Essential Question: How are elements, compounds, and mixtures related?

S8P1b. Describe the difference between pure substances (elements and compounds) and mixtures

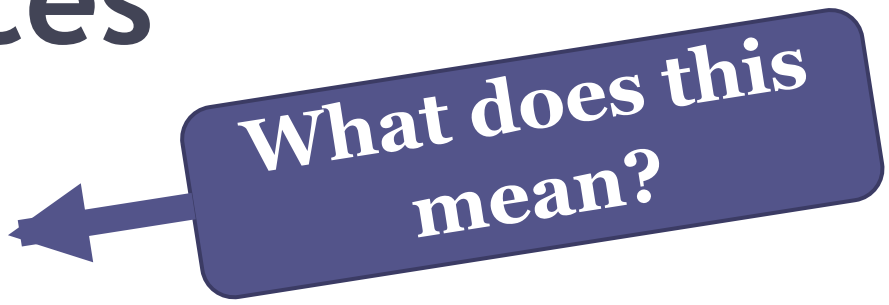
Matter is anything that has mass and takes up space (volume)

There are different types of Matter: Pure Substances (elements and compounds) and Mixtures

The composition (structure) of a substance determines its Matter type.

Characteristics of Pure Substances

- Fixed composition
- Distinct properties
- Cannot be separated into simpler substances by physical methods
- Can only be changed in identity and properties by chemical methods
- Properties do not vary one sample to another sample

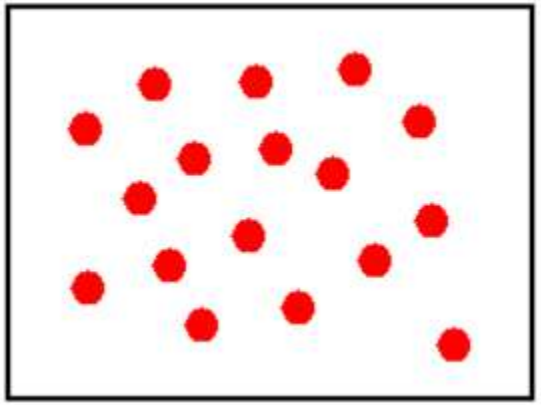


Types of Pure Substances:

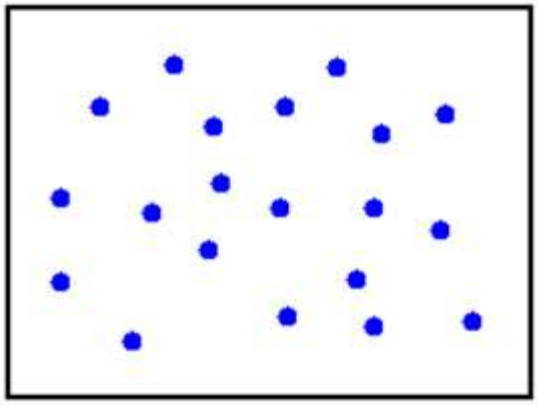
Elements And Compounds

Elements

- Made up of one type of atom
- Cannot be broken down by physical and chemical methods
- Examples: Oxygen, Nitrogen, Carbon

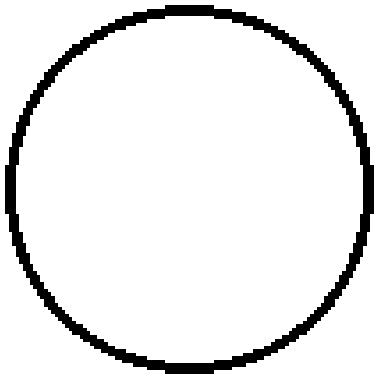


Sample of the Element Lead



Sample of the Element Chlorine

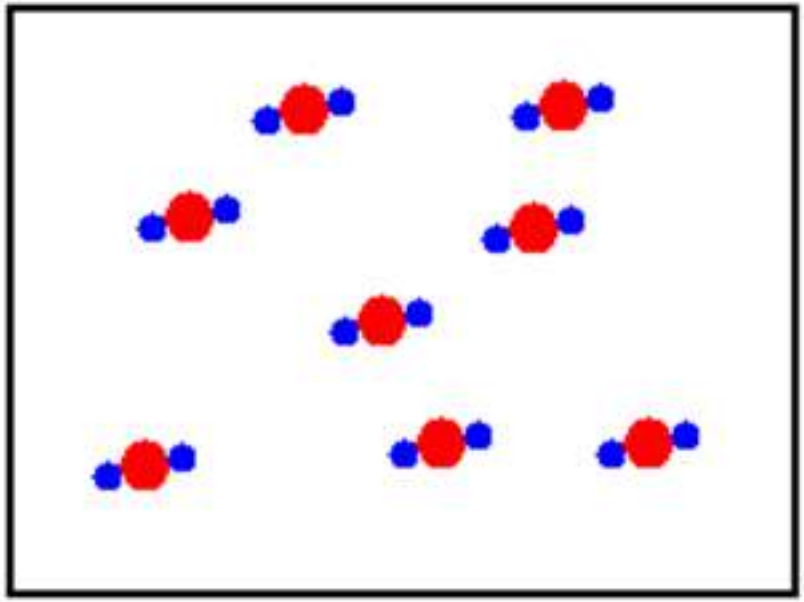
Compounds

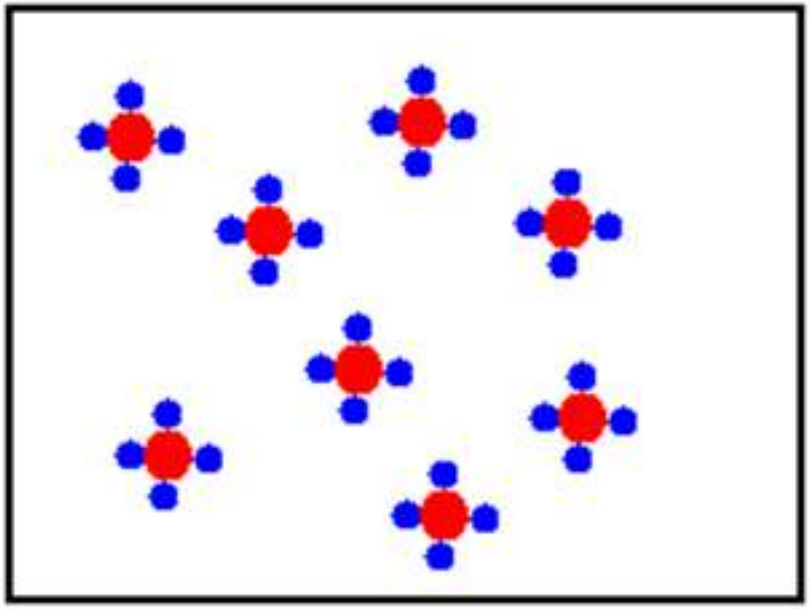


- Form when two or more different elements join (bond) together chemically
- Composition is identical in each sample
- Can be separated only by chemical methods
- Properties of a compound are totally different than the properties of the elements that form them
- Examples: Water, Carbon dioxide, Sugar

Animated images and notes from http://www.chem.purdue.edu/gchelp/atoms/elements.html

Compounds



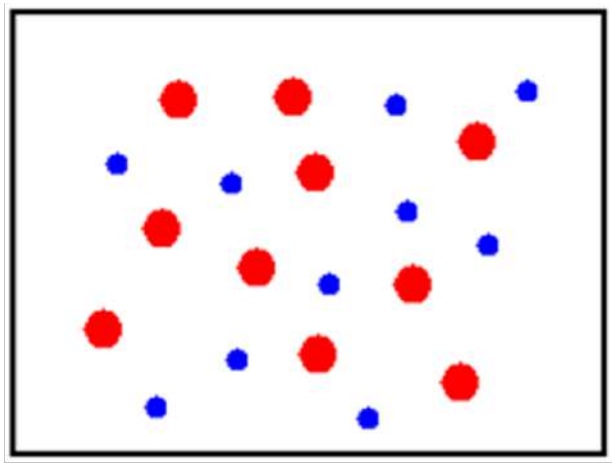


Elements and Compounds Study Jams Video

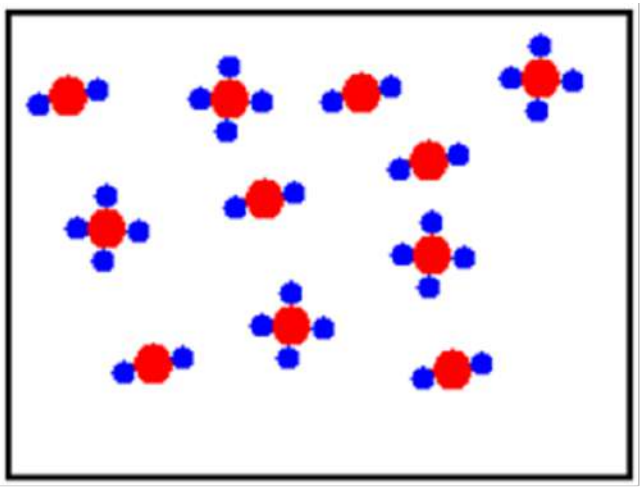
http://studyjams.scholastic.com/studyjams/jams/science/matter/elements-and-compounds.htm

Mixtures

- Form when elements and/or compounds are combined physically NOT chemically (no reactions between substances)



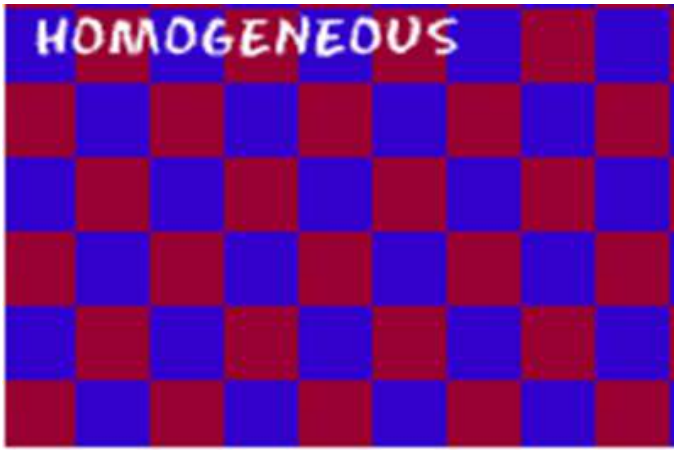
Mixture of Different Elements

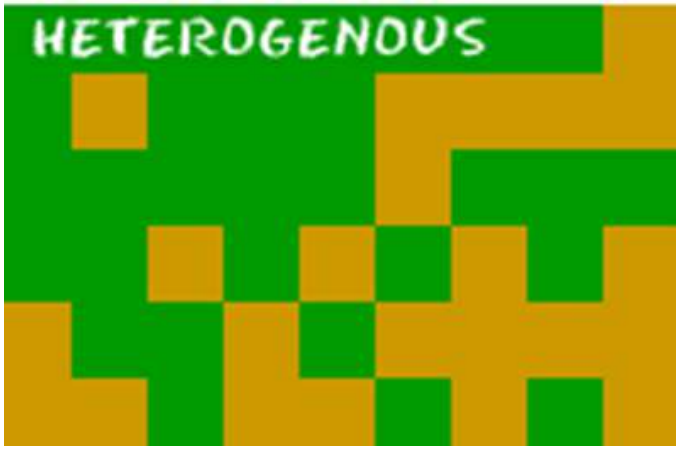


Mixture of Different Compounds

Mixtures

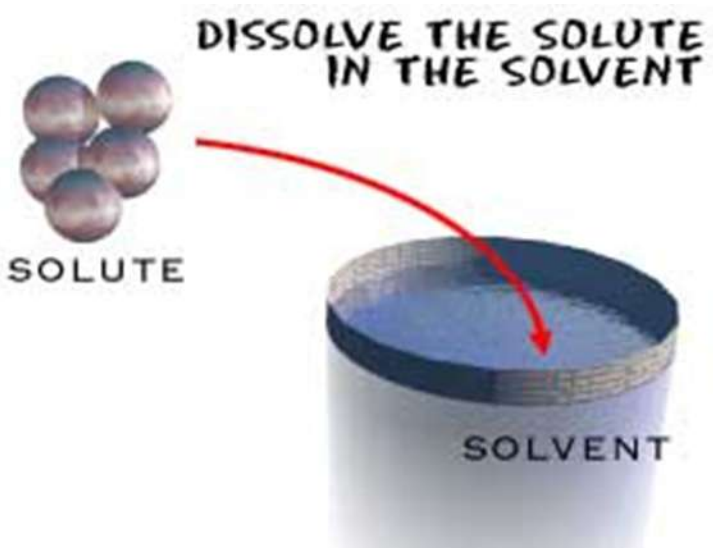
Mixtures are often referred to as homogeneous or heterogeneous.

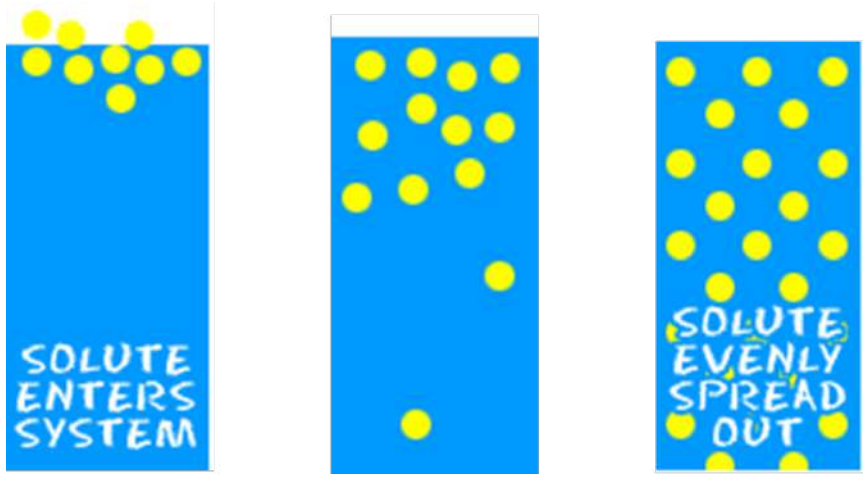




Mixtures

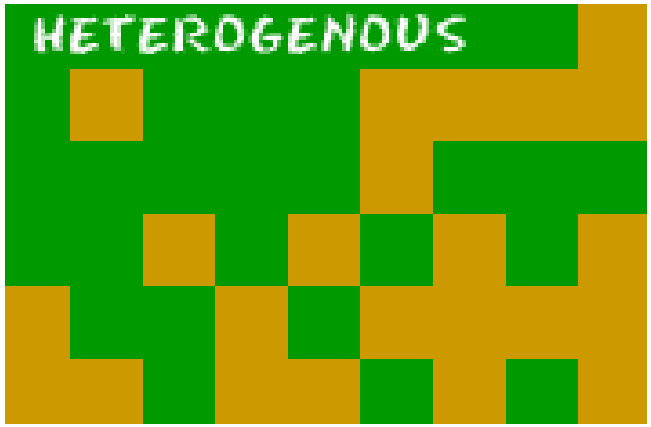
- Homogeneous mixtures (called Solutions) have a uniform distribution.
- For example: Tea, Perfume, Air





Mixtures

- Heterogeneous mixtures do not have a uniform distribution.
- Parts are often visible
- For example:
  Salad, Beach Sand,
  Oil and Vinegar dressing



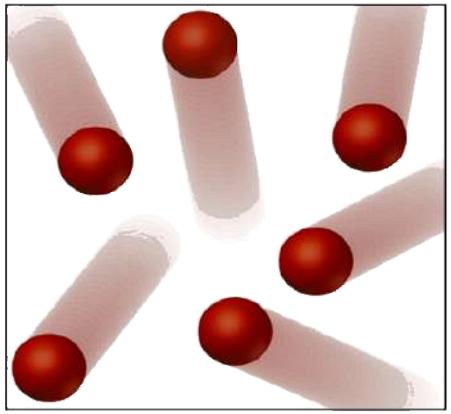
Mixtures

- Properties of a mixture are related to its components
- Composition varies from sample to sample
- Can be separated by physical methods
- Examples of Mixtures: Tea, Perfume, Air, Salad, Beach sand, oil and vinegar salad dressing, etc.

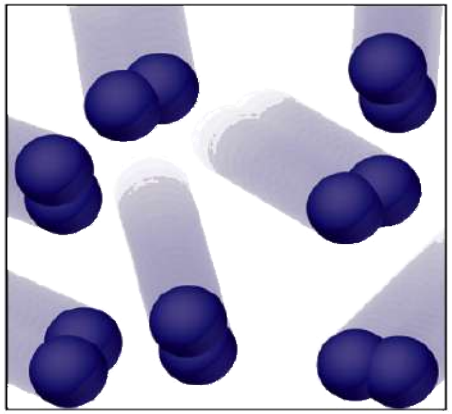
Mixtures Study Jams Video

http://studyjams.scholastic.com/studyjams/jams/science/matter/mixtures.htm

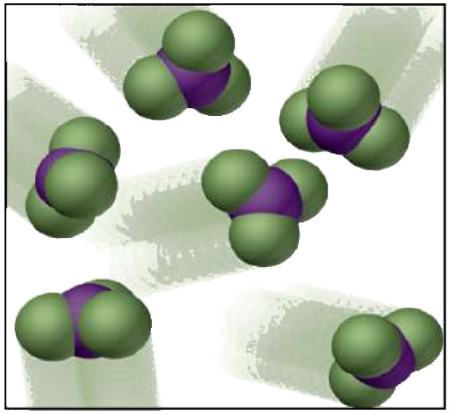
Distinguishing between Elements, Compounds, and Mixtures



