SHOW ME THE SHREDS!

Federal Reserve Bank *of* Kansas City

Teacher Introduction

Students often wonder how U.S. currency is produced and delivered to their bank or financial institution. This interactive lesson walks them through the currency process from production to final shredding. They learn how the fitness of a bill is determined, the average lifespan, and how bills are recycled for other uses. A final art competition can be done with shreds from the Federal Reserve Bank.

Lesson Description

Students will be introduced to the production and distribution process for U.S. currency. They will learn about financial services that the Federal Reserve gives to banks and credit unions in this process. Students will become aware of efforts to recycle unfit currency, and have the option of participating in a Shred Challenge art competition based on a personal finance theme.

Grade Level: 6-12

Concepts: Bureau of Engraving and Printing, Treasury, Federal Reserve Bank, fit/unfit currency, counterfeit

Time Required: 60 minutes for lesson; 1-3 hours for art competition

Objectives:

Students will be able to:

1. Describe the roles of the Bureau of Engraving and Printing, Treasury, and Federal Reserve Bank in the printing and distribution of currency.
2. Explain how currency is processed from its production to its shredding.
3. Give examples of ways that unfit currency can be recycled.
4. Complete a Shred Challenge art project (optional).

Materials

- Visual 1, "Follow the Cash Flow Name Cards," cut into individual cards
- Visual 2, "Follow the Cash Flow Scenario," 1 copy for teacher
- Website link for fit/unfit bills "Fitness Guidelines for Federal Reserve Notes," p. 4-8
  http://www.frbservices.org/files/operations/pdf/FRB_fitness_guidelines_2008_dec_11.pdf
- Handout 1, "How Long Does Currency Live?"; one copy for each student

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Procedure

1. Hold up a bag of shredded money and ask students if they can identify what's inside the bag. (*Answers will vary.*)
2. Inform students that the bag holds money that has been shredded by the Federal Reserve Bank. Tell them that the Federal Reserve is the central bank of the United States, which means it is the main bank for commercial banks. One of its roles is offering financial services to these banks and credit unions. It fulfills this role by distributing money to these financial institutions when needed, and by storing excess money in its vaults when not needed. It also collects currency that is worn, dirty, torn or otherwise unfit to be in circulation for shredding.
3. Ask students if they know where U.S. currency is printed. (*Answers will vary. Possible responses could be the bank; the Federal Reserve; or some other organization.*) Tell them that the Bureau of Engraving and Printing (BEP), which has two locations in Washington, D.C. and Fort Worth, Texas, prints all U.S. currency. The BEP is part of the Treasury, which oversees production of currency and coins, revenue collection (taxes), and payments to the public (such as Social Security and IRS payments).
4. Announce that students will take part in an activity to show how currency is processed. Choose 13 volunteers to represent the following organizations: Scene 1: Treasury; Bureau of Engraving and Printing; Armored Car A; Federal Reserve Bank; FRB Vault. Scene 2A: Commercial Bank A; Federal Reserve Bank; Armored Car B. Scene 2B: Commercial Bank B; Fit Currency; FRB Vault; Unfit Currency; Shredder; Counterfeit Currency; Secret Service. (Volunteers representing the Federal Reserve Bank and the FRB Vault are in multiple scenes.) Give each volunteer a name card from Visual 1, "Follow the Cash Flow Name Cards" to hold. Tell volunteers that you will read Visual 2, "Follow the Cash Flow Scenario," and that they should follow the movement directions on their card to show the route currency takes from production to shredding.
5. Display the website link showing photos of actual fit and unfit notes. Explain that the Federal Reserve uses the following guidelines to help determine whether bills are fit or unfit:
   a) $20, $10 and $5 should not be older than 1996 to be fit currency.
   b) Bills should not be too soiled or dirty to be fit currency.
   c) Bills should not show "ink wear" or blurring of ink due to use.
   d) Bills should not have tears or missing corners to be fit currency.
   e) Bills should not be written on extensively.

