

# Covariation

# Introduction

- Teaching is the most important profession in the world
- We need the best teachers we can possibly have
- High standards, high expectations

# Covariation Wars

- Ideas in your book are 20-15 years old, and have not been updated.
- Two different styles of covariation got their start in 1989.
- The definitive discrete style paper was Confrey & Smith (1994, 1995).
- The definite continuous style paper was Saldana and Thompson (1998) and Thompson (2008)
- These two rival clans hate each other, but in a nice way.

# The core of the argument

- Claim: Discrete style is easier for students.
- Claim: Continuous style is more useful for students later in their careers.

**Why is (continuous)  
covariation important?**

Public High School  
9th grade Algebra I  
May

# Why is (continuous) covariation important?

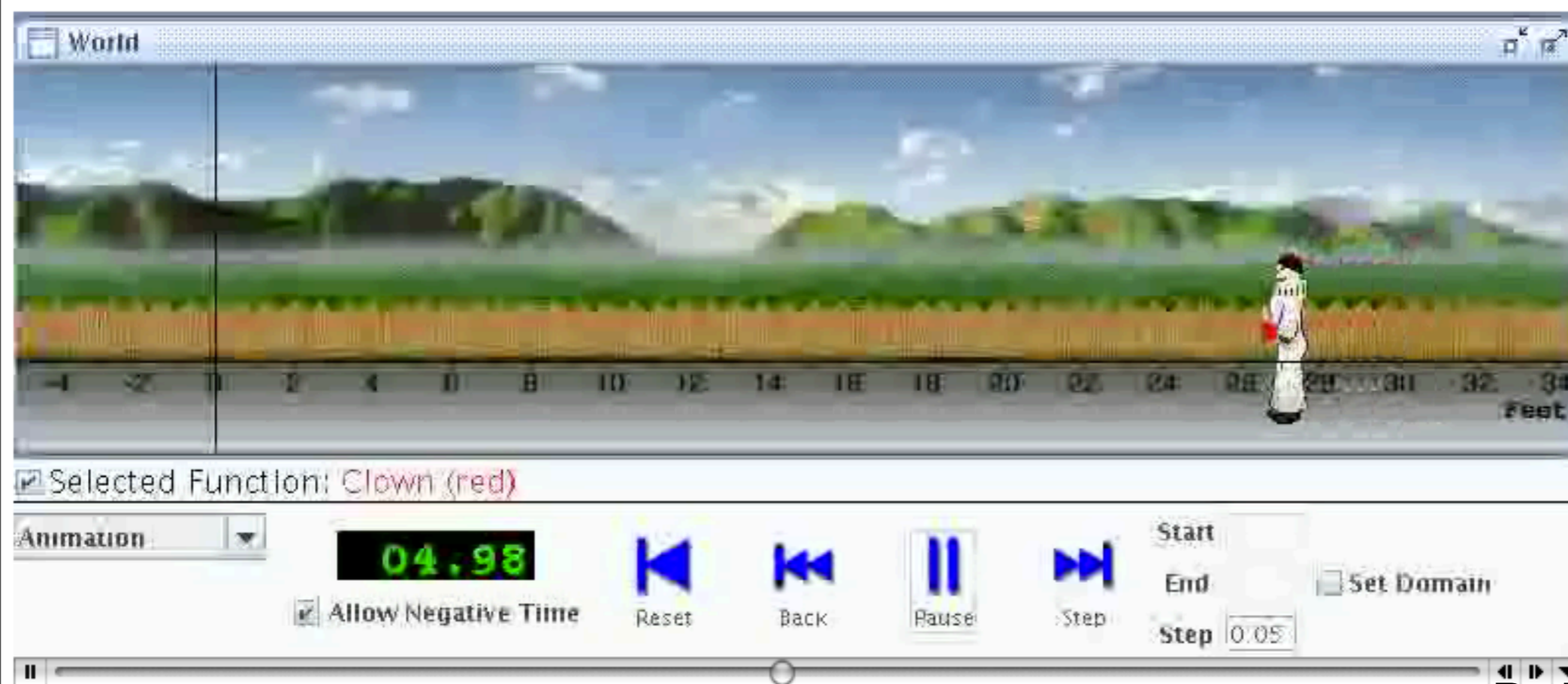


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# Clown takes a walk

Play the movie of Clown taking a walk. *You may pause the movie and then use the left and right arrow keys to move Clown little bits at a time.* Use a printout of the coordinate system at the end of this page as you practice doing these activities. *Read all seven steps before beginning!*

1. Track the timer along the horizontal axis using your right index finger. Do this all by itself. Go to Step 2 only after you are comfortable doing this.
2. Track Clown's *total* distance along the vertical axis using your left index finger. Do this all by itself. Go to Step 3 only after you are comfortable doing this.
3. Do steps 1 and 2 together. Keep your distance finger along the vertical axis and your time finger along the horizontal axis. Go to Step 4 only after you are comfortable doing this.
4. Do steps 1 and 2 together. Keep your distance finger *directly above* your time finger.
5. Pretend that you've dipped your distance finger in pixie dust. Do step 4 again.
6. Now use your pencil to show the pixie dust trail your finger left behind.
7. Pick three particles of pixie dust. How much time had elapsed and how far had Clown walked when you dropped each particle of pixie dust?



