Girl Guides of Canada Guides du Canada
BRITISH COLUMBIA COUNCIL

MAD SCIENTIST

AN INSTANT MEETING FOR SPARKS
FROM THE BC PROGRAM COMMITTEE

This will take one meeting and can be done inside your regular meeting place. The Sparks will earn their Science STEM challenge crest with this meeting. Note that you can substitute any of the activities from the ***STEM Challenge: Science*** booklet and still earn the crest. You may want to ask for parent helpers to assist you.

**adapted from the "Sparks Instant Meeting Booklet #1" August 2009.*

Meeting Plan

Before the meeting: Meeting space will need to be decorated prior to Sparks' arrival. Guiders dressed as scientists in lab coats, gloves and safety goggles. The meeting room is decorated with blinking Christmas lights, beakers with collared water, science equipment and shredded plastic of streamers hanging from doorway for a "Decontamination Area". The girls arrive and depart through this doorway.

10 min:	Gathering: Thing in a Jar Colouring
5 min:	Spark Opening
40 min:	Rotate through stations
	10 min: Taste Test
	10 min: Magical Milk
	10 min: Dancing Cranberries
	10 min: Ack, It's Gak!
If time:	Active game of your choice
5 min:	Spark Closing

60 minute meeting. Approximate activity times shown.

