Guide To Meeting The Education And Transition Needs Of All Students With *Project Discovery*

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GUIDE TO MEETING THE EDUCATION AND TRANSITION NEEDS OF ALL STUDENTS WITH *PROJECT DISCOVERY*

A Special Needs and Alternative Education Resource
Utilizing a Research-Based, Proven Program and
Effective Teaching Strategies

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Introduction

Who They Are

Education Associates, Inc. is a national research and development firm that provides a diverse array of services to the educational and workforce communities. Established in 1980, Education Associates has assisted organizations and institutions with needs analysis, assessment, curriculum development, media technology services, grant writing, training and evaluation. Due to their expertise in these areas, Education Associates has been selected by the U.S. Departments of Education and Labor as a **National Technical Assistance Provider.**

Recognized nationally for developing hands-on curricula that integrate academic standards with career exploration and preparation, Education Associates has found great success with *Project Discovery*. The *Project Discovery* programs embody EAI's motto, "*Passionate about education…committed to creating superior solutions."* Students are provided a series of hands-on activities embedded in lessons that are designed to help students gain career awareness, basic work skills, and an understanding of the academic skills needed to complete specific job tasks. The program is also aligned with core academic standards.

The Need for *Project Discovery*

Throughout the growth of our education system, teachers have had to balance the diverse needs of students. Is our primary responsibility to teach academic standards? How do we present academic skills so they are relevant to students? How can we enable our students to gain both the academic skills and the career development skills needed to transition to jobs that capitalize on our students' interests, skills and abilities? Specific career exploration programs have been implemented in numerous school districts across the country. The question, however, remains – "*How do we integrate core academic requirements with a successful transition plan*?"

With the passage of the *No Child Left Behind Act* of 2001, schools have become accountable for their students' academic achievement and graduation success. The Department of Education found that each year, one of every twenty high school students drops out of school (U.S. Dept. of Education, Office of Vocational and Adult Ed.). The truancy and drop out rate for students at risk and students with disabilities continues to rise as students find themselves in academic courses that are not related to their interests, nor do they understand how to apply the academic skills they are being asked to learn (Lehr, 2004; Wagner, 2004).

The importance of keeping students interested, successful, and involved in school has become a primary objective for educators, institutions, and curriculum developers. School-to-Work opportunities have provided a means for collaboration between academic goals and career readiness. Under the *Goals 2000: Educate America Act*, standards are required to provide students with "the skills and knowledge needed to succeed" (U.S. Department of Education, 1998). Experience has shown that to better prepare today's youth for the workforce, students require career exploration to be built upon an academic foundation. In this system, students are able to see the connections between their education and their lives.

***Project Discovery* – Hands-On Instruction and Skill Development**
Project Discovery institutes a system where students are exposed to a variety of career opportunities. Students use real tools of the trades to perform the actual tasks of workers in career fields, while learning the academic skills necessary to perform the tasks. The *Project Discovery* programs allow students to see the need for the academic skills required to complete specific job tasks. One Louisiana teacher remarked,

> ***"The fact that each of the actual skills competencies are systematically addressed by the kits is fantastic for educators. Having pre-made lesson plans results in a great savings of valuable teacher time. Everything is at their fingertips."***

Teachers are able to monitor students' understanding of core academic concepts by the academic alignment charts provided for each lesson. Work Performance Benchmarks help teachers identify which occupational qualifications a student has completed and the level of proficiency.

The benefit of involving students in their instruction has proven to be effective against drop out rates in schools using *Project Discovery*. In the Tony Goetz Elementary School in Oklahoma, disciplinary incidents decreased by 48% and enrollment nearly doubled (276 – 418) in five years (National Consortium for State Guidance Leadership, 2005). As research has shown, students with individualized instruction are more likely to complete school and have successful outcomes (Daggett, 2005; Lehr, 2004; Newman, Marder & Wagner, 2004; Wagner, 2004).

Education Associates, Inc. has developed innovative curricula that combine rigor and relevance. Students experience a wide variety of hands-on activities across high interest careers that integrate job tasks and academic skills required by our state departments. Students become prepared for not only the academic goals required in their education, but the abilities and skills necessary to succeed in today's workforce.

Validation/Proven Effective
Project Discovery is a scientifically research-based program that has been proven to be effective. Developed from job tasks from the Dictionary of Occupational Titles (U.S. Department of Labor 1991, 1977), *Project Discovery* passed a rigorous evaluation process by the **U. S. Department of Education** and received its ***validation and approval.*** In addition, *Project Discovery* has been listed in "*Educational Programs That Work: A Collection of Proven Exemplary Educational Programs and Practices*" (U.S. Dept. of Education, 1994).

Project Discovery has also been selected by **The National Dropout Prevention Network** as a *Model Program* and, as such, is listed in their focus database on their website (National Dropout Prevention Network, 2003).

What to Expect
This manual is organized into four main sections:

I. Integrating Academic Achievement with Career Exploration and Skill Development in *Project Discovery*: This section will provide you with a basic overview of the different types of classrooms that exist and the historical context of the inclusive classroom. You can use this section as a guide towards what constitutes an effective learning environment in inclusive classrooms. Other aspects of this section include an exploration of applied curricula and hands-on instruction; how to create an active learning environment; and the ways *Project Discovery* integrates into these environments.

II. Legislative Requirements of *No Child Left Behind Act* and *Individuals with Disabilities Education Improvement Act*: You will be able to see the history of two of the 21st Century's most influential legislative acts in education. This section provides a description of the requirements of each act, and an overview of the challenges facing education. Also included are laws specific to students with disabilities.

III. Supporting Every Student: In Supporting Every Student, you will be exposed to the most common disabilities encountered in the classroom, as well as teaching strategies for each of these. You can use this section as a guide to universal design for learning (UDL). This section provides several techniques a teacher can implement to make his/her learning environment more accessible to different styles of learners.

IV. Strategies for Implementing *Project Discovery*: You can use this section as a guide toward further addressing the lessons and activities in *Project Discovery* for students with disabilities and/or other students with special needs. It outlines key steps you can do to create more accessible lessons and provides instructional strategies.

Also included is a glossary of frequently encountered terms.

I. Integrating Academic Achievement with Career Exploration and Skill Development in *Project Discovery*

Diverse Learning Environments

Social, educational, and legal movements have transformed the general education classroom into a diverse community of learners. The general education classroom of today is composed of students from different socioeconomic groups; students who speak a language other than English; various cultural and ethnic backgrounds; students with specific learning and environmental needs; and students with disabilities. These students are often referred to as students with special needs or at-risk students.

Within this classroom exists a community representing different strengths and styles of learning. The learning community extends beyond the desks and boards of the classroom to the students' lives, where each student becomes even more distinct from the next. It is important to remember this variety when thinking about the ways students are challenged in the classroom and how they are prepared to apply their academic knowledge and skills to their social experiences.

The general curricula historically taught standard academics designed for "typical" students. Students with disabilities were accommodated outside of the general classroom. The educational history of people with disabilities has been mainly one of segregation. Access to public education for persons with disabilities was not ensured until 1975 when the *Education for All Handicapped Children Act* was passed. Today, the *No Child Left Behind Act* of 2001 and the *Individuals With Disabilities Education Act* of 2004 (discussed in detail in chapter 3), ensure that *all* students receive a free and appropriate public education designed to support, provide, and protect their education and transition needs within the least restrictive environment.

The increasingly inclusive learning environment means that teachers must find innovative strategies and curricula that teach the academic standards in ways that are relevant to students and capitalize on their interests, such as *Project Discovery*. The variety of learning styles represented in an inclusive setting can provide challenges. How do we modify the curricula for a student with special needs without making that student stand out? In what ways can a teacher help a student who has difficulty organizing? What strategies can we use to balance teaching academic standards with enhancing instruction for students with disabilities?

"As our students become more and more diverse, so must our ways of teaching them." –
Shirley Johnson-Delgado, Senior Administrator,
Orange County Public Schools, Orlando, FL

Project Discovery's effectiveness is largely attributed to the multimodal activities and instruction the program employs. Students actively engage in the tasks of a trained worker. They become involved in the planning and organizing of their project, and eventually link what they learn in the classroom to their communities. Multimedia packages, peer cooperation, and flexible course structures promote student involvement. With *Project Discovery*, applied academic instruction and meaningful hands-on activities facilitate all students' learning and develop relevant skills acquisition and greater student self-esteem. The more ways students can access information and become involved in their learning, the greater the opportunity for post-school success as they transition from school to college and/or employment.

The Inclusive Classroom

According to the National Center for Education Statistics (2005), nearly half of all students with disabilities, ages 6-21, were in the general education classroom 80% of the school day during the 2003-2004 academic year. The *No Child Left Behind Act* and *Individuals with Disabilities Education Act* along with growing enrollment in public education (Dept. of Education, 2005) and standards-based reform, has challenged general educators to provide a supportive instructional environment while also meeting rigorous academic standards (Izzo & Lamb, 2002; NCES, 2005; Sitlington & Clark, 2006; Wagner, 2004). An inclusive classroom is currently the term used to describe the educational setting that includes both students with disabilities and their non-disabled peers.

Commitment to All Students

Inclusive learning environments operate under the commitment to educate *all* students and to bring support into the classroom rather than having students leave the learning community (Algozinne & Ysseldyke, 1992; Hamill and Everington, 2002; Rose & Meyer, 2002). Central to the success of an inclusive setting is considering how other students may benefit from modifications and adaptations in instruction, curricula, materials used, and means of participating. More than likely, an activity that engages multiple skill levels, preferences, and interests will benefit a greater number of students. Remember, the inclusive classroom accommodates different learners, work paces, and support needs. Successful inclusive curricula will provide teachers and students with flexible instructional methods, hands-on experiences, and learning objectives compatible to functional skills.

Focus Point

Student Learning is Promoted When:

1. All students have access to curricula and academic programs which are based on clear state standards.
2. Students have access to career and technical education programs that are based on professional and industry standards.
3. Universally designed assessment, curriculum, experiential learning, and work-based learning experiences are provided and applicable to the widest possible range of students.
4. The school builds small learning environments that help all students achieve successful post-school outcomes.
5. High school graduation standards and options are based on meaningful measures of student achievement and learning.

Source: National Alliance for Secondary Education and Transition, "National Standards and Quality Indicators: Transition Toolkit for Systems Improvement" 2005 National Leadership Summit Edition

Achievement for All Students

Student achievement is accelerated in the inclusive learning environment if teachers:

- Have high expectations for all students, regardless of cultural background or disability.
- Integrate reading instruction at least 15 minutes a week within the *Project Discovery* classroom.
- Use differentiated instruction, which recognizes that each student has strengths and challenges and allows for individualized work pace and assessment.
- Facilitate instruction through the involvement of peers, professionals, and members of the community, all of whom foster a cooperative rather than a competitive learning environment.
- Actively engage students in the classroom and learning process, thereby increasing self-esteem, developing communication and social skills, and promoting greater awareness of individual learning needs, strengths, and interests.
- Provide meaningful access to the curriculum, allowing students to experience the full-range of academic options, leading to greater post-school success.
- View students as individuals, which promotes respect, the ability to form friendships, and create a community.

Flexible Approach to Instruction

What makes the *Project Discovery* program successful in the inclusive classroom is a flexible approach to instruction and activity design that allows teachers to determine the specific uses for the kits. The fundamental elements of the program include:

- An organized structure with groups of related occupations
- Self-contained hands-on learning experiences
- Career exploration with specific job opportunities in the workplace
- Activities that help students attain skills through self-directed instruction
- Defined steps that make students aware of the learning process and objectives

The goal of *Project Discovery* is to "expose students to realistic, varied simulated work experiences to increase their base of occupational experiences, increase their awareness of what they like to do, and increase their knowledge of what they have the abilities to do" (Hendee, 1994). The kits allow for individual development by focusing on specific sets of characteristics and actions that span many different occupations. As students discover which tasks they excel at and are interested in, students' self-confidence increases. With increased self-awareness and confidence, comes increased motivation to learn and better career decision-making skills. In addition, the program is accessible for all students (See Case Study).