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**Clown takes a walk**



# Clown takes a walk

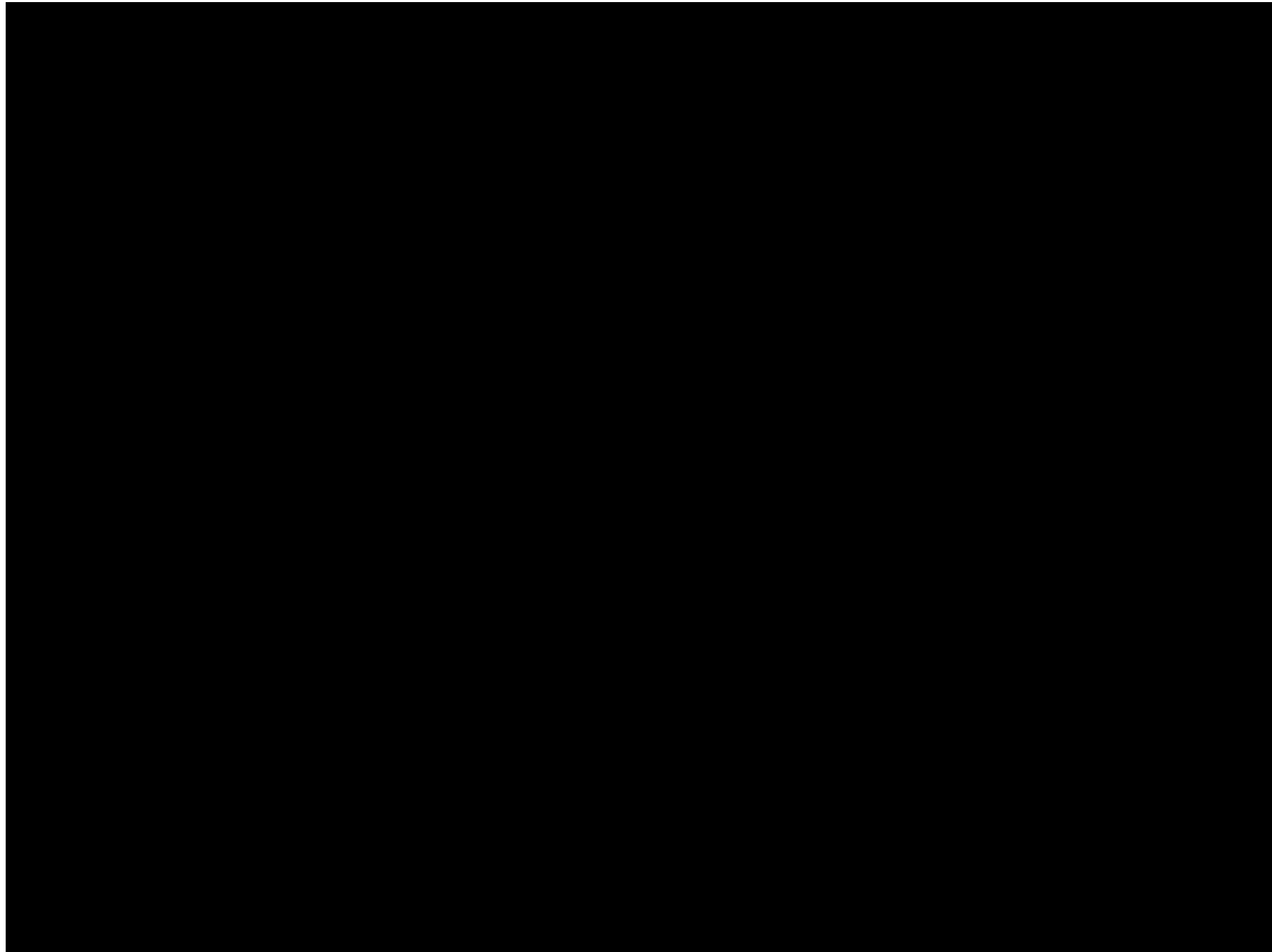
The image shows a software interface for animating a clown character. The main window, titled "World", displays a 3D scene with a clown character standing on a path. The clown is wearing a white outfit with a red circle on the chest. The background features a green field, a brown fence, and rolling hills under a blue sky with clouds. A horizontal timeline at the bottom of the scene is marked with numbers from -4 to 34 in increments of 2, with the unit "Feet" at the end. The clown character is positioned at the 0 mark.

Below the scene, the interface includes the following controls:

- Selected Function: Clown (red)
- Animation:
- Allow Negative Time
- Reset (blue left arrow icon)
- Back (blue double left arrow icon)
- Step (blue right arrow icon with a mouse cursor over it)
- Start (text input field)
- End (text input field)
- Step (text input field with value 0.05)
- Set Domain (checkbox icon)

**With Students**

# With Students



# What is a graph?

# Resources

- Website for RENEW functions breakout here: <https://www.math.ksu.edu/~cwcg/RENEW/>
- Slides
- Buggy prototype of fingertool for iPad
- Your homework assignment