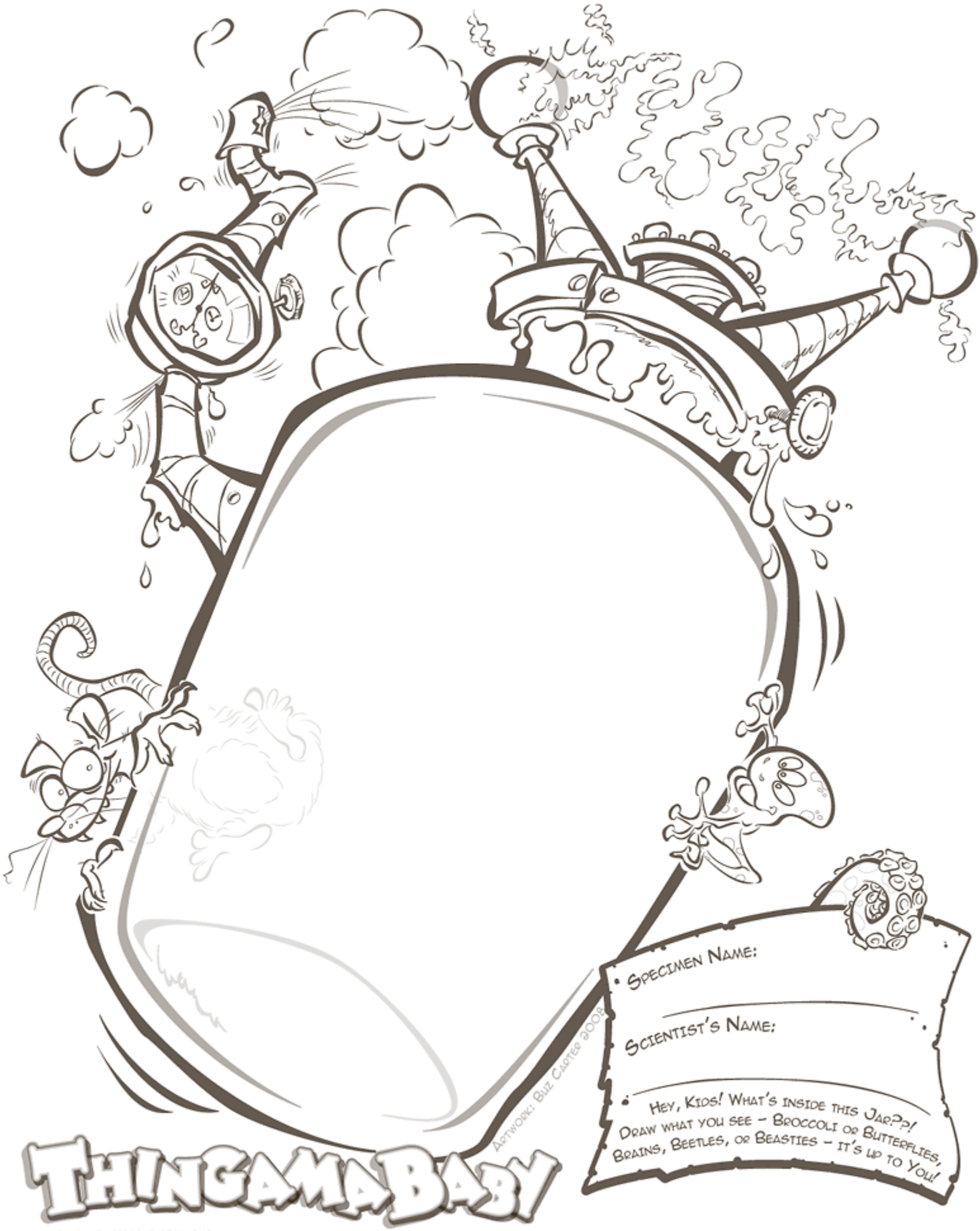
Program Connections

Exploring and Experimenting Keeper

STEM Challenge: Science

Meeting Supplies

- ❑ Thing in a Jar colouring sheets
- ❑ crayons or markers
- ❑ lab coats for Guiders
- ❑ gloves
- ❑ safety goggles
- ❑ Christmas lights
- ❑ beakers
- ❑ coloured water
- ❑ large plastic garbage bags or streamers
- ❑ assorted Lifesavers
- ❑ pie plate or similar wide, shallow dish
- ❑ milk
- ❑ food colouring in two or more colours
- ❑ dish soap
- ❑ a plastic cup
- ❑ cranberries or raisins
- ❑ clear pop
- ❑ cornstarch
- ❑ water
- ❑ a bowl



THINGAMABABY

THINGAMABABY.COM

Opening Discussion

Explain that this is a special meeting and how the four stations will work on a rotating basis.

Taste Test

Supplies

- ❑ Lifesavers or other flavoured candies

Experiment 15 from **Science in a Box** (BC Girl Guides).

Directions

1. Work in pairs.
2. Close your eyes and hold your nose, while a friend feeds you a lifesaver.
3. You should try to guess what flavour the lifesaver is, without letting go of your nose.
4. Observations should proceed for a minute or so as the candy dissolves in your mouth.
5. Is there any change in the taste of the candy from the beginning to the end of the experiment?
6. Describe the tastes.
7. Switch and let your friend try.

Magical Milk

Supplies

- ❑ pie plate or similar wide, shallow dish
- ❑ milk
- ❑ food colouring in two or more colours
- ❑ dish soap

From **STEM Challenge: Science** (BC Girl Guides).

This activity is a spectacular demonstration of the effects of surface tension in a liquid.

Directions

1. Pour the milk into the pie plate so that it is about 1 cm deep.
2. Put a few drops of food colouring into the milk. Use two or more colours, and put them at different locations in the dish so that the colours stay separate for now.

   Note: For a great effect, make several spots of each colour.
3. Add a small drop of dish soap in each of two or three different locations in the dish and watch what happens.
4. Investigate what would happen if you used milk with different fat contents (eg. skim milk, 2% milk, homogenized milk, buttermilk, etc.)

What's Happening?

Most liquids, including milk, have surface tension. That means the molecules of milk are attracted to one another and they want to stick close together, creating a kind of "skin" on the surface of the milk. You can see this if you fill a small glass up to the brim with water, then use an eyedropper or small spoon to carefully add more water, drop by drop. Instead of spilling over, the water mounds up at the top of the glass – surface tension is holding the water together, so you can actually fill the glass up a tiny bit higher than the brim.

When you first put the drops of food colouring into the milk, it forms small coloured patches because the surface tension in the milk won't let the food colouring spread out very much. Dish soap breaks the surface tension, forcing the milk molecules to move away from one another. They take the food colouring with them, resulting in the colourful swirling patterns you see in the dish.

Dancing Cranberries

Experiment 20 from **Science in a Box** (BC Girl Guides).

Supplies

- ❑ a plastic cup
- ❑ 5-6 cranberries or raisins
- ❑ 125 mL clear pop (half a glass)

Directions

1. Pour clear pop (Sprite, Ginger ale) into the cup.
2. Add the cranberries or raisins. Watch what happens.

What's Happening?

When you add the cranberries/raisins, they become coated with air bubbles. When they sinkdown, they collect more air bubbles and rise. When they go up they lose bubbles at the surface and start going down again. They keep going up and down for a long time.

Ack, It's Gak!

Experiment 1 from **Science in a Box** (BC Girl Guides).

Supplies

- ❑ ¼ cup cornstarch
- ❑ 3½ teaspoons water (add more if needed)
- ❑ a bowl
- ❑ food colouring (optional)

Directions

1. Add cornstarch to water in a bowl. Mix with hands (not spoon; needs warmth of hands).
2. When you touch the mixture gently, it should yield like a liquid. When you smack your hand down on it, it should resist like a solid. Add colouring if wanted. Play away!

What's Happening?

Substances can be solid, liquid or a gas (states of matter). This change between states can occur when there is a change of temperature or pressure. Gak is borderline between a solid and liquid.

