

The Junk Drawer Matter Mystery Game

Grade 5th

Vocabulary

physical property
 solid
 liquid
 gas
 conductor
 insulator
 opaque
 mass
 sink
 float
 grams
 solubility
 insoluble
 conduct
 insulate
 relative density
 testable
 observable
 measurable
 magnetism

Activity Overview

In this activity students will classify matter using a Venn diagram for categorization. After collecting this data, students will create a master table to record the outcomes of all the Venn data collected. Using the table students will create mystery matter cards that they will use to guess which junk drawer item they are describing to each other.

TEKS Alignment

5.5A The student is expected to classify matter based on measurable, testable and observable physical properties, including mass, magnetism, physical state (solid, liquid and gas), relative density (sinking and floating using water as a reference point), solubility in water, and the ability to conduct or insulate thermal energy or electric energy.

THE SCIENCE BEHIND IT:

Matter is anything that takes up space and has mass. Matter also has physical properties. A physical property is a term used by scientists to describe characteristics of matter so that you can distinguish one type of matter from another. An example of physical properties might include shape, color, size, density, mass or the ability to be attracted to a magnet.

Knowing and testing for the characteristics of matter comes in handy to scientists in every type of science. For example, geologists might use matter properties to describe different rocks that they discover. In turn, the types of rocks a geologist finds can tell the scientist what happened on the Earth's crust. Without the ability to find a rock's color, size, or mass, we would not be able to create theories about the origins of the rocks.

Here are some of the properties of matter that 5th graders should be familiar with:

- **Mass** (How does the matter of an object compare by weight to something else?)
- **Magnetism** (Can the object be attracted by a magnet? This can tell us if the object contains iron or nickel.)
- **Physical state** (Is the matter solid, liquid, gas or a combination?)
- **Relative density** (Can the object sink or float in water? If it floats, does it suspend in water or does it lay on top?)
- **Solubility** (Can the matter dissolve in water and create a solution?)
- **Conduct electricity or hear** (Can the matter allow heat or electricity to flow, or does it stop it from flowing?)

ENGAGE: CLASSIFYING MATTER BOOK

Students will read the classifying matter foldable included in the student resources.

EXPLORE: PART #1: Measuring, Testing and Observing Matter

Materials:

- Objects and materials that represent solids, liquids and gases that you would normally find in a junk drawer at a house: rubber band, twisty tie, coins, pencil, eraser, metal objects, wooden objects, small toys, and powders and liquids that are and are not soluble in water
- Tools to test the objects: scale to measure mass, graduated cylinders and beakers to measure volume and to see if items sink or float, an electric circuit that includes a small light bulb to test for conductivity, a spoon, clear cups, a magnet
- Tools to collect data: Venn diagram, index cards, Venn diagram worksheet or science journal

Procedure:

1. Have each student bring at least 3-5 items found in a junk drawer at their home. Items should be made of different materials such as metal, glass, plastic, rubber, wood, etc. Teacher should provide to each group 2-3 samples of liquids (including WATER) and soluble and non-soluble samples, such as salt, sugar, and sand. If the group does not have examples of gases, please provide a baggie, balloon or ball that contains air. Each group should have at least 20 items made of different materials and representing different phases of matter.
2. Using circles, label the index cards to read the category that the group will be testing or investigating. Categories are listed in the Venn diagram worksheet and include:
 - magnetic/ not magnetic
 - soluble, not soluble
 - more than 5g, less than 5g clear
 - opaque
 - sink, float
 - conductor of electricity, insulator
3. Students take turns testing or making observations about the items and place them into the appropriate part of the Venn diagram.

4. Group records their findings on the Venn diagram worksheets or in their science journal.
5. Data for a total of 6 observations or tests should be collected so that students have enough data to complete the next activity.

EXPLAIN: PART #2: Organizing Data

Materials:

- “Design a Table” worksheet or science journal
- Chart tablet paper, markers

Procedure

1. Students will design a chart that lists the items tested in the Venn diagram investigation. The charts will be developed individually and not as a group. The chart should meet the following criteria:
 - Be properly titled and labeled
 - Includes all the properties investigated
 - Includes all items being tested or observed
 - Is easy to read and interpret
2. Chart critique: Students will share their charts that they designed with their group to see which chart best fits the criteria. The best chart will be copied onto chart tablet paper with markers and will be shared with the class. Group members will help create the chart by helping to draw and label the items that were tested on the chart paper surrounding the chart. Groups will use this chart to create the next activity.

ELABORATE: PART #3: Creating the Junk Drawer Matter Mystery Game

Materials:

- Mystery Card Template Printed Double Sided (front and back)
- Pencils
- Group Chart

Procedure:

Students will design game cards for the Junk Drawer Matter Mystery Game using their Group Charts:

1. The group will cut apart cards from the template and distribute them evenly among the group members.
2. Using the chart, each student will write clues about each piece of matter that was investigated. Each clue must be verified through the group chart, (example: attracted by a magnet or soluble in water).
3. If there are items that have identical properties to other items on the chart, the group may use a clue that distinguishes that item from the other item (example: color, measurement or other property).
4. At the end of each clue list, there should be a correct answer listed so that the person giving the clues can verify the correct answer.
5. Once all of the cards are prepared, the group is ready to set up their game table by placing the mystery cards and items from the investigation in the middle of the table and place the chart in a place that can be easily accessed.

How to play the game!

- All items are placed on the table in front of the group.
- Student groups will rotate so each group plays a game with items that they did not test.
- The person with the birthday closest to today's date will give clues to the person on their right. From there, players will play going counter-clockwise.
- The clue-giver will read the clues on the mystery card. If the item is guessed correctly, the person will pull the item from the middle of the table.
- If the guess is not correct, the person to the right can steal the item by giving the correct answer.
- The person with the most mystery items guessed wins the round.
- Groups will rotate with the next group after completing the round.
- Charts and game cards can be saved for games to play in class or for a review.

