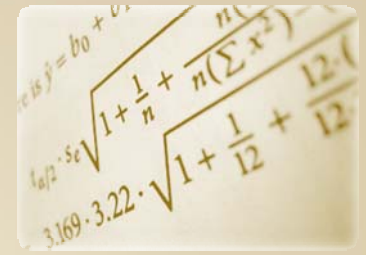


Mike Tenneson, PhD  
Steve Badger, PhD  
Evangel University



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# Measuring Pentecostal Attitudes and Beliefs about Origins

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American Scientific Affiliation  
Baylor University  
August 1, 2009



$$y = b_0 + b_1 x$$
$$s_e = \sqrt{1 + \frac{1}{n} + \frac{n(\sum x^2)}{(\sum x)^2}}$$
$$3.169 \cdot 3.22 \cdot \sqrt{1 + \frac{1}{12} + \frac{12 \cdot (12)}{12^2}}$$

# Origins Camps

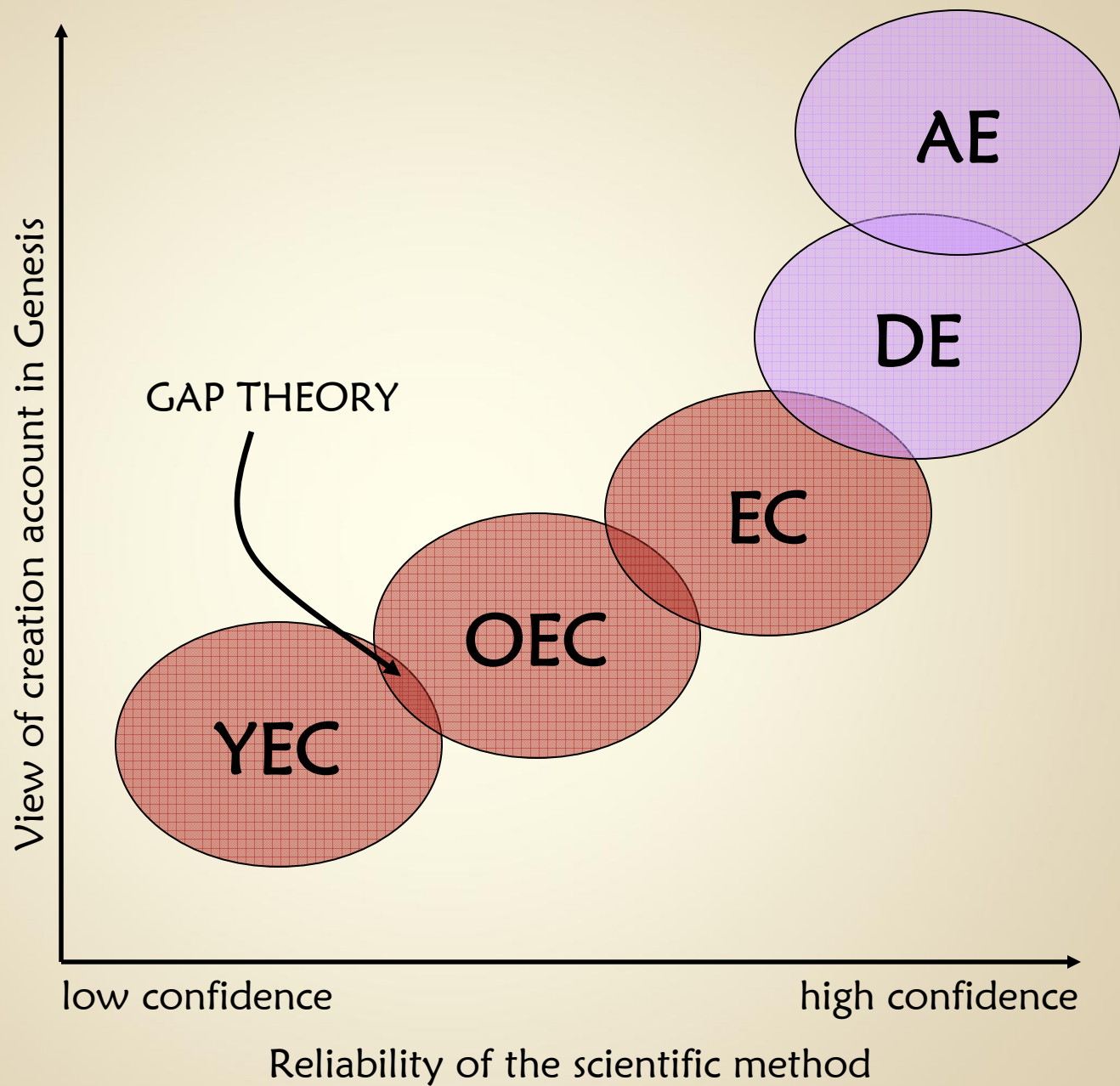


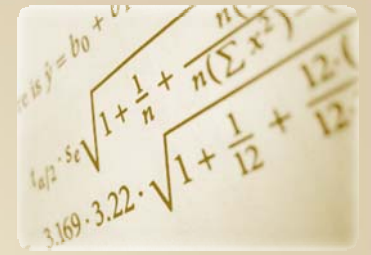
GCA is ancient myth

GCA is ancient science, not historical narrative

GCA is part historical narrative with poetic elements

GCA is historical narrative & scientifically accurate

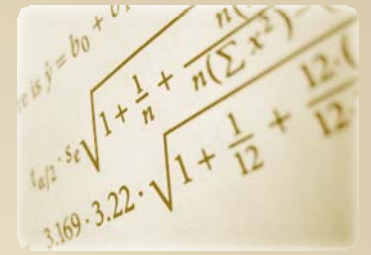


A decorative graphic in the top right corner featuring mathematical formulas. It includes the linear regression equation  $y = b_0 + b_1x$ , the formula for the standard error of the estimate  $s_e = \sqrt{1 + \frac{1}{n} + \frac{n(\sum x^2)}{n(\sum x^2)}}$ , and a numerical calculation  $3.169 \cdot 3.22 \cdot \sqrt{1 + \frac{1}{12} + \frac{12 \cdot (}{12}}$ .

# The Online Origins Surveys



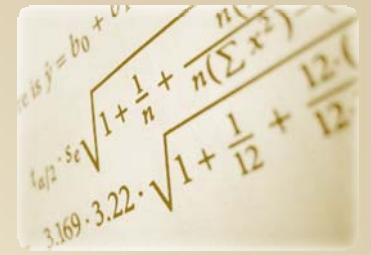
# Purposes



- Investigate the Origins views of Pentecostal faculty, staff, and students.
- Evaluate and improve instruction in science and theology classes.



