

# Meaningful Support for Teachers

## *Specific Ways to Encourage Game-Based Learning in the Classroom*

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Geniverse was  
opinions, findings, and conclusions or recommendations expressed in this material are those of the  
author(s) and do not necessarily reflect the views of the National Science Foundation.

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*Leveling Up*

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*Math Snacks*

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How do we guide classroom learning?

What did we learn about what teachers need?

# Let's Learn

How did we involve teachers in the design process?

How did we support teachers' professional development?

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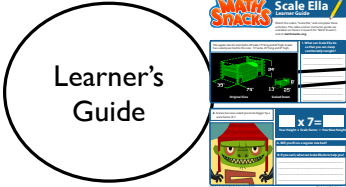
mathsnacks.org



5 games



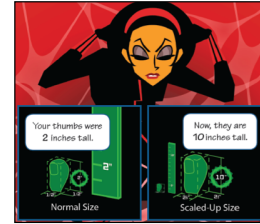
3 apps



Learner's Guide



Teacher's Guide



6 animations



Teaching With Video



hands-on activities



discussion prompts

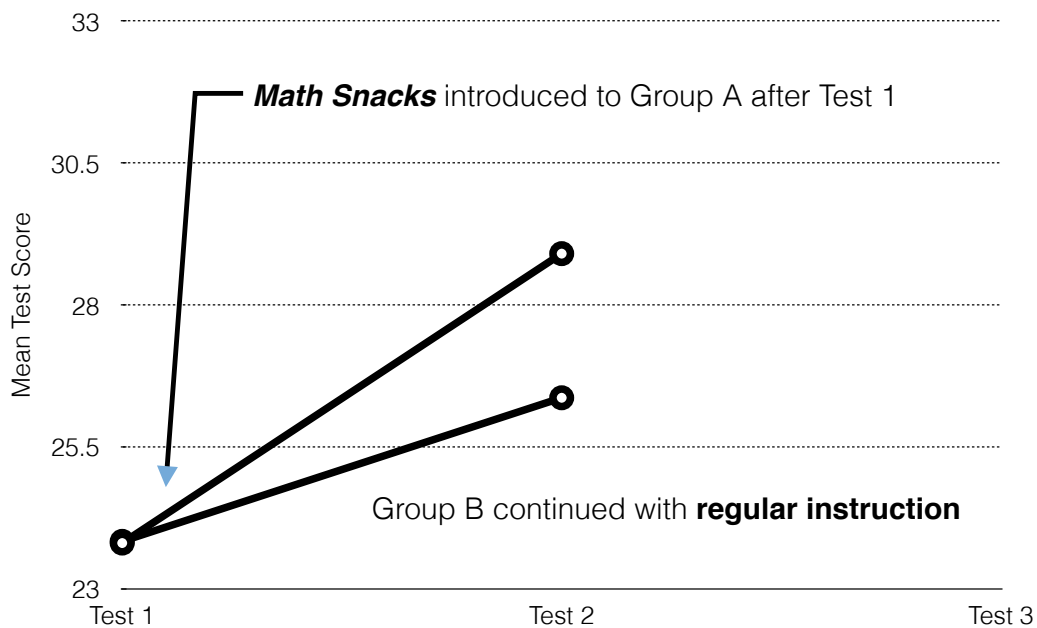


how to use

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# Impact of Math Snacks Games Use Math Test Performance of 5th Graders

