learning Package cost... \$75

*Additional apparatus & supplies needed... Modulated laser and receiver, small amplifier box and microphone, cassette player, and various mirrors*

*Estimated cost of apparatus & supplies... \$575*



## Hydroponics

**Hydroponics** is a eye-opening module that guides students through the unconventional method of soilless gardening, the pros and cons of hydroponics, and the role it plays in our future.

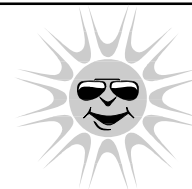
Students will explore the differences of active and passive hydroponic systems. They will be provided the opportunity to germinate, transplant, and chart the growth of plants in such systems.

CCM-021      Modular Learning Package cost... \$75

*Additional apparatus & supplies needed... Aquafarm kit, leni hydroculture kit, hydroponics video, 5 - gallon aquarium, aquarium air pump, horticulture, and a supply of seeds*

*Estimated cost of apparatus... \$190*

## Solar Power



**Solar Power** is an intriguing module which gives students a chance to operate both passive and active solar power systems.

Students will test a passive solar powered water heater and explore how solar cells can produce electricity which powers work.

CCM-008      Modular Learning Package cost... \$75

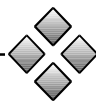
*Additional apparatus & supplies needed... passive solar panels, DC motors, and miscellaneous propellers*

*Estimated cost of apparatus... \$60*



# CHANGE OF PACE -- ONE TO TWO WEEK UNITS

"Try out these funfilled, challenging units ... designed to make your teaching easier. Use these to *pre-teach* all the necessary skills needed to enhance student success in an *action-based lab*."



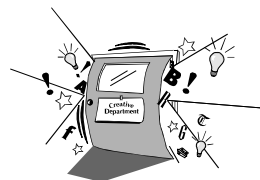
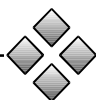
## Pre-Teaching for Success in Modular Instruction

CLP-075

Learning Package cost ... \$75

**Pre-Teaching for Success in Modular Instruction** is an essential learning package for the teacher just starting out in modular learning. It contains carefully-crafted activities used to prepare students for the transition from unit-based to modular learning.

Students will be introduced to a variety of activities designed to build skills in working productively together, to learn to be a self starter and problem solver, and to become self-reliant instead of relying on the teacher. *Make a purchase of over \$200 and you receive this package FREE!*



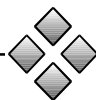
## Teaching Creativity & Critical Thinking Skills

CLP-076

Learning Package cost ... \$75

**Teaching Creativity & Critical Thinking Skills** is a change-of-pace, unit-based learning package created to challenge students to put newly acquired design and problem solving skills into action.

Students will design, produce, and test solutions to a series of unique problems using a variety of tools, materials, and production processes.



## Quick Thinker Activities for Design & Technology

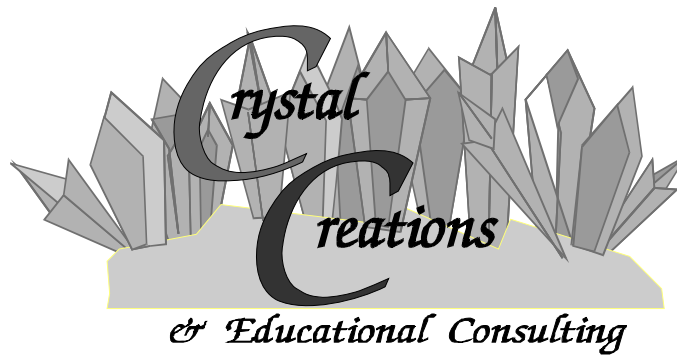
CLP-077

Learning Package cost ... \$75

**Quick Thinker Activities for Design & Technology** is a very interactive learning package that fosters skills in *brainstorming*, *problem-sensing*, *risk-taking*, *decision-making*, and *problem solving*.

Students will learn how to break from **habit thinking** with activities such as word "pundles", creativity challenges, and design solutions through problem solving. The critical thinking skills learned in these activities will lead to further success in action-based learning.





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