   Discuss reasons why each bill pictured on the website is labeled fit or unfit.
6. Distribute Handout 1, "How Long Does Currency Live?" Discuss that currency is made of 75% cotton and 25% linen, making currency paper much more durable than paper from wood pulp. When bills eventually become unfit, the smaller denomination notes (*$1, $5, $10*) generally wear out before the larger denominations (*$20, $50, $100*) because they are used more often for transactions. Ask students to review the chart. Which bill has the longest lifespan and what is the average number of years? (*$100 - 15 years*) Which has the shortest lifespan and what is the number of years? (*$50 - 3.7 years*) Why is that surprising information? (*The $50 bill is a large denomination, so you would think it would have a longer lifespan.*) Can you think of reasons why the $50 bill has a shorter span? (*Answer will vary, but could include the idea that people like to carry and pay for items with $50 bills, or that $50 bills are given out when paychecks are cashed.*)

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7. Tell students that when the unfit currency is shredded, all denominations are mixed during the shredding process. A portion of these shreds are recycled and packed into souvenir bags for the public. The average bag from the Kansas City Fed has an approximate value of $165 in shredded money.
8. Inform students that most of the cash shredded goes to landfills today. Challenge them to guess how many dollars are shredded in the Tenth District (which includes Colorado, Wyoming, Nebraska, Kansas, Oklahoma, parts of New Mexico and Missouri) in a year (*approximately $2.5 billion*). Explain that some of this shredded money is now being recycled in other ways. The Treasury has approved of combining shreds with other materials to produce roofing shingles, countertops, insulation and fuel pellets. Novelty items made with shreds include pens, ornaments, jewelry, key chains and picture frames. Ask students to think of other ways that shreds might be recycled. (*Answers will vary.*)

NOTE: If you will be participating in the optional Shred Challenge art project, discuss possible sculptures or works of art that could be created using shreds.

Closure

9. Ask students the following questions:
   a) What is the role of the Bureau of Engraving and Printing? (*The BEP prints all U.S. currency.*)
   b) What is the role of the Federal Reserve Bank in the area of financial services? (*The Federal Reserve is the central bank of our country, and has the role of being the bank for other financial institutions. The Federal Reserve receives new currency from the BEP and stores it in its vaults for use by banks, and also stores banks' excess currency. In addition, it collects currency from banks that are worn, dirty, torn or otherwise unfit for shredding.*)
   c) What is the role of the Treasury? (*The Treasury oversees production of currency and coin, collects revenues, or taxes, and makes payments to the public, such as Social Security and IRS.*)
   d) Explain how currency is processed from production to shredding. (*The **U.S. Treasury** authorizes a new printing of bills. The **Bureau of Engraving and Printing** receives this authorization and begins the printing process. After the notes are produced, they are transported by **armored car** to the **Federal Reserve Bank**. The **Federal Reserve** receives the bill and stores them in the **Fed vault** for future use. A **commercial bank** orders some new bills from the **Federal Reserve**. The **Federal Reserve** prepares the order and gives it to an **armored car** to be delivered to the **commercial bank**. Another bank sends excess currency by **armored car** to the **Federal Reserve** for storage. When the **Fed** receives the excess money, it uses high-speed machines to count and verify the total deposit. The counters separate the bills into **fit currency**, which is money that can be recirculated, and **unfit currency**, which is money that is worn, dirty, written on, torn or otherwise unfit to be recirculated. The **fit currency** is sent to the **vault** to be held for future bank requests. The **unfit currency** is **shredded**. Any **counterfeit or fake currency** found is held out and delivered to the **Secret Service** for investigation.*)
   e) How can unfit currency by recycled? (*Unfit currency can be shredded and recycled into souvenir bags at the Federal Reserve. It can also be recycled into shingles, countertops, insulation, fuel pellets, jewelry, pens, and other decorations.*)

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Enrichment Activity (Optional)

10. Introduce the "Shred Challenge" art project by telling students they will have a chance to recycle shreds into an art piece that reflects a financial theme. They must create an original work of art using the following guidelines:
    - The project can contain up to three bags of shredded money and must use a mat board surface of 11" x 14" for the base or as a canvas.
    - The artwork can be two or three-dimensional and must stay within the mat board dimensions.
    - The project must be at least 60 percent shredded currency (visibly more than half).
    - An essay of 250 words or less must accompany the artwork, describing the piece and how it reflects a financial theme. Suggested themes include: saving; financial decision-making; budgeting; choosing a financial institution; investing. (Check with your local Federal Reserve for this year's specific topic.)

