

# Teacher Guide for ASK

October 2010: Secrets of Alchemy

Betty Lou Askin, a retired educator, who lives in Toronto Ontario, prepared this guide.

## Objectives:

- To understand how the science of chemistry came to be.
- To appreciate the various elements in the world and their uses
- To realize and respect the beauty and danger of fireworks.

## Pre-reading:

If the students are not aware of the meaning of **alchemy**, ask them to look at the cover and try to predict its meaning. Use the Table of Contents in the same manner.

**Vocabulary to be found in this magazine:** ecologist, permafrost, wetland, huitlacoche, fungus, carbon dioxide, algae, alchemy, alchemist, elements, chemistry, metalsmiths, phosphorus, pharmacy, atom, sulfur, mercury, copper oxygen, carbon, nitrogen, molecules, pyrotechnician, saltpeter, elixir, indium, selenium, lead oxide, potassium benzoate and potassium nitrate.

## Scoops (pages 2-3)

### Busy Beavers Build Big

- What is Google Earth?
- Where is the biggest beaver dam? What size is it?
- Why is the beaver dam so long?

### Finish Your Fungus

- What is **huitlacoche**?
- Why is corn smut good for humans?
- What do you think that corn growers might do in the future?

### Great Skates

- What are Chariot Skates?
- Why is the lack of boots important?
- What are the advantages of Chariot Skates?

### Just Add Water

- Explain why increasing the whale population would help to lower global warming.

**Ask** the students to look for more science "scoops" while they read the newspaper and watch television news/shows. Create a bulletin board to post their information.

## Nestor's Dock (pages 4-5)

- You may need to explain to the students about the philosopher's stone. Or, maybe they are familiar with this concept due to television/movie/books that have given this type of information.
- Why were the friends disillusioned with the idea of the future?

### **Secrets of the Alchemists** (pages 6-13)

Use these ideas as a focus for the reading of this article:

- How was the science of chemistry developed?
- What gift did the gift did the craftsmen of ancient Egypt give to the world?
- Explain why the Egyptian and the Greeks made a good team.
- What was the thinking of Aristotle? Do you think that he was right?
- What was the philosopher's stone according to the Arab alchemists?
- Describe some of the contributions made by alchemist during the Middle Ages. Make a list.
- Explain Hennig Brandt's contribution to the knowledge about chemicals.
- Why is Paracelsus important to us today?
- Make a list on the chalk board or on chart paper showing the contributions made by Robert Boyle.
- How did chemist Antoine contribute to the concept of chemical change?
- Why was Lavoisier considered the father of modern chemistry?
- **Creative Drama:** There are 4 alchemists who are highlighted in this article. Ask a few students to read and prepare a personal biography using this information. Let them stand and recite the information as if they are the actual alchemist.

### **The Alchemist Apprentice** (pages 14-19)

- Do a picture walk-through of the art asking for comments and predictions.
- A] Read the story aloud. B) And/or, divide the class into groups of 6 to correspond with the characters in the story. Let the students in the groups read aloud their part of the fiction. Ask them to stop at the end of each page to discuss the content.
- **Discussion Ideas:**
  - What is the main idea of this story?
  - Provide details to support your main idea.
  - How did the alchemist earn his living?
  - Make a list of 3 that the young apprentice learned in this article.
  - Why did the apprentice scratch out the **al** in alchemist?
  - How did the apprentice learn to get gold?

### **What Are You Made Of?** (pages 20-21)

- What are the four main elements that make up your body?
- What are some of the other elements present in your body?
- What are molecules?

### **Iron Kid** (page 21)

- Enjoy the experiment.
- Why do we need iron in our bodies?

### **Sneaky Tricks of the Alchemists** (page 22)

- Read this article aloud.
- Ask the students to write 3 paragraphs, one for each sneaky trick. Tell them that they are to use their own words to relay the information.
- Have them read their version aloud to the rest of the class.

### **Scratch, Swoosh, Foom, Boom** (pages 23-27)

Reading for information:

- Where and when were fireworks invented?
- What is a pyrotechnician?
- Why are fireworks not suitable as a lab chemistry?
- What is the main ingredient in fireworks?
- What are the ingredients in gunpowder?
- Explain how a firework is created.
- Describe how a fireworks show is set up.
- Why are special clothes worn in a fireworks factory?
- What makes the colors in fireworks?
- Why does Bickar like to use charcoal?
- **Creative Work:**
  1. Make drawings of fireworks using art material.
  2. Write a newspaper article to accompany the drawing telling about a fireworks show.

### **Making Change** (page 31)

Read the information on this page. Ask the students to follow the instructions. Have the students share their creations.

### **Jimmy the Bug** (page 32)

- Explain why you sneeze.
- What can cause you to sneeze?
- How can we stop spreading germs?

### **Marvin and Friends**

- Why was Marvin trying to be an alchemist?
- Was he planning on being honest?
- Explain why Rats wanted Marvin to be a real alchemist.