



A Basic Science Pre-Test to Assess Academic Risk of First Year Nursing Students

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Background

- High attrition of first year baccalaureate students
 - Focus on program completion
- Science, pre-requisite grades predict program completion
 - Robert (2018)
 - Seago et al (2012)
 - Newton et al. (2007, 2009)
 - Simon, McGinnis & Krause (2013)
- High school preparation varies widely!



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Who needs help? Project goal...

- Target students who may struggle in sciences
- Early connection to tutoring and supplemental instruction
- Premise: **A student starting “from scratch” or who has poor recall skills will have greater difficulty**



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Collaboration with science faculty on key questions

- Who struggles ?
- Who is “starting from scratch”?
- Which students have poor recall or lack of exposure to science?
- Can we make an easy to administer screening test?



Development of a screening “pre-test”

- 3 science faculty collaborated
- 25 multiple choice items developed
- Item analysis reviewed
- Items slightly revised in 2017



Sample item

- Electrically charged atoms are called

A. Ions

B. Isotopes

C. Molecules

D. Elements

Sample item

- Which step of gene expression results in the production of a messenger RNA molecule?
 - A. RNA replication
 - B. DNA replication
 - C. Transcription
 - D. Translation

Sample item

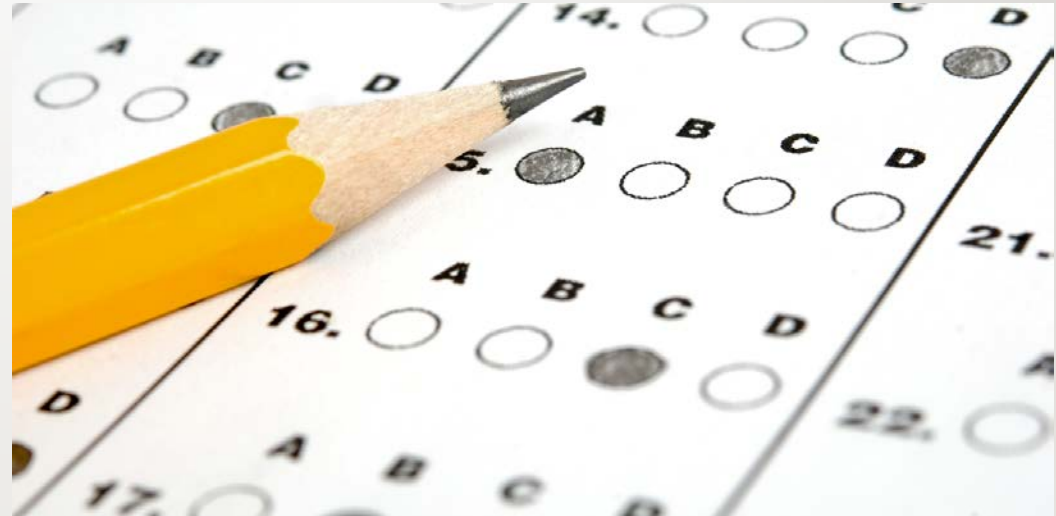
- In mitosis, which of the following is true?
 - A. One haploid cell and one diploid cell are formed
 - B. Two haploid cells are formed
 - C. Two identical diploid cells are formed
 - D. Four haploid cells are formed

Sample item

- The basic building blocks of proteins are:
 - A. Nitrogenous bases
 - B. Amino acids
 - C. Triglycerides
 - D. Monosaccharides

Administration

- Orientation weekend
- 30 minutes scheduled
- Paper and pencil
- Assistance by Academic Support Center staff



Results

- Mean score for nursing students
16/25 (64%)
- KR20= 0.60 (Years 2014-16, n= 485)
- KR20 = 0.67 (Revised 2017, n= 187)

Results: Correlation of Pretest and Grades

- Statistically significant, $p < .05$
 - Positive correlation: Science pre-test scores and:
 - Separate science course grades across freshman year
 - Cumulative science GPA
- Higher pretest scores, higher science grades

Results: Pretest score (Hi/Lo) and Eligible to Progress

- Pearson Chi-Square:

$$\chi^2 (2, N= 485) = 8.967, p = .003$$

- Students with low scores less likely to be eligible to progress

Action

- Score 12 or lower shared with students
 - Notified of risk
 - Advised to utilize resources
- Goal = Raise student awareness & mobilize to action



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Next steps

- Track utilization of resources in Academic Success Center
- Interviews to assess qualitative feedback about transition to collegiate science study
- Development of early interventions to support science learning



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Questions?



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- Thank you for your attention!