Properties of Air Student Investigations

Station 1 – Does Air Take Up Space?
Materials: 2 balloons
Task: Blow up one balloon & tie it
Observations of blown up balloon as compared to empty balloon:

Claim (air does or doesn't take up space)

Evidence that supports the claim:

Station 2 – Does Air Have Weight?
Materials: 4 balloons, air pump, balance
Task: Assemble two sets of double balloons. A double balloon is a set of two balloons, with one balloon inserted into the other balloon. Sliding the balloons over the eraser end of a pencil will help insert one balloon inside the other. Use the balloon pump to inflate and tie off one of the double balloons. Only the inner balloon needs to be tied. Use one hand to squeeze the balloons against the pump nozzle and the other hand pump rapidly to inflate the double balloon to near-maximum size.

Weigh both sets of double balloons (one inflated and one not) with the balance.

Observations:

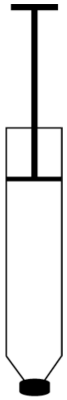
Claim (air does or doesn't have weight)

Evidence that supports the claim:

Station 3 – How does the compressibility of air and water compare?
Materials: 2 syringes, cup of water
Task: Take one syringe and pull to the 5 ml mark. Take the 2nd syringe and fill with water to the 5 ml mark (*be careful to remove air bubbles*).

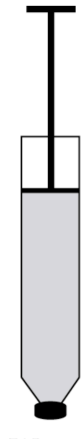
Air Syringe
Cover the end of the air syringe with one of your fingers and push the plunger. Does the plunger move? How far? What happens when you release the plunger but still have the end covered with your finger?

Observations-include sketch and details of what you see:


Air

Water Syringe
Cover the end of the water syringe with one of your fingers and push the plunger. Does the plunger move? How far? What happens when you release the plunger but still have the end covered with your finger?

Observations-include sketch and details of what you see:


Water

Properties of Air Student Investigations

Wait to complete this page until after you view the Particle Magnifier with Air and Water Interactive!

Explaining the compressibility of water and air

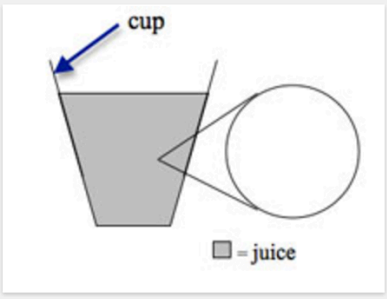
Use Annotated drawings to explain observations. *See the diagram at the bottom of the page for how to create an annotated drawing with a magnifier.*
• How do you explain the difference in the compressibility of air and water?
• What would you see at the particle level to explain what is going on?

Model for an Annotated Drawing Poster

Annotated Drawings

1. Provide an explanation.
2. Use simple outline drawings.
3. Use a magnifier to show things too small to see.
4. Use labels, arrows, and a color key.
5. Add notes to explain important ideas.

You can change your annotated drawing as your understanding and your explanation changes.



Station 4 – How strong is a bag of compressed air?
Materials:
Per Participant - One gallon (nonzip) plastic bag, Masking tape, Flexible straw
For Class: Items to test (pens, notebooks, phone, laptop, book, etc.)
Task: Make predictions about what you will and won't be able to lift with your bag of compressed air. Test them out.

Predictions – What do you think you will and won't be able to life with your bag of compressed air?

Items it Will Lift	Items it Won't Lift

Data Collection – Record your observations in the following table.

Item	Observations	Item	Observations

Make an annotated particle drawing of what was happening in the bag as it lifted one of the items.

THINK – PAIR - SHARE

Based on your observations, how strong is a bag of compressed air? How do you know?

My name: _____ Partner's name: _____

Think – my thoughts or understanding at this time.	**Pair** – what I understand my partner is telling me.
Share – our common understanding after talking, what we can share with others or what was most important from our dialogue.	

Write a scientific explanation that answers the question and uses evidence to support answer. Use scientific principles about the properties of air in your explanation.

CLAIM - EVIDENCE - REASONING WORKSHEET

QUESTION:	
CLAIM:	
EVIDENCE (Primary **data** that you collected OR **data** from a reliable source, including observations of the natural world and results from a controlled experiment)	**REASONING** (Information that explains **how** the evidence **supports** your claim. Often scientific background from text, lecture, or other sources)