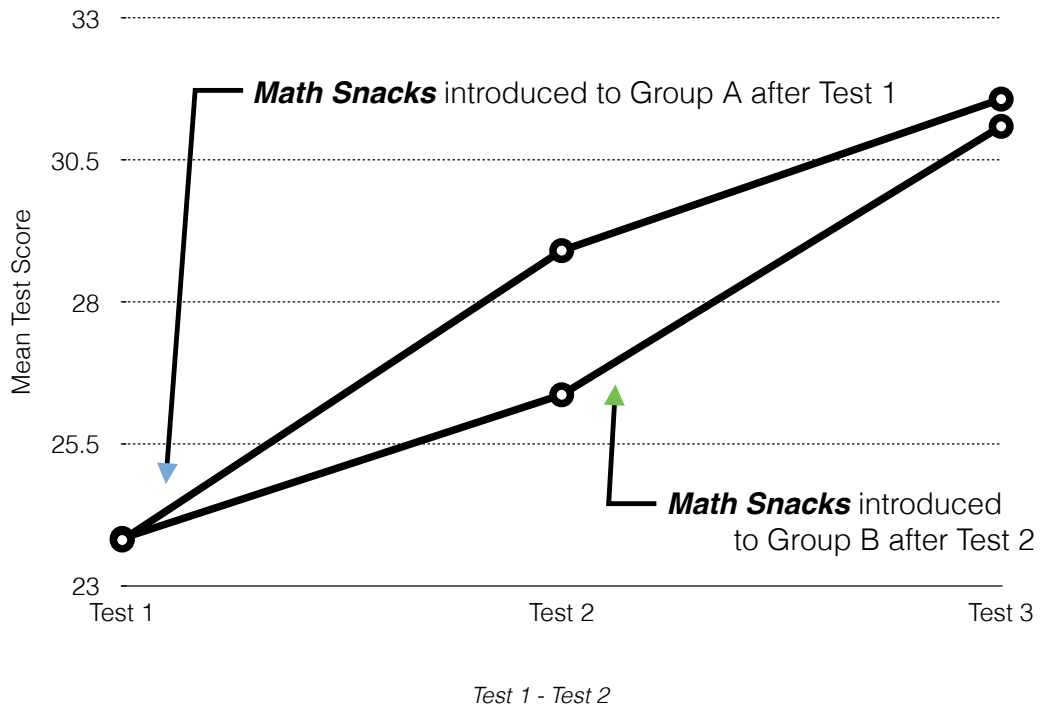
n=741 students in fifth grade





# Impact of *Math Snacks* Games Use Math Test Performance of 5th Graders

*n=741 students in fifth grade*



## Let's Learn



# gameplay

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# create some numbers

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## Gate Teacher Guide

Gate is available at MathSnacks.org

**Gate** is a game where students take a journey to free spirits from darkness. At the start of each level, the player builds numbers to open the gate. Then, they defeat monsters by building similar numbers. *Gate* isn't just about place value: it helps students start to compose and decompose numbers with addition, subtraction and multiplication — gradually doing so in more efficient ways. It will take students a few levels to become proficient with the game mechanics for building the numbers.

There are 16 levels in this game and students will be asked to build numbers as large as 999 and as small as .01. Students are encouraged to use addition, subtraction and even multiplication to build these numbers as efficiently as possible. Please make sure to point out the number line at the bottom of the screen and the number wheel under the main character.

Talking is allowed! Encourage your students to talk to each other and share strategies. Remind students that proper hand placement on the keyboard helps. Turn the sound up on the game — that helps too!

**Time Required:** Two gaming sessions: 40 minutes each. Bonus activity: 30 minutes

**Learning Objectives:**

By playing *Gate* and engaging in at least one of the recommended bonus activities, students will be able to:

- Build numbers using addition, subtraction, multiplication and division.
- Recognize place value from hundreds to hundredths.
- Develop mental computation skills using place value and the four basic operations.

**Vocabulary:** Hundreds, tens, ones, tenths, hundredths, decimal, place value

**Vocabulary in Spanish:** Cientos, decenas, unidades, décimas, centésimas, decimal, dar un valor

**Materials and Technology required:**

- Access to computers and the Internet
- Bonus activity: Strips of white paper and sheets of colored construction paper

### Common Core State Standards Covered

Standard	Standard Description
4.NBT.1	Recognize that in a multi-digit whole number, a digit in one place represents ten times what it represents in the place to its right.
4.NBT.2	Read and write multi-digit whole numbers using base-ten numerals, number names, and expanded form.
4.NF.7	Add, subtract, multiply and divide decimals to hundredths, using concrete models or drawings or strategies based on place value, properties of operations, and/or the relationship between addition and subtraction; relate the strategy to a written method and explain the reasoning used.
5.NBT	<b>Perform operations with multi-digit whole numbers and with decimals to hundredths.</b>

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Play *Gate* and view the *Teaching with Gate* video at  
<http://mathsnacks.com/gate-en.html>

# Let's Learn



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# Let's Learn



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What have we created to support

# teacher development?



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## Support Materials

Comprehensive website: [Geniversity](#)

- ◆ Planning materials
- ◆ Quick Start
- ◆ Teacher guides
- ◆ Lesson plans
- ◆ Assessments
- ◆ Screencast videos




# Teacher Guides

- ◆ Overview
- ◆ Preparing
- ◆ Considerations
- ◆ Potential difficulties
- ◆ Key points
- ◆ Questions for deeper thinking
- ◆ Underlying genetics

# Lesson Plans

- ◆ Materials
- ◆ Eliciting prior knowledge
- ◆ Engage/Explore/Explain
- ◆ Evaluate
- ◆ Follow-up



# Geniversity

Support for Classroom Implementation of Geniverse

- Home
- ▼ What is Geniverse?
  - Learning Goals
  - Lessons in a Nutshell
  - The Real Genes of Geniverse
  - Scientific Argumentation
  - Teacher Testimonials
  - Geniverse and the Standards
- ▼ Before Using Geniverse
  - Which Version of Geniverse is Right for You?
  - Quick Start Guide
  - Portal Instructions
  - 3-Lesson Primer
  - System Requirements
- ▼ Planning Resources
  - Teacher Guides
  - Lesson Plans **updated**
  - Handouts **updated**
  - Teaching with a Game **new**
  - The FACTS: Formative Assessment Classroom Techniques
  - Assessment
  - The Genie: Molecular Model of Inheritance **new**
  - Guide to Using Arrow's Story **new**
  - Glossary
  - Videos and Tutorials
- Frequently Asked Questions
- Discussion Forums
- Geniverse Test Team
- Credits
- Contact us!

