

# Research and Design (10-assignment)



This is an integrated instructional module designed specifically to operate within a Modular Program environment. It is ideal for use with our Scantek Technology program. The module includes a 10-assignment exploratory curriculum that is split into two parts. Each part includes a pre-test and post test. The module includes hardware, software and curriculum materials sufficient to provide a complete learning experience.

The curriculum incorporates continuous assessment through questions. When used in conjunction with a ClassAct networked management system, this provides instant feedback of student performance. The assessments begin with a comprehensive pre-test. This quiz includes questions for each subsequent assignment, together with questions that will specifically test math and reading ability.

Every assignment starts with a series of questions designed to track inventory. These ensure that any missing items are located before they are needed.

Each assignment is divided into a series of tasks. Hands-on tasks form the core of the student work. Where appropriate, these are accompanied by research tasks based upon illustrated textbooks and software applications. Assessment questions are incorporated into each task.

**Typical 10-assignment topic areas include:**

- Magnetic attraction and repulsion
- Construction of a model levitation vehicle
- Problem solving/design process
- Speed and velocity and time
- Using light gates to measure vehicle speed
- Acceleration and deceleration forces
- Power level versus time graphs
- Impact sensor to detect vehicle impact
- Prototypes

**Typical 10-assignment activities include:**

- Compare the principles of magnetic attraction and repulsion and explore how a magnetic levitation vehicle works.
- Look at the principles of design and learn how to connect the equipment and to build and operate the LJ Maglev vehicle.
- Construct the model levitation vehicle.
- Learn the different types of energy and the forms they take.
- Operate the LJ Maglev control software to time events.
- Identify the problem and interpret the design brief.
- Discover the difference between speed and velocity.
- Time the vehicle travelling between the two light gates and calculate the speed (velocity) of the vehicle.
- Research the sources of energy used in transportation systems.
- To learn how to write a test program for automatic control of the vehicle.
- Use graphs to portray the input to a system.
- Investigate and assess the suitability of various acceleration and deceleration methods for passenger vehicle control.
- Develop the solution to achieve controlled acceleration and deceleration.
- Build and test prototype of chosen solution by performing test runs.
- Test, evaluate and refine the chosen solution.

Each assignment is designed around a list of performance objectives. These lists include academic, technical and occupational objectives. The assignments are written in such a way as to enable a student to attain the performance objectives, with the assessment questions linked to these in order to provide a measure of true competency.

The performance objectives are used by the ClassAct management system to generate a comprehensive portfolio of student competency reports. Default reports supplied with this module include:

- Entry report
- Technical/Occupational Exit report
- Basic Skills report based upon the federal SCAN's report.

**The items supplied with this instructional module include:**

- 10-assignment On-Screen Student Assignment Guide CD
- 10-assignment Student Assignment Guide
- 10-assignment Student Workbook
- 10-assignment Instructor Guide
- Computer Aided Instruction software
- Book: 'Exploring Transportation'
- Magnetic Levitation Track (Maglev track)
- Interface Panel
- Impact Sensor
- Propulsion Unit
- System Control Panel
- Accessory kit

**Additional items required:**

- Computer

## Module Facts

For Technology Program, order as: ST150/10 Research and Design

	No.	Average time
Assignments	10	45 minutes
Extension Activities	2	45 minutes
<b>Total</b>		<b>9 hours</b>



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