

LESSON PLAN: Magnetic Currency with *Smack Dab in the Middle of Maybe*

In *Smack Dab in the Middle of Maybe*, Cricket uses a doogaloo to open the treasure box. Doogaloos, also known as scrip, were coins created to be used as currency in some mill towns. Students will use the doogaloo in the novel as a starting point for finding out more about metals and magnetism.

Learning Objectives

- Students will be able to identify a doogaloo and its purpose.
- Students will be able to define *ferromagnetic*.
- Students will be able to identify the metals that are ferromagnetic.
- Students will be able to identify the metals used in U.S. and Canadian currency.
- Students will be able to explain why some coins are magnetic while others are not.

Supplies

- *Smack Dab in the Middle of Maybe*
- Computers for student use
- One magnet per student
- US coins of various denominations
- Canadian coins of various denominations

Introduction

In *Smack Dab in the Middle of Maybe*, Cricket uses a doogaloo to open the treasure box. The doogaloo works as a key because it is magnetic. In this lesson, students will learn about doogaloos and magnetic metals.

1. In Chapter 7 of *Smack Dab in the Middle of Maybe*, Cricket describes the tiny, round painting her mother gave her. When her cousins try to blow it up with a firecracker, the paint comes off of the surface. Instruct the students to read Chapter 7 again, paying close attention to the description of the painted object.
2. Have the students read the article about scrip on these pages: <https://remembercliffside.com/odds-ends/artifacts/scrip/> and <http://www.appalachianhistory.net/2015/09/company-store-scrip.html>
3. As a class, discuss what a doogaloo was and how it was used.

Main Lesson

1. Instruct the students to re-read Chapter 18 about the doogaloo in *Smack Dab in the Middle of Maybe*.
2. In Chapter 7, Cricket says that the doogaloo is the same color as a nickel. As a class, brainstorm as to why this is important when she uses it to open the wooden box.
3. Explain that the box opened because the doogaloo was made of nickel, a magnetic metal. Only three metals are ferromagnetic, or strongly attracted to a magnet. Iron and cobalt are the other two. Resource:
<https://www.acs.org/content/dam/acsorg/education/resources/highschool/chemmatters/articlesbytopic/metals%20and%20nonmetals/chemmatters-april2007-coins.pdf>

Independent Practice

1. Provide students with magnets and a variety of US and Canadian coins. Instruct them to test the coins to see which are attracted to magnets and which are not.
 2. Ask the students to create a chart showing this data. Be sure to include the date of each coin.
 3. Have the students share their results with the class. Did they find any coins that were magnetic?
 4. Explain the findings to the class. Resources:
<https://www.usmint.gov/learn/history/coin-production>
<http://www.science.ca/askascientist/viewquestion.php?qID=337>
- U.S. Pennies: Only pennies made in 1943 are magnetic. Pennies that year were made of steel; steel is made from iron and carbon. All other pennies since 1864 are made of copper and zinc (not magnetic).
 - U.S. Nickels: Nickels are 75% copper and 25% nickel. Although there is nickel in the coin, it's not enough to magnetize it (not magnetic).
 - U.S. Dimes and Quarters: While they appear silver, dimes and quarters are made mostly of copper with a small amount of nickel (not enough nickel to be magnetic).
 - Canadian Pennies: From 1908 until 1997, Canadian pennies were 95.5 percent copper (not magnetic). From 1997 through 1999, the Canadian penny was mostly zinc (not magnetic). From 2000 until the last year Canadian pennies were minted (2013), the pennies were 94% steel (magnetic).
 - Canadian Nickels: From 1922-1981, nickels were made mostly of nickel (magnetic). From 1982-1999, they were made mostly of copper (not magnetic). Since 2000, the nickels are made mostly of nickel-plated steel (magnetic).

- Canadian Dimes, Quarters, and Fifty-Cent Pieces: These were made mostly of nickel until 2000 (magnetic). Since 2000, they are made mostly of steel (magnetic).

Extensions

- Research the composition of coins in other countries. Are those coins magnetic? Why or why not?
- Research to find out how magnets work. Prepare a presentation with a working visual using magnets for the class.
- Find out more about doogaloos, or scrip. Why did companies create them? Did people like using them? Why or why not?

Assessment

Student will create a chart showing which coins are magnetic.

Standards

CCSS.ELA-LITERACY.SL.6-8.1
CCSS.ELA-LITERACY.SL.6-8.2
CCSS.ELA-LITERACY.L.6-8.1
CCSS.ELA-LITERACY.L.6-8.3
CCSS.ELA-LITERACY.RST.6-8.3
CCSS.ELA-LITERACY.RST.6-8.9
CCSS.ELA-LITERACY.RH.6-8.2
CCSS.ELA-LITERACY.RH.6-8.4