

6-14-2006

# Matter [6th grade]

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## Repository Citation

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*Education Department*

*Understanding by Design Curriculum Units*

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*Trinity University*

*Year 2006*

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Matter

Anne Cowell  
Trinity University,

# Understanding by Design

## Unit Cover Page Matter 6<sup>th</sup> grade

Unit title: What's the matter?

Grade Level: 6

Subject/Topic Area(s): science/chemistry

Designed by: Anne Cowell

Time Frame: 5-6wks (depending on students' prior knowledge and skills)

School District: Northside Independent School District

School: Rawlinson Middle School

School Address and Phone:     Rawlinson Middle School  
  14100 Vance Jackson  
  San Antonio, TX 78249  
  (210) 397-4900

### Unit Summary:

In this unit students will identify matter by its chemical and physical properties and begin learning how to write sections of a lab report. Students will also practice using scientific equipment especially graduated cylinders, beakers, and triple beam balances.

## Unit: Matter

### Grade: 6

2006

## Stage 1: Desired Results

### Understandings

*Students will understand that...*

- Matter can never be created or destroyed only changed.
- Each type of matter has its own physical properties.
- Each type of matter has its own specific chemical properties that describe its ability to change into new matter.

### Essential Questions

### Knowledge

What is matter? What is not?  
(What are the properties of matter?)

How can matter be changed?  
(physical/chemical)

(6.7B) Demonstrate that new substances can be made when two or more substances are chemically combined and compare the properties of the new substances to the original substances.

(6.7B) Classify substances by their physical and chemical properties

### Vocabulary

### Skill

Matter  
Density  
Physical property  
Plasma  
Precipitate  
Chemical property  
Flammability  
Oxidation  
Reactivity  
Tarnish

Safety  
Form hypothesis  
Collect data  
Make inferences and predictions  
Draw conclusions  
Construct charts  
Use chemical formulas  
Use beakers and measuring tools  
Recognize patterns and extrapolate data

## Stage 2: Assessment Evidence

Performance Task:

- **Dirty Money**  
Scenario: It has been discovered that the tarnish on pennies harbors many germs that could pose a health risk if tarnished pennies are left circulating. Assignment: Create a procedure to clean pennies using the available lab materials and submit it to the U.S. mint with an explanation of your experiment's results.
- The Baffled Baker: students use physical and chemical properties to identify unknown samples. <http://www.uh.edu/hti/cu/2004/v03/07.pdf>

Other evidence:

Labs with conclusion questions

quiz

Exit slips

District unit test

## Stage 3: Learning Activities

*(Steps taken to get students to answer Stage 1 questions and complete performance task)*

- Phases of matter lunch sort, notes on molecule movement in states of matter, run in place like a solid, liquid, and gas, WS identify molecules on the move and illustrate molecules in each state
- What makes matter change state? What if temperature changes but not enough for matter to change state? Do multiple mini expts (*eggstra-ordinary expt, funny money, its cold in here, a real cool expt, jug of fun, mass water as ice and then liquid*) to witness this info and practice hypothesizing, hypothesis practice sheet
- What is matter?, *No vacancy* expt...use inquiry to come up with matter def. take notes on how to measure volume. Station lab measuring volume. Measure volume in beaker of water and leave out...hypothesize volume measurement next week.  
Use *blow out* expt to demonstrate matter has mass and volume, practice hypothesis, Mass “station” lab by passing objects from desk to desk. Exit slip with volume pics
- (review hypothesis form in warm-up) Potato lab (students describe potato and then have to find it again in a group of potatoes), notes on observations and physical properties (review mass and volume) Measure volume in beaker of water that has been sitting out, practice listing properties of materials in the room, sort objects into groups by physical properties as a class w/hoola hoops
- How do you know if a piece of pie is good? Do you need to measure it?...etc. Discuss physical property observations and take notes on qualitative and quantitative...Sort index cards with observations into qualitative or quantitative, Measure volume in beaker of water that has been sitting out, Twizzler lab...vocabulary review using letter game
- Measure volume in beaker of water that has been sitting out. How can matter be changed? Provide paper, paper clip, ice, have students describe properties before and after physical change. Dissolve sugar in water and discuss what happened. Station lab where kids test solubility of household items being sure that they measure mass and volume. Is this a physical property? Qualitative or Quantitative?
- Sugar cube dissolving race if time
- Measure volume in beaker and discuss. Use suitcase and then packing peanuts to discuss and demonstrate density. Lab mixing oil and water. Use sugar water and plain water if time.
- Does an egg float in water? Can we make it? How can density help us with this? Lab adding salt to water until egg floats...us this lab to begin learning to write a procedure Matter and physical properties quiz
- Have a student make observations of a pencil. Break the pencil. How has it changed? Is it still a pencil? This is a physical change. Define chemical property. Discuss and burn pencil. Identify new substance and describe its physical properties. Make silly putty using glue and borax. Its all in the bag rxn with calcium chloride sodium bicarbonate and phenol red.
- Chemical changes station lab then notes on signs of a chemical change, Read “A Case of

Foul Play” and determine what type of properties the detectives used. Two kinds of change WS

- Food coloring and water then bleach, dry ice with warm soapy water watch and discuss chem. vs. physical
- Alka Seltzer lab...students write procedure, identify chemical change, and take mass to see matter is never created or destroyed. Identify same principal with dissolving kool-aid, massing before and after. Physical vs chemical WS
- Graphic organizer for physical/chemical change. Sort physical/chemical change cards with a partner...check as a class...explain your answer for the cards with stars
- Tarnished pennies task



Solving the problem of...

# Dirty Money

**From:** United States of America

**To:** Rawlinson laboratory

**Memo:**

The tarnish on pennies has been found to provide a great home for germs. We want our nation healthy. A method of cleaning pennies must be developed and explained to the Center for Disease Control. Use the enclosed form to submit your cleaning method to our office.

**Question/Problem:**

What available materials can be used to easily clean the tarnish from pennies?

**Hypothesis:**

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**Materials:**

- 10mL Vinegar with salt
- 10mL Vinegar
- 10mL dish soap
- 10mL dish soap with salt
- 4 paper towels
- 4 beakers
- 4 tarnished pennies

**Pre-lab information:**

1. List at least three physical properties of the tarnish on the pennies:
2. List at least three physical properties of each cleaning solution:
  - Vinegar with salt:
  - Vinegar:
  - Dish soap:
  - Dish soap with salt:



*Attempt to clean each penny with the possible cleaning agents. You may scrub or soak the pennies as you wish. Give a brief description of the procedure you plan below then list each step you go through as you are performing the experiment.*

Procedure Summary:

**Procedure:**

- 1.
- 2.

**Results:**

Cleaning agent	Penny appearance before	Penny appearance after

**Conclusions:**

1. What cleaning agent worked best on the pennies?

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2. Explain how you know it is the best agent?

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3. Did you utilize a physical or chemical change to clean the pennies?

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4. How do you know it was a chemical or physical change (EXPLAIN)?

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5. Where is the germ filled tarnish now?

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6. Did your hypothesis agree with the results?

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7. Why do you think it your hypothesis agreed or did not?

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