    Each student will be provided with bags of currency and the mat board surface through the participating Federal Reserve Bank. (NOTE: Not all Federal Reserve branches participate in the competition. For information, contact the Federal Reserve economic education department closest to your location at: www.kansascityfed.org/education/contacts. Logistics, judging and awards information will be available through your local contact.)

Content Standards

Common Core Standards

English and Language Arts - Reading
- CCSS.ELA-Literacy. RL. 6.1; 7.1; 8.1
- CCSS.ELA-Literacy. RI.9-10.3
- CCSS.ELA-Literacy. RI.11-12.3

National Economic Standards
Content Standard 10 - Institutions
Grade 8, Benchmark 2

National Standards for Financial Literacy
Strand 3 - Saving
Grade 12, Benchmark 6

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VISUAL 1 - FOLLOW THE CASH FLOW NAME CARDS

Treasury

Scene 1: Walk to BEP and shake hands.

Bureau of Engraving and Printing (BEP)

Scene 1: Pantomime printing dollars, then walk to Armored Car A.

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VISUAL 1 - FOLLOW THE CASH FLOW NAME CARDS

Armored Car A

Scene 1: Load dollars and drive to Federal Reserve Bank.

Federal Reserve Bank

Scene 1: Unload dollars and walk to Vault.
Scene 2A: Pantomime bagging dollars, then walk to Armored Car B.
Scene 2B: Receive dollars and feed them into machine for counting, ending up with two piles for Fit and Unfit currency.

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VISUAL 1 - FOLLOW THE CASH FLOW NAME CARDS

Vault

Scene 1: Receive the dollars and put on shelf to store.
Scene 2B: Receive Fit currency and put on shelf to store.

Commercial Bank A

Scene 2A: Pantomime signing order and walk to Federal Reserve Bank.

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VISUAL 1 - FOLLOW THE CASH FLOW NAME CARDS

Commercial Bank B

Scene 2B: Walk to Armored Car B and hand off dollars.

Armored Car B

Scene 2A: Load dollars and drive to commercial bank to deliver.
Scene 2B: Load dollars and drive to Federal Reserve Bank to deliver.

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VISUAL 1 - FOLLOW THE CASH FLOW NAME CARDS

Fit Currency

Scene 2B: Walk to Vault to be stored.

Unfit Currency

Scene 2B: Walk to Shredder and crumple to the floor as you are shredded.

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VISUAL 1 - FOLLOW THE CASH FLOW NAME CARDS

Shredder

Scene 2B: Pantomime shredding dollars.

Counterfeit Currency

Scene 2B: Walk to Secret Service with your head down.

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VISUAL 1 - FOLLOW THE CASH FLOW NAME CARDS

Secret Service

Scene 2B: Pantomime handcuffing Counterfeit Currency and walk with him/her off stage.

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VISUAL 2 - FOLLOW THE CASH FLOW SCENARIO

Scene 1: The **U.S. Treasury** authorizes a new printing of $20 bills. The **Bureau of Engraving and Printing** receives this authorization and begins the printing process. After the notes are produced, they are transported by **armored car** to the **Federal Reserve Bank**. The **Federal Reserve** receives the bills and stores them in the **Fed vault** for future use.

Scene 2A: A **commercial bank** orders some new $20 bills from the **Federal Reserve**. The **Federal Reserve** prepares the order and gives it to an **armored car** to be delivered to the commercial bank.

Scene 2B: Another bank sends excess currency by **armored car** to the **Federal Reserve** for storage. When the Fed receives the excess money, it uses high-speed machines to count and verify the total deposit. The counters separate the bills into **fit currency**, which is money that can be recirculated, and **unfit currency**, which is money that is worn, dirty, written on, torn or otherwise unfit to be recirculated. The **fit currency** is sent to the **vault** to be held for future bank requests. The **unfit currency** is **shredded**. Any **counterfeit or fake currency** found is held out and delivered to the **Secret Service** for investigation.

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HANDOUT 1 - HOW LONG DOES CURRENCY LIVE?

Denomination	Estimated Lifespan*
$1	5.9 years
$5	4.9 years
$10	4.2 years
$20	7.7 years
$50	3.7 years
$100	15.0 years

* Information from www.federalreserve.gov/faqs/faq.htm, Dec., 2012. The $2 is not included because of limited use.

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