Case Study

***Project Discovery* Reaches Two Levels of Students**

Ms. Gard, a Supervisor of Special Education, worked with *Project Discovery* for the past two years. She began by purchasing three kits with federal funds. As funds became available, her program expanded, to seven kits. The *Project Discovery* program now reaches two levels of students: 8th grade students in special education classrooms and high school age students with more significant disabilities. The 8th graders are exposed to the *Project Discovery* program to help them make more appropriate choices when they reach their high school vocational classes. The older students receive more in-depth assessment for vocational evaluation with kits such as "Grocery Clerking" and "Food Service". Ms. Gard stated that the strong point of the program is that "*everything is right there*." She also commented that "*teachers like the Project Discovery kits as well as the students*." In addition to the kits mentioned above, "Mail Handling" is another favorite with both teachers and students. In the school district, the kits are rotated every six weeks among five campuses. The portability of the kits was a key factor in the adoption of the *Project Discovery* program.

Like Ms. Gard, you have the ability to adapt the activities and instructions to your students' needs. The basic skills engage all student levels, however, a teacher can adapt the higher skill competencies to special needs students when appropriate (See Chapter IV: Strategies for Implementation of *Project Discovery*). Cooperative learning groups can work through activities as well as individual students. Collaboration between instructors may occur as well. For example, the classroom teacher may focus on the academic instruction while a career guidance counselor may work with the students to develop career exploration. You may find that your students can work on different levels of activities within the kit. Tailoring the pacing of the activities and instructions to your students are all aspects of a successful inclusive environment. *Project Discovery* facilitates this process by outlining implementation approaches and the purposes of each individual activity.

Applied Curriculum

An applied curriculum makes content learned in the classroom relevant and meaningful to students' lives outside the classroom. Practice and research have proven time and time again that interest in school increases when students can apply what they learn in the classroom to nonacademic environments (Algozzine & Ysseldyke, 1993; Hamill & Everington, 2002; NASET, 2005; Rose & Meyer, 2002). Applied curriculum encourages students to generalize the information they learn to their social and nonacademic lives while also emphasizing academic skills. For example, in the Case Study: Elementary Students Build a Mall, students developed math and language arts skills by learning how to run a successful business and maintained a relationship with a local retail store.

Case Study

Elementary Students Build a Mall

Prior to the fifth-grade, students at Ballard County Elementary School had not been involved in career exploration, classroom work or training in practical living skills and vocational studies. During their fifth-grade school year, students began a career awareness system called *Careers in Action*, the elementary component of *Project Discovery*. This system contained ten hands-on kits designed to help students gain awareness of career clusters, typical jobs within those clusters, the tasks and duties of these jobs, and the tools, materials and training required to be successful in performing these duties. Activities integrated academic subjects, such as math, language arts, social studies, communication, science, music, art, health, physical education and character education, into the practical living and vocational skills areas. Throughout the kits, students performed hands-on tasks with the tools and materials of a specific career field. Learning transferred outside of the classroom as students engaged with different members of their community. For example, a local retail store entered into a partnership with the class after students worked through activities in the *Let's Discover the World of Business* kit. The fifth-graders recreated a mall at the school, called the Fifth Dimension Mall. This school-based enterprise involved all of the fifth graders, including students with special needs. Tasks were assigned by appropriate skill-level, and students produced, bought and sold goods and merchandise at their mall. The local retail store's personnel became valuable resources for the class. The *Let's Discover the World of Business* kit integrated math, art, and language arts with a relevant activity in students' lives – going to the mall. After this hands-on experience, student performance and knowledge in the practical living/vocational studies area of the KIRIS tests increased by 8.6 academic index points. This is a 53% increase after one year of using the applied curricula in the *Careers in Action* system. Scores in other subject areas, such as reading, math, writing, and arts and humanities also increased. Over the course of five years, the *Careers in Action* system has continued to increase test scores.

Source: Gabbard, Pamela Kaye and Wells-Farmer, Mary Anne. "Assessment in School-to-Work: Ballard County (Kentucky) Elementary School Test Results 1997 – 2000".

The ability to transfer knowledge to situations outside of the classroom is a significant skill that will help students become successful members of their communities. As detailed in the case study, the fifth graders' scores in several key competency areas improved because of their ability to generalize the academic knowledge in *Project Discovery*. Another benefit of using the various *Project Discovery* programs is that schools can continue to provide their students with increasingly challenging kits. As your students begin to plateau, you have the advantage of offering them more career awareness and higher level occupational skills.

"The program offers activities across curriculum areas by covering many subject areas, such as math, high-order thinking, critical thinking, reading, problem-solving, etc. Very little planning of activities are involved with the project, it's all spelled out for you."

Active Learners

Applied curricula generally involve community-referenced programs, career and vocational education, and hands-on activities that make students active partners in the learning process (Hamill & Everington, 2002; Sitlington & Clark, 2006). Students are more successful when "a broad spectrum of work-based learning components such as career exploration" are included in the academic curricula (American Youth Policy Forum & Center for Workforce Development, 2000). This is due to the development of work-related skills that allow students the ability to identify their personal strengths and interests, and eventually make better-informed career decisions.

"Excerpts of Applied Math Skills from Project Discovery Carpentry Kit Competencies and Correlated Tasks"

Carpentry Competencies	Carpentry Kit Tasks
• Describe the tools used in measuring activities and in carpentry work	• Use basic measuring tools of a carpenter to accurately measure sizes. • Identify and convert between English and Metric systems. • Successfully complete measurement activities and "Math and Measurement Quiz." • Recognize and identify basic blueprint terms. • Use architectural and engineer's scales in measurement activities.
• Accurately measure, mark and cut wood.	• Use tape measure, carpenter's square, combination square and level to accurately measure and mark wood according to specifications. • Use chalk line and plumb bob and line to check for level in measuring and marking wood for cutting. • Accurately measure wood and cut wood according to specifications to build a saw horse and workbench. • Use miter saw to make 45° and 95° cuts. • Use crosscut saw to make required cuts.
• Use mathematic computations and measurement skills in planning and designing a workbench.	• Complete "Workbench Parts Diagram" worksheet to calculate lumber needed and sizes. • Perform math needed to accurately measure wood needed for specifications of workbench. • Identify costs of all materials needed and complete "Workbench Cost Sheet." • Use tools including wood, saws,

	clamps, hammer, drill, screwdriver, wrench, file, chisel, sockets, and orbital sander to build a workbench.
• Identify and discuss geometric patterns that repeat or that has rotational or reflective symmetry.	• Define and explain reflective symmetry. • Demonstrate the process of making shapes with reflective symmetry. • Identify common two dimensional shapes. • Complete "Reflective Symmetry" worksheet and produce required shapes.
• Calculate the area or perimeter of various two-dimensional shapes.	• Accurately complete the "How to Find the Perimeter and Area" worksheet. • Accurately complete quiz.
• Understand the application of mathematic skills to the carpentry trade.	• Explain importance of accurate measurement and calculation skills in carpentry tasks. • Accurately perform such measurements and calculations. • Use mathematic skills to compute the cost of a project.

Facilitating Assessment

The career exploration approach also facilitates teacher assessment. With the detailed Work Performance Benchmarks and occupational skills competencies provided with each *Project Discovery* lesson, you have the ability to measure a student's actual skill acquisition (See below for a sample Benchmark).

ELECTRICITY - WORK PERFORMANCE BENCHMARKS

Client's Name: _____ Date: _____ ITEM # PD 13-03

Trial Number ___1___2___3___4___5___6___7___8___9___10

Overall Rating: 1 2 3 4

Performance Scale: 1 2 3 4 (Yes / No)

Activity 1 - Matching Color Coded Wire

1.

(a) Matched each color wire correctly to matching spring. (a)

Activity 2 - Soldering

2.

(a) Tinned tip of soldering iron by following instructions. (a)
(b) Solder each wire by following instructions. (b)
(c) Connection is shiny and smooth. (c)
(d) Desoldered as per instructions. (d)

Activity 3 - Cable Splicing

3.

(a) Completed pigtail splice correctly as per instructions. (a)
(b) Completed western union splice correctly as per instructions. (b)
(c) Completed bunch splice correctly as per instructions. (c)
(d) Completed all three splices before soldering. (d)
(e) Prepared splice for soldering by applying resin Flux. (e)
(f) Built heat bridge and then soldered connection. (f)
(g) Wiped extra Flux from splice after it cooled. (g)
(h) Solder was smooth and shiny. (h)
(i) Could see outline of splice. (i)
(j) Cleaned work area. (j)

Activity 4 - Taping Splices

4.

(a) Taped each splice per instructions (pigtail and western union) (a)
(b) Taped from right to left using overlapping and beginning 2 tape widths to the right of the splice. (b)
(c) Stopped 2 tape widths to the left of the splice. (c)
(d) Repeated winding left to right. (d)
(e) Repeated winding right to left. (e)
(f) Cut the tape. (f)
(g) Taped the bunch splice by wrapping wire around the soldered splice, and then the top and back down the splice to wire 2 and 3. (g)
(h) Wrapped tape around wire 2. (h)
(i) Wrapped tape around wire 3. (i)
(j) Wrapped tape around wire again, folded tape over at the end of the splice and cut it. (j)
(k) Cut separate piece of tape and made one or two turns around the folded ends. (k)
(l) Cleaned up work area. (l)

Activity 5 - Wiring Circuits

5.

(a)Wired closed circuit so that bulb would light. (a)
(b) Hypothesized whether bulb would light per diagrams provided. (b)
(c) Wired circuits to determine if hypotheses were correct. (c)

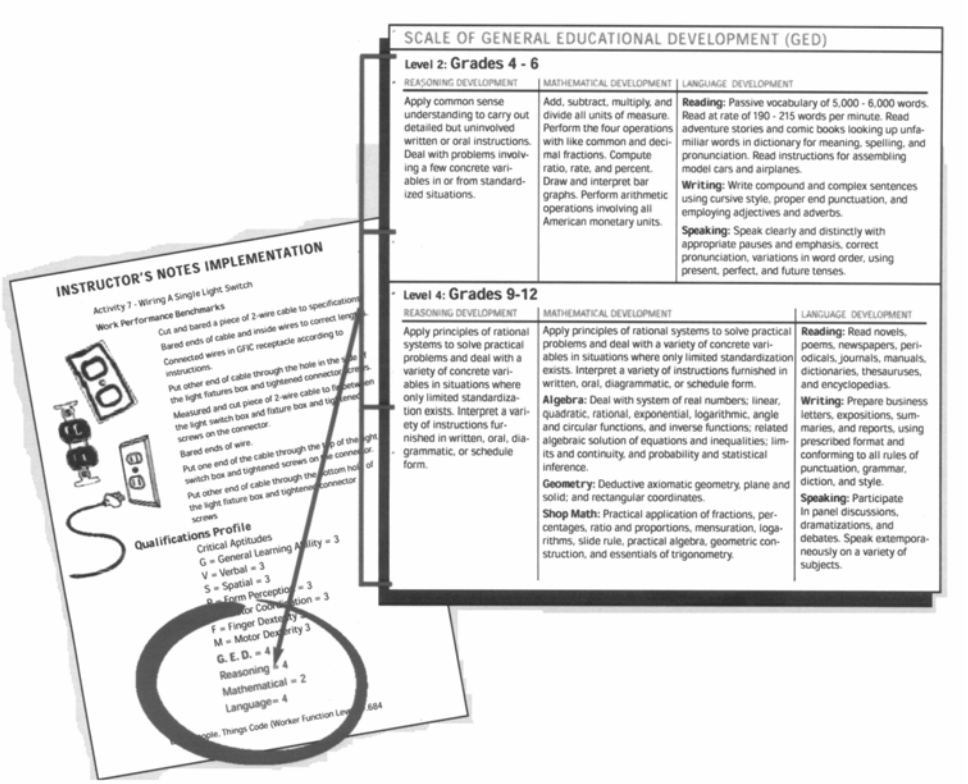
Activity 6 - Installing a Wall Socket and Plug

6.

