Algebraic Reasoning: A Model Approach

AMATYC 2019

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Southwest Baptist University
Algebraic Reasoning & Modeling

• A three credit hour, one semester college algebra-ish class that meets for 75 minutes two times per week in a traditional classroom

• Prerequisite: Math Literacy

• Technology:
  • Publisher eHomework system
  • Excel
  • Desmos
  • Online apps
Pre Class Learning

- Videos
  - Focused, average length 9:23
  - Create your own
- Video notes
  - Templates
  - Checked during 1st 5 minutes of class
  - Turned in at test time, 10% of grade
Student Feedback

“But I’m a visual learner!”

“The videos are what made the biggest difference to me. Having someone walk you through how to do a problem made understanding the problems so much better.”

“Hey, this isn’t that bad!”
In Class Learning

- Activities
- Worksheets
- Turned at test time, 10% of grade
Activities

WGOITG (What’s Going On In This Graph?):

• The American Statistical Association (ASA) has partnered with the New York Times Learning Network to help students better understand and think more critically about graphs.
• WGOITG hosts a live discussion most Wednesdays throughout the school year about a timely graph.
Activities

WGOITG (What’s Going On In This Graph?):

• Students are asked
  • What do you notice?
  • What do you wonder?
  • What's going on in this graph?
• Students can post comments about what they notice and wonder about in an online forum.
• Moderators respond to the comments in real time and encourage students to go deeper.
April 10, 2019: Top 10 Summer Hits

“Pour Some Sugar on Me”
Def Leppard - 1988

“On Our Own”
Bobby Brown - 1989

“Vision of Love”
Mariah Carey - 1990

“Rush, Rush”
Paula Abdul - 1991

“Bad Blood”
Taylor Swift - 2015

“Can’t Stop the Feeling!”
Justin Timberlake - 2016

“Despacito”
Luis Fonsi and Daddy Yankee - 2017

“Nice For What”
Drake - 2018
April 10, 2019: Top 10 Summer Hits

• Fingerprints for Top 10 summer hits for 8 years
• 5 variables
  • Loudness
  • Energy
  • Danceability
  • Acousticness
  • Valence (cheerfulness)
• Fingerprints generated using the algorithm Spotify created to generate music recommendations
Oct. 30, 2019: Annual Ticket Sales by League
## Activities

**Robert Wadlow**

<table>
<thead>
<tr>
<th>Age (yr)</th>
<th>Height (ft in)</th>
<th>Weight (lb)</th>
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<td>-</td>
<td>8.5</td>
</tr>
<tr>
<td>1/2</td>
<td>-</td>
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<td>6 10 1/2</td>
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Activities

Robert Wadlow Investigations:
1. Plot the data of height vs age on graph paper.
2. Graph a line of best fit for the height data.
3. Find the slope and vertical intercept of the line of best fit for the height data.
4. Write the equation of the line of best fit for the height data.
5. Make a table of height vs age based on this height equation.
Activities

Robert Wadlow Investigations:
6. Answer the following questions.
   a. Assuming his growth follows this line, how many inches in height will he grow each year?
   b. Find three ways to predict his height at age 30.
   c. How many years will it be before he could hit his head on an official basketball goal if standing underneath it?
   d. Does the vertical intercept seem reasonable?
   e. His shoe size at one point was 37EE. Draw an outline of that shoe size.
Activities

- Desmos class activities
- Class code: K46Y37
Group Work using Worksheets

- Students work in groups
- Focus on data shown in tables, graphs, and functions
- I carry the answer key with me. Students can check their work.
<table>
<thead>
<tr>
<th>Score</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>3</td>
<td>Did not work with group/unprepared/easily distracted/Incomplete worksheet or activity report</td>
</tr>
<tr>
<td>7</td>
<td>Participated in group when prompted/came to class prepared/completed worksheet or activity report</td>
</tr>
<tr>
<td>10</td>
<td>Participated actively in group/helped others in group/came to class prepared/completed worksheet or activity report</td>
</tr>
</tbody>
</table>
Post Class Learning

- Online homework-publisher website
- Due by next class period
- 100% for each question completed by the due date
- 50% for each question completed after the due date but before the test
- 20% of the grade
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