# Desired Characteristics

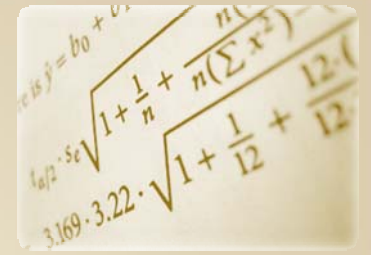


Handwritten mathematical formulas on a piece of paper, including the linear regression equation  $y = b_0 + b_1x$ , the standard error of the estimate formula  $s_{est} = \sqrt{1 + \frac{1}{n} + \frac{n(\sum x^2)}{n(\sum x^2)}}$ , and a calculation  $3.169 \cdot 3.22 \cdot \sqrt{1 + \frac{1}{12} + \frac{12 \cdot (}{12}}$ .

- Valid
- Reliable
- Convenient
- Anonymous



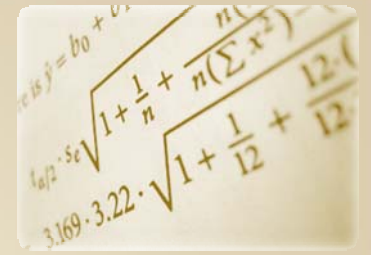
# Three Surveys



- 2004
- 2008
- 2009



# 2004: Five Mental Constructs



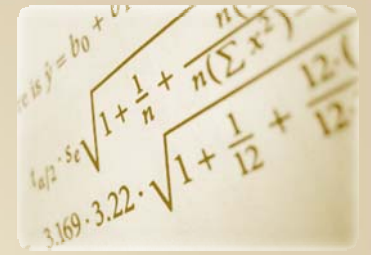
Factor	Students (n=763)	Faculty (n=224)
1	Evolutionary Creation	Old Earth Creation



- Scree plots and eigenvalues indicated five factors.
- Varimax orthogonal rotation resulted in highest factor loadings.
- Factor loadings >0.40 are moderate to high.



# 2004: Five Mental Constructs

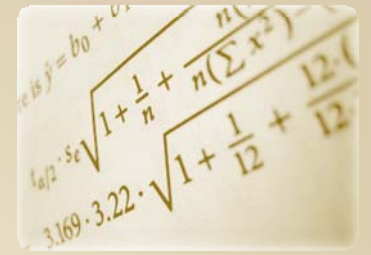


Factor	Students (n=763)	Faculty (n=224)
1	Evolutionary Creation	Old Earth Creation
2	Old Earth Creation	Evolutionary Creation



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# 2004: Five Mental Constructs

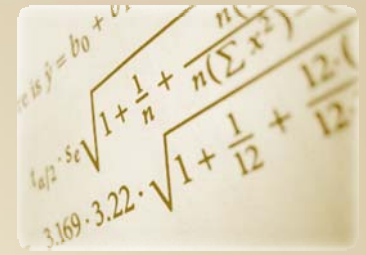


Factor	Students (n=763)	Faculty (n=224)
1	Evolutionary Creation	Old Earth Creation
2	Old Earth Creation	Evolutionary Creation
3	Young Earth Creation	Science Over Theology



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# 2004: Five Mental Constructs

