Research Basis of the Underlying Premises of the *DynaNotes*™ *OrderUp,TexMatch, LabMatch, MathMatch, ScienceMatch* and *AmeriMatch* Card Decks

There is an abundance of research supporting the underlying premises of the *DynaNotes OrderUp, TexMatch, LabMatch, MathMatch*, *ScienceMatch,* and *AmeriMatch* card decks, including the use of:

- vocabulary and concept reinforcement
- games

Vocabulary and Concept Reinforcement

Research recommends vocabulary development and reinforcement for all students. One way to accomplish this is through the use of games and flashcards. The research of Austermuehle, Kautz, and Sprenzels (2007) found that elementary students showed a growth in vocabulary knowledge after using such techniques as flashcards and vocabulary dictionaries.

A study of 21 sixth-grade classrooms by Kelley, Lesaux, Kieffer, and Faller (2010) showed that teaching academic vocabulary in meaningful and systematic ways helped to improve students' vocabulary and reading comprehension. Madeline Kovarik (2010) states that vocabulary instruction is critical in content areas, and particularly so for economically disadvantaged students who may come to school with limited background knowledge. The research of Burgoyne, Kelly nee Hutchinson, Whiteley, and Spooner (2009) showed that the difficulties that English Language Learners have in understanding texts are related to these students' significantly lower level of vocabulary knowledge. Likewise, Jalongo and Sobolak (2011) assert that students need to be actively engaged in vocabulary development to show vocabulary gains. Those students who speak English as a second language and those who are economically disadvantaged are particularly at risk of not making vocabulary gains. Medina et al. (2007) in *Science Teacher* proposes that English Language Learners may benefit from explicit teaching of new scientific vocabulary. Sharilyn Daniels' 2009 study found that English Language Learners showed gains when they were provided with intervention that included exposure to vocabulary words, definitions, model sentences, and context.

The DynaNotes card decks reinforce critical vocabulary and concepts in a student-friendly format.

Games

Several educators have described how using games and other means of actively engaging students increases students' level of motivation, interest, and effort. Teachers must first obtain students' interest in order to motivate them to learn. It is believed that games can provide such motivation when used in conjunction with other teaching strategies (Brendzel, 2004). Furthermore, some educators state that there is "no doubt that one way to generate children's interest in mathematics and science is through their favorite activities and games" (Williamson, Land, Bulter, & Ndahi, 2004). Daniel Fishman (2010) believes that games allow unengaged students who do not enjoy math to experience the exhilaration that comes with the hard work and accomplishment in math.

"Student understanding and retention can be enhanced and improved by providing alternative learning activities and environments" (p. 259) according to Chow, Woodford, and Maes (2011). They state that repetitive games can enhance problem solving skills and the ability to process information and reach logical decisions. Carl Smith (2003) states that learning vocabulary should be an "active process that engages students in entertaining activities."

Researchers DeGeorge and Santoro (2004) state that "the power and effectiveness of hands-on instruction have been proven in a wide range of subject areas – particularly math" and that "hands-on learning helps students to more readily understand concepts and boost their self-confidence" (p. 28). Klara Pinter (2011) states that math games allow opportunities for all levels of students to develop strategies, ask questions, and formulate hypotheses. Researchers Terzian and Moore (2009) evaluated 11 summer learning programs involving economically disadvantaged urban students and found that the effective programs included hands-on, enjoyable activities that had real-world applications.

The *TexMatch, MathMatch, LabMatch, ScienceMatch, AmeriMatch, and OrderUp* card decks are a fun, interactive way to motivate students to learn grade level vocabulary and concepts. To add an element of competition, the decks can be used as a memory style card game.

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