(a) Connecting a plug: (a)
(b) Bared wires according to instructions (b)
(c) Made hook in the ends of all three wires using needle nose pliers. (c)
(d) Connected three wires to three screws inside the plug and replaced the cardboard insulating disk over the screws. (d)

Each lesson builds upon the knowledge and skills gained from previous activities, therefore allowing you to assess whether a student has reached a point requiring additional supports. The

close relationship between academic and occupation skills in *Project Discovery* provides a framework for evaluating whether or not a student can perform the basic academic skills needed on the job at the level specified in the kit.



INSTRUCTOR'S NOTES IMPLEMENTATION

Activity 7 - Wiring A Single Light Switch

Work Performance Benchmarks

Cut and bared a piece of 2-wire cable to specifications

Bared ends of cable and inside wires to correct length

Connected wires in GFIC receptacle according to instructions.

Put other end of cable through the hole in the side of the light fixtures box and tightened connector screws.

Measured and cut piece of 2-wire cable to fit between the light switch box and fixture box and tightened screws on the connector.

Bared ends of wire.

Put one end of the cable through the hole of the light switch box and tightened screws on the connector.

Put other end of cable through the bottom hole of the light fixture box and tightened connector screws

Qualifications Profile

Critical Aptitudes

G = General Learning Ability = 3

V = Verbal = 3

S = Spatial = 3

P = Form Perception = 3

Q = Clerical Perception = 3

K = Motor Coordination = 3

F = Finger Dexterity = 3

M = Motor Dexterity 3

G. E. D. = 4

Reasoning = 4

Mathematical = 2

Language= 4

People, Things Code (Worker Function Level) 684

SCALE OF GENERAL EDUCATIONAL DEVELOPMENT (GED)

Level 2: Grades 4 - 6

REASONING DEVELOPMENT	MATHEMATICAL DEVELOPMENT	LANGUAGE DEVELOPMENT
Apply common sense understanding to carry out detailed but uninvolved written or oral instructions. Deal with problems involving a few concrete variables in or from standardized situations.	Add, subtract, multiply, and divide all units of measure. Perform the four operations with like common and decimal fractions. Compute ratio, rate, and percent. Draw and interpret bar graphs. Perform arithmetic operations involving all American monetary units.	**Reading:** Passive vocabulary of 5,000 - 6,000 words. Read at rate of 190 - 215 words per minute. Read adventure stories and comic books looking up unfamiliar words in dictionary for meaning, spelling, and pronunciation. Read instructions for assembling model cars and airplanes. **Writing:** Write compound and complex sentences using cursive style, proper end punctuation, and employing adjectives and adverbs. **Speaking:** Speak clearly and distinctly with appropriate pauses and emphasis, correct pronunciation, variations in word order, using present, perfect, and future tenses.

Level 4: Grades 9-12

REASONING DEVELOPMENT	MATHEMATICAL DEVELOPMENT	LANGUAGE DEVELOPMENT
Apply principles of rational systems to solve practical problems and deal with a variety of concrete variables in situations where only limited standardization exists. Interpret a variety of instructions furnished in written, oral, diagrammatic, or schedule form.	Apply principles of rational systems to solve practical problems and deal with a variety of concrete variables in situations where only limited standardization exists. Interpret a variety of instructions furnished in written, oral, diagrammatic, or schedule form. **Algebra:** Deal with system of real numbers; linear, quadratic, rational, exponential, logarithmic, angle and circular functions, and inverse functions; related algebraic solution of equations and inequalities; limits and continuity, and probability and statistical inference. **Geometry:** Deductive axiomatic geometry, plane and solid; and rectangular coordinates. **Shop Math:** Practical application of fractions, percentages, ratio and proportions, mensuration, logarithms, slide rule, practical algebra, geometric construction, and essentials of trigonometry.	**Reading:** Read novels, poems, newspapers, periodicals, journals, manuals, dictionaries, thesauruses, and encyclopedias. **Writing:** Prepare business letters, expositions, summaries, and reports, using prescribed format and conforming to all rules of punctuation, grammar, diction, and style. **Speaking:** Participate in panel discussions, dramatizations, and debates. Speak extemporaneously on a variety of subjects.

Teachers Join the Learning Community

One more aspect to remember is that as a teacher using an applied curriculum, you become a part of the learning community. You may find yourself demonstrating how to use a tiller, one of the tools used in the landscaping kit, or helping to build a hydroponics system. As you engage and encourage your students to take part in this learning community, you are instilling a sense of responsibility to each individual student.

Students that are in a learning environment that fosters personal development and self-esteem building are more likely to continue with school and increase their achievement. Drop-out rates for students at high-risk has been shown to decrease when they are in these types of environments (NASET, 2005; Wagner, 2004). In Bradley County and Orange County School Districts, *Project Discovery* impacted drop-out rates by approximately 15% and 11%

respectively. One teacher commented, "*This program has turned our Option III program around. Our teachers are excited. The students are eager to learn and we are looking forward to next year*." The integrated academic and career exploration will motivate students to become active learners, and will provide teachers with a readily accessible applied curriculum.

"This program has turned our Option III program around. Our teachers are excited. The students are eager to learn and we are looking forward to next year."

Hands-On Instruction

People generally retain 10% of what they read; 20% of what they hear; 30% of what they see; 50% of what they see and hear; 70% of what they say; and 90% of what they do and say (Magnesen, 1983). Instruction methods that stimulate the widest variety of senses will generally be the most effective, which is why the hands-on instruction in *Project Discovery* is so valuable. As you will further discover in Chapter 4: Supporting Every Student, one of the best tools you can use to make applied academic curricula accessible to all of your students is to:

- Use curricula
- Use instruction methods
- Use materials
- Use content

THAT CAN BE MODIFIED OR ADAPTED TO MANY DIFFERENT LEARNING STYLES

Hands-on instruction challenges students. It facilitates learning by having them become active partners. Students discover *why* they do things, and are enabled to think for themselves, taking risks and responsibilities for their decisions. Students engaged in an active learning environment are stimulated by the different tasks they perform. With *Project Discovery's* hands-on approach, students can

- Self-direct the learning process
- Develop greater independence and understanding of their individual strengths
- Learn how to communicate more effectively with their peers.

The hands-on activities and lessons combined with the applied curricula, gives students "real-world connections" that prepare students for the skills they need after they graduate.

As one instructor noted, *Project Discovery* "*is almost like an on-the-job training*." Students are prepared to enter the world of work because they perform the actual work tasks of a specific occupation. They are introduced to workers in the field, and are provided the tools to leave high school with at least entry-level work skills. In addition to their basic work skills, students have the academic knowledge necessary to improve school performance.

In this age of high-standards and accountability, a program that facilitates gaining life skills and academic proficiency is invaluable. The teacher does not need to choose which to focus on; *Project Discovery* delivers both.

Summary

Previous models of education did not emphasize providing a challenging, relevant curriculum for *all* students. In addition to current educational laws, research has shown that students with disabilities and students who are at risk perform better when they are engaged in an organized curriculum that is relevant to their lives. The inclusive setting operates under the commitment that instruction can be individualized. Teachers are encouraged to use flexible approaches and instructional materials. When students are provided a means of relating academic content to the real world they have a greater chance of success and are more interested in learning. Hands-on activities and instructions create an active learning environment that involves the teacher in the learning process. *Project Discovery* implements an approach to education that combines rigorous academic subjects with occupational skills, and students consistently engage in the learning process.

II. Legislative Requirements

Current Legislative Mandates

The growing emphasis on academic proficiency, standards-based reform, and high-stakes testing for ALL students has become the guiding force of recent legislation and educational trends. In February of 2005, President Bush announced a 2006 agenda for the accountability provisions of the *No Child Left Behind Act* (NCLB) which would improve the quality of secondary education *and* ensure that students are prepared to enter college and the workforce with the skills to succeed. In order to strengthen high schools and provide necessary interventions, the President proposed a flexible design including:

1. Programs that combine rigorous academic courses with demanding vocational and technical education courses to provide students with high-quality academic and technical training
2. Research-based dropout prevention programs
3. Programs that…prepare students who are at risk of educational failure and dropping out to succeed academically in high school and to enter postsecondary education
4. College preparation and awareness activities for students from low-income families.
   (U.S. Department of Education, 2005)

Federal laws in the fields of education, special education and vocational-technical education have provided legal mandates to ensure that students have access to a full range of educational programs designed to meet students' needs. NCLB addresses the issues of high expectations and academic rigor for all American high school students. The *Individuals with Disabilities Education Improvement Act* of 2004 (IDEA) requires that all students with disabilities receive a free and appropriate public education that emphasizes special education and related services designed to meet their unique needs and prepare them for further education, employment, and independent living (IDEA, Sec. 601, H.R. 1350). Section 504 of the Vocational Rehabilitation Act also provides protection from discrimination for persons with disabilities. This chapter reviews these legislative mandates and provides suggestions for how to meet the education and transition needs of all students.

No Child Left Behind Act of 2001

The *No Child Left Behind Act* offers a rare opportunity for states and educators to address the issues of high expectations and academic rigor for all American high school students. As its name implies, "No Child Left Behind" seeks to "close the achievement gap between disadvantaged and minority students and their peers and to change the culture of America's schools so that all students receive the support and high-quality instruction they need to meet higher expectations." (U.S. Department of Education, Office of Vocational and Adult Education, October 2003, p. 1).

Education Reform Principles of NCLB

1. **Accountability** for results.
2. Use teaching methods based on **scientific research**.
3. Promote **adequate yearly progress** for all students.
4. Highly qualified teachers deliver instruction.
5. Professional Development.
6. Increased **flexibility** and **local control** and expanded options for **parents.**

(National Center on Educational Outcomes, 2003).

States must develop content standards for content areas such as English, math and science, and state assessments must be tied to these academic content standards. All students must be tested in reading and math in grades 3 through 8, and once in high school by 2004-05. By 2007, all students must also be tested in science (Neubert, 2006). For students with significant cognitive impairments (about 2 percent of the school population), NCLB allows schools to administer an alternative assessment that is aligned with state content standards but is appropriate to these students' intellectual level.