## Home Page

**Welcome to Geniversity, the official teacher resource website for Geniverse!**

Geniversity has been designed to help teachers use Geniverse, free web-based software for high school biology that engages students in exploring genetics by breeding and studying virtual dragons. We also welcome middle school and college classrooms to join in the journey through Geniverse.

Geniversity includes teacher guides, lesson plans, student handouts, technical tips and Discussion Forums to support our growing community of dedicated teachers.

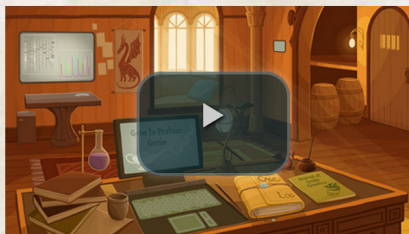
Get Started
Not ready to start? [Learn more.](#)

### Quick & Easy

[Will Geniverse really help my students?](#)

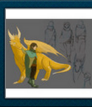
[next >](#)

Watch teachers and students describe how Geniverse has changed their classrooms.



# Online Course

3D GAME LAB



**guildeddragon** Commoner

Group: 0 | 2000  
Rank: 0 | 175

System XP **0**

**Geniverse 101** Available 42 In Progress 1 Completed 0

Name	XP	Avg Time	Rating	Category	Due Date
<b>Dabble or Dive In?</b>	50	30 mins	★★★★★	Apprentice	Aug 24, 2014
<b>Effective Questioning Strategies for Geniverse</b>	50	15 mins	★★★★★	Apprentice	Aug 24, 2014
<b>Explore Geniversity</b>	25	15 mins	★★★★★	Trainee	Aug 24, 2014
<b>Game On: Solve Case 12!</b>	30	30 mins	★★★★★	Journeyman	Aug 24, 2014
<b>Game On: Solve Case 13!</b>	50	30 mins	★★★★★	Journeyman	Aug 24, 2014

QUESTS 1

REWARDS 0

GROUP

ANNOUNCEMENTS 0

GROUP MANAGER

QUEST BUILDER

# Online Course

**3D GAME LAB**

firemonkey Lead Geneticist System XP 1575

Group 1576 | 2000  
Rank 76 | 250

Geniverse 101

**To front load, or not to front load? That is the question.**

By now you've probably noticed that Geniverse uses minimal genetics vocabulary. You've probably also noticed the distinct lack of Punnett squares, as well as lack of detail about meiosis and protein synthesis. This is intentional, and has made some teachers we've worked with wonder.

If any of these things have left you feeling a little queasy, listen to what James Paul Gee has to say. Perhaps he'll put your mind at ease, at least a little.

James Paul Gee on Grading with Games

0:00 / 11:50

(This video was found at edutopia and was produced with support from the John D. and Catherine T. MacArthur Foundation)

QUESTS 1  
REWARDS 13  
GROUP  
ANNOUNCEMENTS 0

# Online Course

**3D GAME LAB**

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Geniverse 101

**Badges**

- Trainee
- Apprentice
- Journeyman
- Master
- Comment-ator
- Genie-ous
- Fabulous Facilit...
- Grand Master

**Achievements**

- Commoner
- Traveler
- Stable Hand
- Drake Handler
- Guild Undergrad
- Guild Lab Assistant
- Guild Grad Student
- Post Doc
- Lead Geneticist
- Master Drake Bre...

QUESTS 0  
REWARDS 13  
GROUP  
ANNOUNCEMENTS 0

# Teacher Materials

- **Video clips**  
game play examples
- **Discussion Guides**  
include tips on how to break down video clip content
- **Teacher Play Guides**  
content support, navigation tips, & guiding questions



## Teacher Materials (cont.)

- **Teacher version of game** (QS only)  
all levels unlocked
- **Sample "bridge" activities**  
EdGE-developed classroom activities that tie game content to formal instruction



# What were our “a HA” moments?



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## Lessons Learned

- ◆ Keeping together vs. own pace
- ◆ Content knowledge / experimentation
- ◆ Practices take practice



# Aha Moments (Lessons Learned)

- **Keep It Simple**  
don't ask teachers to add too much
- **Teachers Want Control**  
customizability & monitoring capabilities are popular requests from teachers
- **Learning More...**  
reviewing & coding teacher logs, looking for new/ additional ways to support teachers



How<sub>do we</sub> help teachers  
prepare<sub>to use games</sub>?



# Helping Teachers Prepare

- ◆ To play's the thing
- ◆ How to use the narrative
- ◆ Argumentation support
- ◆ Triple threat

## Teacher Guidance

- **Google Drive Folders**  
contain all materials & supports for participation in research study
- **Encourage Teachers to Play**  
games are not just for students—teachers need to play too!
- **Keep in Touch**  
email teachers regularly to provide positive reinforcement ... and the occasional “nudge”



# Let's discuss

What do we still need from each other?

*“What do we still not know?”*

*“What can we help each other do?”*

*“What unexpected thing should we expect?”*

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*Specific Ways to Encourage  
Game-Based Learning in the Classroom*

[tinyurl.com/](http://tinyurl.com/DRK12-games-teachers)

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