



EGGS'CEPTIONAL EXPERIMENTS

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Lesson Summary for Grade 4

Chemical changes can become evident using objects that children are familiar with in their everyday lives. Attraction of positive and negative charge becomes evident when dyeing eggs and crystals form inside eggshells to reflect natural patterns found in geodes. And what can be more puzzling than spinning two eggs of the same size, color, and shape only to have one whirl around and the other spin like a “dud?”

Students see evidence of chemical reaction and follow the scientific method to hypothesize, observe, and reach conclusions. The key science topics are chemical reaction, geodes, and the scientific method (hypothesis, procedure, observation, conclusion). Lesson plans are included for cross-curricular integration into language arts, math, and social studies. All of these experiments are tied together through a day of “eggs’ceptional experiments” introduced by the book *Rechenka’s Eggs* by Patricia Pollacco. Students enjoy discovering and writing about patterns in nature. All of the materials are readily available, most of them at the grocery store.

Science Activity 1: Babushka’s Eggs’periment

Students learn about cause-and-effect relationships while discovering that eggs dye better when vinegar is added to the dye bath.

Source: Gertz, S.E.; Portman, D.J.; Sarquis, M. *Teaching Physical Science Through Children’s Literature*; McGraw-Hill: New York, 1996; pp 119–128. (ISBN 007064723-2)

Key Science Topics:

- egg dyeing
- scientific experimentation
- cause and effect

Key Process Skills:

- identifying
- scientific experimentation
- listening
- discussion
- writing/explaining

Science Activity 2: Eggshell Geodes

This activity simulates a geode’s formation using half an eggshell as a “hollow rock” in which crystals can grow from a saturated solution of a mineral salts.

Source: Sarquis, J.; Sarquis, M. *Fun With Chemistry: A Guidebook of K–12 Activities*

from the Institute for Chemical Education; Institute for Chemical Education: University of Wisconsin-Madison, 1993; Vol. 2, pp 281–286.

Key Science Topics:

- crystals, crystallization
- evaporation
- solutions

Key Process Skills:

- discussion
- experimentation
- hypothesizing

Science Activity 3: Crystals from Solutions

Students use a variety of saturated solutions to grow crystals.

Source: Sarquis, J.; Hogue, L.; Sarquis, M.; Woodward, L. *Investigating Solids, Liquids, and Gases with TOYS*; McGraw-Hill: New York, 1997; pp 141–148. (ISBN 0-07-048235-7)

Key Science Topics:

- capillary action
- crystals
- saturated solutions
- solids

Key Process Skills:

- predicting
- comparing/contrasting

Science Activity 4: Mystery Eggs

Students investigate the properties of plastic eggs filled with solids, liquids, and gases.

Source: Sarquis, J.; Hogue, L.; Sarquis, M.; Woodward, L. *Investigating Solids, Liquids, and Gases with TOYS*; McGraw-Hill: New York, 1997; pp 59–70. (ISBN 0-07-048235-7)

Key Science Topics:

- solid, liquid, and gas phases
- fluids

Key Process Skills:

- communicating
- comparing/contrasting
- investigating

Writing Activity 1

Students write in their science journals.

After completing the Science Activity Babushka's Eggs'periment, invite students to write in their Science Journals. Have students follow the scientific method to record hypothesis, procedure, observation, and conclusion.

Writing Activity 2

Students write poems.

After successfully growing Eggshell Geodes in the Science Activity, invite students to use magnifying glasses to closely observe their creations and write poems about them. Encourage students to include the colors and shapes of the crystals in their poems.

Writing Activity 3

Students write about patterns in nature.

After completing the Eggshell Geodes Science Activity, challenge students to describe in writing patterns seen in nature, both simple and complex.

Speaking Activity

Students give an oral presentation to classroom guests.

Have selected students deliver an informal oral presentation to guests visiting the classroom to observe science experiments and/or activities.

Art Activity

Students create Ukrainian Easter eggs.

After Rechenka the goose breaks all of Babushka's eggs, she lays beautifully decorated eggs for Babushka to take to the festival. The story is inspired by the author's hobby of painting beautiful Ukrainian designs on eggs. Invite students to decorate hardboiled eggs using vinegar and food coloring solution and also wax crayons. Students can also create paper Ukrainian Easter eggs by decorating an enlarged egg shape photocopied onto drawing paper. Display students' art in the classroom.