

Are you a Numismatist?
Identifying and Discussing Currency
Teacher Resource

Grade Level **5-12**

Objectives

1. The student will observe and seek out unique features of U.S. currency.
2. The student will learn the concept of probability.
3. The student will employ simple equipment and tools to gather data.
4. The student will demonstrate the use of 21st century technology with a document camera.

National Standards

NSS-EC.5-8.11 ; NSS-EC.9-12.11	Role of Money
NSS-USH.5-12.2	Colonization and Settlement
NSS-USH.5-12.3	Revolution and the New Nation
NM-DATA.9-12.3	Develop and evaluate inferences and predictions that are based on data
NM-DATA.9-12.4	Understand and apply basic concepts of probability
NT.K-12.1	Basic Operations and Concepts
NT.K-12.3	Technology Productivity Tools
NT.K-12.6	Technology Problem-Solving & Decision-Making Tools

Teacher Background Information

This activity might be used to bring new life and vision to some applied probability and word problems, while giving the students the chance to explore the world of currency. U.S. coins have some very unique and distinctive features that set them apart from one another, that make counterfeiting difficult, and make them interesting for U.S. citizens. This exercise gives the teacher the opportunity to discuss the differences among the artistic forms of engraving, lithography, casting, and etching. Additionally students can sharpen their powers of observation by being challenged to find certain objects embedded in the engraving and casting of United States currency.

This activity is rich in its possibilities for teacher and students. The lesson here can be as simple as let us look at things on coins we never stop to look at. Or the lesson can be tied to American history and discussion why an event, animal, figure, edifice or whatever was worth being engraved onto a coin in commemoration. The lesson can be as rich as the instructor wishes it to be. Have your students use a search engine to get background information -- look at terms such as: US coins, Rare U.S. Coins, Old U.S. Coins, History of U.S. Coins, U.S. Nickels, U.S. Currency, U.S. Mint.

MATERIALS

Document Camera
Personal Computer
Interactive White Board/Projector
Penny
Buffalo Nickel (1913-1938)
Nickel (2004, 2005)
Quarter from each state (2010)
New \$1, \$2, \$5 Bill

PROCEDURE

Use the document camera to project an image of coins and paper money onto a projection screen, white board, or interactive board.

Activity 1

1. Explore the fibers of paper money. In what direction(s) do they run? Does the ink run in a certain direction?
2. On the penny: the initials VDB are engraved into the bottom left of the shoulder of the bust, just at the rim of the coin. Originally larger, but later scaled down, they are the initials of the designer, Victor D. Brenner. You need a clean, bright, penny to see it at all.
3. Abe Lincoln's statue is engraved between the center two columns of the Lincoln Memorial on the back of a penny.

4. Look at various nickels:
 - On a “Buffalo” nickel (1913-1938), is that a buffalo or a bison? Does the animal have a beard? Are the animals the same on the old nickel compared to the new one issued in 2005?
 - Find a 2005 Jefferson nickel, with a new profile of Jefferson (first change in 67 years) and a hand-written Liberty, on the face side. On the ‘tails’ side, note that some are of the Peace Medal and some are of a Keelboat from the Lewis and Clark expedition.
 - Since 1938 to 2004, nickels had what building on them, and which President owned that house?
 - Do you have any “Indian Head” nickels in your collection?
 - On some 2004 nickel’s two hands are shaking, what great event in American History is being commended? Why would it be on a nickel with Jefferson?
 - Some nickels from late 2005, on the ‘tails’ side say “Ocean in View! O! The Joy!” Who wrote this line and why did he write it? Do you think his spelling and grammar should have been corrected to put on a coin?
5. On the one-dollar bill: there appears to be an owl or spider in the upper-left corner of the upper-right shield.
6. On the five-dollar bill: The Lincoln Memorial on the back has the names of the states of the Union during Lincoln's term at the top of the columns. The shadows of the bushes at the lower left appear to form a four-digit number.
7. On the face side of the five-dollar bill: the loops on the edge of the bill have the words “five dollar” spelled out.
8. Look at the whole range of new quarters issued in the last nine years. Why did states pick the incident, person, or scene to commemorate? What is the history behind that engraving?
9. Have students examine other coins and bills in order to find little things the engravers have placed in order to reduce the ability to counterfeit currency.

Activity 2

1. Students should now be encouraged to create and solve probability problems and work problems. Here are two examples:

2. *Problem 1:* What is the probability of getting a \$1 bill with the serial numbers all to be ones and have the letter B as both the prefix and suffix?

Answer to Problem 1 $(25)^2 + (9)^8 = 43047346$ possible outcomes

So the probability is 1 in 43047346 chances or .0000000232302 or .0000232302% that you will get this type of \$1 bill.

3. *Problem 2:* What is the probability of not getting this type of bill in the above problem? (hint: probability can never exceed the value of 1)

Answer to Problem 2 $1 - .000000023202 = .99999976798$

So, the probability is 99.9999976798% that you will not get this type of bill.

4. *Problem 3:* If you had 10 billion \$1 notes and spent one every second of every day, how many years would take for you to become broke?

Answer to Problem 3 $60 \times 60 \times 24 \times 365 = 31,536,000$ per year

$1.0 \times 10^9 / 31,536 \times 10^3 \approx 317$ years

5. Have students create own problems or teacher generate more.

PRESENTATION

Have students prepare a lab report including the data, images, and video to give a presentation on the interactive white board or projector for the class.

EXTENSION

- Use a document camera to examine various stamps. What things show up on stamps that are there to prevent copying? Have stamps followed a similar history in the United States? The world?

- Have the students design their own coin to commemorate a local event or historical incident.