

# Coins in the Classroom



## Designing Dollars

There is little doubt that the U. S. Mint's 50 State Quarters Program is a roaring success. Not only has the release of many novel quarter issues each year generated new coin collectors, but the program has also raised awareness of state and national history. As might be expected from the hundreds upon hundreds of designs that will be proposed for the quarters over the life of the program, dissenting opinions will arise. Occasionally, these discussions have even gained significant interest outside the numismatic community despite the final designs having already been adopted; as readers of Numismatic News are acutely aware.

The process of taking a design concept to a final coin is an interesting, if not convoluted one. Not only must considerations be made as to the appropriateness of a design, but the reality of whether or not the design can be appropriately translated into a coin for striking. Despite all the potential bumps along the way, the development and production of a newly designed coin is always exciting.

**PURPOSE** The purpose of this lesson is to introduce students to the process of how coin designs are created and how these designs eventually become the coins in our pockets.

**BACKGROUND** The design on a coin, the images, words, and symbolism, are all the result of an artistic process that begins with an idea or concept, is translated to a physical representation, and then ends up as the spendable piece of metal in your pocket. While it is easy to see how a work of art, such as a painting, is created, but a numismatic work of art may take a little investigating.

The first part of the long process is to develop a concept for the design on a coin. For example, suppose that a new circulating commemorative coin desired. The initial question to address is that of what would appear on the coin. At this stage, the discussion would surround what would be the primary image on both sides of the coin. Numerous factors, including historical, cultural, political, and economical play a significant role in the final decision of a coinage design.

This multifaceted approach to coinage designs is not a new circumstance; in fact, it's as old as coins are. For example, back in the late 1700's when



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the young United States was deciding on coinage designs, there was a push by members of the Continental Congress to place George Washington's portrait on the coins. The only one who seemed to object, however, was Washington himself, as he believed that a current national leader on a coin was too similar to the monarchy from which independence was won. With those sentiments from the leader of the revolution, the framers instead chose to depict representations of the founding principles of the country, such as unity, freedom and liberty.

Once all the social, political, historical, and economic issues involving the theme of the coin design have been resolved, an artist then goes about creating the concept from which the design will arise. A two dimensional design is created, most often this is an original drawing or may be a painting, or photograph. This two-dimensional object is then transformed into a plaster model, normally about 8 inches in diameter. This model is in relief, or raised, just like the future coin it represents. Once the plaster model is refined, a rubber mold is made of the model. Epoxy is then poured into this rubber mold creating a shell. The epoxy shells are then sent to the die makers. As an aside, the use of epoxy is a modern adaptation of the traditional method of creating copper shells, called galvanoes.

Since the epoxy shells are much larger than the final coin, their design must be reduced. This reduction from 8 inches is done in a single step using a process that the mint has used for well over 100 years. The designs are reduced on a Janvier transfer reducing machine. The machine works on the same basic principle of the pantograph, where a planar image is reduced through a fulcrum. One stylus traces the design of the epoxy shell while the stylus at the other end of the fulcrum cuts an exact, reduced replica of the epoxy shell into a piece of soft steel that is the diameter of the future coin. The process of tracing and cutting may take several passes and last a couple of days. The resulting piece of steel is known as a master hub. Great care is taken when producing the master hub, since many master dies, working hubs, and working dies are produced from a single master hub. But there will be more on that in a moment.

The master hub is then tempered, or hardened, by heating to very high temperatures and then cooling quickly in oil. Once the master hub is hardened, it is ready to do its job. The image on the master hub is raised, or in relief, just as the final coin. As you can imagine the master hub cannot strike any coins, instead, the job of the master hub is to make master dies. This is done with a hubbing press that slowly presses the master hub onto a piece of soft die steel. The result is that the image is transferred from the master hub to the die steel. This process is known as "hubbing". In the past, the hubbing process may have taken place several times for each



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master die to be made. The current process used by the mint is efficient in that only one “hubbing” is needed to create a master die.

Is the master die used to strike coins? No, it is used to make more hubs, these however, are called working hubs. In a similar process as outlined above, working hubs are made from master dies. Then just as master dies were made from master hubs, working dies are made from working hubs. Now, do the working dies strike coin? They sure do!

Why not just strike coins with the master dies in the first place? That would seem to make sense and save a lot of time, but that is not the case. The life of a die that strikes coins can be very short. Sometimes the die may only last for a few thousand impressions before it becomes damaged or breaks. Since each master hub can make several master dies, each master die can make several working hubs, and yes, each working hub can make several working dies. With this type of efficiency, it is easy to see how the mint can have so many dies on hand to take the place of those that are wearing out. This way, the mint can keep up with our nation’s the demand for coinage.

### DISCUSSION TOPICS

1. Compare and contrast the designs found on our current circulating coinage. Be sure to have the students discuss why the particular images are on the coins of today.
2. Show the students coins or images of coins from designs that are no longer being produced by the mint. Be sure to include designs from the 1800’s and early 1900’s. Have the students compare these historical designs with current designs and speculate why the older designs were used. Be sure to have the students discuss how the images might represent the ideals of a nation.
3. Discuss with the students a local or national issue of importance. As a group, have the class discuss how a coin commemorating that issue would be designed. Include in the discussion the denomination that would be used and what elements should be part of the design, such as the date, the place of origin, the denomination, etc.

### MATERIALS NEEDED

1. Examples of the currently circulating coins of the United States.
2. Coins from the United States made in the early 1900’s and before. Since these coins can be expensive, images of these coins will work just as well. As a potential source of actual coins, contact parents from the class who collect coins and invite them to participate in the discussion.



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3. Optional: Modeling clay or similar material.

### STUDENT ACTIVITIES

1. Have students select an event, issue, or person they would like to commemorate on a coin. Encourage the students to make notes of what is important about their choice. These notes can be used to help with their final design
2. Have the students create their design on paper, a computer, or other two-dimensional form. As an alternative, the design can be created in three dimensions using modeling clay or similar material.
3. Have the students write a brief paper discussing why they chose the design that they did and the importance of each design element to the coin.

### PRINT RESOURCES

1. *The Modern Minting Process* by James Wiles, Ph.D. This book, printed in 1997, is a correspondence course from the American Numismatic Association and it currently the most thorough and updated discussion of the minting process available from one source.
2. *A Guide Book of United States Coins* by R. S. Yeoman, edited by Kenneth Bressett. Published annually, this is the standard book of coin collectors and contains a wealth of coinage information and an estimate of values.
3. *The Art of Coins and Their Photography* by Gerald Hoberman. Published in 1982, this is a wonderful book whose emphasis is on superb quality photographs of coins throughout time. The book also discusses coinage designs and symbolism and is a welcome addition to any numismatic library.

### INTERNET RESOURCES

Search terms: Minting coins  
Coin dies and designs

Websites: <http://www.money.org>  
<http://www.usmint.gov>  
<http://www.coinfacts.com>

**Note:** This article was written by Lane J. Brunner, Ph.D. and published originally in the *Coins in Education* column in Numismatic News.

