

TABLE OF CONTENTS

INTRODUCTION	v
UNIT 1—OBSERVING	1
Activities 1–5	
1 What Makes a Group?	5
2 What Is That Sound?	9
3 High and Low, Loud and Soft Sounds.....	12
4 What Does It Smell Like?	15
5 Tasting Party	17
6 Taste These!	20
7 How Does It Feel?	24
8 Looking Closer—With Magnifiers.....	27
1–8 Connections	29
UNIT 2—WATER.....	31
Activities 9–14	
9 Exploring Water.....	33
10 Water—A Closer Look.....	37
11 The Shape of Water	41
12 Same Volume, Different Shape	44
13 Evaporation	47
14 Condensation	51
9–14 Connections	54
UNIT 3—BUOYANCY AND SURFACE TENSION	59
Activities 15–18	
15 Can It Sink? Can It Float?	61
16 Rounded Water?	63
17 Float a Paper Clip!.....	66
18 How Do Boats Float?	69
15–18 Connections	72
UNIT 4—AIR	75
Activities 19–24	
19 Exploring Air.....	77
20 Air Can Be Anywhere	80
21 Air Does Take Up Space!	82

Free resource from www.criticalthinking.com. Commercial redistribution prohibited

22	What’s in an “Empty” Cup?	85
23	What’s in a Bubble?	88
24	Dancing Grapes!	90
19–24	Connections	93
UNIT 5—MOVING AIR—AIR PRESSURE		95
Activities 25–29		
25	Fans and Pinwheels	95
26	Streamers	99
27	Parachutes.....	102
28	Paper Airplanes.....	106
29	The Strength of Air.....	109
25–29	Connections	112
UNIT 6—FORCE		113
Activities 30–35		
30	Push and Pull	115
31	Earth-Pull (Gravity).....	117
32	How Much Force Does It Take?.....	119
33	Getting Things Moving, Keeping Them Moving.....	123
34	Force of Falling Objects	125
35	Force of Rolling Objects	128
27–30	Connections	130
UNIT 7—SPACE, LIGHT, AND SHADOWS.....		133
Activities 36–41		
36	Position in Space	137
37	The Path of Light.....	140
38	Blocking the Path of Light	143
39	Indoor Shadows.....	145
40	Outdoor Shadows	149
41	Mirror Images.....	152
36–41	Connections	155

ACTIVITY 24: DANCING GRAPES!

Goal: To understand that air bubbles can make objects rise in a liquid

Skills: Observing, describing, inferring, predicting, explaining, sequencing, generalizing, and comparing

Materials: 2 liters of unopened club soda
1 large bunch of seedless grapes
7 transparent plastic tumblers

Preparation: 1. Divide the students into 6 groups.
2. Distribute to each group:
 1 plastic tumbler
 2–3 grapes
3. For best results, don't open the club soda until you're ready to use it—the fizz is very important!

Preparation Time: 5 minutes

Lesson Time: 10–15 minutes

— Procedure and Questioning Strategy —

Tell students to observe what you are doing. Hold up a bottle of club soda, tell the students what it is, open it, and pour some into a plastic tumbler. Hold the bottle and the tumbler of club soda so all students can see them.

1. What did you observe?

You poured club soda into the tumbler.

2. Describe the club soda.

It has bubbles in it. The bubbles are moving around in the club soda.

3. What do you think is in the bubbles?

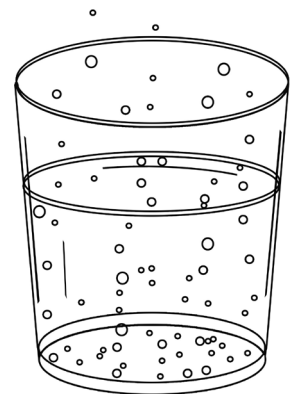
Air.

Hold up a few grapes.

4. What do you think the grapes will do when we drop them into the club soda?

(Sink or float—predictions will vary.)

5. We're going to test our predictions in your groups. I will pour some club soda into your tumbler. As soon as I do, drop 2 or 3 grapes into the tumbler. Observe the grapes carefully for a few minutes, then discuss together what you have observed and why you think it happened. Try to talk quietly so other groups won't hear what your group says. Later we will share what we observed.



Pour club soda for each group and allow time for observation and discussion. When the groups have completed their observations and discussions, continue with the lesson.

6. What are the bubbles doing in your tumbler of soda water?

They are moving up to the top of the soda water.

7. Put your hand over the top of the tumbler. Can you feel the bubbles that have gone into the air?

Yes.

8. Why do you think they are doing that?

There is air in the bubbles.

9. What did the grapes do when you first dropped them into the club soda?

They sank to the bottom of the tumbler.



10. What happened after the grapes had been on the bottom for a little while?

There were bubbles on the grapes.

11. Describe what happened next.

The grapes moved up and down in the soda.

12. Why do you think the grapes moved up in the soda?

There were lots of bubbles on the grapes.

13. What is in the bubbles?

Air.

14. Do you think the air bubbles are lighter or heavier than the grapes?

Lighter.

15. So how do you think the bubbles made the grapes go up?

The bubbles pulled the grapes along with them as they floated up.

16. What happened when the grapes got to the surface (top) of the soda?

They went back down again.

17. Why do you think that happened?

The bubbles on top of the grapes burst when they hit the air above the soda.

18. How do you know?

We could feel the bubbles bursting on our hands. There were fewer bubbles on the grapes.