NCLB requires states to:	***Project Discovery*:**
• **Accountability for Results - Establish annual achievement objectives for all high schools.** State must set adequate yearly progress (AYP) objectives for every high school to ensure that all of its students are proficient in reading and mathematics by the end of the 2013-14 school year.	• **Uses established state standards to develop content.** Lessons are correlated to the academic standards (See Section IV for an excerpted sample). Teachers are provided an outline of the program, which indicates the progression of academic objectives. • **Measures students' skills attainment** thru Pre-post tests and Work Performance Benchmarks. • **Uses Pre-Post test instruments** to follow students' progress and allow for immediate review and/or additional intervention resources for those in need of improvement. • **Accommodates different** learning styles/multiple intelligences. • **Uses Work Performance Benchmarks** to measure and document students' progress.
• **Hold high schools accountable for graduation rates.** Graduation rate is defined by the law as the percentage of students who graduate from high school	• Relationship to content is **meaningful and relevant** to students. *Project Discovery* helps students find their learning strengths and interests. Students

with a regular diploma in the standard number of years. The graduation rate of a high school is included in the AYP objectives of each high school.	also discover *why* they are learning, making them more interested in academics. *Project Discovery* has been proven effective in engaging students' interest, reducing dropout rates, and decreasing disciplinary referrals.
• **Use teaching methods based on scientific research.** Utilize teaching methods that have been proven to be effective.	• Is a **scientifically research-based** program that has been **approved** and **validated** by **the U.S. Department of Education.** • Listed in the U.S. Department of Education's publication **"***Educational Programs That Work*: A Collection of Proven Exemplary Educational Programs and Practices." • Is recognized as a **Model Program** by the **National Dropout Prevention Network** for improving students' attitudes toward learning and decreasing dropout rates and disciplinary referrals.
• **Promote adequate yearly progress for all students.** Measure the progress of all students. States must include separate, annual achievement goals for students from low-income families, racial and ethnic minority students, students with disabilities, and students with limited English proficiency so that the progress of these students is monitored.	• **Definitive academic and functional skills can be incorporated into the IEP.** Due to the clear correlation between academic standards and work-based performance, students can use their proficiency and skills acquisition in *Project Discovery* as an IEP record of what they have achieved. • *Project Discovery* provides intense hands-on educational experiences for students enrolled in **special education, transition** and **alternative settings.** • Through specially-developed components for special needs subgroups, students are exposed to a variety of strategies necessary for learning reading, math, and science activities in an applied, hands-on curriculum. • *Project Discovery* provides instruction for special needs

	students based on their **strengths, interests and abilities** and helps them **transition** to post-school activities as required by the IDEA Act of 2004.
• **Document that "highly qualified" teachers deliver instruction in content areas such as English, math, and science so students are able to master the content standards.** *Highly qualified* means that a teacher meets state certification requirements, holds a least a bachelor's degree, and has demonstrated subject-matter competency in each academic content he or she teaches (U.S. Department of Education, 2004).	• **Flexible instruction methods, hands-on learning, and accurate student assessment.** *Project Discovery* fosters achievement by providing teachers with effective teaching strategies and materials for today's classroom.
• **Professional Development.** Elevate the quality of instruction by providing staff opportunities for meaningful professional development.	• *Project Discovery* **Professional Development Training** component will help ensure that teachers and para-educators are provided the information needed for a successful implementation. • **Nationally-Certified Trainers** conduct on-site professional development to help ensure a successful implementation. • *Project Discovery* **Professional Development** is consistent with nationally-recognized professional standards.
• Increased **flexibility** and **local control** and expanded options for **parents.** Give parents and community leaders the information they need to hold high schools accountable and support improvement. States must ensure that every school district publishes an annual report card for each of its schools that include information on how students performed on state academic assessments.	• *Project Discovery* **increases academic achievement and keeps students interested and motivated.** Schools that have used *Project Discovery* have seen a significant increase in student performance on state assessments. • *Project Discovery* provides an avenue for **parental** and **community support** and **expands flexibility** in the classroom through innovative educational experiences and partnerships.

The NCLB provides the framework, the tools and the resources for improving America's schools and preparing every young person for the future. Many educators across the country

have shown that students who others thought could not achieve can indeed excel with the appropriate curricula, instructional strategies and supports. *Project Discovery* is one of the tools with ample scientifically-based research that these products can engage students, reduce dropout rates and successfully prepare students for the transition to postsecondary education and/or employment.

***Individuals with Disabilities Education Improvement Act* of 2004 (IDEA)**

The special education legislation provided all students with disabilities the right to a free and appropriate public education in the least restrictive environment and mandated that each student have an individualized education program (IEP). The IEP must include the student's present level of performance, measurable annual goals, services to be provided, and plans for initiating and evaluating the services. For students who are 16 years or older, the IEP must include a statement of needed transition services. These transition services are defined in IDEA of 2004 as a coordinated set of activities for a child with a disability that:

(A) is designed to be within a results-oriented process, that is focused on improving the academic and functional achievement of the child with a disability to facilitate the child's movement from school to post-school activities, including post-secondary education, vocational education, integrated employment (including supported employment), continuing and adult education, adult services, independent living, or community participation;

(B) is based on the individual child's needs, taking into account the child's strengths, preferences, and interests, and

(C) includes instruction, related services, community experiences, the development of employment and other post-school adult living objectives, and, when appropriate, acquisition of daily living skills and functional vocational evaluation (IDEA, Sec. 602, H.R. 1350).

The IDEA of 2004 provided the opportunity for teachers to integrate career education and transition assessment into the classroom using *Project Discovery* programs. By delivering instructional programs such as *Project Discovery's* career units, teachers are capitalizing on the student's strengths, preferences, and interests, as required by IDEA. *Project Discover*y delivers instruction that is focused on improving the academic and functional achievement of your students, and also facilitates the students' movement from school to post-school activities including post-secondary education, vocational education and employment. *Project Discovery* is an excellent program that can be used to assist students in gaining the awareness of what skills are needed to be successful in specific occupational areas, as well as the related academic skills that are required by workers in those areas.

Section 504 of the Vocational Rehabilitation Act

Students with disabilities may receive services or reasonable accommodations through Section 504. Students most likely to receive services under Section 504 are those with attention deficit hyperactivity disorder, visual or hearing impairments, or physical disabilities (President's Commission on Excellence in Education in Special Education, 2002). Students who qualify for reasonable accommodations but do not need a comprehensive individualized education program may receive services through a 504 plan. Common accommodations provided in a 504

plan include extra time on tests, note-takers, enlarged print in books and assignments, interpreters, and/or use of assistive technology (Neubert, 2006). Section 504 also protects persons with disabilities from discrimination and guarantees their right to reasonable accommodations in postsecondary and employment settings. For example, students with visual or hearing impairments must have access to enlarged print, Braille, or assistive technology in college or employment, as mandated by Section 504 of the Vocational Rehabilitation Act.

Summary

Research indicates that a variety of instructional approaches, such as the experiential approach that *Project Discovery* utilizes, can be used to increase access to the general curriculum and standards-based instruction. The National Longitudinal Transition Study-2 (NLTS2) reported that students with disabilities who attend general education classes are generally more successful than those in special education classes (Wagner, 2004). However, these students, along with students at risk, are generally not meeting the graduation standards and skills assessments of their peers.

It is critical that educators implement curricular models that have evidence-based research, such as *Project Discovery*, to meet the academic standards, as mandated in NCLB, and also prepare students to transition to employment, as mandated by IDEA. When students are provided a curriculum that has real world applications, an instructor can provide a new pathway toward learning.

Students see the relevance of what they are learning and find that they have something to add to the classroom. The goals of NCLB and IDEA are not to set high expectations that are beyond students' abilities, nor are they encouraging watered-down curricula. These legislative acts are encouraging teachers to create a learning environment that challenges all students and embraces individualized instruction and assessment. When instruction is focused on students' learning styles and interests, and provides a relationship between academics and professional development, students will achieve success both in school and out.

III. Supporting Every Student

Students with Disabilities and Students at Risk

Today, over five million students with disabilities have been identified as requiring special education services in our public schools, making up 11.46 percent of the total student population (U.S. Department of Education, 2005). Approximately half of these students have learning disabilities, a hidden disability that interferes with integrating, acquiring, and/or demonstrating verbal or nonverbal abilities and skills due to processing or memory deficits. Another 4 percent of students with disabilities have other types of hidden disabilities that may not be apparent such as speech or language impairments (2.25%), hearing impairments, or emotional problems. Currently the U.S. Department of Education collects data on the number of students that have been identified as having one (or more) of 13 different categories of disabilities.

Students at risk are those youth that are in need of supports to stay in school (Dynarski & Gleason, 1999) and are consistently identified as having poor academic achievement and attendance (Lehr, 2004). The at-risk population frequently includes youth in the juvenile justice program, youth from low socioeconomic backgrounds, teen-mothers, and students of minority status. This struggling student population has significantly influenced the need to find effective teaching strategies and create better learning environments.

It is more than possible that you will encounter students who have multiple risk factors, which is why it is important to have available a flexible instructional approach. Not all students you encounter will be identified as having a disability. You may find that your students have "passed" other grades undetected, but in your class, they are struggling. In addition to using available supports at your school, you can make a significant difference by supporting every student in the classroom.

The IEP Team

An appropriate educational program for each student with a disability is developed by an IEP team. The IEP team includes the student's teachers, administrators, parents and students. For students with disabilities who are 16 years or older, the IEP must contain transition services that are designed to facilitate the transition from high school to postsecondary goals such as college and/or employment. The *Project Discovery* curricula can be used to assist students in exploring potential careers and gaining access to the appropriate career and technical education program to prepare them for their chosen career.

The IEP team can use the skills acquisition and academic achievement built into *Project Discovery* as indicators of students' progress. The Work Performance Benchmarks (See page 11 for sample) also assist the IEP team by enabling the teacher to:

1. Chart the student's progress through the kit.
2. Identify the tasks involved in each kit.
3. Provide a competency-based approach to learning-students learn tasks that must be successfully completed on the job.
4. Compare the knowledge, skills and abilities of the student to the actual ones required on the job.
5. Provide a tool to evaluate the student's ability to perform tasks.
6. Document tasks performed for the IEP.

Approximately two percent of students with disabilities have significant cognitive disabilities such as mental retardation, autism or multiple disabilities. According to the U.S. Department of Education, two percent of students with disabilities do not need to meet the state assessment standards and pass the state mandated assessments (ed.gov website, June, 2005). However, these students must take an alternative assessment that is determined by members of their Individualized Education Program (IEP) team.

Access to Rigorous Curricula

The majority of students with disabilities can and should be educated in the general education classroom where they can access the same rigorous curricula that their peers need, such as the *Project Discovery* programs. Students with disabilities who are in the general education classroom tend to be significantly less behind than their peers in special education classes (Wagner, 2004). The *Project Discovery* curricula can and will prepare these students for the state mandated assessments if appropriate instructional strategies and supports are implemented in your classroom. In fact, a model high school identified by the International Center for Leadership in Education reported that 68% of students with disabilities graduated with a Regents diploma, the highest diploma available in New York State (Gloeckler, 2005). However, *all* students succeed when they are in a focused learning environment that challenges and involves them.

It is important to provide your students:

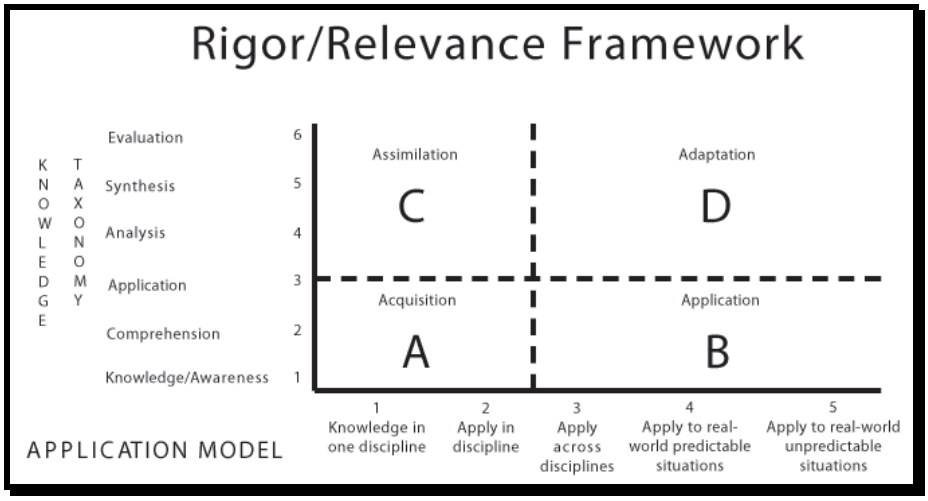
- **High expectations and challenging goals.** Make *all* students aware of your expectations and the goals needed to succeed. Posting the academic and work-skills objectives in an easy-to-see location can do this. You can also provide individual charts where students plot their achievement. Remember, the goals can be the same for the class but the means of achieving them can be individualized.
- **Focus on basic skills and student performance.** Begin with basic skills and then move on, when the student is ready, to higher-level skills. Assess whether a different means of evaluation will help your students show what they have learned. Monitor your students frequently to evaluate their progress. This will also help you evaluate what works best for your individual students.
- **Career awareness and personal development.** Relating career awareness with academic instruction helps you organize your curricula in more logical and meaningful ways. As students gain an understanding of why they are learning, they are able to identify their own strengths and interests. This increases self-esteem and interest.

