Chapter 1 – Process of Science

Java Report: Making sense of the latest buzz in health-related news

Driving Questions
1. How is the scientific method used to test hypotheses?
2. What factors influence the strength of scientific studies and determine whether the results of any given study are applicable to a particular population?
3. How can you evaluate the evidence in media reports of scientific studies?
4. How does the scientific method apply in clinical trials designed to investigate important issues in human health?

Story Summary
This chapter uses experiments and studies about the effects of caffeine, particularly in coffee, to illustrate the process of science. Drawing on examples of conflicting information on the health effects of drinking coffee, the story explains the process of conducting an experiment and factors that can influence the strength of a scientific conclusion, including sample size.

A study in Psychological Science by Ryan et al. on caffeine and memory is used to illustrate the basic components of a controlled experiment (hypothesis, dependent and independent variables, results, conclusion). A study in JAMA by Ross et al. on Parkinson’s disease is used to illustrate the strengths and weaknesses of epidemiological studies, including the idea that correlation does not equal causation.

Core science includes:
- Process of science
- Controlled experiments
- Impact of sample size
- Correlation and causation

Science for a changing world (story-specific science) includes:
- Interpreting conflicting conclusions and media reports of scientific studies of coffee consumption
- Impacts of caffeine on the human body

For additional information: