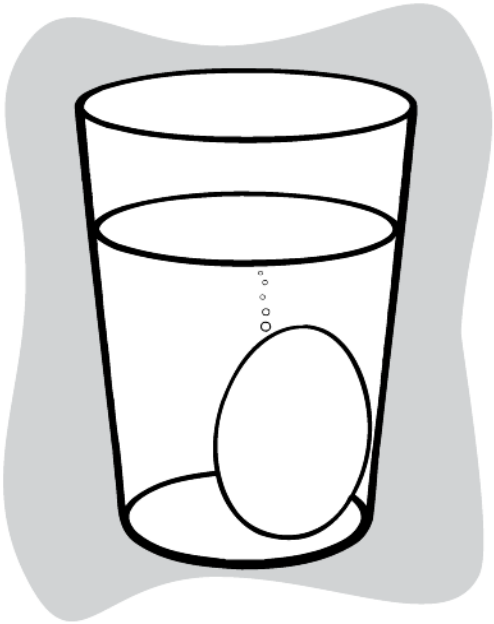
Chemical

42

The Yolk's on You



Objective: Students will demonstrate a chemical reaction.

Question: What will happen to an egg when it is soaked in vinegar for two days?

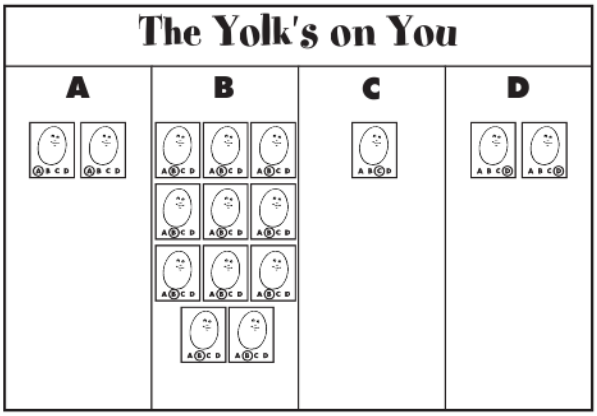
Science Background: A **chemical reaction** occurs when two or more substances combine chemically to form a new substance. Calcium carbonate ($CaCO_3$) is the chief component in the shell of a chicken egg. The calcium carbonate makes the eggshell hard so that the developing chick is protected from the weight of the parent during incubation. Vinegar (CH_3COOH) is an acid that reacts chemically with calcium. When an egg is soaked in vinegar, the vinegar will dissolve the calcium in the eggshell, rendering the shell rubbery.

Materials:

- laminated graph chart
- page 176, reproduced for each student
- page 177, reproduced, one icon for each student
- plastic cups
- uncooked eggs
- vinegar
- paper towels
- newspaper

Teaching Procedure:

1. Post the laminated graph chart at the front of the class. Label the top of the graph "The Yolk's on You."
2. Have each group cover its work area with newspaper. Distribute an investigation sheet and an egg icon to each student.
3. Show students the materials to be used in the experiment. Read aloud the question on the investigation sheet. Refer students to the picture of the experiment on the sheet and briefly explain how the experiment will be set up. Answer any questions students might have about the procedure.
4. Distribute an uncooked egg and a cup filled with vinegar to each group. Have students examine and feel the egg and record their observations on the investigation sheet. Then instruct them to place the egg in the cup of vinegar. Tell them they will leave the egg in the vinegar for two days.
5. Have students select an answer to the question posed on the investigation sheet about what they think will happen to the egg after soaking in vinegar for two days. Tell them to record their answer both on the sheet and on the egg icon. Collect the icons and use them to create a class graph as shown.



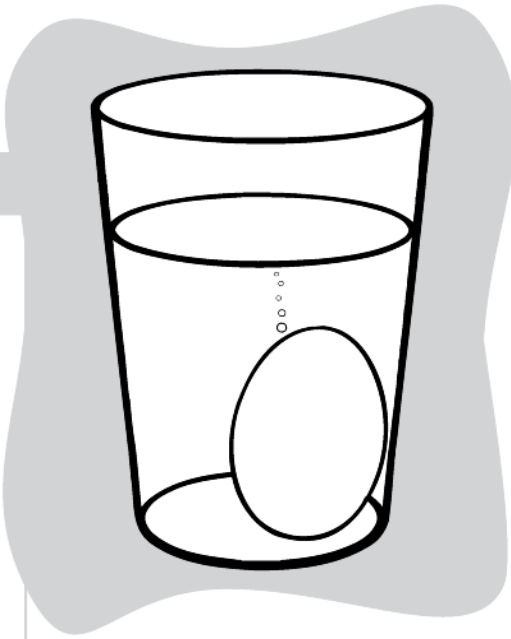
6. After two days, have students remove the egg from the cup of vinegar and wipe it with a paper towel. How has the egg changed? (The shell is now rubbery rather than hard.) Have students record their observations on the investigation sheet.
7. Discuss with students what they observed. Encourage them to offer an explanation for why the eggshell turned rubbery. Once the class has had a chance to discuss their theories, introduce the idea that a chemical reaction took place between the vinegar and the eggshell. That chemical reaction turned the shell rubbery. You might want to explain that the vinegar dissolved the chemical (calcium) in the shell that made it hard.
8. Have students answer the conclusion question on the investigation sheet. Finally, have them draw a picture of the experiment on the back of the sheet. Encourage them to label their drawing and provide a caption that explains what happened in the experiment.

Try this for fun:

Have students try soaking chicken bones in vinegar for several days. Like the eggshells, the bones will eventually become rubbery as the calcium in them dissolves.

Name _____

The Yolk's on You



Question

What do you think will happen to the egg when it is soaked in vinegar for two days?

The egg will _____.

A turn black

B become rubbery

C harden on the inside

D break open

Procedure and Observations

1. Observe your egg. Describe how it feels.

_____

_____

2. Place the egg in a cup of vinegar and let it sit for two days. Then remove the egg and wipe it off with a paper towel. Describe the egg again.

_____

_____

Conclusion

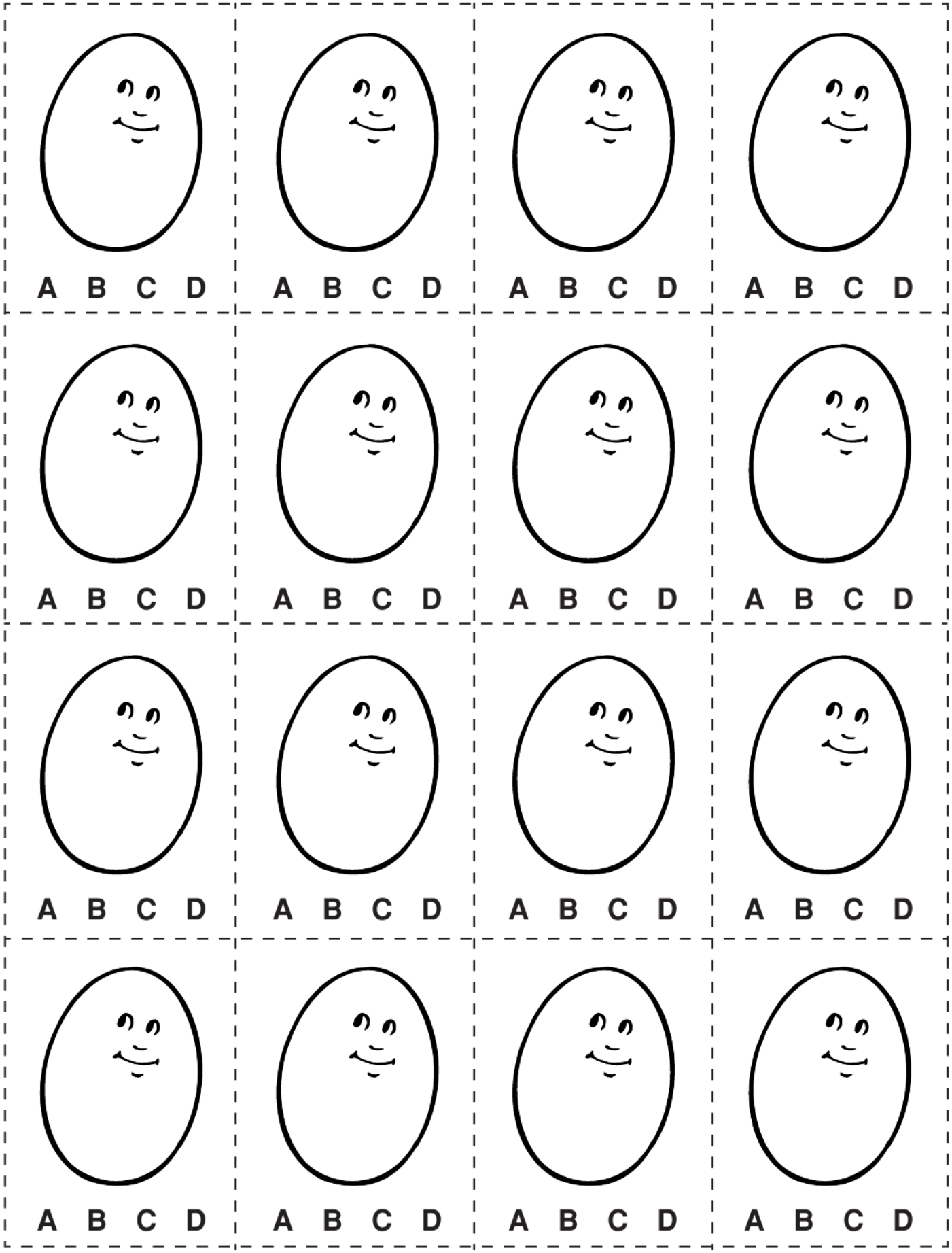
How can you explain what happened to the egg in the experiment?