Highly Successful Schools

The changing world has led us to re-evaluate what makes a successful environment for all students. The U.S. Department of Education, in addition to many other national organizations, defined four characteristics of a highly successful school (Daggett, 2005):

1. **High academic performance in core areas** as measured on state and national tests.
2. **Programs that stretch students well beyond core academic skills** measured by state and national tests.
3. **Community involvement.**
4. **Social and personal development.**

To reach these goals, teachers must provide their students with a Rigor/Relevance Framework (Daggett, 2005). The basic idea of this framework is familiar to all teachers – it involves Bloom's taxonomy. The Rigor/Relevance Framework encourages changing instructional materials and methods in order to have students "understand and conceptualize relevant applications for each academic standard and benchmark being taught" (Daggett, 2005).



The goal is to have students understand how to apply the academic standards and benchmarks being taught to practical and relevant settings. This is exactly what you will be doing when you use the *Project Discovery* program. Your students begin by acquiring basic knowledge, such as vocabulary recognition, and then begin to assimilate that knowledge into other core subjects. By the end of the program, your students will have moved into the most rigorous quadrant – adaptation. The students are applying their knowledge to real-world situations.

This type of instruction is especially helpful for your students with disabilities and students at-risk. You are not teaching watered-down versions, so your students are being challenged; however, you are also creating an accessible framework for instruction. Students will see how they can succeed step-by-step, and will realize how they have the knowledge and skills necessary to succeed in their communities.

Different Learning Styles

Students must be motivated to learn. Every day students need to be prompted to ask themselves:

- What am I learning today?
- Why am I learning it?
- What can I do to enhance my learning?

The best way to motivate your students is to use a variety of teaching styles. You have probably found that where one of your students does best by hearing instructions, another student performs better when the instructions are written down. This is because you are teaching to a classroom filled with different learning styles.

Some common learning styles:

- **Auditory (Aural) Learners:** These students prefer heard or spoken instruction. Auditory learners learn best through hearing lectures, tapes, group discussion, tutorials, and talking things through.
- **Visual Learners:** These students prefer to see instruction in the form of graphs, pictures, diagrams, charts, hierarchies, and other materials that represent what could have been represented in words. This does not necessarily include videos.
- **Read/Write Learners:** These students prefer text-based information and production. These learners emphasize reading and writing in all forms.
- **Kinesthetic Learners:** These students prefer to learn by doing. This learning style may involve visual and auditory senses, but students make sense by action, becoming involved in making a project, and relating what they learn to concrete experiences or examples.

You can help your students find their learning styles and preferences through a variety of self-assessments. One commonly used assessment is the VARK Questionnaire found at http://www.vark-learn.com/english/index.asp. However, even if you do not know the individual learning styles of your students, you can ensure a supportive learning environment by applying the principles of Universal Design for Learning (UDL).

Principles of UDL

The goal of universal design for learning (UDL) is to provide flexible instructional strategies to the classroom so that *all* students benefit. The Center for Applied Special Technology (CAST) has a commitment to provide students with disabilities access to learning curricula. Their goal is to help teachers set appropriate learning goals, choose and develop effective materials, and implement accurate and fair assessments of student progress (Rose & Meyer, 2002). This goal is applicable to all of your students. The challenge you may face is how do you ensure your students are meeting the rigorous academic standards and assessments. UDL is simply good teaching. You are engaging your students' different learning styles and using a curriculum that is flexible.

Focus Point

One way you can choose a flexible curriculum is by asking – Does it allow for multiple means of recognition, expression, and engagement? These are the **three principles of UDL.**

1. **Multiple means of recognition:** Support recognition learning by providing multiple, flexible methods of presentation. Learners need various ways of acquiring information and knowledge.
2. **Multiple strategic pathways:** Support multiple methods of expression and strategic learning. Provide students alternatives for presenting what they have learned.
3. **Multiple options for engagement:** Support affective learning by providing students with multiple options for engaging; increasing interest; offering appropriate challenges; and increasing motivation.

Recognition Networks
Recognition networks are located in the back of the brain and enable us to identify and interpret patterns, such as those in sound, light, taste, smell, and touch (Rose & Meyer, 2002). This is also the area of the brain that is responsible for voice, face, letter, word, and complex pattern recognition. Just as the name implies, recognition networks are the learning networks that are specialized to sense and assign meaning to the patterns you see, and help you to identify and understand information, ideas, and concepts. For instance, knowing subject-verb agreement is a type of recognition – it tells you "what" you are learning. Based on how you recognize patterns, you can determine what your recognition strengths are.

Strategic Networks
The strategic networks are located in the frontal lobes. Strategic networks are specialized to plan, generate and oversee our mental and motor patterns, which mean these networks enable us to define a goal, select an appropriate plan, and self-monitor (Rose & Meyer, 2002). In other words, the strategic networks are what allow us to perform every day activities, whether we are aware of it or not. For example, if you were asked to turn this page, your brain would identify the goal – to get to the next page – and design a suitable plan – pick up the corner of the paper and flip the page over. You execute the plan and correct or adjust your action. Turning the page is a routine task for most of us, so many of us do not think about each step in the overall process. But what would happen if you couldn't use your hand? You would identify a new way to get to the next page. We become more aware of our strategic networks when we are given a more challenging goal.

Affective Networks
Affective networks are primarily located in the core of the brain; however, this process is specialized to assign emotional significance to the patterns we recognize and the actions and tasks we engage with (Rose & Meyer, 2002). The most variable of the specialized networks, the affective networks are what influence how we interpret our environments. For example, a recognition network would enable you to identify a childhood toy, while an affective network would assign emotion to that object, influencing the way you interpret and react to that object.

All three of these networks interact and enable us to learn. This is why it is important to engage all three learning pathways in the classroom. Students have greater success when they are exposed to instruction that uses all of the learning networks rather than favoring one over the other.

Key Strategies of Universal Design for Learning

1. **Identify the essential course content.**
2. **Clearly express the essential content and any feedback given to the student.**
3. **Integrate natural supports for learning, such as cooperative learning, peer buddies, and guided notes.**
4. **Use a variety of instructional methods when presenting materials.**
5. **Allow multiple means of demonstrating understanding of essential course content.**
6. **Use technology to increase accessibility.**
7. **Foster open communication and trust in the classroom.**

Types of Disabilities

There are many different types of disabilities you will encounter in the classroom. As part of IDEA, the U.S. Department of Education's Office of Special Education Program (OSEP) collects information on students with disabilities. OSEP has created thirteen categories of disabilities and defines them as follows:

1. Autism

A developmental disability significantly affecting verbal and nonverbal communication and social interaction, generally evident before age three that adversely affects a child's educational performance. Other characteristics often associated with autism are engagement in repetitive activities and stereotyped movements, resistance to environmental change or change in daily routines, and unusual responses to sensory experiences.

Teaching Strategies for Students with Autism

Visual Schedule	Students with autism perform best when their environment is clear, predictable and organized. Creating and following a schedule will help students anticipate and prepare for any transitions that may occur in the classroom. Be creative and add a tangible object, something the students can relate to the class activity it represents, next to the schedule. Post the schedule in the same location and make it available for all of your students.
Visual & Auditory Stimulation	Many students with autism are oversensitive or under-sensitive to sensory input, such as sound and movement. Other sensations such as touch and visual information can also be difficult for a student to integrate. A student's IEP will suggest the best supports for an individual student, however, you can minimize sound and movement distractions by seating your student away from high noise and movement areas.
Visual Structure In the Classroom Environment	Students do best when they understand what is expected of them and can clearly see the physical layout of the classroom environment. Use symbols, signs, taped outlines on the floors, or chairs labeled with your student's name. Target your assignments so that the student knows what needs to be done, how much needs to be done, and when the student will be finished. Be sure that the student work station accommodates your student – some students with autism will work better in an open environment, while others will need three-sided workstations.
Nonverbal Communication	Use visual organizers to help with schedules and classroom layout. Also have nonverbal communication, such as a gentle pat on the shoulder, in place. Many students with autism may have difficulty with expressive communication. By having nonverbal signals, you can redirect your student without embarrassment, assist with expression, and avoid aggressive behaviors.
Other	A teacher's aide or trained support staff can work with the student daily and help your student when changes in the routine occur. A functional curriculum will help your student with his or her particular strengths and interests. Be sure to be positive and encourage your student. Speak directly to your student to help him or her with the lesson. Ask direct questions and tell your student what you want an appropriate behavior to be. Always remember to affirm your student's achievements.

2. Deaf-Blindness
Concomitant hearing and visual impairments, the combination of which causes such severe communication and other developmental and educational problems that the student cannot be accommodated in special education programs solely for children with deafness or children with blindness.

3. Developmental Delay
This term may apply to children between the ages 3-9 who experience developmental delays in one or more of the following areas: physical development, communication development, social or emotional development, or adaptive development; and who therefore need special education and related services. It is optional for states and local education agencies (LEAs) to adopt and use this term to describe any child within its jurisdiction.

4. Emotional Disturbance
A condition exhibiting one or more of the following characteristics over a long period of time and to a marked degree that adversely affects a child's educational performance:

1. An inability to learn that cannot be explained by intellectual, sensory, or health factors.
2. An inability to build or maintain satisfactory interpersonal relationships with peers and teachers.
3. Inappropriate types of behavior or feelings under normal circumstances.
4. A general pervasive mood of unhappiness or depression.
5. A tendency to develop physical symptoms or fears associated with personal or school problems.

The term includes schizophrenia. The term does not apply to children who are socially maladjusted, unless it is determined that they have an emotional disturbance.

Teaching Strategies for Students with Emotional Disturbance (ED)

Positive Support	Create a supportive environment for your student. Be sure to respect that student's autonomy and welcome the student's requests for accommodations. Many students fear the stigma that surrounds mental health issues. Help that student maintain a network of supportive friends. Maintain open communication with your student.
Assessment Accommodation	Assist students when they request extended time. Communicate openly with your student so the two of you can arrange for make-up work. Many students with ED will miss school and will need this accommodation.
Advanced Organizers	Clearly defined learning objectives and course outlines help your student understand what are the upcoming assignments and assessments. It will also aid in organization.

5. Hearing Impairments
An impairment in hearing, whether permanent or fluctuating, that adversely affects a child's educational performance, but that is not included under the definition of deafness in this section. Although children and youth with deafness are not included in the definition of hearing impairment, they are counted in the hearing impairment category.

Teaching Strategies for Hearing Impairments

Preferential Seating	Offer the student seating near the front of the classroom so she/he can clearly see you, the board, and the interpreter. Encourage your student to tell you which is the best arrangement for him/her during group work and class discussion.
Effective Communication	Face the class when speaking. Repeat or rephrase questions and comments from the class. Try to avoid talking with your back to the class, especially when writing on the board. Make sure the student knows who is speaking during class discussion. Having students face one another will help a student with hearing impairment see the speaker's face.
Captioning	Always use captioning for films and video. Any video made after 1980 should be captioned. If captioning is not available, then provide the text. Providing written presentations is also helpful. With real-time captioning, your student needs to sit in a location that allows him/her to clearly see the screen. Speak clearly and slow your speaking pace so the captioning can be accurate.
Interpreter	Speak directly to the student. The interpreter is there to help facilitate communication, and may ask you to clarify, but it is the student you are communicating with.
Access to Class Notes & Discussion	Always write announcements, assignments, and important instruction on the board. Arrange for written instead of oral exams. Your student may have difficulty taking good notes while watching the interpreter and captioning; assist your student in getting class notes. Try to provide an outline or summary of your instruction.

