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How Do Medications Work in our Bodies?

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edTPA Lesson Plan

Grade Level: 9th

Subject / Content area: STEM: Living Environment, Mathematics, Chemistry

Unit of Study: Cells, Probability, Organic Chemistry

Lesson Title: How do medications work in our bodies?

Group Members: David Krebs, Carolina Ramos, Morgan Sanford, Steven Lauffer

Central Focus for the learning segment:

How can binomial probability be used to investigate the interaction between cells, cell receptors, and medicine molecules?

Content Standard(s):

NYS Living Environment Standards - 3.1a, 1.2j.
Next Generation Science Standards – HS-LS1-2
NYS Chemistry Standards – 3.1ff
Common Core Standards ELA-Literacy. RST.9-10.7
Mathematics Common Core- S-MD: 2,6,7, S-IC: 2, 5, F-IF: 4.
Mathematic Practices- 1, 2, 4.

Learning Objectives

1. The student will use the AgentSheets model and identify a relationship between medicine compounds and the cell receptors.
2. The student will be able to determine the success of a cell receptor binding to a medicine molecule by using the binomial probability equation.
3. The student will explain and justify their results publicly in a gallery walk.

Instructional Resources and Materials

Computer, AgentSheets program, excel, smartboard, calculators, colored pencils (drawing) and class activity worksheets.

Instructional Strategies and Learning Tasks

The Legacy Cycle, 5-E Learning Model, Universal Design for Learning (UDL), Thumbs up/thumbs down (Buehl (2014) p. 96), Turn and talk (Daniels p. 34), Guided inquiry teaching (Chiappetta p. 125), Model activity (Vaughn p. 165), Grouping and Cooperative learning (Chiappetta p. 138), Gallery walk (Daniels p. 115).

Differentiation and planned universal supports:

Students will be receiving explicit instruction (verbal, written, and modeled). Differentiated learning supports include kinesthetic learning (virtual model), visual (graph), and tactile (item that represents the pharmaceutical medication) . Audio (Spoken and recorded text can be available). The classroom environment will be conducive and accessible to meet diverse student needs, and individual accommodations

Language Function students will develop. Additional language demands and language

supports:

Analyze, Explain, Identify, Represent, Interpret, Predict, Compare and Contrast

Type of Student Assessments and what is being assessed:

- **Informal Assessment:** Thumbs up/thumbs down if understand instructions.
Review warm-up questions; clarify misconceptions and provide corrective feedback.
- **Formal Assessment:** Completed worksheet and gallery walk presentation
- **Modifications to the Assessments:** Students can create a video to present their results.

Evaluation Criteria: Rubric

Relevant theories and/or research best practices: Thumbs up thumbs down, think-pair share, modeling, explicit instruction, increased wait time, scaffolding content, collaborative learning, and gallery walk.

Lesson Plan:

Time (min)	Description
5	Warm-up with AgentSheets model
10	Class Share: Go over model & warm questions. How do medications interact with cells in the body? Reinforce prior knowledge & clarify misconceptions
20	Activity engagement – Complete worksheet - Graph data and calculate binomial probability - Determine which medication is effective.
10	Gallery walk -Use information interpreted from graph and the AgentSheets to explain how medications interact with the cells in our body (solving the authentic problem).

References:

- Buehl, D. (2009). Classroom strategies for interactive learning (3rd ed.). Newark, Del.: International Reading Association.
- Buehl, D. (2014). Classroom Strategies for Interactive Learning (4th ed.)(pp. 148-150). Newark, DE: International Reading Association.
- Daniels, H., & Steineke, N. (2011). Texts and lessons for content-area reading. Portsmouth, NH: Heinemann
- Vaughn, S. (2012) *Strategies for Teaching Students with Learning and Behavior Problems* (8th ed.). Upper Saddle River: Pearson

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