_____

_____

_____

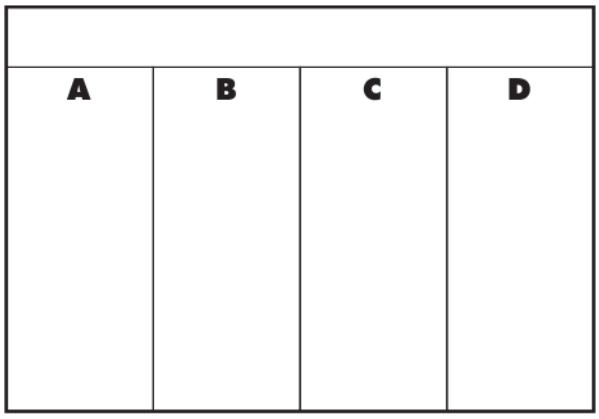
On the back of this sheet, draw a picture showing what happened in your experiment. Label your drawing and write a sentence that describes what it is showing.



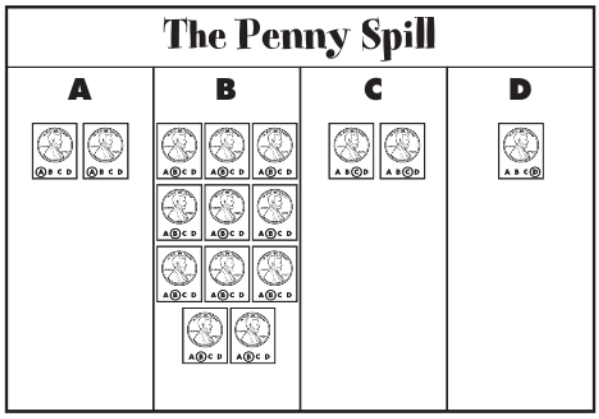
Graph Chart

Early in an experiment, students will be asked to guess what they think will happen in the experiment. While these responses are not technically "predictions," they can be useful in identifying student misconceptions before the experiment begins. These misconceptions may then be discussed once the experiment is complete. The graph charts also function to get students excited about learning the outcome of the experiment.

Prepare a single graph chart that can be reused for each experiment. Use a permanent marker to draw the outline of the chart on a large piece of tagboard. If you are able to laminate the chart, all the better. Then you can use erasable markers to write the name of the experiment at the top of the chart as shown.



Blank Graph Chart



Completed Graph Chart

Post the chart on a corkboard or other place that will accommodate the pushpins used to hold the graph icons to the chart.

Portfolios

Create individual portfolios for each student to keep his or her completed investigation sheets in. Use a colorful file folder secured with ribbon.

- Reproduce the cover on page 303 for students to color and glue to the front of their portfolios.
- Reproduce the experiments log on page 304. After doing each experiment, help students add the experiment to the log.

Decide on a place where the portfolios will be kept, and instruct students to add their investigation sheet to their portfolio after each experiment is completed. The portfolios will allow you and the students to keep track of the work they have completed. Students may take their portfolio home and share their work with their family.