Chapter 10 – Mutations and Cancer

Driving Questions
1. What are mutations, and how can they occur?
2. How does cancer develop, how is it treated, and how can people reduce their risk?
3. Why do people with “inherited” cancer often develop cancer at a relatively young age?

Story Summary
This chapter follows Lorene Ahern, a 47-year-old mother of two who was diagnosed with breast cancer. Using Ahern’s story, the chapter discusses the genetic causes of cancer, the origin and types of mutations, and cancer treatments.

Ahern inherited a mutation in *BRCA1*, a known cancer-susceptibility gene. The chapter discusses the normal function of BRCA proteins in DNA repair and how mutations in *BRCA* genes can lead to defective DNA repair processes.

People who inherit a *BRCA* mutation have a much higher risk of getting certain types of cancer than people without these mutations. Though it can seem drastic, preventive surgery has been shown to reduce risk of cancer by up to 90% in the organ being removed.

Core science includes:
- Mutations, including causes and types
- Cancer and cell cycle regulation
- Impact of mutations on protein structure/function
- Alleles
- Oncogenes and tumor suppressor genes
- Cancer development and progression

Science for a changing world (story-specific science) includes:
- *BRCA* and inherited cancer
- Cancer treatment
- Reducing cancer risk

For additional information: