

# **Games and Simulations**

**Show Me The Money!**

**A Fractional Reserve Banking Simulation**

**Introduction:**

Fractional Reserve Banking is a fundamental part of all modern economies. First introduced in Europe in the 16th Century, bankers ever since have made sure to lend out most - but not all - of the deposits held by their institutions. Originally the reason for holding a fraction in reserve was to protect the bank in case many or most of its depositors needed cash at the same time. Today there are reserve requirements imposed on American banks by the Federal Reserve System in its ongoing effort to manage the nation's money supply.

Whether imposed by prudence or a banking regulation system, fractional reserve banking enables banks to "create money" through lending, thereby expanding the money supply during times of economic growth.

**Objectives:** After this lesson students will be able to

* Calculate the amount of money created by banks in the classroom economy.
* Appreciate the role of banks as creators of money.
* Understand the importance of fractional reserve banking in the process of money creation.

**National Economics Standards Addressed:**

Standard 10 : Role of Economic Institutions  
Institutions evolve in market economies to help individuals and groups accomplish their goals. Banks, labor unions, corporations, legal systems, and not-for-profit organizations are examples of important institutions. A different kind of institution, clearly defined and enforced property rights, is essential to a market economy.

Standard 11 : Role of Money  
Money makes it easier to trade, borrow, save, invest, and compare the value of goods and services

**Intended Audience**: Middle and High School students studying US History or Economics

**Class Time Required**: 45 to 50 minutes

**Materials Required**:

* Copies of **Handout 1** for entire class
* Up to 6 Copies each of **Handouts 2-1, 2-2, 2-3 and 2-4** for bankers  *(It's best to staple the four pages of handout 2 together before the simulation)*
* Three copies of **Handout 2-5** per bank (*These should be cut up with scissors before the simulation begins.)*
* Copies of Handouts 3, 4 & 5 (8 or 9 copies of each)
* Overhead or copies of **Handout 6** for entire class
* Overhead or copies of **Handout 7** for entire class
* 6 Calculators
* Chocolate or candy to give as prizes

**Procedures:**

This activity consists of 11 steps:

1. GENERAL DISCUSSION - Where does money come from?

This can be done with a question on the white board, or a short writing assignment that students can answer at their desks. Students will normally say from "the government", which isn't wrong. The direction you want to suggest, however, is that there may be other agencies out there creating money every day.

2. STARTING THE ACTIVITY: Explain that today's activity is designed to answer the question of where money comes from. Then go over the role descriptions with the class (Handout 1). When the class understands the roles and general procedure of the game, go ahead and select students for each role.

For a class of 35 you will need

6 Banks - 2 students per bank - Handout 2 for each bank

Three pages of handout 2.5 per bank, preferably cut up before hand

23 Borrowers - Handout 3, 4 & 5 (7 or 8 copies of each)

For smaller classes: The ratio of bankers to borrower should be about six borrowers per bank, so a class of 25 would have 4 banks, a class of 20 can get by with only 3 banks.

Each student should get a copy of the handout for his or her particular role.

3. ROUND 1: Give students a moment to read over the particulars of their roles, and then ask if everyone is ready for round one. At this point there are two things to stress with your classes:

* *First, borrowers can borrow only one time per round of the game.*
* *Second, no cash changes hands in this game.* Borrowers get Loan Certificates rather than money.
* *Third, successful borrowers must deposit their loan certificates into a bank other than the one which lent them the funds*. This is important for students to understand - loans become deposits. You'll return to this idea in the debriefing of round 1.

When everyone is ready, go ahead into the first round of the activity, allow borrowers to mingle with bankers and attempt to get funding for their special projects. Round one should last about five minutes - enough time for every borrower to speak to at least two bankers. Successful borrowers will get loan certificates (handout 2.5) - these will be essential for round 2 of the game.

4. DEBRIEF ROUND 1, asking the following questions.

* *How many borrowers were able to get funding in round 1?*
* *For those who were turned down, why did the bank say no?*
* *How many bankers met their goal of lending 80% of their assets?*
* *When those dollars were lent, where did they go?*
* *(The answer to the last question is crucial. When banks lend money it inevitably appears as deposits in some part of the banking system. You can discuss this for a minute with the class. When a bank lends money to someone, it creates deposits for that person. The person then spends the money on a car or something else, but the seller of the car puts the loaned funds into a bank before paying his employees - banks are central to nearly every transaction in an economy.)*
* *Each bank started with $10,000 - Bankers do you have more than that now? How come?*
* *What is all that extra money doing in the economy?*

5. GO ON TO ROUND 2: In Round 2 successful Round 1 borrowers must deposit their funds. They can deposit them in **any bank other than the one where they borrowed**. Bankers need to record their deposits on the Bank Balance sheet. This step shows students that loans from one bank become deposits in another bank after the money is used (spent) by the borrower. This should take about 3 minutes.

After all the bankers have calculated how much they have in new deposits remind them that they can only lend 80% of the new deposits. This should take the bankers about 2 or 3 minutes to calculate.

Go on with borrowing activity in round 2. Round 2 lasts roughly five minutes.

6. DEBRIEF ROUND 2 using the following questions:

* Did all borrowers make deposits into another bank? *(The answer here needs to be yes. All loans must become deposits somewhere.)*
* Borrowers how did you decide which bank to deposit in? How do people decide in real life? *(In real life interest rates attract borrowers, but in this simulation we're keeping things simple in order to focus on the concept of money creation.)*
* Did all bankers receive some new deposits? *(This answer, too, must be yes. Every bank should have new deposits, but some will have more than others.)*
* What do you think this symbolizes in the actual economy? *(In the actual economy this symbolizes what happens to the money after the borrowers spend it. Whoever receives those funds puts them into the bank - so a loan in one bank becomes a deposit in another bank.)*
* Bankers, do you know how to figure out how much you have to lend in round 3? *(This is where the calculator comes in handy - bankers can lend only 80% of their new deposits in round 3.)*
* Borrowers, are you ready?

You may have some students who have achieved their goal after round 2. If so, reward them with candy (or whatever reward you're using) and tell them to sit quietly. If you want to include those students who have finished you can make them bank examiners to check the math of each bank in the simulation.

7. GO ON TO ROUND 3: In Round 3 successful round 2 borrowers must deposit their funds. They can deposit them in **any bank other than the one where they borrowed**. Bankers need to record their deposits on the Bank Balance sheet. This step shows students that loans from one bank become deposits in another bank after the money is used (spent) by the borrower. This should take about 3 minutes.

After all the bankers have calculated how much they have in new deposits remind them that they can only lend 80% of the new deposits. This should take the bankers about 2 or 3 minutes to calculate.

At the end of round 3 direct the bankers to start working on their Banking Summary Sheet (the last page of **handout 2**). Debrief the borrowers as the bankers record their data.

8. DEBRIEF ROUND 3 using the same questions that you used for round 1:

* *How many borrowers were able to get funding in round 3?*
* *For those who were turned down, why did the bank say no?*
* *How many bankers met their goal of lending 80% of their assets?*
* *When those dollars were lent, where did they go? (The answer to the last question is crucial. When banks lend money it inevitably appears as deposits in some part of the banking system. You can discuss this for a minute with the class. When a bank lends money to someone, it creates deposits for that person. The person then spends the money on a car or something else, but the seller of the car puts the loaned funds into a bank before paying his employees - banks are central to nearly every transaction in an economy.)*
* *Each bank started with $10,000 - Bankers do you have more than that now? How come?*
* *What is all that extra money doing in the economy?*

9. CALCULATE THE MONEY SUPPLY: Once the bankers have gathered their data, write the numbers on the white board. Go to the graphing the money supply handout. (**Handout #6**) Have a student in class add it up using a calculator and then graph the growth in money from round 1 to round 3. Have students fill in the graph with the amounts of total deposits in each round.

**Handout 6** can also be used as a written assessment for the simulation also. Once you have the bankers' data, write it up on the whiteboard or on an overhead. Have the kids graph it and then answer the question in writing at the bottom of the page. They can write their names on the top and you can collect them.

10. DEBRIEF THE SIMULATION using the questions in **Handout 7**. This can be done as an overhead or a handout.

11. Give chocolate or candy to the bankers who got the most bonus cash, and to the borrowers who were able to achieve their borrowing goals. This should be all borrowers by the end of round 3.

**Handout 1**

*Fractional Reserve Banking Simulation*

**Role Descriptions**

This simulation has two roles: bankers and borrowers. Read the summary of these roles, then go on to the game procedures.

|  |  |
| --- | --- |
| **Bankers**  (2 students per bank)  Calculator Required | **Borrowers**  (all non-banker students) |
| Objective:  ***To lend out money to borrowers, following some important rules:***  - You cannot lend more than 80% of the assets in your bank in any round.  - You get 10 points for each loan to a Low Risk borrower, 5 points for each loan to a Medium Risk borrower and 3 points for each loan to a High Risk borrower.  - You must fill out your balance sheet at the end of every round. | Objective:  ***To borrow money from a bank in each round of the game.***  - Your goal is to borrow the amount of money shown in your role description.  - You may make ONE loan per round.  - You may not be able to borrow all of the money at once. In that case, you should try to borrow more money in the next round.  - When asked your level of risk you MUST answer truthfully.  - You'll get a loan certificate for each loan you get. This must be deposited in another bank.  - You must fill out your balance sheet at the end of each round. |

**Procedure**

* First, you'll get a balance sheet with specific role information. You'll need to know this information in order to apply for loans or lend money.
* Second, our simulation will consist of three rounds. In each one you'll try to achieve your role's objective - carefully following all the rules of the game.
* Finally, we'll track what happened in our economy and give prizes.

**Handout 2-1**

*Fractional Reserve Banking Simulation*

**Bank Balance Sheet - Round 1**

Congratulations! You have just opened a bank here in Smallville, USA. You have $10,000 in new deposits and the banking regulators have established you can only lend 80% of your new deposits in any given round of the game.

Your goal is to amass bonus dollars by making loans to the people of Smallville, but you have to be careful. There are three kinds of borrowers: Low Risk, Medium Risk and High Risk. For each loan you make you get bonus dollars -

|  |  |  |
| --- | --- | --- |
| **Low-Risk Loan** | **Medium-Risk Loan** | **High-Risk Loan** |
| 10 points | 5 points | 3 points |

You must also keep track of your lending in the tables below.

**Round 1 Beginning Funds**

|  |  |  |
| --- | --- | --- |
| Deposits | Lendable Funds  (80% of New Deposits) | Reserve Requirement  (20% of New Deposits) |
| $10,000 | $8,000 | $2,000 |

**Round 1 Lending**

|  |  |  |  |
| --- | --- | --- | --- |
| Borrower Name | Risk Level | Funds Lent | Points Earned |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
| TOTALS for ROUND 1 | |  |  |

**Round 1 Deposits**

|  |  |
| --- | --- |
| Depositor Name | Amount Deposited |
|  |  |
|  |  |
|  |  |
|  |  |
| TOTAL NEW DEPOSITS FOR NEXT ROUND |  |

**BANKERS - YOUR NEW DEPOSITS FROM THIS ROUND ARE USED FOR MAKING LOANS IN THE NEXT ROUND.**

**Handout 2-2**

*Fractional Reserve Banking Simulation*

**Bank Balance Sheet - Round 2**

Are you ready for round 2? Remember that your lending in round 1 creates new deposits for your bank in round 2. You can now lend up to 80% of those new deposits - so use your calculators to get the correct figures.

**Round 2**

|  |  |  |
| --- | --- | --- |
| New Deposits  *Funds Deposited*  *in Round 1* | Lendable Funds  (80% of New Deposits)  Use your calculator! | Reserve Requirement  (20% of New Deposits)  Use your calculator again! |
|  |  |  |

**Round 2 Lending**

|  |  |  |  |
| --- | --- | --- | --- |
| Borrower Name | Risk Level | Funds Lent | Points Earned |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
| TOTALS for ROUND 2 | |  |  |

**Round 2 Deposits**

|  |  |
| --- | --- |
| Depositor Name | Amount Deposited |
|  |  |
|  |  |
|  |  |
|  |  |
| TOTAL NEW DEPOSITS FOR NEXT ROUND |  |

How is it going? If you need any help with the math call your teacher/bank regulator over to help you. Just remember that your new deposits in this round are used to make loans in the next round.

**Handout 2-3**

*Fractional Reserve Banking Simulation*

**Bank Balance Sheet - Round 3**

Are you ready for round 2? Remember that your lending in round 1 creates new deposits for your bank in round 2. You can now lend up to 80% of those new deposits - so use your calculators to get the correct figures.

|  |  |  |
| --- | --- | --- |
| New Deposits  *Funds lent out in Round2* | Lendable Funds  (80% of New Deposits)  Use your calculator! | Reserve Requirement  (20% of New Deposits)  Use your calculator again! |
|  |  |  |

**Round 3 Lending**

|  |  |  |  |
| --- | --- | --- | --- |
| Borrower Name | Risk Level | Funds Lent | Points Earned |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
|  |  |  |  |
| TOTALS for ROUND 3  Transfer these totals to the next page, your Banker Summary Sheet | |  |  |

**Round 3 Deposits**

|  |  |
| --- | --- |
| Depositor Name | Amount Deposited |
|  |  |
|  |  |
|  |  |
|  |  |
| TOTAL NEW DEPOSITS |  |

Once round 3 is complete go to your summary sheet and start filling in the data.

**Handout 2-4**

*Fractional Reserve Banking Simulation*

**Banker Simulation Summary Sheet**

Look over your data from the three rounds of the game and fill in the tables below.

Lending Activity

Transfer the data from your round 1, 2 and 3 balance sheets into the table below. Use your calculator to add the figures accurately.

|  |  |  |  |
| --- | --- | --- | --- |
| Round | New Deposits | Funds Lent out  in each round | Reserve Funds  in each round |
| 1 | $10,000 |  |  |
| 2 |  |  |  |
| 3 |  |  |  |
| Totals |  |  |  |

Points Earned

Transfer your points earned from your round 1, 2 and 3 balance sheets into the table below. Use your calculator if necessary. There will be prizes for the bankers with the most points.

|  |  |
| --- | --- |
| Round | Points Earned |
| 1 |  |
| 2 |  |
| 3 |  |
| Total Points Earned: |  |

**Handout 2-5**

|  |  |
| --- | --- |
| **LOAN CERTIFICATE**  Borrower Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Banker Name : \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Round: \_\_\_\_\_\_\_\_\_  Amount: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | **LOAN CERTIFICATE**  Borrower Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Banker Name : \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Round: \_\_\_\_\_\_\_\_\_  Amount: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| **LOAN CERTIFICATE**  Borrower Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Banker Name : \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Round: \_\_\_\_\_\_\_\_\_  Amount: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | **LOAN CERTIFICATE**  Borrower Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Banker Name : \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Round: \_\_\_\_\_\_\_\_\_  Amount: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| **LOAN CERTIFICATE**  Borrower Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Banker Name : \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Round: \_\_\_\_\_\_\_\_\_  Amount: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | **LOAN CERTIFICATE**  Borrower Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Banker Name : \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Round: \_\_\_\_\_\_\_\_\_  Amount: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| **LOAN CERTIFICATE**  Borrower Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Banker Name : \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Round: \_\_\_\_\_\_\_\_\_  Amount: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | **LOAN CERTIFICATE**  Borrower Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Banker Name : \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Round: \_\_\_\_\_\_\_\_\_  Amount: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |

**Handout 3**

*Fractional Reserve Banking Simulation*

**Borrower Balance Sheet**

**Borrower A** - Polly Perfect, Model Citizen

You are a model citizen. You have borrowed money many times and always paid your loans on time. You have never missed a loan payment of any kind, ever. You now want to borrow money to remodel your house.

**Low Risk Borrower $6,000 for home remodel**

Before you start the simulation, remember the following rules:

1. You can borrow only one time in each round of the game.
2. You must tell the banker your level of risk.
3. You can only borrow up to your goal stated above - it's okay to borrow less than your goal in each round.
4. You can borrow one time in each round of the game.

|  |  |  |
| --- | --- | --- |
| Round | Banker from whom you borrowed | Amount you borrowed |
| 1 |  |  |
| 2 |  |  |
| 3 |  |  |
| Total Borrowing over all 3 rounds = | |  |

*There will be prizes for all borrowers who meet their goal*

**Handout 4**

*Fractional Reserve Banking Simulation*

**Borrower Balance Sheet**

**Borrower B** - Donald Dysfunction, Mid Life Crisis Guy

You are worried about the future. Your hairline is receding and it's not so easy to get dates as it used to be. So you need to buy a new car! You haven't always paid your bills on time but eventually you get around to it.

**Medium Risk Borrower $4,000 for car down payment**

Before you start the simulation, remember the following rules:

1. You can borrow only one time in each round of the game.
2. You must tell the banker your level of risk.
3. You can only borrow up to your goal stated above - it's okay to borrow less than your goal in each round.
4. You can borrow one time in each round of the game.

|  |  |  |
| --- | --- | --- |
| Round | Banker from whom you borrowed | Amount you borrowed |
| 1 |  |  |
| 2 |  |  |
| 3 |  |  |
| Total Borrowing over all 3 rounds = | |  |

*There will be prizes for all borrowers who meet their goal*

**Handout 5**

*Fractional Reserve Banking Simulation*

**Borrower Balance Sheet**

**Borrower C** - Pamela Plastic, Recovering Shop-a-holic

You have had a hard life. You were addicted to shopping for many years and ran up a lot of credit card bills. Now those are taken care of (you declared bankruptcy) and you want to borrow money to go to college.