6. Visual Impairments

An impairment in vision that, even with correction, adversely affects a child's educational performance. The term includes both partial sight and blindness.

Teaching Strategies for Visual Impairments

Classroom Orientation & Preferential Seating	Allow your student time to explore the physical layout of the classroom and the school. Avoid obstacles, such as book-bags in the pathways, low hanging objects, or furniture. Make sure your student has time to familiarize her or himself with any equipment before using it. If requested, provide your student seating that allows him/her to hear better. Repeat instructions, date changes, and directions.
Alternative Print Formats	A vision specialist or your district's special educator can help you prepare course materials, such as reading assignments, syllabi, outlines, into alternative formats. Give yourself three to five weeks – converting to Braille, enlarged print, audiotapes, or image enhanced materials takes time. Make sure that all course materials have a clear contrast between type and paper, and are visually distinguishable. Your student may need assistive technology, such as a reader or Braille stylus.
Other Accommodations	Make sure the lighting in the room is good. Talk to your student to find which accommodations work best for him or her. Write large

on the board and with chalk that stands out. Allow students to hold printed material close to the face and to use magnifying aids. Use descriptive language and encourage your students to say their name when they raise their hand or begin to speak.

7. Mental Retardation
Significantly subaverage general intellectual functioning, existing concurrently with deficits in adaptive behavior and manifested during the developmental period, that adversely affects a child's educational performance.

8. Multiple Disabilities
Concomitant impairments (such as mental retardation-blindness, mental retardation-orthopedic impairment, etc.), the combination of which causes such severe educational needs that they cannot be accommodated in special education programs solely for one of the impairments. The term does not include deaf-blindness.

9. Orthopedic Impairments
A severe orthopedic impairment that adversely affects a child's educational performance. The term includes impairments caused by congenital anomaly (e.g., clubfoot, absence of some member, etc.), impairments caused by disease (e.g., poliomyelitis, bone tuberculosis, etc.), and impairments from other causes (e.g., cerebral palsy, amputations, and fractures, or burns that cause contractures).

Teaching Strategies for Orthopedic Impairments

Accessible Environment	Avoid congested classroom areas and obstacles. Make sure your student is able to easily navigate around the classroom. When leaving the classroom environment, for example on field trips, ensure that accommodations are arranged so the trip is barrier-free.
Support & Respect	Your student may not have control over certain body parts or functions. Show compassion for your student and teach classmates to ignore these behaviors. Your student may have an aide to assist with note taking, mobility, and lab work. Also, recognize that your student may have difficulty moving from one location to the next; always show patience and encourage your other students to do the same.
Accommodations	Students may need access to class notes and may prefer to record discussion and lectures. Other accommodations, such as extended time, note-takers, and voice recognition software may also be necessary.

10. Other Health Impairments
Having limited strength, vitality, or alertness, including a heightened alertness to environmental stimuli, that results in limited alertness with respect to the educational environment, that

- is due to chronic or acute health problems such as asthma, attention deficit disorder or attention deficit hyperactivity disorder, diabetes, epilepsy, a heart condition, hemophilia, lead poisoning, leukemia, nephritis, rheumatic fever, and sickle cell anemia; and

- adversely affects a child's educational performance.

11. Learning Disabilities

A permanent disorder that interferes with integrating, acquiring, and/or demonstrating verbal or nonverbal abilities and skills. Frequently, there are some processing or memory deficits. Individuals may have difficulty with reading, spelling, written expression, mathematics, problem-solving, listening and oral expression. The disorder is often inconsistent, and each individual has his/her unique set of characteristics.

Teaching Strategies for Learning Disabilities (LD)

Each LD is Unique	There are many different types of learning disabilities, and each student will have his/her own needs. Communicate openly with your student to determine which supports work best for her or him.
Alternative Formats	Your student may need to have print materials converted to a different format. You can consult with your district's special education teacher to find out how to have the materials converted. Allow yourself three to five weeks before the student needs the materials – converting takes time.
Structure of Lessons & Discussion	Your students will benefit from having a clear understanding of course expectations, due dates, and goals. Provide your student with study guides, review sheets, opportunities for questions and answers, and outlines. Provide information in oral and written formats, and provide summaries of important concepts on long reading assignments. Your student may also benefit from peer teams and assistive technology.
Visual Organizers	Use of color, outlines, pictures, and word walls can help your student organize information and learn content. Organizers and structure will also help your student understand his/her own progress.

12. Speech or Language Impairments

A communication disorder, such as stuttering, impaired articulation, a language impairment, or a voice impairment, that adversely affects a child's educational performance.

13. Traumatic Brain Injury

An acquired injury to the brain caused by an external physical force, resulting in total or partial functional disability or psychosocial impairment, or both, that adversely affects a child's educational performance. The term applies to open or closed head injuries resulting in impairments in one or more areas, such as cognition; language; memory; attention; reasoning; abstract thinking; judgment; problem solving; sensory; perceptual, and motor abilities; psychosocial behavior; physical functions; information processing; and speech. The term does not apply to brain injuries that are congenital or degenerative, or to brain injuries induced by birth trauma.

Summary

Your classroom is host to a diverse learning body. By communicating with your students openly and often, and using available resources, such as your special educator, IEP teams, and parents, you can find the best supports for individual students. However, incorporating the principles of universal design for learning – multiple means of recognition, expression, and assessment – will help *all* learners. The *Project Discovery* programs provide a flexible curricula that you can adapt to your specific students' needs.

IV. Strategies for Implementing Project Discovery

This section will present an overview of how to align your academic standards with the specific learning objectives of *Project Discovery*, discuss the variety of classrooms and lab settings that *Project Discovery* kits have been implemented, and finally, provide examples of how to modify the curricula to meet the special learning needs of students.

Aligning the Academic Standards with Project Discovery Learning Objectives

With the national focus on high-stakes testing in English language arts, math and science, teachers must use every classroom opportunity to teach and reinforce the basic reading, writing and math skills that students need to become proficient in these critical academic content areas. Research indicates that students learn best if they see the relevance of the skills they are learning. Many teachers and students report that the *Project Discovery* program provides the motivation for students to learn complex reading, writing, math and science skills because it is relevant to their personal career goals.

Project Discovery provides multiple pathways for teachers to meet the academic standards using an experiential approach to academic instruction. The chart below demonstrates how one state's academic standards align to the "Let's Discover Nature's Resources" curriculum.

Grade Level	Curriculum Integration	Activity	Grade Level/ Standard Alignment
Intermediate	**Science**	**Follow instructions to plant and grow seeds; transplant seedlings after true leaves appear.**	**Students will design and conduct different kinds of simple scientific investigations (Scientific Inquiry 2.1)**
	Language Arts Science	**Make a chart of greenhouse worker's job and compare and contrast to farmers.**	**Students will question scientific investigations and explanations of other science (Conceptual Understanding 2.2-2.6)**
	Math	**Keep a daily log and chart and measure plants as they grow.**	**Students will communicate designs, procedures, and results of scientific investigations (Scientific Inquiry 2.1)**
	Art Science Math	**Construct a greenhouse using plastic and cardboard boxes.**	**Students will design and conduct different kinds of simple scientific investigations (Scientific Inquiry 2.1)**
	Technology	**Use media center and Internet for further research activities.**	**Students will explore and use technology to access ideas and information for authentic tasks (Technology as Communication 1.16)**

Classroom Settings

Project Discovery kits can be implemented in numerous classroom and lab settings to meet a variety of purposes. Teachers have used these curricula in integrated block schedules where English and social studies teachers co-teach both social studies and English content. Also, these curricula have been used in alternative settings and special education classrooms. Some buildings rotate the kits through different classrooms where others have students rotate to one location where several kits are set up as individualized or small group student work stations. Some of the most common implementation strategies are described below.

1. **Pre-Vocational Exploration Lab.** Some buildings have set aside a classroom that serves as the pre-vocational exploration lab. All kits are set up and students progress through the kits based on scheduling patterns, as determined by the teachers. A complete career exploration approach is implemented so numerous different classes can be scheduled throughout the lab each day.

2. **Integration of Academic and Vocational Education.** In this scenario, students needing academic skills instruction would use those kits which have a high level of that academic skill integrated into the kit's activities. For example, students needing math remediation would receive appropriate instruction on how math skills are used in an occupational area of high interest. The student then sees the relevance of the math skills that he/she will need to be successful in a high interest occupational area.

3. **Alternative Classrooms.** School districts are creating alternative classrooms for students who need a more personalized learning environment than the traditional high school

provides. In this scenario, the *Project Discovery* kits would be available for students to use on an individual basis as they complete assignments, or in small groups of students working together on specific activities.

4. **Special Education Classrooms.** Although including students with disabilities is highly recommended, some IEP teams recommend that specific students be placed in a separate classroom for a part of his or her school day. The *Project Discovery* kits assist these students to see the relevance of academic content areas because they have an experiential approach to completing activities that real workers complete as a part of their job.

The *First Look Book* component of each kit provides key vocabulary terms and concepts on a lower reading level and acts as a guide to making content more accessible. The *First Look Book* component contains a book, CD or Powerpoint and can be implemented in any classroom setting.

As you can see, *Project Discovery* is a very flexible program easily adapted to today's busy class schedule. More importantly, these kits can be used to teach a more diverse student population that is entering public schools today. Finally, the Project Discovery program teaches essential academic and work skills needed to be successful in today's society.

Instructional Strategies

Teachers have been customizing and adapting curricula for centuries, and we want to encourage you to continue to meet the diverse needs of your students. *Project Discovery* programs provide instructional implementation strategies to assist teachers in implementing the kits with *all* students.

Some common strategies that can be used to increase the success of your students can range from posting dynamic charts on the walls to using peer tutoring to assisting students in learning and reviewing essential vocabulary terms. Short descriptions of a variety of these instructional strategies follow.

1. **Dynamic Charts:** Convert essential content, such as curricula objectives, skills, rules, techniques to learn, into a classroom chart. The classroom chart can be individualized to students' learning needs, to particular lessons, or can be presented to the entire classroom. The chart can also be used to provide the steps needed to complete a task and gain a skill, such as a visual outline of the lesson they are working on with specific images indicating each step. Incorporate color into the chart, and encourage your students to become a part of the process. Perhaps one student or a student team presents the goal for the day, and another summarizes what they learned at the end of the lesson and marks off a slot on the chart.

2. **Reading Comprehension Strategies:** Research has demonstrated that if teachers teach specific reading strategies for 15 minutes each week, they can significantly increase student achievement. For many of our students who are not reading at grade level, they need direct instruction in reading. As you assign reading activities related to the *Project Discovery* kits, try the following strategies:

    - Develop a KWLS Worksheet that has the following four questions:
      1. What do you **KNOW** about the (fill in the objective of the day)?

2. What do you **WANT** to know about the (fill in the objective___)?
3. What did you **LEARN**?
4. What do you **STILL** want to know?

Have students complete and discuss questions 1 and 2 prior to the activity. Assign questions 3 and 4 as extra credit assignments and/or discuss with the class. Use the KWLS strategy to motivate students to read to find information and connect what they are learning to what they already know and want to learn in the future. Encourage your students to make you aware of question number 4 and to develop learning goals for themselves.

"***Teaching key reading comprehension strategies for only 15 minutes a week can significantly increase student achievement***." Jim Miles, 6/27/05

3. **Vocabulary Flash Cards:** If important vocabulary applies to a specific activity, provide this vocabulary before you begin the lesson. You will help your students remember key vocabulary if they can put the word into a contextual setting. This can be done by matching vocabulary terms up to images, reinforcing when you are using key vocabulary, or by creating games with the vocabulary, like Bingo or word-searches.

