

MAST @ FIU

Biscayne Bay Campus

SUMMER ASSIGNMENT FOR HONORS PHYSICS

Overview

Miami-Dade County Public Schools recognizes the importance of ensuring that students continue to strengthen scientific and problem solving skills and develop a passion for science beyond instructional requirements. Experience and current research support the idea that students who are actively engaged in scientific inquiry throughout the summer demonstrate improved academic performance during the following school year. Cultivating scientific inquiry helps build problem solving skills and enriches students' knowledge base. In addition, increased independent scientific inquiry helps prepare students to be successful in meeting more rigorous academic standards as schools transition to Science Florida Standards.

Summer scientific inquiry provides students with an opportunity for personal exploration and continued intellectual growth. It serves as an essential component of the instructional process in schools. As stated above, research has shown that students who engage in scientific activities throughout the summer improve academically during the following school year. However, school summer science activities are not intended to be excessive or curtail students' participation in recreational and/or family activities.

Required Reading

Obtain and read *Storm in a Teacup: The Physics of Everyday Life*, by Helen Czerski (ISBN 978-0393355475). The book is available through numerous on-line providers for less than \$11.00

Book Summary

Storm in a Teacup is Helen Czerski's lively, entertaining, and richly informed introduction to the world of physics. Czerski provides the tools to alter the way we see everything around us by linking ordinary objects and occurrences, like popcorn popping, coffee stains, and fridge magnets, to big ideas like climate change, the energy crisis, or innovative medical testing. She provides answers to vexing questions: How do ducks keep their feet warm when walking on ice? Why does it take so long for ketchup to come out of a bottle? Why does milk, when added to tea, look like billowing storm clouds? In an engaging voice at once warm and witty, Czerski shares her stunning breadth of knowledge to lift the veil of familiarity from the ordinary.

Assignment

After reading the novel, chose two of the following activities to complete:

1. Blow up two identical balloons one more than the other. Take care that air doesn't leak until you've joined the balloons by a short length of tubing. Explain what happens when they are joined. This same phenomenon occurs when soap bubbles are joined.
2. Obtain a glass and a piece of cardboard that is larger than the mouth of the glass. Fill the glass half way with water and place the piece of cardboard on the mouth of the glass. Holding the cardboard against the glass, invert the glass so the cardboard is on the bottom. Slowly remove your hand. Describe what you observe and explain what happened.
3. Obtain a small jar. Fill the jar half way with water and place a penny in the jar and position the penny so that it is in the center of the bottom. Look down that the penny from various angles. What do you see? How does the image you see change if you place your hand on the side of the jar? Does the image change if your hand is wet? Explain what is happening.