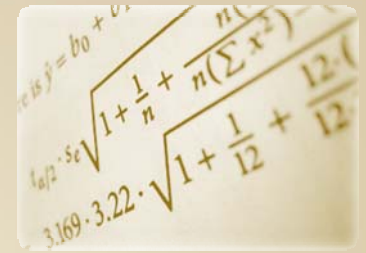


Factor	Students (n=763)	Faculty (n=224)
1	Evolutionary Creation	Old Earth Creation
2	Old Earth Creation	Evolutionary Creation
3	Young Earth Creation	Science Over Theology
4	Historic/Scientific Accuracy of Genesis	Young Earth Creation



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# 2004: Five Mental Constructs

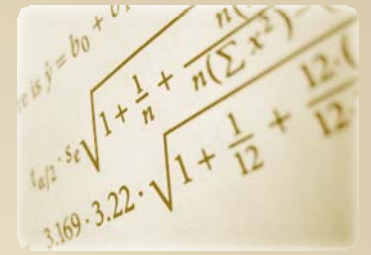


Factor	Students (n=763)	Faculty (n=224)
1	Evolutionary Creation	Old Earth Creation
2	Old Earth Creation	Evolutionary Creation
3	Young Earth Creation	Science Over Theology
4	Historic/Scientific Accuracy of Genesis	Young Earth Creation
5	Fiat Creation	Anti-Deism



- Scree plots and eigenvalues indicated five factors.
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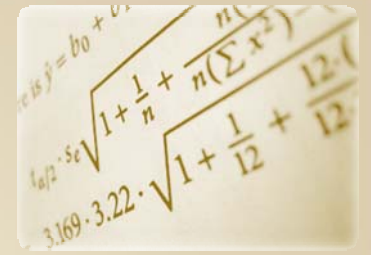
# 2008 Survey



- n=70 Pentecostal educators.
- Most believe:
  - The universe is billions of years old.
  - All life did not have a common ancestor.
  - One theistic position has more support than the others.
  - Arguments for intelligent design (ID) are convincing.
- They are divided on:
  - Whether new life has arisen since creation.
  - Macroevolution should be taught as the unifying concept of biology.



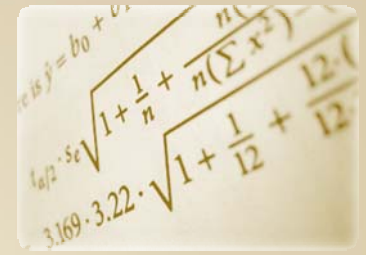
# 2008: Pentecostal Faculty



Self-Reported Position	(n=70)
Young Earth Creationists	24.3%
Old Earth Creationists	38.6%
Evolutionary Creationists	25.7%
Undecided and Blank	10.0%
Atheistic Evolutionists	1.4%



# 2009: Mental Constructs



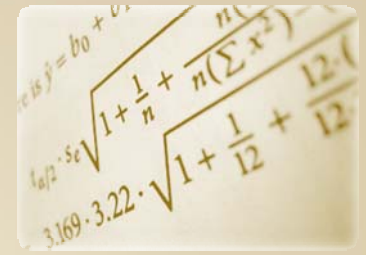
Factor	Students (n=185)	Faculty (n=145)	All Respondents (n=390)
1	Old Earth Creation	Old Earth Creation	Old Earth Creation



- The four identified factors explained 54.8% of the total variance.
- The mental constructs correspond to our theoretical expectations.



# 2009: Mental Constructs



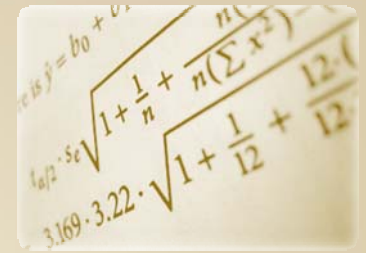
Factor	Students (n=185)	Faculty (n=145)	All Respondents (n=390)
1	Old Earth Creation	Old Earth Creation	Old Earth Creation
2	Evolutionary Creation	Young Earth Creation & ID	Evolutionary Creation



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# 2009: Mental Constructs

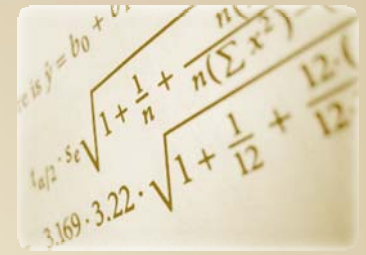


Factor	Students (n=185)	Faculty (n=145)	All Respondents (n=390)
1	Old Earth Creation	Old Earth Creation	Old Earth Creation
2	Evolutionary Creation	Young Earth Creation & ID	Evolutionary Creation
3	Young Earth Creation & ID	Evolutionary Creation	Young Earth Creation



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# 2009: Mental Constructs

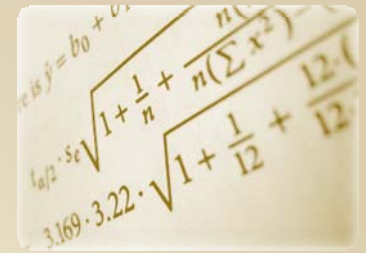


Factor	Students (n=185)	Faculty (n=145)	All Respondents (n=390)
1	Old Earth Creation	Old Earth Creation	Old Earth Creation
2	Evolutionary Creation	Young Earth Creation & ID	Evolutionary Creation
3	Young Earth Creation & ID	Evolutionary Creation	Young Earth Creation
4	Intelligent Design	Gap Theory	Intelligent Design



- The four identified factors explained 54.8% of the total variance.
- The mental constructs correspond to our theoretical expectations.

