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| pn-logo-on-wte | **2013 ACE Critique and Awards Program**  ***NMSU Media Productions — Jeanne Gleason*** |

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| ***Monster School Bus***  **Class 12: Illustration Series** |  |
| **To illustrations submitted from this game, please visit:** <http://ace.nmsu.edu/2013/mathsnacks/Class12_MSB.html> |

Overview:

**Character illustrations** used within the online game ***Monster School Bus*** are part of NMSU’s *Math Snacks* initiative, funded by the National Science Foundation. **Submitted in this category are illustrations specific to character design.** All graphics were tested extensively in the NMSU Learning Games Lab with middle school students before determining an art style and variations on the theme ideally suited to this middle school audience. The game is playable at: <http://mathsnacks.com/monsterschoolbus>.

Of particular interest is how illustration (as opposed to graphic design) influences gameplay. The characters and locations give the game a unique edgy feeling and provide a more mature feeling to a game covering fairly juvenile content. This is important: though students learn this concept of number chunking in earlier grades, they often fail to understand them conceptually. Therefore, this content has the potential to turn off older students, should they feel the game is “below them.” The edginess of the character design is key in helping the content feel more age-appropriate for mid-school audiences. Note, for example, how the buildings “transform” from regular buildings into Monster Buildings as a reward for picking up kids. These beautiful details impact game play by increasing player motivation.

Purpose (goals, objectives, need):

***Monster School Bus*** is part of NMSU’s *Math Snacks* initiative funded by the National Science Foundation to develop innovative tools for teaching content addressed in the National Common Core mathematics standards. *Math Snacks* give students, especially those who don't particularly like math, another way to look at math concepts.

*Monster School Bus* addresses number sense. The graphics within the game are crucial in addressing Common Core Standards for Math, including:

* Understanding numbers, ways of representing numbers, relationships among numbers, and number systems.
* Visualizing numbers as sets and quantities.
* Building new mathematical knowledge through problem solving

Audience:

While this game is designed for middle school content, it has been used successfully with learners in grades 3–8.

Marketing/promotion:

Currently in research phase, use of *Monster School Bus* in randomized control trials has begun. At this time, the game is being used by teachers and children engaged in research trials and by those who have been exposed to the product through presentations, articles in journals, during summer teacher training programs, and through online curriculum portals like Edmodo.com. In anticipation of widespread release of the tools in 2014, NMSU is developing a marketing and promotion plan through NMSU’s *Math Snacks* outreach initiative, supported by a full-time NMSU staff member. The sustainability and commercialization of the products is also being considered, building on current *Math Snacks* distribution partnerships with BrainPop, the National Council of Teachers of Mathematics (NCTM), and a successfully funded NSF I-Corp proposal to investigate commercialization.

Role of each entrant for the project:

All work, including illustration, animation, programming and instructional design, was produced in NMSU’s Media Productions studios by a team of professionals. The specific team for *Monster School Bus* is listed in credits. The overall team includes animators, artists, programmers, designers, content specialists, writers and editors. All have contributed in some way to the graphics development.

Extent to which project met goals and objectives:

Each game is pilot tested throughout development. Beginning in the fall of 2012, the *Math Snacks* team began initial controlled evaluation using random trials in school and after-school settings. The results of this research have not yet been analyzed, but anecdotal reports from teachers and the pilot testing trials suggest that ***Monster School Bus*** is highly effective at teaching key concepts. Throughout the extensive user testing, the game was played by many different groups of kids, yielding suggestions and resulting in changes to gameplay and character design.

How diversity was incorporated into entry:

New Mexico has a Hispanic-majority public school student body populations and has long been considered a bellwether for future student body characteristics in the United States. *Math Snacks* has a proven track record of creating innovative products for all learners, with a design approach that involves underrepresented students throughout the design, development and testing phases of the products. Products have been tested extensively with diverse students and been reviewed by independent quality assurance panels annually, with specific attention paid to accessibility by diverse audiences and cultural sensitivity. Funders, such as the National Science Foundation, have found that interactive modules that test well with New Mexican students are often highly effective in increasing readiness to grasp STEM-related concepts within a national student population.