

States of Matter

4th Grade

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References:

- Kelly

Benchmarks:

SLC/GLI #: PS4

Objectives:

The objective of this lesson is to teach states of matter: explain that matter has different states (solid, liquid, and gas) and that each state has distinct physical properties: has distinct shape/takes shape of container, compressible/incompressible, flows/doesn't flow, invisible/visible.

Materials:

- 3 cups: 1 with a liquid (water), 1 with a solid (I used marbles), 1 with a gas (I just covered the cup with plastic wrap and a rubber band, so my cup contains air)
- aquarium full of water
- 3 stations:
 - Station 1: liquid and gas – I used plastic drinking straws, some with water in them and others just with air in them (I melted the ends so that the materials couldn't escape)
 - Station 2: liquid and solid – I used two cups, one with water in it, and one with a whole bunch of pennies (could use any solid)
 - Station 3: solid and gas – I filled one balloon with air and stuffed another balloon with something solid

Initial Demonstration:

The initial demonstration should make examples of each of the states of matter: solid, liquid, and gas. It should also show differences between the difference states of matter. First I will ask the students what I have in each of the cups and see if they can tell me what state of matter each thing is in. They will probably think that the cup with air in it is actually empty. This is where the aquarium with water comes in. You can transfer the air from one cup to another underwater and they can actually see the air move from one cup to the other. But by saying there's nothing in the cup, they should get to a characteristic of a gas that it's invisible.

Next see if they can help describe some of the characteristics of solids, liquid, and gases (described above in objectives). Make a list on the board. You can decide how much you want to help them and how complete of a list you want to make, or how correct, etc, before you have them go to the stations.

Target Observations:

- Students should notice that there are different physical properties between the different states of matter and that these differences help us distinguish between the different states.

Procedure:

Students will go to each station and experiment with the materials at each station. They need to identify what state of matter each object is. They also need to list two differences between the two different states of matter or one difference and one similarity between them. Students should cycle through each of the stations, making observations and filling out the worksheet that I made to go along with this lesson. This should start out as much inquiry as possible, so the students shouldn't be given too much help. Once they've gone through all the stations and have their worksheets filled out, then go back over everything with them about the correct observations they should have made. Go through all of the stations and properties, having them give their answers for each one, before making additions or corrections to the properties they came up with.

Target Observations:

- Students should notice different physical properties between the different states of matter.

Target Revised Model:

- Students should be able to distinguish the differences between the three states of matter.
- Students should be able to list physical properties of each of the states of matter.

Summary:

This lesson taught states of matter by explaining that matter has different states (solid, liquid, and gas) and that each state has distinct physical properties: has distinct shape/takes shape of container, compressible/imcompressible, flows/doesn't flow, invisible/visible. Students completed an activity by going through stations with different combinations of the three states of matter at which they had to list the state of matter of each object at the station and list similarities and differences between the physical properties of each state of matter at the different stations.