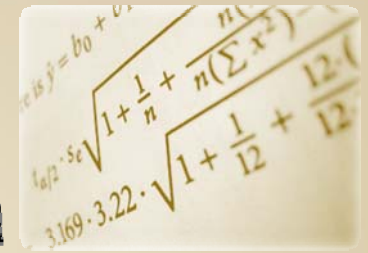
# Factor 1: Old Earth Creation



Item #	18	33	7	19	20	10	2	13
FL	0.801	0.796	0.776	0.740	0.721	0.707	0.688	0.622

Item #	12	23	25	27
FL	0.618	0.427	0.417	-0.630





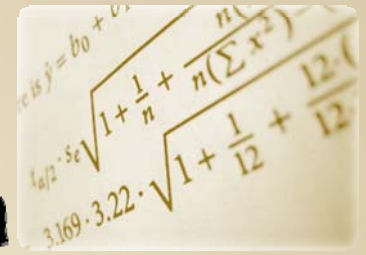
## Factor 2: Evolutionary Creation

Item #	21	4	16	30	11
FL	0.816	0.803	0.731	0.709	0.572

Item #	24	6
FL	-0.687	-0.749



# Factor 3: Young Earth Creation

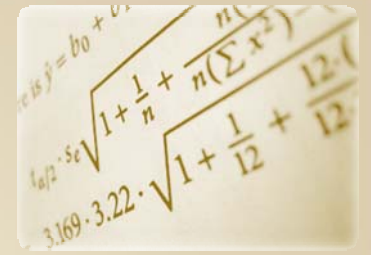


Item #	15	17	1	32	27
FL	0.757	0.630	0.625	0.613	0.439

Item #	10	12	13	23
FL	-0.433	-0.458	-0.521	-0.603



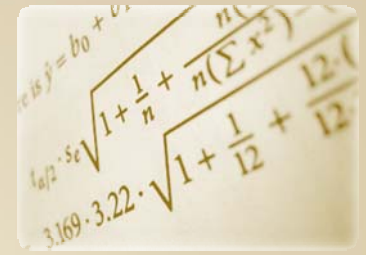
# Factor 4: Intelligent Design



Item #	26	14	9	3	5
FL	0.781	0.697	0.658	0.628	-0.602



# 2009: Reliability



Mental Construct	Reliability ( $\alpha$ )
1	0.922
2	0.860
3	0.871
4	0.721



- Measures precision of the assessment of the affective characteristic.
- Cronbach's alpha  $>0.70$  is evidence of reliability.



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$$y = b_0 + b_1x$$
$$s_{e|y} = \sqrt{1 + \frac{1}{n} + \frac{n(\sum x^2)}{n(\sum x^2)}}$$
$$3.169 \cdot 3.22 \cdot \sqrt{1 + \frac{1}{12} + \frac{12 \cdot 1}{12}}$$





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$$y = b_0 + b_1x$$
$$s_{e^2} = \frac{1}{n} + \frac{x^2}{\sum x^2}$$
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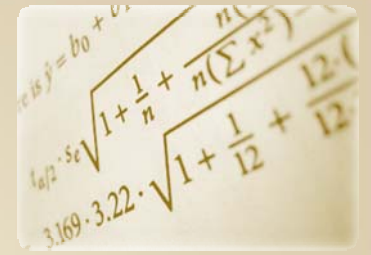


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$$3.169 \cdot 3.22 \cdot \sqrt{1 + \frac{1}{12} + \frac{12 \cdot (}{12}}$$

# Findings



# Respondent Demographics



	2004	2009
Respondents (n)	1,032	390
Students	63%	47%
Educators	19%	32%
Staff	11%	11%
Administrators	3%	5%
A/G Affiliated	74%	80%



# Faculty

Self-Reported Position	2004 A/G (n=224)*
Young Earth Creationists	34.8%
Old Earth Creationists	30.8%
Evolutionary Creationists	12.1%
Undecided and Blank	21.4%
Atheistic Evolutionists	0.8%

\* $p \leq 0.05$ , comparing 2004 and 2009 samples.  
 $\chi^2 = 11.066$ ,  $df = 3$  (AE and DE omitted)

