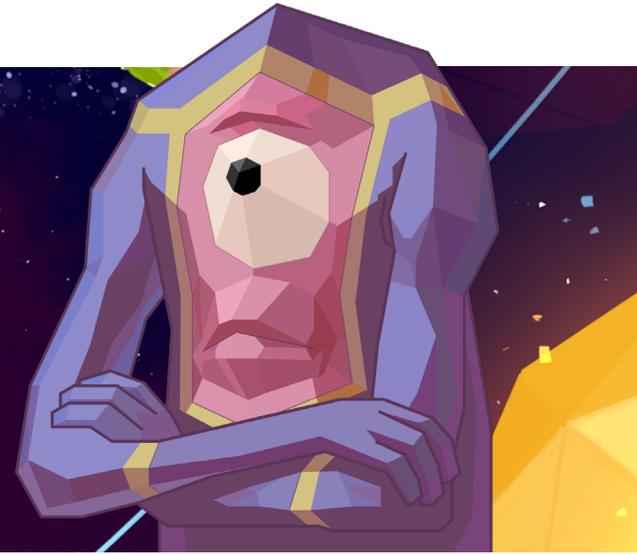


A stylized, low-poly planet with green and blue terrain, a small satellite, and a blue circular highlight around the title text.

# Planet Mechanic: A Classroom Study



## STUDY DESIGN

- *Three testing groups, with 30 students in each group, all of which had commensurate classroom time (1 hour)*
  - Control group 1: Students played the game in class with no support
  - Control group 2: Students participated in a teacher-designed lesson
  - Treatment group: Students played the game as part of a teacher-designed lesson
- *Pre-test and post tests*

## BACKGROUND

Mary Headington, a science teacher in the Sun Prairie Area School District, recently completed a study of how *Planet Mechanic* made a difference in her classroom. For her study, Mary had all of her students take a pre-assessment to test their current knowledge of the content in the game. She then split her students into three sections - a section where students would play only the game, a section where students would only receive traditional instruction from her, and a section where students would both play the game and supplement that gameplay with traditional instruction. Afterwards, all three sections took another post-assessment.

To learn more about how Mary used *Planet Mechanic* in the classroom, read her article in [How to Teach with Games](#).

## ABOUT PLANET MECHANIC

*Planet Mechanic* is a learning game about planets aligned to Common Core and Next Generation Science standards. Players meet the demands of fickle aliens who can't seem to make up their minds about what conditions they want on their homeworld. Experimenting with a planet's core attributes and manipulating its atmosphere, tilt, rotation, and lunar cycles, players learn how these factors change temperature, time, and seasons.

## SIGNIFICANCE OF RESULTS

- The study confirms the findings of Wouters et al<sup>[1]</sup> that the benefit added by learning games is greatest when teachers complement games with a mix of different surrounding activities.
- The results suggest that even with self-sufficient teaching tools like learning games, the teacher retains their role as the most critical component of any pedagogical scenario.

## KEY RESULTS



THE AVERAGED GRADES FOR STUDENTS WHO PLAYED ONLY THE GAME WERE NEARLY FLAT AND WENT UP BY **0.1%**



THE AVERAGED GRADES FOR STUDENTS WHO ONLY RECEIVED TRADITIONAL INSTRUCTION WENT UP BY **6%**.



THE AVERAGED GRADES FOR STUDENTS WHO PLAYED THE GAME AND RECEIVED TRADITIONAL INSTRUCTION WENT UP BY **10% - A FULL LETTER GRADE.**

*“Games are never going to replace the teacher, but games are changing how the teacher teaches. Traditional instruction focuses on providing students with the information we want them to know and then delivering it in a controlled manner. But in this study, we witnessed students struggle with a concept and then determine what they needed to know. They then used this information to direct their own, personalized learning. This looked different for each student. Some students chose to conference with the teacher, some looked to classroom resources and internet links, while others went out on their own in search of the information. These skills teach students how to learn, as opposed to being told what to learn.”*

**- MARY HEADINGTON**

## MORE RESEARCH ABOUT GAME-BASED LEARNING

This study is only a small piece of the larger body of research around game-based learning. For additional context and research on this important topic, see the following studies:

### ***Digital Games, Design & Learning: A Systematic Review & Meta-Analysis***

Stanford Research Institute  
Emily E. Tanner-Smith, Douglas B. Clark, Stephen S. Killingsworth

### ***The A-Games Project***

University of Michigan School of Information  
Barry Fishman, Jan L. Plass, Michelle Riconscente, Rachel Snider, Tzuchi Tsaih

### ***A Meta-Analysis of the Cognitive & Motivational Effects of Serious Games***

Journal of Educational Psychology  
Pieter Wouters, Christof van Nimwegen, Herre van Oostendorp, Erik D. Van der Spek

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1. Wouters, P., van Nimwegen, C., van Oostendorp, H., & van der Spek, E. D. (2013, February 4). A Meta-Analysis of the Cognitive and Motivational Effects of Serious Games. *Journal of Educational Psychology*, 105(2), 249-265.