   Give students index cards to make their vocabulary cards. The word can be pre-typed or students can write the term themselves. One side shows the term, while the other has the definition. Encourage students to use images, colors, or provide the vocabulary term in a contextual sentence. Vocabulary flash cards can be color coded into sections of the curricula. This may help the students organize the terms into the appropriate learning sequences. The students should define the words themselves and be able to put the terms into context. Give students 5 – 10 minutes to practice with a peer buddy prior to starting an activity or giving a test.

   Project Discovery kits provide key vocabulary terms and concepts through the use of the *First Look Book* component.

4. **Worksheet with Student-Generated Examples:** Create a worksheet for students that provide the concept they will be learning or the lesson objective. As a peer team, individually, or with teacher guidance, have students outline the specific materials, procedures, or strategies the student will need to successfully complete for that lesson. You can customize this to your needs. The goal is to make an abstract concept more concrete. See the example that follows:

Example – Lesson 1: Attitudes for Workplace Success
(from Horticulture/Greenhouse Kit)

Name: Sabrina Torres	Lesson: 1 Attitudes for Workplace Success	Project Discovery Kit: Horticulture/Greenhouse
Today's Goal:	Demonstrate Effective Social Skills	Students will learn important skills and attitudes necessary for job success.
What that means to me:	I will learn the best way to work with others.	Complete "Attitudes for Workplace Success" handout.
	I need to be polite, friendly, and listen to the people I work with.	
What I need:	"Attitudes for Workplace Success" hand-out	
	Folder	
What I discovered:	I am interested in doing a good job most of the time.	
	I don't like trying new tasks unless I think I can do it.	
Goals for Next time:	Work better in a group.	

5. **Guided Notes:** Extensive content that requires absorbing many different facts should be made into guided notes. The guided notes will provide a study guide to the content. Students use the guided notes as a way to outline the content and recognize essential material. Guided notes can also be used to keep students on task in the classroom, as it requires students to interact with the content**.** The guided notes should prompt students by asking questions or requiring them to fill-in information that they can only answer by interacting with the content. For example:

   Activity 1: Testing Seed for Germination
   1. _____ means to start to grow.
   2. What are the three things you need for the germination test?

   In order to find the answer, a student needs to read the content. These types of outlines prevent scanning and work as great review guides.

6. **Sub-Divide Long Lessons:** Long lessons should be broken down into stream-lined lessons that emphasize the core skills/concepts needed for that lesson. Inform students that the sub-divisions are a part of a single lesson. Review the key concept or skill of the individual lesson at the start. Before advancing to the next lesson, provide an overview of what the following lesson requires and how it combines with the previous lesson. Begin the subsequent lesson with a quick review of previous content learned. Long lessons can be sub-divided by skill, knowledge area, or learning context.

7. **Comparison Charts:** Provide students with a comparison chart when learning two different techniques or skills. The comparison can be done between a skill that the student has already established, and one that the student needs to accomplish. Also ask students to

reflect on the comparisons they have recorded and apply what they have learned. For instance, if students are learning the different types of greenhouse pests, provide each student with his/her own pair of greenhouse pests to compare. The students can create a presentation from their comparison chart and share what they have learned with the rest of the class. In addition to physical differences, students can look at techniques used to identify and prevent these greenhouse pests.

8. **Decrease and/or Simplify Student Steps:** For lessons that involve multiple steps that are dependent on one another, decrease the amount of student steps. This may be done by eliminating "extra" information. Simplifying the lessons can also be done by having certain student tasks done by the teacher. For example, in "Setting Up a Hydroponics Experiment Station" students are required to make up the various nutrient solutions. Instead, you can make these solutions in front of the class (or pre-class) and explain to the students what you are doing. Ask for student "assistants" and allow them to help you perform the task. The students can perform the rest of the lesson in which they use the nutrient solutions with their plants.

9. **Use Peer Buddy Groups:** As the teacher, demonstrate the lesson with student "helpers". You may set-up a single station or several work stations, and then work with the students to accomplish the specified lesson. In this way, the students are learning and becoming involved in the lesson, but you, the teacher, are part of their "team".

10. **Monitor Student Skills with Checklists:** Have the students or class form a list of the skills they are gaining from the lessons. This can be done as individualized student checklists. Be as specific as possible. Have the students create their own personalized "summary" of what they excel at. This will also act as an advanced organizer – your students can see what they have accomplished and what they still need to do.

    The *Project Discovery* Work Performance Benchmarks in each kit provide such a checklist for both teacher and student.

11. **Structure Space and Time:** Use the space in the classroom as a way to organize what the students are learning. One bulletin board may represent the academic goals and what the students are learning, while another can represent the occupational skills. Post daily assignments, schedules, and procedures and be sure to maintain schedules. The more structure your students have, the better prepared they are to transition between tasks and to understand their roles.

12. **Flexible Assessments:** If your student is having difficulty performing a specific task in the *Project Discovery* kit, ask whether it is possible to have that student show their knowledge in a different way? Can your student present what he or she learned to the class or on a poster? Perhaps your student can write an essay or make a PowerPoint presentation using images from the kit. Be creative – you may find that your students are able to show what they learned through role playing, acting, art, or performance.

13. **Positive Feedback:** Always encourage your students, even if they have made a mistake. Use their errors as a chance for instruction. Reinforce the lesson and tell them why their mistake was wrong, and what you expect. Students may need a second or third chance. Applying what they have learned or are doing to a real-life setting always helps. Students

also need to recognize their strengths. Tell your students what they are doing correctly, and help them to know what they need to improve.

Summary

Teachers have power. You can expect your students to achieve – and they will. You can structure the classroom environment for success by supporting your students with the tools and strategies they need to give you their best. The suggestions in this guide, as well as the practices you and your colleagues have learned over time can be integrated into your classrooms to assist students in giving you their best. Students want to be successful, and you have the power to structure the learning environment so students can be successful. The power of teachers is summarized best by the quote from Haim Ginott, as quoted by Jim Miles, a business education teacher:

> ***"I have come to a frightening conclusion. I am the decisive element in the classroom. It is my personal approach that creates the climate. It is my daily mood that makes the weather. As a teacher, I possess tremendous power to make a child's life miserable or joyous. I can be a tool of torture or an instrument of inspiration. I can humiliate or humor, hurt or heal. In all situations, it is my response that decides whether a crisis will be escalated or de-escalated, and a child humanized or de-humanized."***
>
> **Haim Ginott, 6/27/05**
>
> **Presented by Jim Miles, Model School Conference, 6/27/05**

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Glossary

Accommodation- A change in how an academic requirement (e.g.; assignment, assessment, etc.) is presented or how the student demonstrates competency, which may include changes in the presentation format, response format, setting, timing, or scheduling. This term generally refers to changes that do not significantly alter the requirement. It results from a student need; it is not intended to give the student an unfair advantage.

Alternate Format Materials- The production of print materials in a format that enables a person with a disability to read the materials using adaptive skills or technologies. Alternate format materials may include large print, audiotapes, electronic text, and Braille.

Americans with Disabilities Act (ADA) - Civil rights legislation signed by President George Bush on July 26, 1990. Prohibits discrimination against individuals with disabilities in the areas of employment, state and local government, public accommodations and services, transportation, and telecommunications.

Assistive Technology- a broad range of devices designed to increase, maintain, or improve the functional capabilities of a student with a disability. Assistive technology may include equipment or product systems. It allows persons with disabilities the same access to information and production as their peers.

Attention Deficit Hyperactivity Disorder (ADHD)- A neurobiological disorder that interferes with a person's ability to sustain attention or focus on a task and to control impulsive behavior. If the inability to sustain or focus attention occurs without hyperactivity, the condition is referred to Attention Deficit Disorder (ADD).

Auditory Aids- Equipment or software items designed or used to compensate for a person's total inability to hear or limited ability to hear. The auditory aid(s) used depends upon usable residual hearing and preference. Auditory aids allow students with hearing disabilities the same access to information and production as their peers.

Autism- A developmental disability significantly affecting verbal and nonverbal communication and social interaction, generally evident before age 3, that adversely affects a child's educational performance. Other characteristics often associated with autism are engagement in repetitive activities and stereotyped movements, resistance to environmental change or change in daily routines, and unusual responses to sensory experiences.

Auxiliary Aids- Equipment or services designed to compensate for functional limitations related to disability and that allow equal access to course content. Examples include but are not limited to: services such as interpreters or note takers, adaptive technologies such as voice input or voice output computer software, alternative media such as Braille texts or video captioning, adapted work stations such as a lower lab table for wheelchairs with modified equipment for participation in lab experiments, etc.

Chronic Fatigue Syndrome (CFS)- a mysterious and puzzling disorder that causes severe and prolonged tiredness and fatigue. The exact cause is not known, but symptoms may include: headache, fever, fatigue, muscle weakness, body and muscle aches, swollen or tender lymph nodes, difficulty concentrating, sleep disturbances, depression, and anxiety. Its symptoms can resemble fibromyalgia.

Cognitive Disabilities- a generic term that refers to a heterogeneous group of disorders characterized by significant difficulties in the acquisition and use of listening, speaking, reading, writing, reasoning, or mathematical abilities, or of social skills. These disorders are presumed to be due to central nervous system dysfunction. A cognitive disability may occur concomitantly with other disabling conditions (e.g., sensory impairment, mental retardation, social and emotion disturbance), with socio-environmental influences (e.g., cultural differences, insufficient or inappropriate instruction, psychogenic factors), and especially with attention deficit disorder, all of which may cause learning problems.

Deaf-blindness- Concomitant hearing and visual impairments, the combination of which causes such severe communication and other developmental and educational problems that the student cannot be accommodated in special education programs solely for children with deafness or children with blindness.

Deaf/Hard of Hearing: Conditions characterized by total inability to hear or by limited ability to hear. Those individuals who are deaf or hard of hearing vary considerably and, depending upon usable residual hearing and preference, may use different types of auxiliary aids and accommodations. Some speak; others use very little or no oral communication.

Developmental Delay- This term may apply to children between the ages 3-9 who experience developmental delays in one or more of the following areas: physical development, communication development, social or emotional development, or adaptive development; and who therefore need special education and related services. It is optional for states and local education agencies (LEAs) to adopt and use this term to describe any child within its jurisdiction.

Disability- As defined by the Americans with Disabilities Act (ADA): "(A) a physical or mental impairment that substantially limits one or more major life activities of an individual; (B) a record of such an impairment; or (C) being regarded as having such an impairment." 42 U.S.C. §12102.

Distraction-reduced Space- A controlled setting in which a student with a disability may take exams without distractions from the environment. It is an accommodation commonly used for individuals who have difficulties concentrating, such as those with ADHD.

Documentation- Comprehensive written validation of a person's disability and the functional limitations of the disability provided by an appropriate professional qualified to make a specific type of diagnosis. This documentation must be given to service providers before appropriate services, accommodations and auxiliary aids can be approved.

Dyslexic- Dyslexia is a specific learning disability that is neurobiological in origin. It is characterized by difficulties with accurate and/or fluent word recognition and by poor spelling and decoding abilities. These difficulties typically result from a deficit in the phonological component of language that is often unexpected in relation to other cognitive abilities. These difficulties typically result from a deficit in the phonological component of language that is often unexpected in relation to other cognitive abilities and the provision of effective classroom instruction. Secondary consequences may include problems in reading comprehension and reduced reading experience that can impede growth of vocabulary and background knowledge.

Emotional Disturbance- A condition exhibiting one or more of the following characteristics over a long period of time and to a marked degree that adversely affects a child's educational performance:

1. An inability to learn that cannot be explained by intellectual, sensory, or health factors.

2. An inability to build or maintain satisfactory interpersonal relationships with peers and teachers.

3. Inappropriate types of behavior or feelings under normal circumstances.

4. A general pervasive mood of unhappiness or depression.

5. A tendency to develop physical symptoms or fears associated with personal or school problems.

The term includes schizophrenia. The term does not apply to children who are socially maladjusted, unless it is determined that they have an emotional disturbance.