# Faculty

Self-Reported Position	2004 A/G (n=224)*	2008 Pentecostals (n=70)
Young Earth Creationists	34.8%	24.3%
Old Earth Creationists	30.8%	38.6%
Evolutionary Creationists	12.1%	25.7%
Undecided and Blank	21.4%	10.0%
Atheistic Evolutionists	0.8%	1.4%

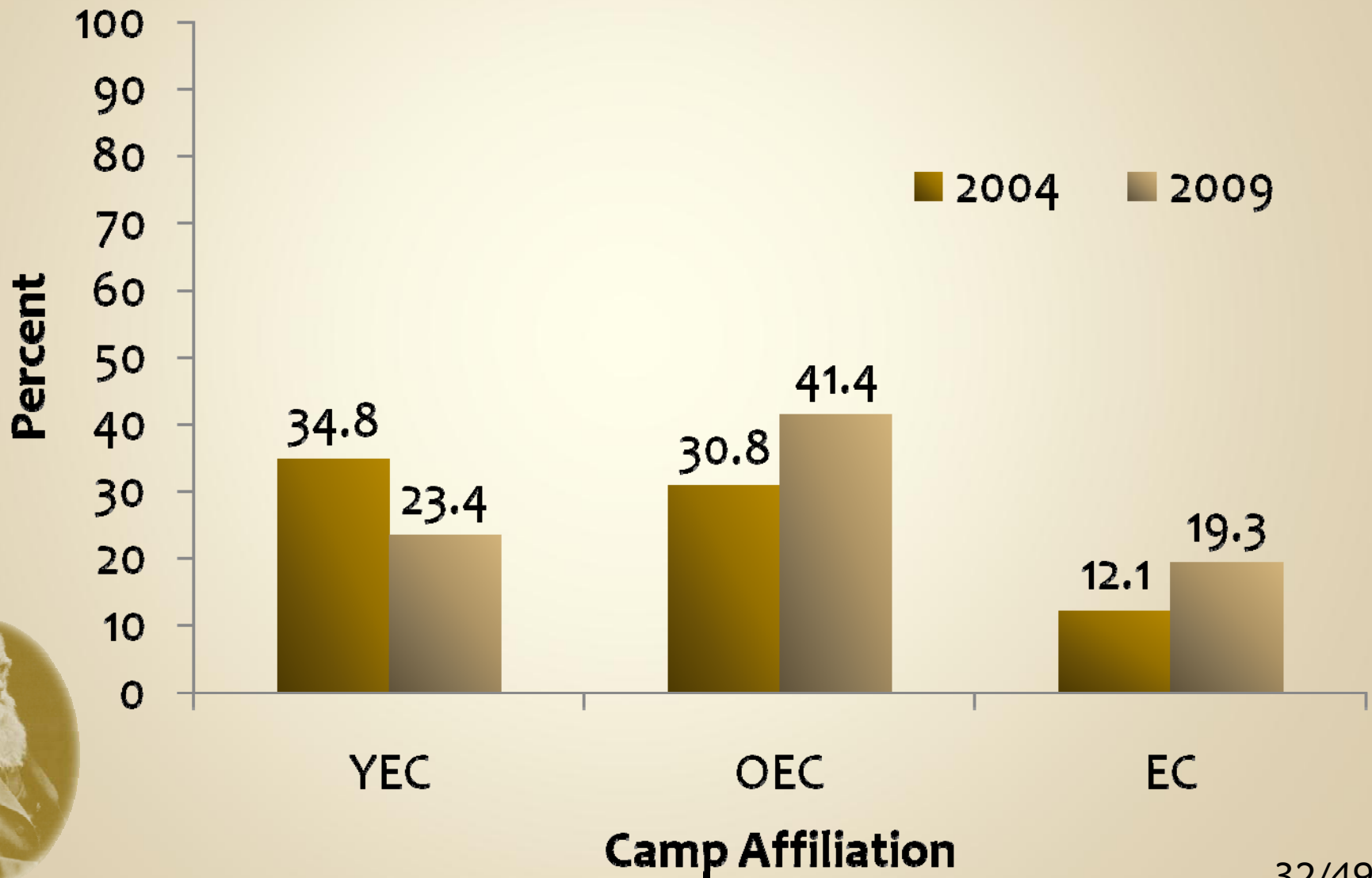
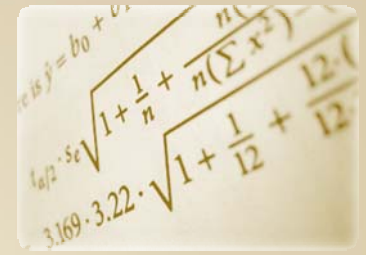
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# Faculty

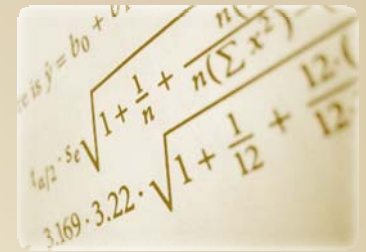
Self-Reported Position	2004 A/G (n=224)*	2008 Pentecostals (n=70)	2009 A/G (n=145)*
Young Earth Creationists	34.8%	24.3%	23.4%
Old Earth Creationists	30.8%	38.6%	41.4%
Evolutionary Creationists	12.1%	25.7%	19.3%
Undecided and Blank	21.4%	10.0%	15.8%
Atheistic Evolutionists	0.8%	1.4%	0%