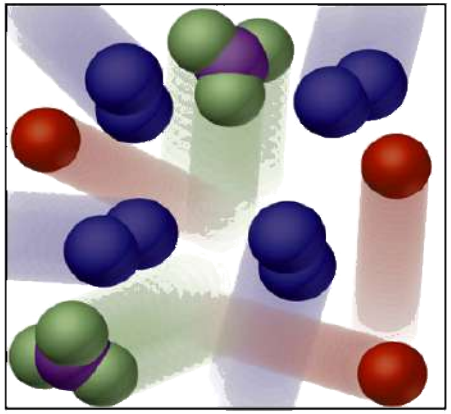
(a) Atoms of an element



(b) Molecules of an element



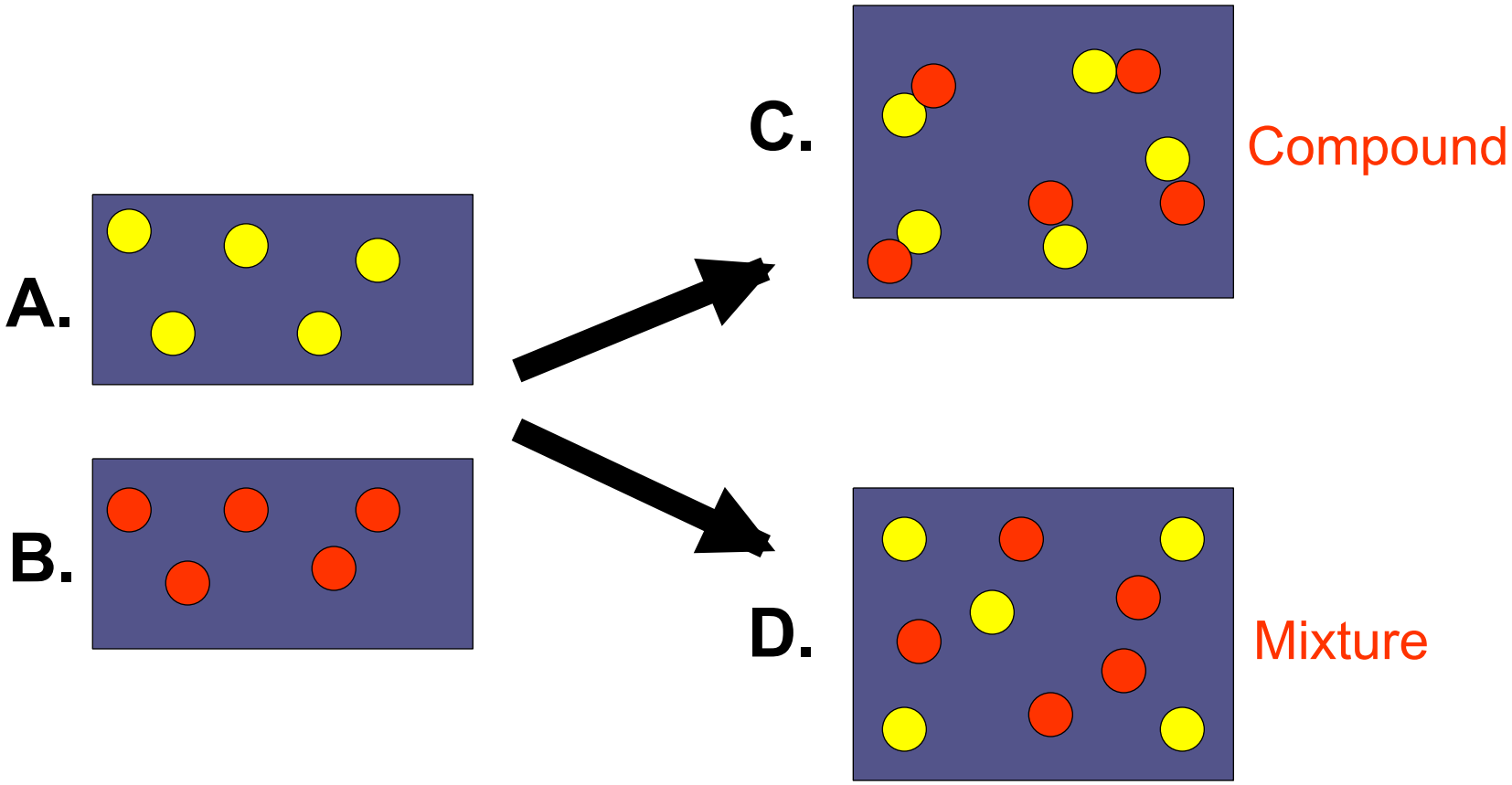
(c) Molecules of a compound



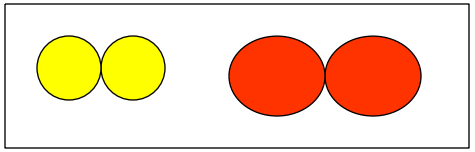
(d) Mixture of elements and a compound

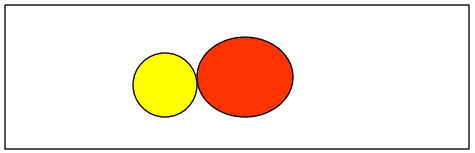
Distributed Summarizing

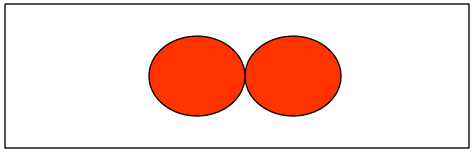
The diagram below shows how two elements can be mixed together…Which is a Compound? A Mixture?

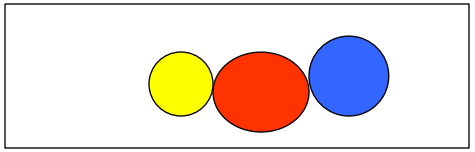


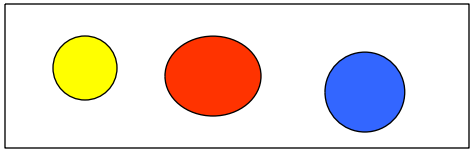
Match the Picture to the Description

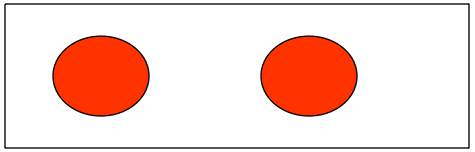












Compound of 2 Elements

Mixture of Molecules

Element Molecule

Compound of 3 Elements

Element/ Atoms

Mixture of Atoms

Additional Review Activities
[see resources]

Vocabulary Matching Pairs

Directions: Name: _____

Place the definition next to the correct vocabulary word. Glue the definition into the correct box.

Matter	
Atoms	
Molecules	
Compound	
Heterogeneous	
Homogeneous	

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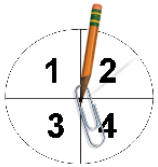
Types of Matter Cube Review

Types of Matter Cube Review

Directions:

- Take a look at the cube. Each side identifies one type of matter (Atoms, Molecules, Compounds, Mixtures, Elements, Pure Substances).
- Take a look at the Spinner provided. The Spinner contains the numbers 1-4. Take the jumbo paper clip provided and place the top loop over the star on your numbered circle. Then place your pen or pencil in the loop (see the image below if needed). Gently hit the paper clip with your finger to practice using the spinner.



- Decide which player will go first.
- The first player will roll the cube to identify which type of matter he/she will use for the task. Then, the player will use the spinner to determine the task. If you spin a **1**, your task is to **define/describe** the type of matter. If you spin a **2**, your task is to **give an example** of the type of matter. If you spin a **3**, your task is to **compare the type of matter to another type of matter on the cube**. If you spin a **4**, your task is to **illustrate the type of matter**.
- Partners take turns rolling the cube and using the spinner. Each player will write down his/her tasks on the Response Sheet provided. If you roll a Type of Matter and a Task that you have already completed, Spin or roll again.
- The answer key can be used for reference (hints) or for checking answers.