Exam Accommodations- Legally mandated services that allow students with disabilities to exhibit their knowledge on exams by using auxiliary aids which include but are not limited to: extra time, a reader/scribe, computers, large print, CCTV, distraction reduced environment, etc.

Fibromyalgia- A condition characterized by aching and pain in muscles, tendons, and joints all over the body, especially along the spine. The exact cause is not known. The condition is not associated with muscle, nerve, or joint injury; any serious bodily damage or disease; or inadequate muscle repair. Other symptoms often associated with the pain include: sleep disturbances, depression, daytime fatigue, feelings of weakness, headaches, alternating diarrhea and constipation, numbness and tingling in the hands and feet, feelings of weakness, memory difficulties, and dizziness. Its symptoms resemble those of Chronic Fatigue Syndrome (CFS).

Flexible Schedule- Because of architectural barriers or use of adaptive transportation, some students may arrive late to class or need to leave early. Also, some students may miss class due to a chronic disability or treatment. It is essential not to penalize a student for his/her disability and at the same time maintain the integrity of the requirements of the class. Examples are, but not limited to: make-up tests and extended time for assignments.

Functional Limitations- Restrictions resulting from a disability which prevents an individual (without accommodations or auxiliary aids) from participating in major life activities including but not limited to walking, seeing, hearing, learning, etc.

Guided Notes- Skeleton outlines that contain the main idea and related concepts of lecture with designated spaces for students to complete during lecture. Guided notes use a consistent format and provide maximum student response.

Hearing Impairments- An impairment in hearing, whether permanent or fluctuating, that adversely affects a child's educational performance, but that is not included under the definition of deafness in this section.

Although children and youth with deafness are not included in the definition of hearing impairment, they are counted in the hearing impairment category.

Homebound/hospital- includes children who are served in either a home or hospital setting including those receiving special education and related services in the home and provided by a professional or paraprofessional who visits the home on a regular basis or schedule.

Lab Adaptations or Assistants- Accommodations consisting of the use of specialized equipment (such as assistive/adaptive technology) and/or the assistance of a lab attendant to assist with the completion of tasks in a laboratory setting.

Learning Disability- A permanent disorder that interferes with integrating, acquiring, and/or demonstrating verbal or nonverbal abilities and skills. Frequently, there are some processing or memory deficits. Individuals may have difficulty with reading, spelling, written expression, mathematics, problem-solving, listening and oral expression. The disorder is often inconsistent, and each individual has his/her unique set of characteristics.

Medical Disability- These disabilities are varied, and the accommodations provided to students with a medical disability are dependent upon the unique characteristic of the disability. Individuals with medical disabilities may exhibit several functional limitations. Some types of conditions that may fall under this category are multiple sclerosis, diabetes, seizure disorder, chronic fatigue, multiple chemical sensitivity, muscular dystrophy etc.

Mental Retardation- Significantly sub-average general intellectual functioning, existing concurrently with deficits in adaptive behavior and manifested during the developmental period, that adversely affects a child's educational performance.

Mobility Impairment- A disability that limits an individual's ability to move; walk independently without the aid of a wheelchair, walker or some type of assistive device; or walk long distances due to situations such as limited energy or chronic pain.

Multi-modality Instruction (see also Varied Instructional Strategies)- Providing important information and assignments in both oral and visual formats to help promote accessibility to course content. An example is: creating project and exam choices that can be completed in written or oral form.

Multiple Disabilities- Concomitant impairments (such as mental retardation-blindness, mental retardation-orthopedic impairment, etc.), the combination of which causes such severe educational needs that they cannot be accommodated in special education programs solely for one of the impairments. The term does not include deaf-blindness.

Note Taker- A person provided as an accommodation to assist in taking class notes. This accommodation is generally used for persons who are unable to write due to their disability, such as students with a learning disability in written expression, students who are blind, or students with upper body limitations.

Orthopedic Impairments- A severe orthopedic impairment that adversely affects a child's educational performance. The term includes impairments caused by congenital anomaly (e.g., clubfoot, absence of some member, etc.), impairments caused by disease (e.g., poliomyelitis,

bone tuberculosis, etc.), and impairments from other causes (e.g., cerebral palsy, amputations, and fractures, or burns that cause contractures).

Other Health Impairments- Having limited strength, vitality, or alertness, including a heightened alertness to environmental stimuli, that results in limited alertness with respect to the educational environment, that

- is due to chronic or acute health problems such as asthma, attention deficit disorder or attention deficit hyperactivity disorder, diabetes, epilepsy, a heart condition, hemophilia, lead poisoning, leukemia, nephritis, rheumatic fever, and sickle cell anemia; and
- adversely affects a child's educational performance.

Peer Mentoring- Providing students with a peer they can trust, respect, and learn from who is knowledgeable, and interested.

Psychiatric Disability- A disability that involves some type of diagnosed emotional illness. Individuals who have this disability may exhibit inappropriate types of behaviors or feelings under normal circumstances, have a pervasive mood of unhappiness or depression, or develop uncontrollable fears associated with personal or school problems as well as a multitude of other characteristics. These characteristics are generally beyond the individual's control but may be helped with treatment.

Reader- This is an exam accommodation that some students with a learning disability in reading, students who are blind, or students with upper body limitations may use. A reader reads print material verbatim to the student with a disability. A reader never interprets nor augments what is in print.

Real Time Captioning- An auxiliary aid for students with hearing impairments that allows them instant access to lectures. The lecture content is typed verbatim by a trained professional as the lecture occurs. Students view the lecture on a monitor.

Reasonable Accommodations- An adjustment made to assist a student that allows equal participation in a public service, program, and/or employment opportunity. In the educational setting, reasonable accommodations may involve modifications or adjustments that provide equal access to programs, services, and activities of the institution, including classroom access, internships and field experiences, housing facilities, and recreational programs. Access may be achieved through the provision of auxiliary aids, assistive technologies, and modification of instructional and examination practices. Reasonable accommodations do not include lowering of academic standards, alternation of the fundamental nature of programs, personal services, or accommodations that result in undue financial or administrative burden.

Regular Classroom- includes children who receive special education services in programs designed primarily for non-disabled children.

Residential Facility (public and private)- includes children who are served in publicly or privately operated programs in which children receive *special education* or *related services* for greater than 50 percent of the school day.

Scanner- A scanner captures an image of any flat material and converts it to computer data. Typical items to scan include Text (pages from a book, etc.) photos, maps, film negatives, slides, business forms, or any other graphic or text material desired to be preserved in digital form. Flatbed scanners have a flat glass plate; photos or documents to be scanned are placed against the plate.

Screen Reader- A text-to-speech system, intended for use by blind or low-vision users, that speaks the text content of a computer display.

Scribe- A person provided as an accommodation to assist in transferring verbally expressed communication to a written form. This accommodation is generally used for persons who are unable to write due to their disability, such as students with a learning disability in written expression, students who are blind, or students with upper body limitations. A scribe takes pure dictation from a student with a disability and never edits the material. The student is responsible for proofing the work to ensure the scribe has been accurate.

Seating Arrangements- An accommodation in which a person with a disability is given preferential seating to access course content (such as sitting near the instructor in order to see the chalkboard or read his/her lips) or seating that reduces classroom distractions and/or that allows minimal class disruption (such as sitting in the back of the class or near an exit) in order to maximize the learning environment. Since students with disabilities may want the same anonymity as other students, it is important that instructors not point out the student or the alternative arrangements to others in the class.

Section 504 of the Rehabilitation Act of 1973- The first law to specifically address the needs of students with disabilities. It is a civil rights statute intended to prevent discrimination on the basis of disability. Section 504 requires that educational agencies provide students with disabilities the same opportunities as non-disabled students.

Section 508 of the Rehabilitation Act of 1973- This 1998 addition to The Rehabilitation Act expands responsibility for providing access to electronic and information technology. It is sometimes described as "electronic curb cuts."

Seizure Disorder- Epilepsy or recurrent seizures. **Seizures-** A seizure is an electrical misfiring in the brain. Seizures can range in severity from virtually unnoticed to episodes with convulsions or loss of consciousness. Seizures usually come on vary suddenly and can vary in duration. A seizure may occur only once or it may occur repeatedly.

Self-advocacy- The ability to assertively state wants, needs and rights, determine and pursue needed supports, and conduct one's affairs.

Self-determination- A combination of skills, knowledge and beliefs that enables a person to engage in goal-directed self-regulated behavior.

Separate Facility (public and private)- includes children and youth who receive special education services for greater than 50 percent of the school day in a facility that does not house programs for students without disabilities.

Service Dogs- Animals that are professionally trained to assist persons with visual or physical impairments in daily functions and activities. Service dogs are working animals and must be

allowed in all classes. They are not to be petted or fed by others but rather should be treated as professional attendants.

Sign Language Interpreter/Interpreting Services- An auxiliary aid provided to individuals who are deaf or hard of hearing. The sign language interpreter is a trained professional who facilitates communication and conveys all auditory and signed information so that both hearing and hearing impaired individuals may fully interact.

Specific Learning Disability- A disorder in one or more of the basic psychological processes involved in understanding or in using language, spoken or written, that may manifest itself in an imperfect ability to listen, think, speak, read, write, spell, or to do mathematical calculations, including conditions such as perceptual disabilities, brain injury, minimal brain dysfunction, dyslexia and developmental aphasia. The term does not include learning problems that are primarily the result of visual, hearing, or motor disabilities, of mental retardation, of emotional disturbance, or of environmental, cultural, or economic disadvantage.

Speech or Language Impairments- A communication disorder, such as stuttering, impaired articulation, a language impairment, or a voice impairment, that adversely affects a child's educational performance.

Text-to-speech- The automatic conversion of written text words from a computer document (e.g. word processor document, web page) into audible speech spoken either by a synthetic (computer-generated) or digitized (recorded) human voice.

Traumatic Brain Injury- an acquired injury to the brain caused by an external physical force, resulting in total or partial functional disability or psychosocial impairment, or both, that adversely affects a child's educational performance. The term applies to open or closed head injuries resulting in impairments in one or more areas, such as cognition; language; memory; attention; reasoning; abstract thinking; judgment; problem solving; sensory; perceptual, and motor abilities; psychosocial behavior; physical functions; information processing; and speech. The term does not apply to brain injuries that are congenital or degenerative, or to brain injuries induced by birth trauma.

TTY- TTY stands for Text Teletype, which is a telephone system used by individuals who are deaf, hard of hearing, or speech disabled. Instead of speaking into a phone, the persons communicating type messages into a device (TTY). The other person on the line instantly is able to see the printed message and types a message back. Each state has a relay system that can help to facilitate phone and TTY conversations for people who are deaf, hard of hearing, or speech disabled. The relay service allows a TTY user to call someone who does not have a TTY (or vice versa) as well. It is a free service.

Universal Design for Learning (UDL) - UDL is a term that extends the concept of universal design to the field of education. It denotes the process of creating general education curricula (including the standards, materials, methods, and assessments of which they are comprised) that are conceived, designed, developed and validated to achieve results for the widest spectrum of students, including those with disabilities, without the need for subsequent adaptation or specialized design. Universal Design for Learning provides curricular flexibility (in activities, in the ways that information is presented, in the ways that students respond or demonstrate knowledge, and in the ways in which students are engaged) to provide appropriate support and challenge for a typically diverse spectrum of learners.

Visual Aids- Equipment or software items designed or used to compensate for a person's total lack of sight or limited sight. The visual aid(s) used by a student depends upon usable residual vision and preference. Visual aids allow students with visual disabilities the same access to information and production as their peers.

Visual Impairments- An impairment in vision that, even with correction, adversely affects a child's educational performance. The term includes both partial sight and blindness.

Web Accessibility- Making web pages more usable, regardless of disability or method of access; making web pages compatible with common assistive technologies.