\* $p \leq 0.05$ , comparing 2004 and 2009 samples.  
 $\chi^2 = 11.066$ ,  $df = 3$  (AE and DE omitted)

# A/G Faculty



# CCCU Biology Faculty (2005)



Self-Reported Position	Percent
Young Earth Creationists	25%
Old Earth Creationists or Reluctant to Commit	48%
Evolutionary Creationists	27%

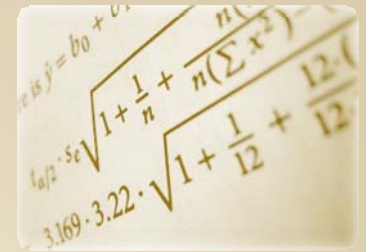
n=67 CCCU schools



Sutherland, J.C. (July 1, 2005) "Evangelical Biologists and Evolution." *Science* 309:51



# A/G Students

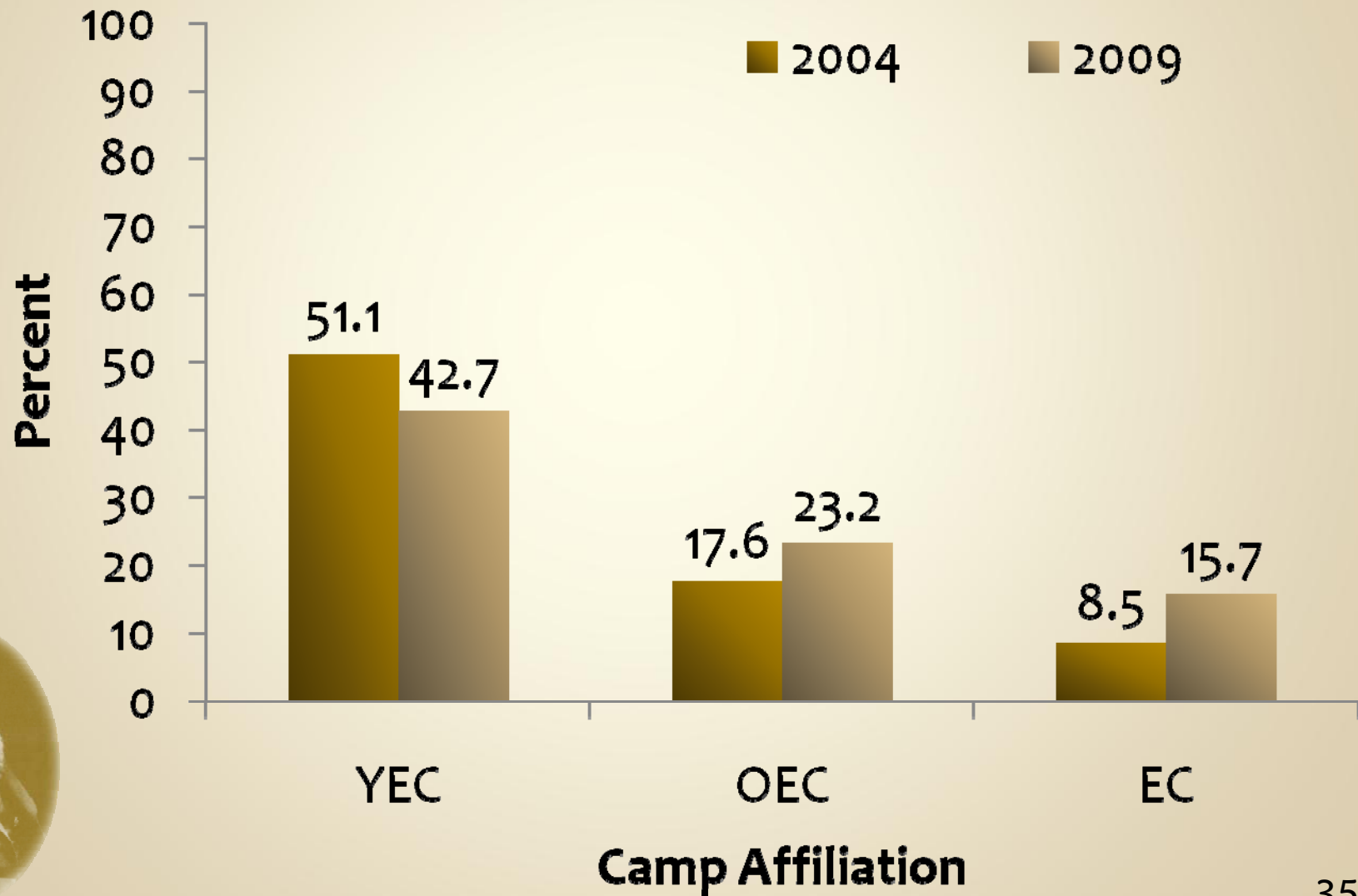
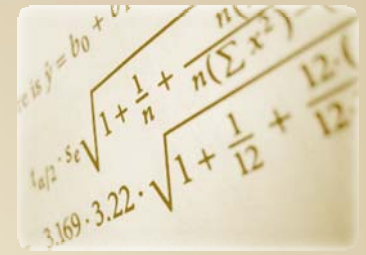