**High Risk Borrower $3,000 for tuition at community college**

Before you start the simulation, remember the following rules:

1. You can borrow only one time in each round of the game.
2. You must tell the banker your level of risk.
3. You can only borrow up to your goal stated above - it's okay to borrow less than your goal in each round.
4. You can borrow one time in each round of the game.

|  |  |  |
| --- | --- | --- |
| Round | Banker from whom you borrowed | Amount you borrowed |
| 1 |  |  |
| 2 |  |  |
| 3 |  |  |
| Total Borrowing over all 3 rounds = | |  |

*There will be prizes for all borrowers who meet their goal*

**Handout 6**

*Fractional Reserve Banking Simulation*

**Money Supply Graph**

In our simulation today we started with the question "where does money come from?" Let's think about that question as we graph the data from our bankers.

Round 2

Round 3

$50 K

$75 K

$100 k

**Total Bank Deposits**

Round 1

1. Remember that money supply is the total deposits (all banks included) in any round of the game. Ask the bankers how much they had in deposits at the start of round 1, round 2 and round 3. Graph these amounts above.
2. We ended with a lot more deposits than we started with. So the question is where did the new money come from? Write your answer in the space below.

**Handout 7**

*Fractional Reserve Banking Simulation*

**Final Debriefing Questions**

Now that we've finished this simulation, there are some important concepts to emphasize and review.

1. In this activity the incentive for banks to make loans was bonus bucks/candy. What incentive do banks have for making loans in the real world? What incentive do people have for keeping their money in the bank?
2. We started with a money supply of only $50,000. We finished with a whole lot more than that. Where did the extra money come from?
3. What would the borrowers do with all the money they borrowed? Would their activity be helpful or harmful for an economy? How can you tell?
4. In our simulation all of the loans were "good" loans because the borrowers all paid them back. What would happen in an economy where people stopped paying back their loans? What would banks be forced to do?
5. Our reserve requirement in this simulation was 20%. What would happen to the simulation if it were changed to 30%? How about if it were changed to only 10%?
6. Most economics textbooks say that banks "create" money. After our simulation do you agree? Why or why not?

*Fractional Reserve Banking Simulation*

**Final Debriefing Questions**

-Teacher Version -

1. In this activity the incentive for banks to make loans was bonus points/candy. What incentive do banks have for making loans in the real world? What incentive do people have for keeping their money in the bank?

*The answer here, of course, is interest. In the real world banks are "borrowing" money from depositors (to whom they pay interest) and lending it to borrowers (who pay interest to the bank).*

1. We started with a money supply of only $50,000. We finished with a whole lot more than that. Where did the extra money come from?

*Loans that each bank made in an early round became deposits for a later round. This is how banks “create money.” Loans they make eventually become deposits in banks which can then be used to make new loans.*

1. What would the borrowers do with all the money they borrowed? Would their activity be helpful or harmful for an economy? How can you tell?

*The borrowers would be hiring people to remodel their homes, buying cars and investing in college educations. All three of these activities would stimulate demand in the economy and could potentially be very helpful. If the economy were in a slow period this could be helpful. If the economy were already humming along near the peak of the business cycle then more lending could create inflation.*

1. In our simulation all of the loans were "good" loans because the borrowers all paid them back. What would happen in an economy where people stopped paying back their loans? What would banks be forced to do?

*When people stop paying their loans off banks have to declare those loans to be "losses". This makes the bank less profitable and also makes the bank much more cautious about lending money. When the banks slow or stop their lending the economy will slow down overall. Banks might be forced to repossess things purchased with borrowed money, or even to demand payment all at once from some of their other borrowers in order to stay in business.*

1. Our reserve requirement in this simulation was 20%. What would happen to the simulation if it were changed to 30%? How about if it were changed to only 10%? *If the reserve requirement is raised to 30% then banks would lend less money, few bonus dollars would be earned and fewer borrowers would achieve their goals. If the reserve requirement were dropped to only 10% then bankers would lend more money, earning more bonus dollars and borrowers could achieve their goals.*
2. Most economics textbooks say that banks "create" money. After our simulation do you agree? Why or why not?

*Most kids should agree with this by the end of the simulation, but there are some other views which are just as accurate. Some students could say that the same dollars are in more than one place, as indeed they are. Eighty percent of the bank deposits are loaned out, but they're still considered as being "in the bank."*