

Concept/Topic: Science, Health and Wellness

General Goals:

- Students will compare the acidic effect of liquids on an egg's shell
- Students will rank the acidity of the liquids by observation and use of pH paper
- Students will predict the effect of acidic beverages on teeth

Indiana State Standards: (refer to your individual state curriculum guidelines)

Health and Wellness:

- 4.1.1/5.11 - Explain the connection between behaviors and personal health.
- 4.1.4/5.14 - Explain ways to prevent common health problems.

Science:

- 4.2.5 - Write descriptions of investigations, using observations and other evidence as support for explanations.
- 4.2.7 - Identify better reasons for believing something than “Everybody knows that ...” or “I just know,” and discount such reasons when given by others.
- 5.2.4 - Keep a notebook to record observations and be able to distinguish inferences* from actual observations.
- 5.5.1 - Make precise and varied measurements and specify the appropriate units.

Materials and Resources:

- Acid and Sugar Resource card (PDF provided at www.DrinksDestroyTeeth.org)
- Lab sheet (PDF provided at www.DrinksDestroyTeeth.org)
- pH strips (Indiana schools: request free pH strips at www.DrinksDestroyTeeth.org)
- DrinksDestroyTeeth Powerpoint(available at www.DrinksDestroyTeeth.org)
- DrinksDestroyTeeth App interactive lessons available on iTunes and Google play
- 8 hard boiled eggs
- 8 glass or plastic containers
- ½ cup,(118 ml) different beverages
- Suggest water, milk, Gatorade, Monster, Coke, Mountain Dew and vinegar.
- Measuring cup
- 1 sturdy paper plate
- Marker or tape to label containers
- Paper towels
- Fluoride/optional



Get the Drinks Destroy Teeth App
on iTunes or the Google Play Store



Procedures:

1. Place students in small groups.
2. Have each group observe one of the eggs and record their observations. Students should include the color, texture, and mass (if possible) of the egg.
3. Students should also include the hardness of the egg. To do this, have students scrape the surface of the egg with their thumbnail. (CAUTION: Students do not want to BREAK the shell!) Student should record which one they think is harder – their nail or the shell.
4. Label the cups. Measure each liquid and pour it into the correct cup.
5. Record the pH of each liquid, discuss what pH scale indicates (do before placing the egg or repeat with new drinks because of chemical reaction with the egg) Egg alters pH
6. Place one egg in each cup of liquid.
7. Label the paper plate per group and place the cups on the plate.
8. Return the eggs to each group. Observe in 24 hours, 48, 72 hr intervals.
9. Have students observe each egg and record their findings. They should again include the color, texture, mass, and hardness of each egg.

Concluding the Lesson: Drinksdestroyteeth App

1. Have students read Drinks Destroy Teeth. Discuss the effects of acid on the egg shells. Have students rank the liquids from most acidic to least acidic based on their observations.
2. Compare the eggshell to the enamel of a tooth. Have students predict how each drink might affect their teeth. (Remind students that vinegar is NOT a drink.)
3. Have students choose which drinks are most beneficial for their teeth and explain why.
4. Go to the DrinksDestroyTeeth App and play the video on acid. Allow students to do interactive science lab on Power of pH. Suggest waiting to use the app until students have done the egg experiment; this introduces them to the concept of acid. Also wait to introduce the 3D mouth until lesson 2. Quiz at end of lessons 1 and 2 on App.

Variations:

- Soak one egg in a fluoride solution (ACT or another fluoride rinse) to compare
- Using only vinegar, observe and record the effects on the egg at 10 minutes, 30 minutes, 2 hours, 4 hours, and 24 hours
- Measure the volume of the egg using the displacement method.

Resources:

- Visit www.DrinksDestroyTeeth.org to download lab sheets, request pH strips and find additional resources
- DrinksDestroyTeeth App available on iTunes and Google play