BIG SUR ROUNDUP - MARCH 2019 ARTICLE
By David Allan

During the stormy winter months, Highway 1 becomes subject to road closures, and at Pacific Valley School, we work extra hard at the task of providing our high standards of education to the local children within the Big Sur Unified School District despite the conditions. We must devise ways to "take the classroom to them". Through effort and ingenuity, our teachers have developed all sorts of creative skills at delivering quality education across the divides of broken roads and fallen boulders. When threat of storm dangers are anticipated, they spend many extra hours preparing portable learning packets, to send home for the time of need, containing all the necessary resource materials, instructions, fact sheets, pictures, diagrams, and maps. The assignments must be comprehensively designed to guide the student through hands-on activities that meet the learning objectives. Over the many years of experience, our staff has become expert at providing high level of education during even the most horrific weather conditions! Proof can be seen in just viewing all the awards on the walls of the school offices, and knowing about our graduated students who have gone on to top level-colleges. Pacific Valley School delivers!

Now may be a good opportunity to tell of just what it takes to deliver that quality of education for which we are known. Seemingly complex systems with names and acronyms like "Common Core Standards", "STEM Curriculum", and "Bloom's Taxonomy" may befuddle one who is not a professional educator, so here are simplified explanations about them.

In the news, one may have heard a lot about the educational acronym "STEM". It stands for the trend to bring the separate classroom subjects like Science, Technology, Engineering, and Math together in collaboration with each other. In life itself, we combine our abilities to achieve. Thus, subjects can be blended as they are in real life, and the learning becomes more relevant. Learning activities can be based on projects that cross the curriculum. For example, in Science class, a project-based activity to study Physics, of velocity and acceleration, in turn, may employ the Engineering skills of designing and building of model vehicles that will accelerate and gain velocity as they roll down an angled ramp. The students witness how acceleration relates to the angle of the ramp, and can use Math to calculate the acceleration based on any given angle. Then, they can use Technology to design more streamlined vehicle shapes that reduce air-drag friction. In the realm of Engineering, they can realize that they are working with machines, learning that both an inclined plane (the ramp) and the wheels are themselves simple machines which can be altered and re-designed for varied effects. The possibilities go on and on. To the students, the hands-on, real-life activity becomes a fascinating blend of work and play, which may captivate life-long interest that leads to career achievement in the distant future! At our school, one may see highly-motivated students learning through designing, building, measuring and calculating with dedicated purpose and intense learning. This is what STEM can do!

While STEM crosses the spectrum of learning, we can then consider the depth. Our minds do not just KNOW things. The complexity of our brains go far beyond that. During the early 1950's, teams of top professionals, under the leadership of an educational psychologist, Benjamin Bloom, discovered six levels on which human learning and thinking is built. Called "Bloom's Taxonomy", this system ascends upward through these six levels: KNOWLEDGE, COMPREHENSION, APPLICATION, ANALYSIS, SYNTHESIS, AND EVALUATION. First comes KNOWLEDGE, which is awareness of the existence of something...just the basic and specific facts. Next comes COMPREHENSION, which is understanding the depth, variety, and range of what is known. Third comes APPLICATION, which is the technical term for USE, and that understood knowledge can be put to use. Fourth, ANALYSIS, the ability to "take apart" what is known, reveals its many components so one can delve into all the different ways they can be used. Then, one can then put those parts back together in new and different ways to get CREATIVE! This is called SYNTHESIS, which is Bloom's fancy term for what inventors, designers, and artists do. Finally, one needs to judge the value of what is learned, to "zero in" on what works best. Bloom named this final

level EVALUATION. So when we teach, how can we most effectively use these six levels? We can design "real-life", "hands-on" activities (like those described in STEM) to provide a fascinating and intensive experience which a student can readily do at school or at home. The pinnacle is reached when the student feels the success and becomes highly motivated. I remember such an example: "How did the prehistoric Pterodactyls fly?". Upon getting to know what a pterodactyl was, the students wanted to comprehend how their wings employed force through the air to cause lift. They intently studied the physics of upward force with wing shape. By comprehending and analyzing the various principles of force in flight, the students became inspired to build models of pterodactyls and use them to test the ability to fly. From the trial flights came creative redesigning. The students evaluated what worked and what did not. Their ability to evaluate led to creating (synthesis of) new wing shape designs that worked better and better (evaluation). This process became the base of one of our prized learning events, "Operation Egg-Drop"!

With all the modern realization of what learning and thinking really is, a new form of learning standards has been developed and titled COMMON CORE. The intent of his new form of standards is to supersede the existing Content Standards, which basically list what a student is expected to KNOW, in EACH SUBJECT at each grade level. The intent of Common Core to identify the presence of higher levels of learning and thinking based on research and evidence in areas such as STEM and Bloom's Taxonomy. They are still being refined to better align with expectations for college and career success, to include the combined content and use (application) of the multiple subjects to attain high-order abilities which prepare students to succeed in our global economy and society. What has been described in the previous paragraphs has led to the development of the Common Core Standards, and hopefully will lead on to higher level achievement in the lives of all our students.

It is written in Pacific Valley School's MISSION STATEMENT: "Our mission is to provide the environment and means for each student to become a responsible, contributing citizen who is an effective communicator, a complex thinker, an independent learner, a quality producer, and a collaborative learner."