Self-Reported Position	2004* (n=763)	2009* (n=185)
Young Earth Creationists	51.1%	42.7%
Old Earth Creationists	17.6%	23.2%
Evolutionary Creationists	8.5%	15.7%
Undecided and Blank	22.5%	18.3%
Atheistic/Deistic Evolutionists	0.2%	0%

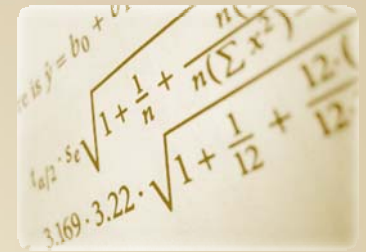
\* $p \leq 0.01$ ,  $\chi^2 = 14.933$ ,  $df = 3$



# A/G Students



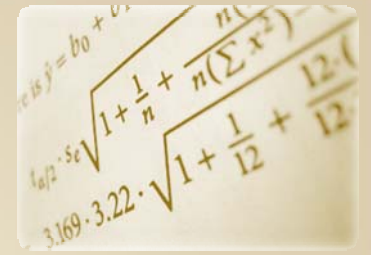
# Do you embrace the theory of Intelligent Design?



Response	Faculty	Students
Yes	84.1%	83.2%
No	4.1%	3.8%
Blank	11.7%	13.0%



# Do you embrace the Gap Theory?

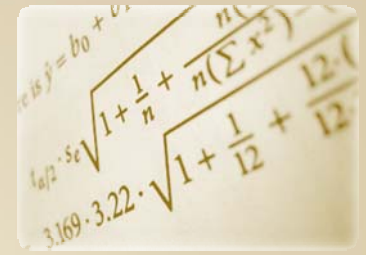


Decorative graphic showing mathematical formulas, including the linear regression equation  $y = b_0 + b_1x$  and formulas for standard error and confidence intervals.

Response	Faculty	Students
Yes	22.8%	15.7%
No	38.6%	54.6%
Blank	38.6%	29.7%



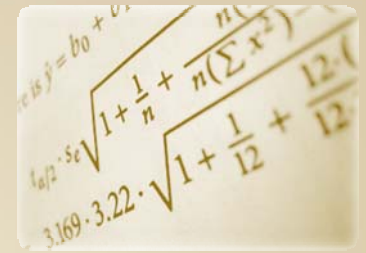
# Stated Positions & Knowledge of Core Concepts, 2009



Camp	SA or A 4 of 5 Top Items	SA or A 5 of 5 Top Items	SA or A 4 or 5 of 5 Top Items
YEC	68/138 (49%)	3/138 (2%)	71/138 (51%)
OEC	16/122 (13%)	12/122 (10%)	28/122 (23%)
EC	13/62 (21%)	1/62 (2%)	14/62 (23%)



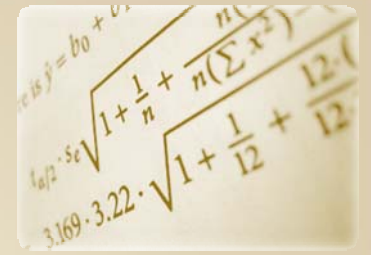
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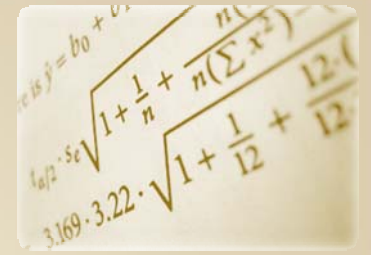
# Usefulness in Teaching



- Evaluate the development of critical thinking skills
  - Willingness to change one's viewpoint in light of new evidence.
  - Holding positions that are internally consistent.
- Gain insights into students' preexisting opinions before a unit of instruction.



# Applications



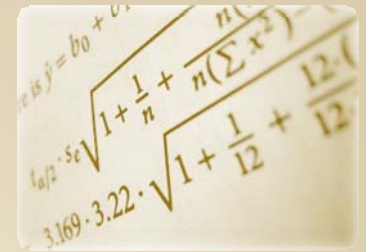
Used by faculty teaching:

- Biology
- Theology
- Bible or religion
- Psychology





# Pentecostal Contributions

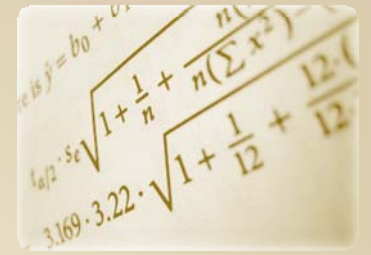


- Pentecostals:
  - Have not developed a *distinctive* theology of origins.
  - Have embraced Evangelical & Fundamentalist positions.
- Amos Yong:
  - Integrates emergence theory with pneumatology.
  - Expresses a dynamic role of the Spirit in creation via evolution.
- Pentecostals should be open to divine creation via evolution.



Yong, A. 2006. "*Ruach*, the Primordial Waters, and the Breath of Life: Emergence Theory and the Creation Narratives in Pneumatological Perspective," in Michael Welker, ed., *The Work of the Spirit: Pneumatology and Pentecostalism* (Grand Rapids: Eerdmans), 183-204.

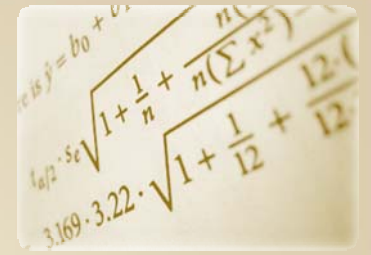
# Conclusions



- The Online Origins surveys are valid and reliable.
- Pentecostal students and educators today have diverse views on Origins.
- Ancient creation views are gaining prominence among Pentecostals in higher education.
- Responses to survey items are often inconsistent with self identified camp affiliation.

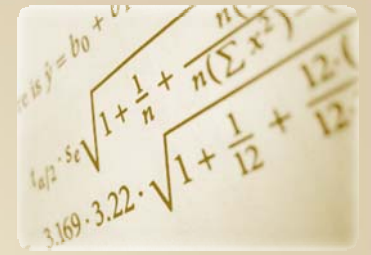


# Acknowledgements



- Dr. Amos Yong, Regent University
- Dr. Robert Cook, The Alliance for AG Higher Education
- Dr. Marilyn Abplanalp, The Alliance for AG Higher Education
- Dr. Robert Spence, President, EU
- Dr. Glenn Bernet, VP Academic Affairs, EU
- Dr. Mike McCorcle, Chair, Department of Science & Technology, EU



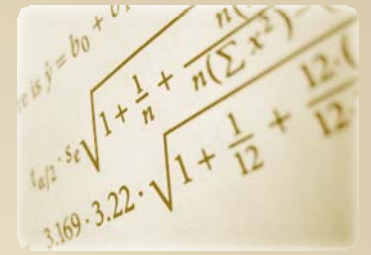


A decorative graphic in the top right corner featuring mathematical formulas. The formulas include the linear regression equation  $\hat{y} = b_0 + b_1x$ , the standard error of the estimate  $s_e = \sqrt{1 + \frac{1}{n} + \frac{n(\sum x^2)}{n(\sum x^2)}}$ , and a numerical calculation  $3.169 \cdot 3.22 \cdot \sqrt{1 + \frac{1}{12} + \frac{12 \cdot (12 \cdot 12)}{12 \cdot 12}}$ .

# Questions? Comments?



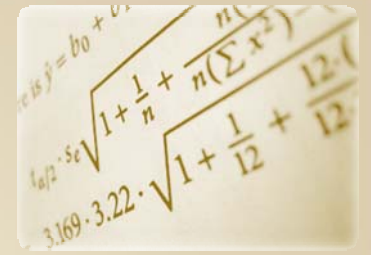
# Usefulness in Teaching



- Evaluate consistency between stated camp affiliation and bases for holding these views.
- Evaluate the effectiveness of various instructional approaches.



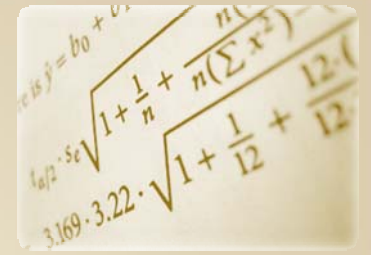
# Recommendations to Teachers



- Explain the effects of the following on beliefs about Origins:
  - epistemology
  - presuppositions
  - theories of the natural sciences
  - worldviews
- Teach that a position on Origins should be based on an honest attempt to integrate the biblical creation accounts and the findings of science.



# Recommendations to Teachers

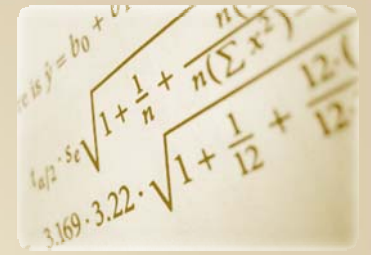


- Let the advocates for each Origins camp speak to that view's strengths, and let the detractors summarize the weaknesses.
- Teach that intelligent, informed, genuine Christians embrace different positions on Origins.





# Recommendations to Teachers



- Show people the evidences and arguments and insist that they think and arrive at their own conclusions.
- The areas of agreement among YEC, OEC, and EC are greater and more important than the areas of disagreement.
- Christians should stop fighting and dividing over Origins and work together to address other important issues.

